Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Source Area Response Completion Report

Revised: September 2, 2010

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List of Acronyms/Definitions

Company – Enbridge Energy, Limited Partnership

HSP – Health and Safety Plan

MDNRE – Michigan Department of Natural Resources and Environment

NREPA – Natural Resources and Environmental Protection Act

Oil Saturated Soil – Soils containing free-phase product capable of flowing or migrating as an oil and/or a sheen, either of which is affecting or threatens to affect navigable waterways.

ORCP – Oil Recovery and Containment Plan

PRWP – Pipeline Repair Work Plan

QAPP – Quality Assurance Project Plan

RAO – Removal Administrative Order

Response – The initial response to remove oil affected-media and/or sheen affecting and/or posing a risk to navigable water bodies

RPDIA – Response Plan for Downstream Impacted Areas

SAP – Sampling and Analysis Plan

SA – Source Area - Origin of crude oil release, located south of Enbridge pipeline 6B between the pipeline release point and Talmage Creek (Division A, Areas A-1-A-4).

SAR – Source Area Response Plan - A workplan describing interim response actions designed to protect navigable waters from the crude oil release

SARCR – Source Area Response Completion Report

U.S. EPA – Unites States Environmental Protection Agency

U.S. FWS – United States Fish and Wildlife Service

WTTDP – Waste Treatment, Transportation, and Disposal Plan

1.0 Introduction

1.1 Overview

The purpose of this Source Area Response Completion Report (SARCR) is to provide a final summary of the response actions conducted at the Enbridge Energy, Limited Partnership's (Company) Line 6B M.P. 608 crude oil release site in Marshall, Michigan. The SARCR specifically summarizes response actions, including excavation and removal of crude oil and oil saturated soil exhibiting the capacity to impact navigable waterways. These response actions were performed at the Source Area (SA), defined as the area designated as Division A, north of and between the pipeline release point and Talmage Creek (A1 through A4). The SARCR includes a written summary of response activities, with relevant supporting documentation, including field screening data, analytical data, and field and photographic documentation. The response actions were conducted in accordance with the United States Environmental Protection Agency (U.S. EPA) approved Source Area Response (SAR) Plan dated August 17, 2010. The SAR was prepared in response to the U.S. EPA Removal Administrative Order (RAO) dated July 27, 2010, including Section V, Subsection 18, Bullet Point 3, and provides a description of interim remedial activities required to address the excavation and removal of crude oil and Oil Saturated Soil from the SA. This SARCR serves as a final documentation of SA in Division A.

1.2 Site Release History and Boundaries

On July 26, 2010, a release of heavy crude oil from the Company's 30-inch pipeline (referred to as "Line 6B") was discovered. The crude oil originated from the Cold Lake deposit in Alberta, Canada. The oil is designated "heavy" due to its thickness or viscosity (heavy crudes typically have viscosity above 100 centipoise at reservoir conditions). Heavy crude are made up of hydrocarbons, resins, asphaltenes and inorganic fractions. Other light-petroleum fractions, or diluents, were added to the heavy crude to facilitate pumping of the media over long distances. The Company's pipeline release site is located just west of pipeline mile post 608 in Marshall, Calhoun County, Michigan, (North ½ Section 2, T3S, R6W, Latitude: 42.2395273 Longitude: -84.9662018) in an undeveloped rural area, south of town. The site location is shown on Figure 1.

The SA is comprised of an approximate 5-acre parcel, adjacent to the pipeline release location, as shown in Figure 1. During response activities, the SA was divided into four sub-units designated as A1 through A4. The SA (A1 to A4) is within a delineated wetland that is part of the Talmadge Creek watershed. Most of the surrounding area can be characterized as rural, including undeveloped and

agricultural areas. Vegetation in the SA consists of herbaceous emergent wetland plants in low lying areas, as well as brush and trees in upland areas.

In conjunction with the August 17, 2010 SAR, the following Work Plans were requested by the RAO and were prepared, submitted to the U.S. EPA and approved by the U.S. EPA as separate documents:

- Health and Safety Plan (HSP) - August 2, 2010
  - (Revised August 5, 2010 per U.S. EPA August 3, 2010 Notice of Approval with Modifications)
- Pipeline Repair Work Plan (PRWP) –August 2, 2010
  - (Revised August 5, 2010 per U.S. EPA August 3, 2010 Notice of Approval with Modifications)
- Sampling and Analysis Plan (SAP) –August 2, 2010
  - (Revised August 17, 2010 per U.S. EPA August 17, 2010 Notice of Approval with Modifications)
- Quality Assurance Project Plan (QAPP) – August 2, 2010
  - (Revised August 17, 2010 per U.S. EPA August 17, 2010 Notice of Approval with Modifications)
- Oil Recovery and Containment Plan (ORCP) – August 2, 2010
  - (Revised August 5, 2010 per U.S. EPA August 3, 2010 Notice of Approval with Modifications)
- Response Plan for Downstream Impacted Area (RPDIA) Plan– August 2, 2010
  - (Revised August 17, 2010 per U.S. EPA August 17, 2010 Notice of Approval with Modifications)
- Waste Treatment, Transportation, and Disposal Plan (WTTDP) – August 2, 2010
  - (Revised August 5, 2010 per U.S. EPA August 3, 2010 Notice of Approval with Modifications)

1.3 SAR Objectives and Metrics

The SAR (Section 1.6, page 5) identified the objectives associated with SA removal activities and the metrics for determining attainment. The primary objective under the SAR consisted of removal of crude oil, Oil Saturated Soil, and impacted media (vegetation covered with crude oil) from the SA that potentially threatened navigable waterways. Soil exhibiting a rainbow sheen was considered Oil Saturated Soil (Section 4.1, page 13 of the SAP). Additional field screening tests were performed, including volatile organic headspace analysis using a photo-ionization detector (PID) and oil sheen tests. Standard operating procedures (SOPs) for these field screening tests are described in Section 4.1 of the SAP, and in the Field Sampling SOPs (Appendix C of the SAP), except as modified below.

1.4 Deviations from SAP

Various deviations from the SAP were implemented and include.

- Oil sheen tests applied in the field differed in field methodology than what was proposed in the SAP, Section 4.4 of SOP-1 Multi-Media Sampling, using “sheen net apparatus”. A more efficient field methodology was developed and used in the field by directly placing an approximate 50 gram aliquot of soil on a stainless steel spoon and applying a clean water rinseate over the sample to observe for sheen. The modified test as performed is not a significant deviation from the “net sheen apparatus” procedure. This procedure is included in the SOPs as Attachment A of this document.
- SOP-1, Multi-Media Sampling, Section 4.2 Sample Photographs. Documentation of photographs did not strictly follow the prescribed methods included in the SAP. Specifically, photo documentation was not made of all samples.

2.0 Response Actions and Results

2.1 Source Area

As outlined in the SAR, the response actions required within the SA included the following:

- Construction of temporary access roads into the affected area
- Construction of temporary berms for crude oil containment
- Installation of a sheet pile trench box around the release site in Line 6B
- Construction of berms in the SA area to prevent flow of oil to Talmadge Creek
- Installation of temporary collection trenches for the containment and recovery of crude oil
- Stormwater management and erosion control
- Site clearing and grubbing of trees and vegetation to allow completion of free-phase crude oil removal activities
- Soil removal, staging, and bulking of crude oil impacted soil
- Oil and water recovery
- Interim source area restoration

The source area is presented on Figure 2, (Source Area Status) showing pertinent features including pipe line 6B, Divisions A1 through A4, access roads, berms, former trench boxes and recovery trenches, and other response action features.

2.1.1 Temporary Access Roads

An access road constructed primarily of timber mats was constructed to access the SA from Division Drive. Safety turn-around work areas were created and grading of the SA was completed to allow for heavy traffic related to the response activities. These temporary access roads are presented on Figure 2.

2.1.2 Installation of Trench Box

A sheet pile trench box approximately 180 feet long was installed and constructed proximal and parallel to Line 6B to allow for dewatering and access to the pipeline release area and pipeline 6B. The trench box and associated sheet piling was removed from the SA after soil removal activities.

The trench box and associated sheet-piling was cleaned and decontaminated as required in Section 2.8.2, page 13, of the SAR.

2.1.3 Construction of Temporary Containment Berms and Collection Trenches

Temporary containment berms and collection trenches were constructed in the SA, as necessary, to prevent the migration of oil to Talmadge Creek as outlined in Sections 2.1.1 and 2.1.2 of the Work Plan. The containment berms were constructed of clean on-site soil and granular materials brought to the SA and were constructed less than five-feet in height to satisfy MDNRE requirements. The berms were constructed in this manner to reduce the potential for subsurface water flow or channeling under the temporary berms.

Temporary receptor/collection trenches were also constructed to enhance the recovery of oil within the SA. One to two foot deep trenches were excavated adjacent to berm areas to allow for recovery of crude oil via skimmer pumps and/or pump trucks. Locations of the temporary containment berms and trenches are provided on Figure 2 (Source Area Status).

2.1.4 Stormwater Management and Erosion Control

Silt fencing, flow control structures, and other engineered devices, were used in the SA for stormwater management around construction areas consistent with Part 91 of NREPA. A preliminary joint permit application for stormwater discharge and erosion control was submitted on August 2, 2010, and was re-submitted for MDNRE review on August 30, 2010 to address current remediation activities.

2.1.5 Source Area Clearing and Grubbing

Clearing and grubbing of surface vegetation in the SA was accomplished using manual and mechanized methods to gain access for response activities. Prior to removal of any trees, U.S. FWS and MDNRE were consulted for compliance with Threatened and Endangered (T&E) species regulation. On July 30, 2010, Region 5 EPA also requested U.S. FWS emergency consultation on the potential existence of the federally endangered Indiana Bat (*Myotis sodalis*) in the SA. A preliminary T&E assessment was conducted by the MDNRE and concluded that there were no T&E species within the SA. It is not known if U.S. FWS has provided emergency consultation on the potential existence of the Indiana Bat.

Trees and other vegetation removed for the purpose of interim response activities were shredded/chipped on-site and mixed with oil saturated soil in the staging area. Crude oil impacted vegetation was cleared and managed in accordance with the WTTDP (Section 2.4). Timber matting

was used in wetlands for access to the SA and to minimize soil erosion. Additional information regarding soil erosion control was provided in Section 2.1.4 of this document.

2.1.6 Source Area Soil Removal and Staging

Oil saturated soil within the SA was excavated based on petroleum sheen test described in Attachment A of this document (derived from Attachment C of the final approved SAP). The presence of a "rainbow sheen" on native soils triggered the removal of impacted soil until soil samples collected did not exhibit a visible sheen. During sheen testing of soils in the SA, various locations were re-screened to verify the presence/or absence of oil saturated soils. Re-screened samples were assigned a sample number related to the original sample, i.e. (designated as .1, .2, etc.) Approximately 38 locations were re-screened following addition soil removal. The results of all the re-screened locations passed the sheen test indicating that the requirements of the SAR had been achieved.

Excavation activities were conducted within the SA using timber mats to allow equipment access to the area and to minimize soil erosion. The estimated areal extent of impacted soil that was excavated is shown on Figure 3 (Source Area Field Screening and Analytical Location). The estimated quantity of soil and/or debris removed from the SA is approximately 30,000 cubic yards. The soil was disposed of as specified in the WTTDP. The oil-impacted soils and vegetation were ultimately shipped to Envirosafe Services, Inc. in Ohio as hazardous waste. These materials were subsequently characterized as non-hazardous. Non-hazardous Oil Saturated Soil was shipped to Waste Management facility in Three Rivers, Michigan.

Excavated impacted soil was placed in soil staging areas to allow for the drainage and collection of crude oil. The soil staging areas were constructed using a series of containment berms to prevent stormwater run-on and/or run-off. The bermed staging areas were lined with polyethylene sheeting to prevent infiltration and/or contact with native soils. Soil staging occurred only within the constructed/lined areas where residual oil was recovered and contained. Staged soil was sampled and analyzed in accordance with Section 4.6 of the SAP (page 23) and disposed of in accordance with Section 2.2 of the WTTDP. Excavated soil was bulked and dried by adding wood chips and kiln dust, respectively.

Water generated during soil excavation activities was managed in accordance with the WTTDP (Section 2.1). In addition, water was treated on site and transported for disposal in accordance with the WTTDP.

Air and dust monitoring was conducted during excavation activities in the SA as defined in the final approved Air Sampling and Monitoring Plan dated August 15, 2010. Air monitoring included, on-site monitoring for worker health and safety and perimeter monitoring for the protection of public health. Worker exposure was measured through real time monitoring of benzene, carbon monoxide (CO), and hydrogen sulfide (H_2S). On-site personnel monitoring was conducted in accordance with the approved Health and Safety Plan (Section 2.03). Roving real time air monitoring for fugitive emissions (including dust) occurred 24 hours per day, traveling along public roadways in and around the SA. Air monitoring and sampling was conducted in accordance with the approved Air Sampling and Monitoring Plan (Sections 2 and 3), dated August 15, 2010.

2.1.7 Field Screening and Laboratory Analytical Results

Metrics used to determine removal of oil impacted soil were described in Section 1.3 of this document. For qualitatively evaluating visible oil and/or sheen, the primary method used was the petroleum sheen test. The petroleum sheen test is a subjective test based on the visual appearance of samples tested. Samples were ranked by the following sheen criteria: 1) None (no sheen visually detected); 2) Trace (possible or faint sheen (may not continue to generate sheen as additional water is added); 3) Light (obvious sheen that may not cover the entire water surface); 4)Moderate (definite sheen that covers entire surface of sample, but no rainbow); 5) Heavy (definite oil film that does not display rainbow); and 6) Rainbow (definite oil sheen, film or product that displays rainbow).

The petroleum sheen test was used to direct the excavation activities. Soil that exhibited a rainbow sheen was removed and the location re-screened until no rainbow sheen was present. Additional field screening parameters included measurement of organic headspace (ppm-range VOCs measured using a photo-ionization detector) and petroleum odor (petroleum odor was considered a secondary incidental characteristic). The field screening SOPs are provided in Attachment A of this document. As described in Section 4.1 of the SAP, a passing test was defined as soils that did not exhibit rainbow sheen. Locations that did not pass the sheen test were re-screened after additional soil was removed. Headspace analyses of soils provided supplementary data to support the qualitative assessment of passing in as described by the sheen test. Copies of the Source Area Field Screening Results are provided in Attachment B, summarized in Table 1 (Summary of Field Screening Results), and shown on Figure 3 (Source Area Field Screening and Analytical Location).

Limited soil sampling and laboratory analysis was also performed at the SA. Based on verbal communications between U.S. EPA and the Company, quantitative analytical samples were collected to confirm the use of the petroleum sheen test as an adequate method for directing the limits of

excavation. These analyses were performed to determine if there was a correlation between presence of hydrocarbons in soil and sheen test (conceptually, those samples with hydrocarbon concentrations above saturation limits for specific compounds would be impacted by crude-oil and yield evidence of sheen). However, several other factors not evaluated can affect presence of crude in soils, including natural carbon content of soils, porosity, presence of water, texture and arrangement of soil particles. Eight random soil samples were collected within the former SA and one background sample outside the affected area. Samples were located to provide even distribution within the SA. Samples were field screened, field staked, and the locations GPS surveyed. The sample locations are shown on Figure 3 (Source Area Field Screening and Analytical Location).

The eight random and one background samples were submitted to the New Age Landmark mobile laboratory located at Incident Command for analysis. The requested analytical parameters include total petroleum hydrocarbons (TPH as diesel range organics (DRO), gasoline range organics (GRO), oil range organics (ORO), and benzene, toluene, ethyl benzene, and xylenes (collectively as BTEX). The preliminary (not validated) quantitative analytical results are provided in Attachment C of this document and summarized in Table 2 (Quantitative Soil Analytical Data from Source Area). The data provided in this document has not yet been validated and does not serve as regulatory compliance data. The data is presented to show potential correlation between field screening tests and empirical quantitative analyses only.

In accordance with the approved August 17, 2010 Pipe Trench Backfill Plan, six soil samples were collected from the base of the trench box excavation and analyzed for BTEX, 1, 2, 4-trimethylbenzene, 1, 3, 5-trimethylbenzene, naphthalene, 2-methylnapthalene, and polynuclear aromatic hydrocarbons. Nine additional trench samples were collected from the east of the sheet pile on Line 6B, including three from the base and three from the north and south sidewall, respectively. Five soil samples were also collected from the base of the 42-inch Vector natural gas pipeline excavation (Figure 2 - Source Area Status) and analyzed for the soil analytical parameters in Table 4.5 of the SAP. Laboratory analytical results for the samples from the six soil samples collected from the trench box excavation are included in Attachment C of this document. The remaining fourteen samples were submitted for analysis on August 27, 2010. The results will be provided to the U.S. EPA once received and validated. Chain-of-custody documentation is also included in Appendix C in this document.

2.1.8 Oil/Water Recovery

Oil/water recovery was conducted during remedial activities using a series of vacuum trucks and petroleum skimmers in and around containment structures (berms and trenches), constructed within the SA and as a result of construction dewatering necessary to facilitate pipeline repair. The basic design of a flume is a pipe, or series of pipes, that extend through a temporary flow control structure such as a berm. For a crude oil release to surface water, the pipe intakes are submerged on the upstream side of the berm to allow oil-free water to flow through the pipe. This prevented the crude oil floating on top of the water from migrating further downstream.

Recovered oil/water mixtures were managed in accordance with Section 6.0 of the Oil Recovery and Containment Plan. As of August 24, 2010, an estimated 4.3 million gallons of oil/water mix had been recovered from the SA.

2.1.9 Oil/Water Disposal

Wastewater and crude generated during recovery activities was managed in accordance with the WTTDP (Sections 1.3 and 2.1). Mixed oil/water from the SA was recovered and transported to frac tanks staged primarily adjacent to the release site. Reclaimed crude oil separated from the frac tanks was shipped to the Company's Griffith facility for re-use.

2.1.10 Interim Source Area Restoration Activities

Interim restoration activities in the SA included minimal backfilling with organic soil in low lying areas resulting from excavation activities. Minimal backfilling was conducted due to the need to conduct soil verification sampling for the MDNRE. Backfilling near the pipeline included placement of clean granular material. Details of SA restoration will be fully determined through consultation with appropriate regulatory agencies.

3.0 Conclusions

Based on the soil field screening data (petroleum sheen test) and the eight confirmatory soil sample laboratory analytical results, oil saturated soil that could negatively affect a navigable waterway has been removed from the SA. In conclusion, an evaluation of these completed activities demonstrates that the requirements of the RAO have been accomplished.

Tables

Table 1

Summary of Field Screening Activities

Table 1
Summary of Field Screening Activities
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
Division A1							
8/22/2010	MEN	A1-0001	None	None	0.7		
8/25/2010	MEN	A1-0001.1	Light	Moderate	6.0	YES	
8/22/2010	MEN	A1-0002	Moderate	Rainbow	7.0		product in spoon
8/25/2010	MEN	A1-0002.1	Moderate	Rainbow	22.0		
8/26/2010	MEN	A1-0002.2	Moderate	Moderate	60.7	YES	
8/22/2010	MEN	A1-0003	Moderate	Moderate	452		
8/25/2010	MEN	A1-0003.1	Moderate	Moderate	150	YES	
8/22/2010	MEN	A1-0004	Light	Trace	186		
8/25/2010	MEN	A1-0004.1	None	None	26.0	YES	
8/22/2010	MEN	A1-0005	Light	Light	786	YES	
8/22/2010	MEN	A1-0006	Light	Rainbow	14.8		
8/29/2010	AMD2	A1-0006.1	None	None	0.2	YES	After additional excavation performed prior to 8/27/10
8/22/2010	MEN	A1-0007	None	None	1.6		
8/25/2010	LCM	A1-0007.1	None	None	0.1	YES	
8/22/2010	MEN	A1-0008	None	Light	3.7		
8/25/2010	LCM	A1-0008.1	None	None	0.6	YES	
8/22/2010	MEN	A1-0009	None	None	21.9		
8/25/2010	LCM	A1-0009.1	None	None	0.4	YES	
8/22/2010	MEN	A1-0010	None	None	88.7		
8/25/2010	LCM	A1-0010.1	None	None	0.9	YES	
8/22/2010	MEN	A1-0011	Moderate	Rainbow	231		product in spoon
8/25/2010	MEN	A1-0011.1	Moderate	Rainbow	3.0		
8/26/2010	MEN	A1-0011.2	Moderate	Moderate	9.6	YES	
8/22/2010	MEN	A1-0012	Light	Light	23.9		
8/25/2010	MEN	A1-0012.1	None	Trace	0.0	YES	
8/22/2010	MEN	A1-0013	None	None	2.2		product observed in isolated pockets near location
8/25/2010	MEN	A1-0013.1	None	None	0.0	YES	
8/22/2010	MEN	A1-0014	Strong	Rainbow	210		product pools, product observed in isolated pockets near location
8/25/2010	MEN	A1-0014.1	None	None	0.6	YES	
8/25/2010	LCM	A1-0014.2	None	None	3.8		
8/22/2010	MEN	A1-0015	Moderate	Rainbow	109		product in spoon
8/25/2010	MEN	A1-0015.1	None	None	1.8	YES	
8/22/2010	MEN	A1-0016	None	Rainbow	6.9		product in spoon
8/25/2010	LCM	A1-0016.1	None	None	0.7	YES	
8/22/2010	MEN	A1-0017	Strong	Rainbow	150		product observed in isolated pockets near location
8/25/2010	LCM	A1-0017.1	None	None	1.9	YES	
8/22/2010	MEN	A1-0018	Light	None	0.8		product observed in isolated pockets near location

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Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/25/2010	LCM	A1-0018.1	None	None	1.4	YES	
8/22/2010	MEN	A1-0019	None	None	3.0		
8/25/2010	MEN	A1-0019.1	Strong	Rainbow	--		
8/29/2010	AMD2	A1-0019.2	None	Trace	0.2	YES	After additional excavation performed prior to 8/27/10
8/22/2010	MEN	A1-0020	Light	Rainbow	6.1		product pools, product observed in isolated pockets near location
8/25/2010	MEN	A1-0020.1	None	None	0.0	YES	
8/22/2010	MEN	A1-0021	Moderate	Rainbow	63.1		product pools, product in spoon
8/25/2010	LCM	A1-0021.1	Moderate	Heavy	506		
9/2/2010	KAM	A1-0021.2	None	None	1.2	YES	After additional excavation performed prior to 8/27/10
Division A2							
8/20/2010	AJN	A2-0001	Light	None	17.4	YES	
8/20/2010	AJN	A2-0002	Light	None	21.4	YES	
8/20/2010	AJN	A2-0003	Light	Trace	34.6	YES	
8/20/2010	LCM	A2-0004	None	None	0.4	YES	
8/20/2010	LCM	A2-0005	Light	None	1.9	YES	
8/20/2010	LCM	A2-0006	Light	Trace	22.5	YES	
8/20/2010	LCM	A2-0007	Light	None	0.8	YES	
8/21/2010	DMR	A2-0008	Light	None	0.0	YES	
8/21/2010	DMR	A2-0009	Light	None	1.3	YES	
8/21/2010	DMR	A2-0010	Light	Trace	14.2	YES	
8/21/2010	LCM	A2-0011	Light	None	17.5	YES	
8/21/2010	LCM	A2-0012	Light	None	42.9	YES	
8/21/2010	DMR	A2-0013	Light	Light	4.6	YES	
8/21/2010	DMR	A2-0014	Light	Light	7.9	YES	
8/21/2010	DMR	A2-0015	None	None	0.0	YES	
8/21/2010	DMR	A2-0016	None	None	0.0	YES	
8/21/2010	DMR	A2-0017	None	None	0.8	YES	
8/21/2010	DMR	A2-0018	None	None	0.4	YES	
8/21/2010	LCM	A2-0019	Strong	Rainbow	375		
8/21/2010	LCM	A2-0019.1	None	None	0.1	YES	
8/21/2010	LCM	A2-0020	None	None	20.8	YES	
8/21/2010	LCM	A2-0021	None	Trace	1.3	YES	
8/21/2010	LCM	A2-0022	Light	None	3.1	YES	
8/21/2010	LCM	A2-0023	Light	None	15.9	YES	
8/21/2010	LCM	A2-0024	None	None	17.8	YES	
8/22/2010	DMR	A2-0025	Light	Trace	3.4	YES	
8/22/2010	DMR	A2-0026	None	None	2.6	YES	

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Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/22/2010	DMR	A2-0027	Light	Trace	13	YES	
8/22/2010	DMR	A2-0028	None	None	0.8	YES	
8/23/2010	LCM	A2-0029	None	None	5.8	YES	
8/23/2010	LCM	A2-0030	None	None	6.3	YES	
8/23/2010	LCM	A2-0031	Light	None	4.8	YES	
8/23/2010	LCM	A2-0032	None	None	0.7	YES	
8/23/2010	LCM	A2-0033	Light	None	0.8	YES	
8/23/2010	LCM	A2-0034	None	None	0.8	YES	
8/23/2010	LCM	A2-0035	None	None	1.8	YES	
8/23/2010	LCM	A2-0036	None	None	0.7	YES	
8/23/2010	LCM	A2-0037	None	None	0.8	YES	
8/23/2010	LCM	A2-0038	None	None	0.0	YES	
8/23/2010	LCM	A2-0039	Light	Light	108		contains visible product
8/30/2010	AMD2	A2-0039.1	None	None	1.2	YES	After additional excavation performed prior to 8/27/10
8/26/2010	LCM	A2-0040	None	None	0.0	YES	
8/26/2010	LCM	A2-0041	None	None	6.9	YES	
8/26/2010	LCM	A2-0042	None	None	0.0	YES	
8/26/2010	LCM	A2-0043	None	None	9.5	YES	
8/26/2010	LCM	A2-0044	None	None	0.8	YES	
8/26/2010	LCM	A2-0045	None	None	0.0	YES	
8/26/2010	LCM	A2-0046	None	None	7.8	YES	
8/26/2010	LCM	A2-0047	None	None	2.4	YES	
8/26/2010	LCM	A2-0048	None	None	0.0	YES	
8/26/2010	MEN	A2-0101	None	Trace	0.3	YES	
8/26/2010	MEN	A2-0102	None	None	0.6	YES	
8/26/2010	MEN	A2-0103	None	None	4.3	YES	
8/26/2010	MEN	A2-0104	None	Light	0.0	YES	
8/26/2010	MEN	A2-0105	None	None	1.1	YES	
8/26/2010	MEN	A2-0106	None	None	0.0	YES	
8/26/2010	MEN	A2-0107	None	Trace	0.2	YES	
8/26/2010	MEN	A2-0108	None	None	0.6	YES	
8/26/2010	MEN	A2-0109	Moderate	Moderate	11.3	YES	
8/26/2010	MEN	A2-0110	None	None	0.2	YES	
8/26/2010	MEN	A2-0111	None	None	0.0	YES	
8/26/2010	MEN	A2-0112	None	None	0.0	YES	
8/26/2010	LCM	A2-0113	None	None	0.6	YES	

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Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/26/2010	LCM	A2-0114	None	None	6.2	YES	
8/26/2010	LCM	A2-0115	None	None	3.7	YES	
8/26/2010	LCM	A2-0116	None	None	3.4	YES	
8/26/2010	LCM	A2-0117	None	None	13.9	YES	
8/26/2010	LCM	A2-0118	None	None	3.7	YES	
8/26/2010	AMD2	A2-1001	None	Trace	0.0	YES	
8/26/2010	AMD2	A2-1002	None	Light	8.8	YES	
8/26/2010	AMD2	A2-1003	Light	Trace	0.0	YES	
8/26/2010	AMD2	A2-1004	None	Trace	33.8	YES	
8/26/2010	WAF	A2-1006	None	None	0.0	YES	
8/26/2010	WAF	A2-1007	None	None	0.0	YES	
8/26/2010	WAF	A2-1008	None	None	0.0	YES	
8/26/2010	WAF	A2-1009	None	Trace	1.7	YES	
8/26/2010	WAF	A2-1010	None	None	4.3	YES	
8/26/2010	WAF	A2-1011	None	None	0.0	YES	
8/26/2010	WAF	A2-1012	None	Trace	1.7	YES	
8/26/2010	WAF	A2-1013	None	Trace	0.5	YES	
8/26/2010	WAF	A2-1014	None	None	0.0	YES	
8/26/2010	WAF	A2-1015	None	None	7.1	YES	
8/26/2010	WAF	A2-1016	None	None	0.1	YES	
8/26/2010	WAF	A2-1017	None	None	2.5	YES	
8/26/2010	WAF	A2-1018	Light	None	8.2	YES	
8/26/2010	WAF	A2-1019	Light	None	7.9	YES	
8/26/2010	WAF	A2-1020	None	None	3.1	YES	
8/26/2010	WAF	A2-1021	Light	None	10.8	YES	
8/26/2010	WAF	A2-1022	Light	Trace	14.7	YES	
8/26/2010	WAF	A2-1023	Light	None	12.0	YES	
8/26/2010	WAF	A2-1024	None	None	0.4	YES	
8/26/2010	WAF	A2-1025	None	None	1.3	YES	
8/26/2010	WAF	A2-1026	Light	None	23.1	YES	
8/26/2010	WAF	A2-1027	None	None	14.7	YES	
8/26/2010	WAF	A2-1028	None	None	0.0	YES	
Division A3							
8/22/2010	NHM	A3-001	Light	Trace	0.3	YES	nw corner
8/22/2010	NHM	A3-002	None	None	0.6	YES	nw corner
8/22/2010	NHM	A3-003	None	None	2.5	YES	ne corner

Table 1
Summary of Field Screening Activities
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/22/2010	NHM	A3-004	None	None	0.5	YES	ne corner
8/22/2010	NHM	A3-005	Moderate	Moderate	332	YES	se corner
8/22/2010	NHM	A3-006	None	None	1.4	YES	se corner
8/22/2010	NHM	A3-007	None	None	3.0	YES	sw corner
8/24/2010	NHM	A3-1	None	None	1.0	YES	sample taken from bank; location under water
8/24/2010	NHM	A3-2	None	None	2.2	YES	sample taken from bank; location under water
8/24/2010	NHM	A3-3	Light	None	0.6	YES	sample taken from bank; location under water
8/24/2010	NHM	A3-4	Light	None	1.2	YES	sample taken from bank; location under water
8/24/2010	NHM	A3-5	None	None	0.4	YES	NE side
8/24/2010	NHM	A3-6	None	None	0.7	YES	middle NE side
8/23/2010	BLW	A3-tree1	Light	moderate	11.6	YES	
8/23/2010	BLW	A3-tree2	Light	light	10.3		product found - Area re-excavated
8/29/2010	AMD2	A3-tree2.1	Light	Trace	1.6	YES	
8/24/2010	BLW	A3-tree3	Light	Moderate	12.8	YES	
8/24/2010	BLW	A3-tree4	Light	Light	4.7	YES	
8/24/2010	BLW	A3-tree5	Light	Moderate	4.6	YES	
8/24/2010	BLW	A3-tree6	Light	Light	15.0	YES	
8/24/2010	BLW	A3-tree7	None	None	1.8	YES	
8/24/2010	BLW	A3-tree8	None	Light	2.7	YES	
8/24/2010	BLW	A3-tree9	Moderate	Heavy	46.9	YES	
8/24/2010	BLW	A3-tree10	None	None	1.6	YES	
8/24/2010	BLW	A3-tree11	None	None	0.3	YES	
8/24/2010	BLW	A3-tree12	Light	None	16.7	YES	
8/20/2010	BLW/DHN	A3-0001	Moderate	Moderate	131	YES	
8/20/2010	BLW/DHN	A3-0002	None	None	1.1	YES	
8/20/2010	BLW/DHN	A3-0003	Strong	Rainbow	952		
8/21/2010	TW	A3-0003.1	Moderate	Moderate	8.8	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0004	Strong	Rainbow	560		product observed
8/21/2010	TW	A3-0004.1	Moderate	Light	61.6	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0005	None	None	1.5	YES	
8/20/2010	BLW/DHN	A3-0006	None	Moderate	8.7	YES	flag moved 2' out of water
8/20/2010	BLW/DHN	A3-0007	None	Trace	2.3	YES	flag moved 5' out of water
8/20/2010	BLW/DHN	A3-0008	None	None	3.5	YES	flag moved 3' out of water
8/20/2010	BLW/DHN	A3-0009	None	None	0.5	YES	
8/20/2010	BLW/DHN	A3-0010	None	None	2.0	YES	
8/20/2010	BLW/DHN	A3-0011	None	Trace	1.5	YES	
8/20/2010	BLW/DHN	A3-0012	None	Light	1.9	YES	

Table 1
Summary of Field Screening Activities
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/20/2010	BLW/DHN	A3-0013	None	None	1.5	YES	
8/20/2010	BLW/DHN	A3-0014	None	None	1.6	YES	
8/20/2010	BLW/DHN	A3-0015	None	None	1.1	YES	moved 8' due to water
8/20/2010	BLW/DHN	A3-0016	None	None	1.0	YES	
8/20/2010	BLW/DHN	A3-0017	None	None	2.4	YES	
8/20/2010	BLW/DHN	A3-0018	Light	Moderate	35.7	YES	
8/20/2010	BLW/DHN	A3-0019	Strong	Rainbow	72.5		
8/30/2010	AMD2	A3-0019.1	Moderate	--	622		product observed
8/30/2010	AMD2	A3-0019.2	Light	None	19.0	YES	After additional excavation performed on 8/30/10
8/20/2010	BLW/DHN	A3-0020	None	None	1.1	YES	
8/20/2010	BLW/DHN	A3-0021	None	Trace	17.8	YES	
8/20/2010	BLW/DHN	A3-0022	None	None	1.0	YES	
8/20/2010	BLW/DHN	A3-0023	Strong	Rainbow	447		
8/21/2010	TW	A3-0023.1	None	Light	1.9	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0024	None	None	6.9	YES	
8/20/2010	BLW/DHN	A3-0025	Strong	Heavy	47.7		
8/21/2010	TW	A3-0025.1	None	Heavy	7.0	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0026	Strong	Heavy	194		product observed
8/21/2010	TW	A3-0026.1	Strong	Heavy	406		second screening here, after scraping, visible product
8/30/2010	AMD2	A3-0026.2	Light	Trace	31.6	YES	After additional excavation performed prior to 8/27/10
8/20/2010	BLW/DHN	A3-0027	None	None	10.6	YES	
8/20/2010	BLW/DHN	A3-0028	Moderate	Heavy	86.0		
8/21/2010	TW	A3-0028.1	Strong	Light	428	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0029	None	None	1.5	YES	
8/20/2010	BLW/DHN	A3-0030	None	None	6.4	YES	
8/20/2010	BLW/DHN	A3-0031	Strong	Rainbow	85.1		moved 8' due to water
8/30/2010	AMD2	A3-0031.1	None	Trace	0.6	YES	second screening here, after scraping prior to 8/27/10
8/20/2010	BLW/DHN	A3-0032	Light	Trace	23.3	YES	
8/20/2010	BLW/DHN	A3-0033	Moderate	Heavy	130		
8/21/2010	TW	A3-0033.1	None	None	--	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0034	Moderate	Heavy	39.7		
8/20/2010	AMS2	A3-0034.1	None	None	40.6	YES	second screening here, after scraping
8/21/2010	TW	A3-0034.2	None	Light	208	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0035	Strong	Rainbow	148		
8/21/2010	TW	A3-0035.1	Light	Moderate	97.7	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0036	None	None	1.0	YES	
8/20/2010	BLW/DHN	A3-0037	None	None	1.1	YES	
8/20/2010	BLW/DHN	A3-0038	Moderate	Rainbow	215		moved 4' due to water

Table 1
Summary of Field Screening Activities
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments
8/21/2010	TW	A3-0038.1	Strong	Heavy	692		second screening here, after scraping
8/20/2010	AMS2	A3-0038.2	Light	None	2.9	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0039	None	Light	9.8		
8/20/2010	AMS2	A3-0039.1	None	Light	14.7	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0040	None	None	36	YES	
8/20/2010	BLW/DHN	A3-0041	Strong	Rainbow	614		product observed
8/20/2010	AMS2	A3-0041.1	None	None	0.2	YES	second screening here, after scraping
8/20/2010	BLW/DHN	A3-0042	Moderate	Heavy	69.7		moved 6', on a sand bag
8/20/2010	AMS2	A3-0042.1	None	None	38.0	YES	second screening here, after scraping
8/24/2010	NHM	Mat Rd.	None	None	0.8	YES	east side of mat road
Division A4							
8/20/2010	AMS2	A4-0001	None	None	0.3	YES	
8/20/2010	AMS2	A4-0002	None	None	0.0	YES	
8/20/2010	AMS2	A4-0003	None	None	0.1	YES	
8/20/2010	AMS2	A4-0004	Light	None	1.8	YES	
8/20/2010	AMS2	A4-0005	None	None	0.0	YES	
8/20/2010	AMS2	A4-0006	None	None	13.9	YES	
8/20/2010	AMS2	A4-0007	None	None	0.1	YES	
8/20/2010	AMS2	A4-0008	None	None	2.0	YES	
8/20/2010	AMS2	A4-0009	None	None	0.0	YES	
8/20/2010	AMS2	A4-0010	None	None	3.2	YES	
8/20/2010	AMS2	A4-0011	Moderate	Moderate	33.1	YES	flag moved 2' north out of water
8/20/2010	AMS2	A4-0012	None	None	0.6	YES	berm material
8/20/2010	AMS2	A4-0013	None	None	1.5	YES	berm material

LEGEND:

Odor:
None (N) = No odor detected
Light (L) = Faint odor detected
Moderate (M) = Odor detected
Strong (S) = obvious odor detected
if evident, the type will be noted

Visual Sheen Observation:
None (N) = No Sheen Detected
Trace (T) = Possible or faint oil sheen observed (may not continue to generate sheen as additional water was added)

Table 1
Summary of Field Screening Activities
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Date	Completed by	Location	Odor	Visible	Headspace (ppm)	Metric Accomplished	Comments

Light (L) = Obvious sheen that may cover the entire water surface
Moderate (M) = Definite oil sheen that covers entire surface, but rainbow colors not distinguishable
Heavy (H) = Definite oil film or product that does not display rainbow colors
Rainbow (R) = Definite oil sheen, film or product that displays rainbow colors
-- No data

PID (Photo Ionization Detection)
(all measurements are recorded in ppm above background)
ND = No detection
-- No data

Sample Nomenclature
Ax-00y.z
Ax Indicates Sub-Division
00y indicates unique sample location
.z indicates additional samples at depth (if necessary)

Table 2

Quantitative Soil Analytical Data from Source Area

Table 2
Soil Analytic Data from Division A
Line 6B MP 608
Enbridge Energy Partnership, Marshall, MI

Sample ID Sample Date Chemical Name	A1-1L 8/25/2010	A1-2L 8/25/2010	A1-3L 8/25/2010	A3-1L 8/25/2010	A3-2L 8/25/2010	A3-3L 8/25/2010	A3-4L 8/25/2010	A4-1L 8/25/2010	BG-1 8/25/2010
Benzene	<287 ug/kg	<361 ug/kg	<158 ug/kg	<292 ug/kg	<245 ug/kg	<368 ug/kg	<110 ug/kg	<209 ug/kg	<243 ug/kg
Toluene	<287 ug/kg	<361 ug/kg	<158 ug/kg	<292 ug/kg	<245 ug/kg	<368 ug/kg	<110 ug/kg	<209 ug/kg	<243 ug/kg
Ethylbenzene	<287 ug/kg	<361 ug/kg	<158 ug/kg	<292 ug/kg	<245 ug/kg	<368 ug/kg	<110 ug/kg	<209 ug/kg	<243 ug/kg
p&m-Xylene	<575 ug/kg	<721 ug/kg	<315 ug/kg	<584 ug/kg	<490 ug/kg	<735 ug/kg	<220 ug/kg	<418 ug/kg	<486 ug/kg
o-Xylene	<287 ug/kg	<361 ug/kg	<158 ug/kg	<292 ug/kg	<245 ug/kg	<368 ug/kg	<110 ug/kg	<209 ug/kg	<243 ug/kg
GRO (CS-C10)	**31 mg/kg**	**59 ug/kg**	**21 ug/kg**	**37 ug/kg**	**32 ug/kg**	**51 ug/kg**	**14 ug/kg**	**32 ug/kg**	**35 ug/kg**
TPH (C10-C38)	**290 mg/kg**	**2100 mg/kg**	**710 mg/kg**	**270 mg/kg**	**1300 mg/kg**	**2700 mg/kg**	**680 mg/kg**	**940 mg/kg**	**980 ug/kg**

Notes:

(1) All Data Preliminary Pending Validation

(2) Bold values indicate concentrations above laboratory detection limits

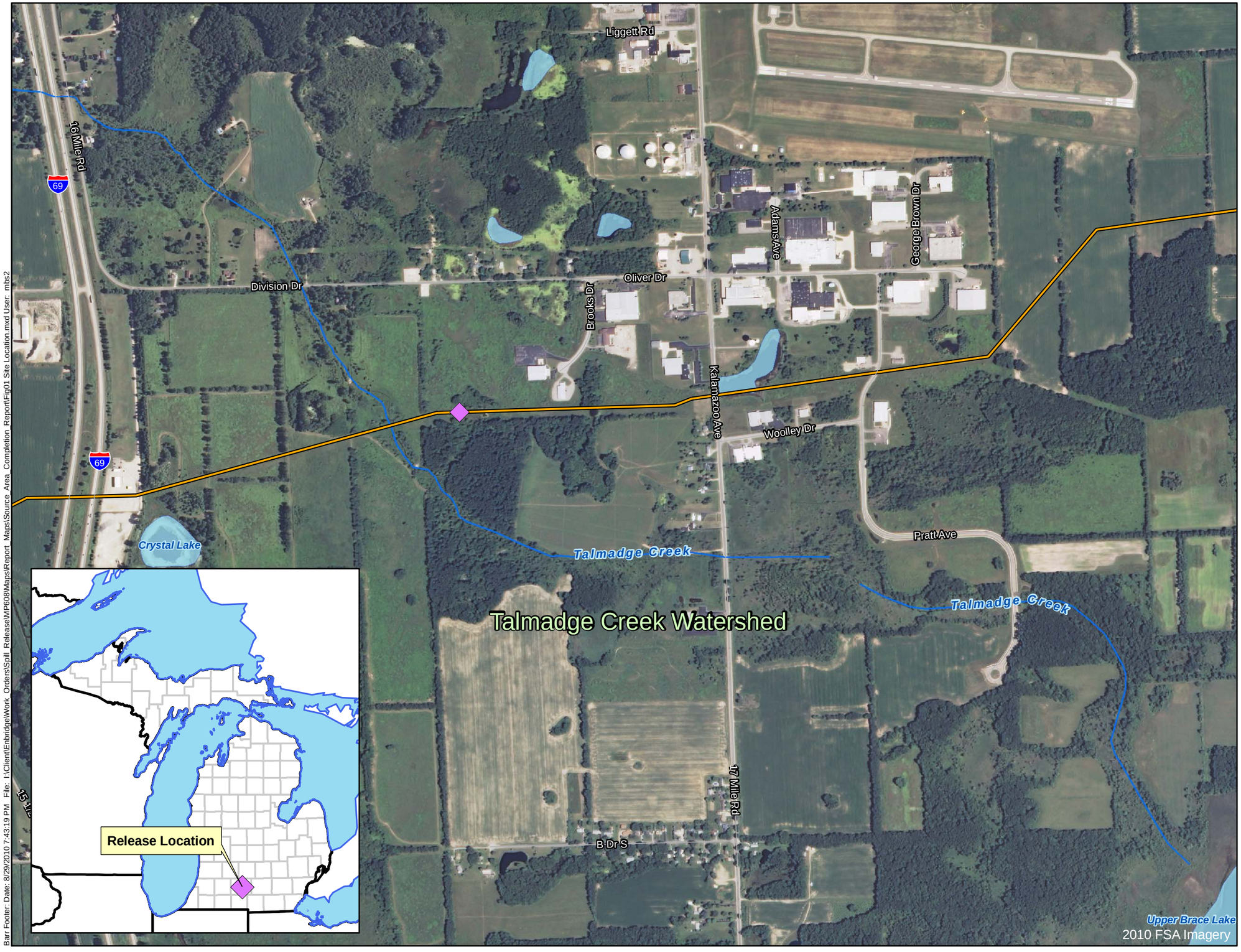
(3) Units are mass of chemical per mass of soil in milligrams per kilogram (mg/kg) or micrograms per kilogram(ug/kg)

(4) Sample nomenclature refers to location within Division A and sample number. The "L" refers to the sample being analyzed in a laboratory.

Figures

Figure 1

Source Area Location



Release Location
Michigan Roads
Line 6B
Talmadge Creek
Waterbody

N

0 500 1,000
Feet

1 Inch = 870 Feet

Figure 1

SITE LOCATION
Milepost 608

ENBRIDGE

Figure 2

Source Area Status

APPROXIMATE RELEASE LOCATION

APPROXIMATE TRENCH BOX LOCATION

TRENCH

A1

A2

A3

A4

A5

EXISTING ENBRIDGE 30" 6B PIPELINE

EXISTING VECTOR 42" NATURAL GAS PIPELINE

BERM

BERM

BERM

SOURCE AREA

TALMADGE CREEK

LEGEND

- MAT ROADS
- GRAVEL ROADS
- CLEAN WITH BACKFILL
- CLEAN AREA (EST)
- APPROXIMATE TRENCH BOX LOCATION
- SOURCE AREA
- APPROXIMATE RELEASE LOCATION
- OVERHEAD POWER
- TREE LINE
- GRASS LINE

N

0 50 100

SCALE IN FEET

PROGRESS AT 8/27/10 05:00

FIGURE 2
SOURCE AREA STATUS

ENBRIDGE

Figure 3

Source Area Field Screening and Analytical Locations

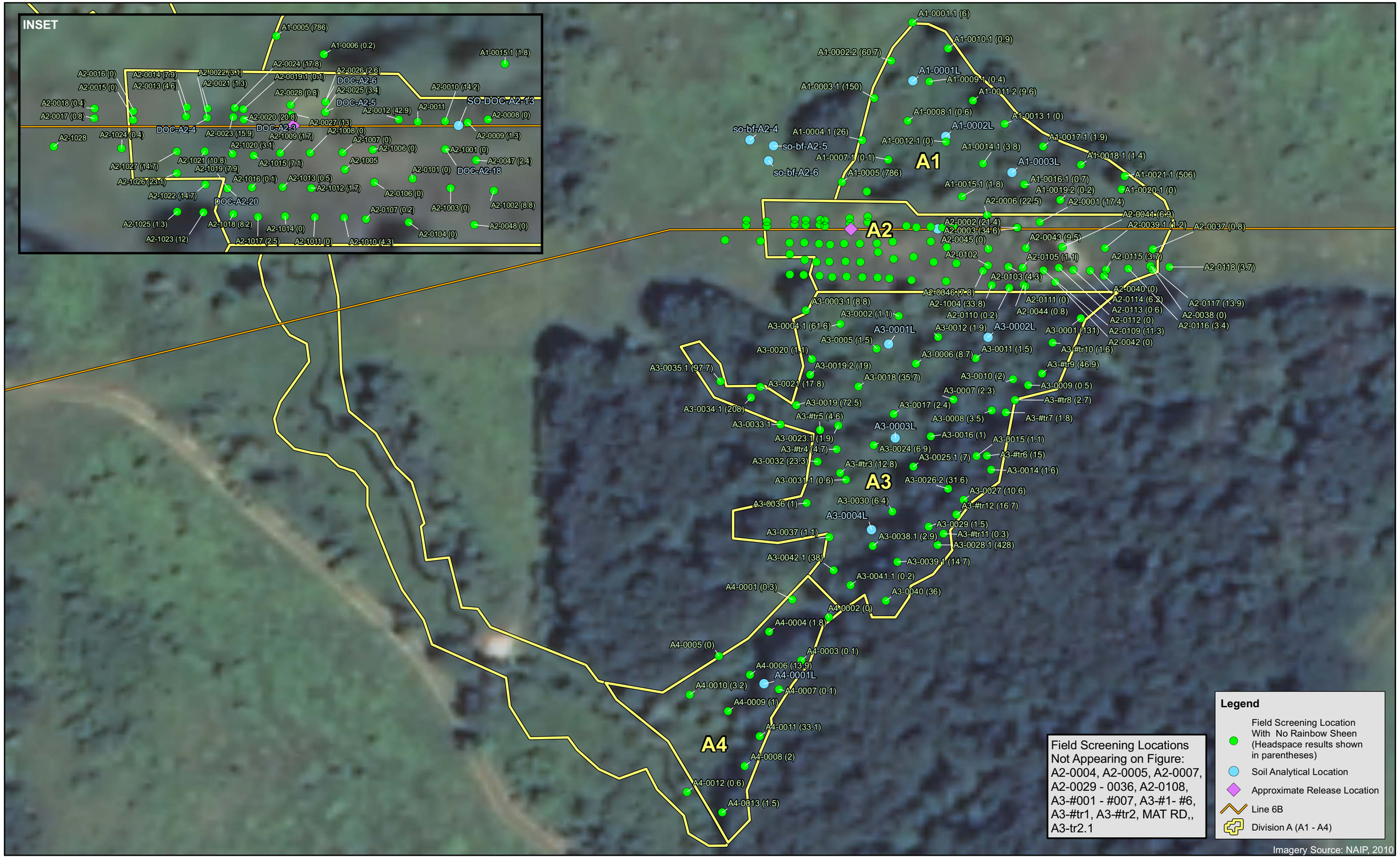


Figure 3: Source Area Field Screening and Analytical Locations

ENBRIDGE

Attachments

Attachment A

Standard Operating Procedures
Field Screening Soil Samples

STANDARD OPERATING PROCEDURE

Field Screening Soil Samples

Revision 2

August 27, 2007

Approved By:

Andrea Nord		8/27/07
Print	QA Manager(s) Signature	Date

KEVIN McGILP		8/27/07
Print	Field Technician(s) Signature	Date

Barr Engineering Company
4700 West 77th Street • Minneapolis, MN 55435-4803
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Minneapolis, MN • Hibbing, MN • Duluth, MN • Ann Arbor, MI • Jefferson City, MO • Bismarck, ND

Annual Review of the SOP has been performed and the SOP still reflects current practice.

Initials: CF	Date: 03-03-09
Initials:	Date:
Initials:	Date:
Initials:	Date:
Initials:	Date:

Standard Operating Procedure for Field Screening Soil Samples

Purpose

To describe the procedure for properly screening soil or sediment samples in the field.

Applicability

This procedure applies to all field technicians responsible for field screening soil or sediment samples.

Definitions

PPE Personal protective equipment
PID Photoionization Detector
FID Flame Ionization Detector

Equipment

PPE (gloves, safety glasses)
Project Health and Safety Plan
Quart-sized-self-sealing Polyethylene bag
Photoionization detector (PID)
Flame ionization detector (FID)
Thermometer
Indelible ink pen or pencil
Stainless-steel spoon
Squirt bottle with tap water
Logbook
Alconox®
Brush

Responsibilities

The environmental technician(s) is responsible for the proper sample identification; field screening procedures; field equipment and calibration; quality control procedures and documentation.

Procedure

The field screening techniques for soils are as follows: (1) visual examination; (2) odor; (3) headspace organic vapor screening; and (4) oil sheen. The results of these four screening procedures may be used to screen soil samples for possible contamination.

- **Visual Examination.** A visual examination of the soil sample will include noting any discoloration of the soil or visible oiliness or tar.

- **Odor.** The sampler will note odor only if noticed incidentally while handling the soil sample. Samplers will not unduly expose themselves to sample odors. Odor will be described as light, moderate, or strong, and appropriate description of the type and odor, if evident.

- **Headspace Organic Vapor Screening.** The polyethylene bag headspace method recommended by the Minnesota Pollution Control Agency will be used in the field to screen soils suspected to contain volatile organic compounds. The screening method is intended to be used in conjunction with other "real time" observations.

  The following equipment is required to conduct headspace organic vapor screening: photoionization or flame ionization detector (PID or FID), self-sealing quart-sized polyethylene bag, a log book or record sheet, and the appropriate personal protective equipment necessary for collection and handling of soil samples as described in the Project Health and Safety Plan (PHASP). The meter shall be calibrated daily or more frequently if suspect data is obtained.

  The following procedure will be used for checking the calibration of the flame ionization detector:

  FID calibration check is conducted using a two point calibration process with methane gas. Calibrate the instrument by analyzing the calibration gas at 100 ppm and 1,000 ppm. If instrument values exceed ± 5% from true value, then the FID needs to be recalibrated.

  Reference the Standard Operating procedure for the TVA1000B (FID) for further information.

  The following procedure will be used for checking the calibration of the PID:

  PID calibration check is conducted using isobutylene calibration gas. Analyze a sample of the calibration gas, evaluate result, if result exceeds ± 5% from true value, then the PID needs to be recalibrated.

  Reference the Standard Operating procedure for the HNU PI-101 for further information.

The following procedure will be used for conducting headspace organic vapor screening:

1. Soil samples collected from a split-barrel sampler or a direct-push (i.e., Geoprobe®) sample liner will be collected immediately after opening the barrel or liner. If the sample is collected from an excavation wall, soil pile, or backhoe bucket, it will be collected from a freshly exposed surface.

2. Half-fill the bag with the sample to be analyzed using a stainless-steel spoon or a gloved hand and immediately seal it.

3. Agitate the bag for 15 seconds. Manually break up any soil clumps within the bag.

4. Allow headspace development for approximately 10 minutes. The sample should be kept in a shaded area out of direct sunlight. Ambient temperatures during headspace development should be recorded. When ambient temperatures are below 50°F, headspace development should be conducted inside a heated vehicle or building.

5. Agitate the bag for an additional 15 seconds.

6. Quickly puncture the bag with the sampling probe to a point about one-half of the headspace depth. Exercise care to avoid uptake of water droplets or soil particles.

7. Record the highest meter response as the headspace concentration. The maximum response will likely occur between 0 to 5 seconds.

8. When using a FID, it may be necessary to correct for methane. In this case, take a reading first with carbon filter, then without. This will require two duplicate bag samples. The second reading less the first is the headspace adjusted for methane. Adjusted readings less than zero are considered zero. Methane correction is not necessary if a PID is used.

- **Oil Sheen Test.** The oil sheen or hydrocarbon is a method used to immediately determine the approximate magnitude of coal tar contamination in soil by observation of the sample in the field. The test is useful in soils which do not have a high binding capacity with polyaromatic hydrocarbons (PAHs) (i.e., the PAHs are free on the surface of the soil particles and can be released by a stream of water).

  The equipment required to conduct the oil sheen test includes: a stainless-steel spoon, a squirt bottle filled with tap water, a log book or recording sheet, and the appropriate personal protective equipment necessary for collection and handling of soil samples as described in the Project Health and Safety Plan. Decontamination of the spoon between test events will consist of scrubbing the surface of the spoon with a solution of Alconox® in water using a brush and then rinsing the spoon with water.

  The procedure for conducting the oil sheen test consists of obtaining approximately 50 grams (about 30 cc) of representative soil with the spoon and then directing a stream of water onto the soil in the spoon with the squirt bottle until the soil is saturated and water begins to collect around the soil. The amount of oil sheen present on the water is determined by observation and the results of the test are reported as a magnitude of oil sheen observed: none, trace, light, moderate, heavy or rainbow. The test results, sample location, and observations of the sample's appearance and odor are recorded in the log book.

  The specific soil types at the area of investigation should be accounted for when performing the oil sheen test. The best results are obtained in silts, sands, and/or gravels with low organic content. The results obtained from clayey soils may appear deceptively low. Typical descriptions of each test result are given below.

Oil Sheen Test Result	Description
None	No sheen detected.
Trace	Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light	Obvious sheen that may not cover entire water surface
Moderate	Definite oil sheen that covers entire surface, but "rainbow colors" not distinguishable.
Heavy	Definite oil film or product that does not display rainbow colors.
Rainbow	Definite oil sheen, film or product that displays rainbow colors.

Interferences

Interferences on the test can be caused by any contaminant which will cause an oil sheen on water. The samples will be carefully observed for characteristic appearance or odors which may indicate a possible contaminant other than coal tar. Sunlight and low temperatures may interfere with headspace development. Water and soil particles may interfere with PID and FID readings.

Documentation

The technician(s) will document the soil sampling events in a project dedicated field logbook or on field log data sheets.

Attachments

Attachment 1: Field Sampling Report
Attachment 2: Field Log Data Sheet

Attachment 1
Field Sampling Report

BARR

FIELD SAMPLING REPORT

Date:

Project:

Contact:

Barr Engineering Company
4700 W. 77th Street
Minneapolis, MN 55435-4803

Field Sampling

Field Report

Attachments

-
-
-
-
-
-
-

Laboratory Analysis Status

<Name inserts here>
Environmental Technician

Attachment 2
Field Log Data Sheet

BARR

Barr Engineering Company
Field Log Data Sheet
Soil Samples

Client:
Location:
Project #:
Project Name:

Sample Identification	Collection		Matrix			Type			Number of Containers/ Analysis																				
	Date	Time	Soil	Sludge		Grab	Comp.	QC	2 oz. Pres.	2 oz. Unpres.	4 oz. Unpres.	8 oz. Unpres.	Moisture-plastic vial etc.	Other:	SVOC	PAH	VOC	WIGRO	WIDRO	PCB	RCRA Metals	Moisture	Other:	Other:					
1.																													
2.																													
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4.																													
5.																													
6.																													
7.																													
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18																													
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Attachment B

Field Screening Results

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP606 Pipeline Release DATE: 9/2/10

PROJ. NUMBER: 22131005 COMPLETED BY: KAM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-0021.2	None	None	1.2	NA

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background
ND= No detection

BARR

DBE 8/29/10

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release

PROJ. NUMBER: 22131003

DATE: 8/28/10 JCW

COMPLETED BY: AMD2

Location	Field Soil Screening			Talmadge Creek Streambed
	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-6.1	None	None	0.2	—
A1-19.2	None	Trace	0.2	—
A3+12.1	Light	Trace	1.6	—

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

entered 08/28/10 WAF

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/26-27/10

PROJ. NUMBER: 22131003 COMPLETED BY: WAF

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace [3]ppm	Visible[2] (N, T, L, M, H, R)
AZ-1006	None	None	0.0	
AZ-1007	None	None	0.0	
AZ-1008	None	None	0.0	
AZ-1009	None	Trace	1.7	
AZ-1010	None	None	4.3	
AZ-1011	None	None	0.0	
AZ-1012	None	Trace	1.7	
AZ-1013	None	Trace	0.5	
AZ-1014	None	None	0.0	
AZ-1015	None	None	7.1	
AZ-1016	None	None	0.1	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Entered 08/28/10 WAF

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/26-27/10

PROJ. NUMBER: 22131003 COMPLETED BY: WAF

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace [3]ppm	Visible[2] (N, T, L, M, H, R)
A2-1017	None	None	2.5	
A2-1018	Light	None	8.2	
*A2-1019	Light	None	7.9	
A2-1020	None	None	3.1	
A2-1021	Light	None	10.8	
A2-1022	Light	Trace	14.7	
A2-1023	Light	None	12.0	
A2-1024	None	None	0.4	
A2-1025	None	None	1.3	
A2-1026	Light	None	23.1	
A2-1027	None	None	14.7	

*Same location as Analytical, SO-DOC-A2-20-082610

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Entered 08/28/10 WAF

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/26-27/10

PROJ. NUMBER: 22131003 COMPLETED BY: WAF

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace [3]ppm	Visible[2] (N, T, L, M, H, R)
A2-1028	None	None	0.0	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

Entered 08/28/10 WAE

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/26/10

PROJ. NUMBER: 22131003 COMPLETED BY: LCM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A2-0040 TC	N no odor	N no sheen	0.0	
A2-0041 TC	N no odor	N no sheen	6.9	
A2-0042 TC	N no odor	N no sheen	0.0	
A2-0043 TC	N no odor	N no sheen	9.5	
A2-0044 TC	N no odor	N no sheen	0.8	
A2-0045 TC	N no odor	N no sheen	0.0	
A2-0046 TC	N no odor	N no sheen	7.8	
A2-0047 TC	N no odor	N no sheen	2.4	
A2-0048 TC	N no odor	N no sheen	0.0	
A2-0113 TC	N no odor	N no odor	0.6	
A2-0114 TC	N no odor	N no odor	6.2	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Entered 08/28/10 WAF

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/26/10

PROJ. NUMBER: 22131003 COMPLETED BY: LCM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A2-0115	N no odor	N no sheen	3.7	
A2-0116	N no odor	N no sheen	3.4	
A2-0117	N no odor	N no sheen	13.9	
A2-0118	N no odor	N no sheen	3.7	

Picture 1 - Sheet
2 - Soils
3 - Creek Stic

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) – Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/25/10

PROJ. NUMBER: 22131003 COMPLETED BY: LCM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-07.1	N none	N no sheen	0.1	
A1-08.1	N	N	0.6	
A1-09.1	N	N	0.4	
A1-10.1	N	N	0.9	
A1-14.1	N	N	3.8	
A1-96.1	N	N	0.7	
A1-97.1	N	N	1.9	
A1-98.1	N	N	1.4	
A1-21.1	M	H definite product splotches	506	586
[illegible]				

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/25/10

PROJ. NUMBER: 22131003 COMPLETED BY: MEN

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-000-2.1 TW	MODERATE	RAINBOW; PRODUCT DROPLETS	22.0	N/A
~~A1-000-1.1 TW~~ A1-000-1.1 MW	SLIGHT	MODERATE	6.0	
A1-000-3.1 TW	MODERATE	MODERATE	150	
A1-000-4.1 TW	NONE	NONE	26.0	
A1-000-11.1 TW	**MODERATE**	**RAINBOW**	3.0	
A1-000-12.1 TW	NONE	TRACE	0.0	
A1-000-13.1 TW	NONE	NONE	0.0	
A1-000-14.1 TW	NONE	NONE	0.6	
A1-000-15.1 TW	NONE	NONE	1.8	
A1-000-19.1 * TW	STRONG	RAINBOW	(NM)	
A1-000-20.1 TW	NONE	NONE	0.0	

* Location very impacted.

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

NM- Not Measured

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8-24-2010 5:30am

PROJ. NUMBER: 22131003 COMPLETED BY: NORM METCALF

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3 #1	NO SMELL OF OIL EARTH SMELL	NO SHEEN	1.0	AREA UNDER WATER SAMPLE TAKEN FROM BANK
A3 #2	EARTH SMELL. NO SMELL OF OIL.	NO SHEEN	2.2 ~~1.2~~	AREA UNDER WATER SAMPLE TAKEN FROM BANK.
A3 #3	VERY SLIGHT SMELL MORE EARTH SMELL THAN OIL	(SAMPLE TAKEN ~ 4") NO SHEEN	0.6 ~~0.6~~	TAKEN FROM BANK AREA UNDER H_2O
A3 #4	VERY SLIGHT SMELL (SAMPLE TAKEN ~ 4")	NO SHEEN	1.2	TAKEN FROM BANK AREA UNDER H_2O
A3 #5	NO SMELL SMELLS LIKE EARTH	NO SHEEN	0.4	NEXT TO BANK NE SIDE
A3 # 6	NO SMELL	NO SHEEN	0.7	MIDDLE NE SIDE
MTRD.	NO SMELL	NO SHEEN	0.8	EAST SIDE OF MAT RD.

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Page 1 of 1

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/24/10

PROJ. NUMBER: 22131003 COMPLETED BY: BLW

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-tree 1	moderate	moderate	11.7	wiped out 8/24, note: done yesterday, could not locate
A3-tree 2	slight	slight	10.6	wiped out by note: done yesterday, excavator
A3-tree 3	slight	moderate	12.8	
A3-tree 4	slight	slight	4.7	
A3-tree 5	slight	moderate	4.6	
A3-tree 6	slight	slight	15.0	
A3-tree 7	none	none	1.8	
A3-tree 8	none	slight	2.7	
A3-tree 9	moderate	heavy (no product)	46.9	
A3-tree 10	none	none	1.6	
A3-tree 11	none	none	0.3	
A3-tree 12	slight	none	16.7	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Entered 08/28/10 WBT

Soil Screening Field Log

Page ___ of ___

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/23

PROJ. NUMBER: 22131003 COMPLETED BY: LCM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A2-029 TK	N no odor	N no visible sheen	5.8	
A2-030 TK	N no odor	N no sheen	6.3	
A2-031 TK	L light odor	N no sheen	4.8	
A2-032 TK	N no odor	N no sheen	0.7	
A2-033 TK	L light odor	N no sheen	0.8	
A2-034 TK	N no odor	N no sheen	~~1.8~~ 0.8	
A2-035 TK	N no odor	N no sheen	1.8	
A2-036 TK	N no odor	N no sheen	0.7	
A2-037 TK	N no odor	N no sheen	0.8	
A2-038 TK	N no odor	N no sheen	0.0	
A2-039 TK	L light odor	L light sheen well-defined black splotches of product	108	

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Duplicate Shotgun

Soil Screening Field Log

Page ___ of ___

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/23/10

PROJ. NUMBER: 22131003 COMPLETED BY: BCW

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-Tree 1	light	moderate	11.6	
A3-tree 2	light	light	10.3	note: due to product that came in after test, the location was re-excavated, flag gone
A3-tree 3				

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/22/10

PROJ. NUMBER: 22131003 COMPLETED BY: MEN

	Field Soil Screening			Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-001 TLK	NONE	NONE	0.7	N/A
A1-002 TLK	MODERATE	RAINBOW; PRODUCT IN SPOON	7.0	
A1-003 TLK	MODERATE	MODERATE	452	
A1-004 TLK	LIGHT	TRACE	186	
A1-005 TLK	LIGHT	LIGHT	786	
A1-006 TLK	LIGHT	RAINBOW	14.8	
A1-007 TLK	NONE	NONE	1.6	
A1-008 TLK	NONE	LIGHT	3.7	
A1-009 TLK	NONE	NONE	21.9	
A1-010 TLK	NONE	NONE	88.7	
A1-011 TLK	MODERATE	RAINBOW; PRODUCT IN SPOON	231	

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 08/22/10

PROJ. NUMBER: 22131003 COMPLETED BY: MEN

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A1-0012 TW	LIGHT	LIGHT	23.9	N/A
A1-0013* TW	NONE	NONE	2.2	
A1-0014* TW	STRONG	RAINBOW/PRODUCT POOLS	210	
A1-0015 TW	MODERATE	RAINBOW/PRODUCT IN SPOON	109	
A1-0016 TW	NONE	RAINBOW/PRODUCT IN SPOON	6.9	
A1-0017* TW	STRONG	RAINBOW/PRODUCT POOLS	150	
A1-0018* TW	LIGHT	NONE	0.8	
A1-0019 TW	NONE	NONE	3.0	
A1-0020* TW	LIGHT	RAINBOW/PRODUCT POOLS	6.1	
A1-0021 TW	MODERATE	RAINBOW/PRODUCT IN SPOON	63.1	

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

*PRODUCT OBSERVED IN ISOLATED POCKETS NEAR LOCATION

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8-22-10

PROJ. NUMBER: 22131003 COMPLETED BY: NHM

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3 NW CORNER #1 A3-001TM	SLIGHT ODOR	LITTLE TO NO SHEEN	0.3	
A3 NW CORNER #2 A3-002TM	NO ODOR	NO SHEEN	0.6	
A3 NE CORNER #1 A3-003TM	NO ODOR	NO SHEEN	2.5	
A3 NE CORNER #2 A3-004TM	NO ODOR	NO SHEEN	0.5	
A3 SE CORNER #1 A3-005TM	MODERATE ODOR	MEDIUM SHEEN	332	
A3 SE CORNER #2 A3-006TM	NO ODOR	NO SHEEN	1.4	
A3 SW CORNER #1 A3-007TM	NO ODOR	NO SHEEN	3.0	
~~A3 SW CORNER #2~~				

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/21/10

PROJ. NUMBER: 22131003 COMPLETED BY: TAYLOR WEDDNER - ENVIROLOGIC

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-3.1	MODERATE	MODERATE SHEEN / NO RAINBOW	8.8	
A3-4.1	MODERATE	SLIGHT SHEEN	61.6	
A3-23.1	NONE	SLIGHT SHEEN	1.9	
A3-25.1	NONE	HEAVY SHEEN / NO RAINBOW	7.0	
A3-26.1	STRONG	PRODUCT	406	
A3-28.1	STRONG	LIGHT	428	
A3-33.1	NONE	NONE	[redacted]	
A3-34.1 TLK	NONE	LIGHT	208	
A3-35.1	LIGHT	MODERATE	97.7	
A3-38.1	STRONG	HEAVY / NO RAINBOW	692	
A3-41.1				

Hit A:
A3-3
A3-4
A3-23
A3-25
A3-26
A3-28
A3-33
A3-34
A3-35
A3-38
A3-41

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Soil Screening ~~Field Log~~

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10 / 8/21/10

PROJ. NUMBER: 22131003 COMPLETED BY: ASN/LCM/DMR/DAS

	Field Soil Screening			
	Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm
8/20/10 0700	A2-1	L very faint odor	N no visible sheen	17.4
	A2-2	L faint odor	N slight vegetation sheen / No oil sheen	21.4
LCM 8/20-8/21 1900	A2-3	L faint odor	& T very faint oil sheen	34.6
	A2-4	No odor	N no visible sheen	0.4
	A2-5	L faint odor	N no visible sheen	1.9 ~~0.5~~
	A2-6	L faint odor	T tested three times - first had some small spots, other 2 were clear	22.5
	A2-7	L faint odor → earthy/organic	N no visible sheen	0.8
DMR DAS 8/21/10 0700 (SEE BELOW)	A2-8	L VERY FAINT ODOR	N NO VISIBLE SHEEN	0.0
	A2-9	L FAINT ODOR	N NO VISIBLE SHEEN	1.3
	A2-10	L FAINT ODOR	T FAINT OIL SHEEN	14.2
LCM 8/21 1900	A2-11	L Faint odor	N no visible sheen	17.5
	A2-12	L faint odor	N no visible sheen	42.9
DMR 0700 8/21/10 (CONT. ABOVE)	A2-13	L FAINT ODOR	L FAINT OIL SHEEN. TRENCH BOX	4.6 S 140'
	A2-14	L FAINT ODOR	L FAINT OIL SHEEN	7.9 N 140'
	A2-15	NO ODOR	N NO VISIBLE SHEEN	0.0 S 140'
	A2-16	NO ODOR	N NO VISIBLE SHEEN	0.0 N 140'
	A2-17	NO ODOR	N NO VISIBLE SHEEN	0.8 0 YES'
	A2-18	NO ODOR	N NO VISIBLE SHEEN	0.4 N YES

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/21 & 22/10

PROJ. NUMBER: 22131003 COMPLETED BY: LCM & DMR

	Field Soil Screening				Talmadge Creek Streambed
	Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	~~Visible[2] (N, T, L, M, H, R)~~
LCM 8/21 1900	A2-19	S-STRONG PETRO ODOR	R-DEFINITE RAINBOW SHEEN	375	~~75~~ N TRENCH BOX
	A2-19.1	N-NO ODOR	N-NO VISIBLE SHEEN	0.1	~~75~~ N
	A2-20	N-NO ODOR	N-NO VISIBLE SHEEN	20.8	~~75~~ S
	A2-21	N-NO ODOR	T-VERY LIGHT SHEEN	1.3	~~95~~ N
	A2-22	L-SLIGHT ODOR	N-NO SHEEN	3.1	~~95~~ S
	A2-23	L-SLIGHT ODOR	N-NO SHEEN	15.9	~~80~~ S
	A2-24	N-NO ODOR	N-NO SHEEN	17.8	~~80~~ N
DMR 8/22 0700	A2-25	L-SLIGHT ODOR	T-VERY LIGHT SHEEN	3.4	TRENCH BOX FT & ANALYTICAL
	A2-26	N-NO ODOR	N-NO SHEEN	2.6	FT & ANALYTICAL
	A2-27	L-SLIGHT ODOR	T-VERY LIGHT SHEEN	13.0	FT ONLY
	A2-28	N-NO ODOR	N-NO SHEEN	0.8	FT ONLY

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP606 Pipeline Release DATE: 083010

PROJ. NUMBER: 22131003 COMPLETED BY: AMO2

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-19.1	Moderate	[redacted] Product	622	—
A3-31.2 31.1	None	Trace	0.6	—
A3-19.3	Light	None	19.0	—
A2-009.1	None	None	1.2	—
A3-0026.2	Light	Trace	31.6	—

(1) Light (L), moderate (M), Strong (S) and type if evident.
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

P:22131003

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10

PROJ. NUMBER: 22131003 COMPLETED BY: BLW/DHN

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-001	moderate	moderate	131	
A3-002	none	none	1.1	
A3-003	strong	rainbow	952	
A3-004	strong	rainbow/product	560	
A3-005	none	none	1.5	
A3-006	none	moderate	8.7	flag moved 2' out of water
A3-007	none	trace	2.3	flag moved 5' out of water
A3-008	none	none	3.5	flag moved 3' out of water
A3-009	none	none	0.5	
A3-010	none	none	2.0	
A3-011	none	trace	1.5	

(1) Light (L), moderate (M), Strong (S) and type if evident

(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.

(3) PID/FID readouts in ppm above background

ND= No detection

BARR

~~Soil Screening~~ Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10

PROJ. NUMBER: 22131003 COMPLETED BY: BCW/DHN/TMW

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)
A3-sd2	none	light sheen	1.9	
A3-sd3	none	none	1.5	
A3-sd4	none	none	1.6	
A3-sd5	none	none	1.1	location moved 8' due to water
A3-sd6	none	none	1.0	
A3-sd7	none	none	2.4	
A3-sd8	slight	moderate	35.7	
A3-sd9	strong	rainbow	725	
A3-sd20	none	none	1.1	
A3-sd21	none	trace	17.8	
A3-sd22	none	none	1.0	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

~~Soil Screening Field Log~~

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10 TW

PROJ. NUMBER: 22131003 COMPLETED BY: _____

Field Soil Screening				Talmadge Creek Streambed
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace [3]ppm	Visible[2] (N, T, L, M, H, R)
A3-23	strong	rainbow	447	
A3-24	none	none	6.9	
A3-25	strong	heavy - no product	47.7	
A3-26	strong	heavy - product	194	
A3-27	none	none	10.6	
A3-28	moderate	heavy - no product	86.0	
A3-29	none	none	1.5	
A3-30	none	none	6.4	
A3-31	strong	rainbow	85.1	moved 8' due to standing water
A3-32	light	trace	23.3	
A3-33	moderate	heavy - no product	130	

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10

PROJ. NUMBER: 22131003 COMPLETED BY: BLW/DMN/TMW

Field Soil Screening				Talmadge Creek Streambed	
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm	Visible[2] (N, T, L, M, H, R)	
A3-34	moderate	heavy - no product	39.7		
A3-35	strong	rainbow	148		
A3-36	none	none	1.0		
A3-37	none	none	1.1		
A3-38	moderate	rainbow	215	moved 4' due to water	
A3-39	none	light	9.8		
A3-40	none	none	36		
A3-41	strong	rainbow - product	614		
A3-42	moderate	heavy	69.7	moved 6', on 9 sand bags	
A5-1	NONE	NONE	0.0	12' OFF BERM.	NM
A5-2	MODERATE	NONE	6.0		NM

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added),
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

BARR

Soil Screening Field Log

PROJ. NAME: Marshall Line 6B MP608 Pipeline Release DATE: 8/20/10 - 8/21/10

PROJ. NUMBER: 22131003 COMPLETED BY: AMS

Field Soil Screening			
Location	Odor[1] (N, L, M, S) w/comments	Visible[2] (N, T, L, M, H, R) w/comments	Headspace[3] ppm
A3-42.1	No odor - earthy	No sheen	38.0
A3-41.1	No odor	No sheen	0.2
A3-39.1	No odor	Slight sheen	14.7
A3-38.8 AMS			
~~A3-38.1~~	Very lt. odor	No sheen	2.9
A3-34.1 ~~A3-34.1~~ JK	No odor	No sheen	40.6
~~A3-31~~			
A4-1	No odor	No sheen	0.3
A4-2	No odor	No sheen	0.0
A4-3	No odor	No sheen	0.1
A4-4	Lt. odor	No sheen	1.8
A4-5	No odor	No sheen	0.0
A4-6	No odor	No sheen	18.9
A4-7	No odor	No sheen	0.1
A4-8	No odor	No sheen	2.0
A4-9	NO ODOR	NO SHEEN	0.0
A4-10	No odor	No sheen	3.2
A4-11	Moderate odor	Moderate sheen - flag moved 8' N out of water	33.1
A4-12	No odor	No sheen - berm material	0.6
A4-13	No odor	No sheen - berm material	1.5

(1) Light (L), moderate (M), Strong (S) and type if evident
(2) None (N) – No Sheen Detected.
Trace (T) - Possible or faint oil sheen observed (may not continue to generate sheen as additional water is added).
Light (L) – Obvious sheen that may cover the entire water surface.
Moderate M) – Definite oil sheen that covers entire surface, but "Rainbow" colors not distinguishable.
Heavy (H) – Definite oil film or product that does not display rainbow colors.
Rainbow (R) - Definite oil sheen, film or product that displays rainbow colors.
(3) PID/FID readouts in ppm above background
ND= No detection

1 OF 2 MEN 08/26/10

0730 MEN + DMR TO A1/A2 AREA TO CONTINUE DIGGING, FIELD SCREENING, + ANALYTICAL SAMPLING. DMR TO DIG. IN A2 AREA (FIELD OBSERVATIONS), MEN TO MAP OUT ANALYTICAL SAMPLE LOCATIONS

1030 DMR TO GO TO AIRPORT TRAILER (PER PHONECALL). MEN TO CONTINUE WORKING IN B-2 AREA

ANALYTICAL SAMPLE	TIME	QC?	ODOR/SHEEN/PID
SO-DOC-A2-13-082610	10:50	NO	N/N/0.0
↳ (18", S. SIDEWALL OF 6B TRENCH)			
SO-DOC-A2-14-082610	11:40	MS/MSD	N/N/0.0
↳ (18", S. SIDEWALL OF 6B TRENCH)			
SO-DOC-A2-17-082610	16:15	MS/MSD	N/N/0.0
↳ (18", S. SIDEWALL OF 6B TRENCH)			
SO-DOC-A2-15-082610	13:15	SO-MI-082610 (DUP.)	N/Trace/0.0
↳ (VECTOR LINE FLOOR SAMPLE)			
SO-DOC-A2-16-082610	13:35	NO	N/N/0.0
↳ (VECTOR LINE FLOOR SAMPLE)			

1700 CREW BEGINS SCRAPING AREAS IN A1:

2 OF 2 MEN 08/26/10

A1-2.1 (+ A1-11.1). SCRAPE AREAS UNTIL NO RAINBOW SHEEN OR VISIBLE PRODUCT DROPLETS.

LOC'N	ODOR	SHEEN	PID
A1-2.2	MODERATE	MODERATE	60.7
A1-11.2	MODERATE	MODERATE	9.6

FIELD SCREENING IN A2:

LOC'N	ODOR	SHEEN	PID
A2-101	NO	TRACE	0.3
A2-102	NO	NO	0.6
A2-103	NO	NO	4.3
A2-104	NO	SLIGHT	0.0
A2-105	NO	NO	1.1
A2-106	NO	NO	0.0
A2-107	NO	TRACE	6.2
A2-108	NO	NO	0.6
A2-109	MODERATE	MODERATE	11.3
A2-110	NO	NO	6.2
A2-111	NO	NO	0.0
A2-112	NO	NO	0.0

1915 MEN OFF A2; NIGHT CREW WILL RESUME WORK IN A2

Location Marshall, MI Date 8-26-10

Project / Client

Locn	Odor	Sheen	PID
AD-1001	Organic	Tr	0.0
AD-1002	Organic	LT	8.8
AD-1003	LT	Tr	0.0
AD-1004	Organic	Tr	33.8

Location Marshall, MI Date 8-26-10

Project / Client

1330 Talked to DEQ about [illegible] around vector line
- very uncomfortable around HL line while exposing weights

Andrew
- Were photos taken?
- Table compared to MDE [illegible]

GPS figure out each [illegible] area

Attachment C

Quantitative Laboratory Analytical Data from Source Area

New Age/Landmark Mobile Laboratory Services
160 Veterans Blvd. • South Haven, Michigan 49090
Tel: 888-685-1628 • mobilelabs@newagelandmark.com

ANALYTICAL REPORT

Superior Environmental
1680 Marquette Ave.
Bay City, MI 48706
ATTN: Todd White

Project #: NAL10-067
Project Site: Enbridge Pipeline Release
Marshall, Michigan

Analytical results meet the requirements of NELAC Standards. The results reported apply solely to the sample analyzed and all results are reported on a dry weight basis unless stated otherwise. Any questions concerning this report should be directed to Scott D. Wall, President

***** = NAL is not certified for this compound by NELAC.
B = Analyte is found in the associated blank as well as in the sample.
D = Compound identified in an analysis at a secondary dilution factor.
E = Compound's concentration exceeds the calibration range of the instrument at this dilution.
X = Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative for explanation.
J = Estimated value, compound meets the identification criteria but the result is less than the limit of quantitation but greater than the MDL.
U = Non-detect

Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-659	A1-1L	TRG	71-43-2	Benzene		U	ug/Kg	287	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG	108-88-3	Toluene		U	ug/Kg	287	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	287	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	575	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG	95-47-6	o-Xylene		U	ug/Kg	287	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG		GRO (C5-C10)		U	mg/Kg	14.4	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1					SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	SUR	1868-53-7	Dibromofluoromethane	56				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1	50	112%			SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	SUR	17060-07-0	1,2-Dichloroethane d4	63				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1	50	126%			SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	SUR	2037-26-5	Toluene d8	58				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1	50	116%			SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	SUR	460-00-4	Bromofluorobenzene	44				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	18.1	50	88%			SW8260B	NALJ5793	J082510BEEB
NAL10067B-659	A1-1L	TRG		TPH (C10-C38)	290		mg/Kg	274	8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	18.1					SW8270C	NALX4954	X082510ATAS
NAL10067B-659	A1-1L	SUR	4165-60-0	Nitrobenzene-d5	2.3		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	18.1	20	12%			SW8270C	NALX4954	X082510ATAS
NAL10067B-659	A1-1L	SUR	321-60-8	2-Fluorobiphenyl	5.2		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	18.1	20	26%			SW8270C	NALX4954	X082510ATAS
NAL10067B-659	A1-1L	SUR	1718-51-0	p-Terphenyl-d14	3.8		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	18.1	20	19%			SW8270C	NALX4954	X082510ATAS

New Age/Landmark Mobile Laboratory Services
160 Veterans Blvd. • South Haven, Michigan 49090
Tel: 888-685-1628 • mobilelabs@newagelandmark.com

ANALYTICAL REPORT

Superior Environmental
1680 Marquette Ave.
Bay City, MI 48706
ATTN: Todd White

Project #: NAL10-067
Project Site: Enbridge Pipeline Release
Marshall, Michigan

Analytical results meet the requirements of NELAC Standards. The results reported apply solely to the sample analyzed and all results are reported on a dry weight basis unless stated otherwise. Any questions concerning this report should be directed to Scott D. Wall, President

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B = Analyte is found in the associated blank as well as in the sample.
D = Compound identified in an analysis at a secondary dilution factor.
E = Compound's concentration exceeds the calibration range of the instrument at this dilution.
X = Estimated value, some aspect of the test relative to this compound did not meet QC criteria. See batch narrative for explanation.
J = Estimated value, compound meets the identification criteria but the result is less than the limit of quantitation but greater than the MDL.
U = Non-detect

Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-660	A1-2L	TRG	71-43-2	Benzene		U	ug/Kg	361	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG	108-88-3	Toluene		U	ug/Kg	361	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	361	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	721	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG	95-47-6	o-Xylene		U	ug/Kg	361	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG		GRO (C5-C10)	29		mg/Kg	18.0	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3					SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	SUR	1868-53-7	Dibromofluoromethane	54				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3	50	108%			SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	SUR	17060-07-0	1,2-Dichloroethane d4	56				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3	50	112%			SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	SUR	2037-26-5	Toluene d8	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3	50	110%			SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	SUR	460-00-4	Bromofluorobenzene	47				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	14.3	50	94%			SW8260B	NALJ5802	J082510BEEB
NAL10067B-660	A1-2L	TRG		TPH (C10-C38)	2100		mg/Kg	348	8/25/2010	8/26/2010	8/26/2010	SO	1	30.21	5	14.3					SW8270C	NALX4955	X082510ATAS
NAL10067B-660	A1-2L	SUR	4165-60-0	Nitrobenzene-d5	7.6		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.21	5	14.3	20	38%			SW8270C	NALX4955	X082510ATAS
NAL10067B-660	A1-2L	SUR	321-60-8	2-Fluorobiphenyl	14		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.21	5	14.3	20	70%			SW8270C	NALX4955	X082510ATAS
NAL10067B-660	A1-2L	SUR	1718-51-0	p-Terphenyl-d14	6.9		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.21	5	14.3	20	35%			SW8270C	NALX4955	X082510ATAS

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Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-661	A1-3L	TRG	71-43-2	Benzene		U	ug/Kg	158	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG	108-88-3	Toluene		U	ug/Kg	158	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	158	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	315	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG	95-47-6	o-Xylene		U	ug/Kg	158	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG		GRO (C5-C10)	5.4		mg/Kg	7.9	8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3					SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	SUR	1868-53-7	Dibromofluoromethane	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3	50	110%			SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	SUR	17060-07-0	1,2-Dichloroethane d4	59				8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3	50	118%			SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	SUR	2037-26-5	Toluene d8	56				8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3	50	112%			SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	SUR	460-00-4	Bromofluorobenzene	45				8/25/2010	8/26/2010	8/26/2010	SO	50	10.5	10.0	33.3	50	90%			SW8260B	NALJ5803	J082510BEEB
NAL10067B-661	A1-3L	TRG		TPH (C10-C38)	710		mg/Kg	149	8/25/2010	8/26/2010	8/26/2010	SO	1	30.18	5	33.3					SW8270C	NALX4956	X082510ATAS
NAL10067B-661	A1-3L	SUR	4165-60-0	Nitrobenzene-d5	5.8		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.18	5	33.3	20	29%			SW8270C	NALX4956	X082510ATAS
NAL10067B-661	A1-3L	SUR	321-60-8	2-Fluorobiphenyl	12		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.18	5	33.3	20	60%			SW8270C	NALX4956	X082510ATAS
NAL10067B-661	A1-3L	SUR	1718-51-0	p-Terphenyl-d14	7.1		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.18	5	33.3	20	36%			SW8270C	NALX4956	X082510ATAS

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Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-662	A3-1L	TRG	71-43-2	Benzene		U	ug/Kg	292	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG	108-88-3	Toluene		U	ug/Kg	292	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	292	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	584	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG	95-47-6	o-Xylene		U	ug/Kg	292	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG		GRO (C5-C10)			mg/Kg	14.6	8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3					SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	SUR	1868-53-7	Dibromofluoromethane	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3	50	110%			SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	SUR	17060-07-0	1,2-Dichloroethane d4	61				8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3	50	122%			SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	SUR	2037-26-5	Toluene d8	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3	50	110%			SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	SUR	460-00-4	Bromofluorobenzene	45				8/25/2010	8/26/2010	8/26/2010	SO	50	10.1	10.0	17.3	50	90%			SW8260B	NALJ5804	J082510BEEB
NAL10067B-662	A3-1L	TRG		TPH (C10-C38)	270		mg/Kg	287	8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	17.3					SW8270C	NALX4957	X082510ATAS
NAL10067B-662	A3-1L	SUR	4165-60-0	Nitrobenzene-d5	5.7		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	17.3	20	29%			SW8270C	NALX4957	X082510ATAS
NAL10067B-662	A3-1L	SUR	321-60-8	2-Fluorobiphenyl	14		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	17.3	20	70%			SW8270C	NALX4957	X082510ATAS
NAL10067B-662	A3-1L	SUR	1718-51-0	p-Terphenyl-d14	8.7		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.2	5	17.3	20	44%			SW8270C	NALX4957	X082510ATAS

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Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-663	A3-2L	TRG	71-43-2	Benzene		U	ug/Kg	245	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG	108-88-3	Toluene		U	ug/Kg	245	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	245	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	490	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG	95-47-6	o-Xylene		U	ug/Kg	245	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG		GRO (C5-C10)	5.8		mg/Kg	12.3	8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0					SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	SUR	1868-53-7	Dibromofluoromethane	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0	50	110%			SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	SUR	17060-07-0	1,2-Dichloroethane d4	61				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0	50	122%			SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	SUR	2037-26-5	Toluene d8	57				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0	50	114%			SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	SUR	460-00-4	Bromofluorobenzene	44				8/25/2010	8/26/2010	8/26/2010	SO	50	10.3	10.0	21.0	50	88%			SW8260B	NALJ5790	J082510BEEB
NAL10067B-663	A3-2L	TRG		TPH (C10-C38)	1300		mg/Kg	231	8/25/2010	8/26/2010	8/26/2010	SO	1	30.9	5	21.0					SW8270C	NALX4963	X082510ATAS
NAL10067B-663	A3-2L	SUR	4165-60-0	Nitrobenzene-d5	7.0		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.9	5	21.0	20	35%			SW8270C	NALX4963	X082510ATAS
NAL10067B-663	A3-2L	SUR	321-60-8	2-Fluorobiphenyl	13		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.9	5	21.0	20	65%			SW8270C	NALX4963	X082510ATAS
NAL10067B-663	A3-2L	SUR	1718-51-0	p-Terphenyl-d14	8.8		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.9	5	21.0	20	44%			SW8270C	NALX4963	X082510ATAS

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NAL10067B-664	A3-3L	TRG	71-43-2	Benzene		U	ug/Kg	368	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG	108-88-3	Toluene		U	ug/Kg	368	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	368	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	735	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG	95-47-6	o-Xylene		U	ug/Kg	368	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG		GRO (C5-C10)	16		mg/Kg	18.4	8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1					SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	SUR	1868-53-7	Dibromofluoromethane	55				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1	50	110%			SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	SUR	17060-07-0	1,2-Dichloroethane d4	61				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1	50	122%			SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	SUR	2037-26-5	Toluene d8	56				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1	50	112%			SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	SUR	460-00-4	Bromofluorobenzene	45				8/25/2010	8/26/2010	8/26/2010	SO	50	10.4	10.0	14.1	50	90%			SW8260B	NALJ5791	J082510BEEB
NAL10067B-664	A3-3L	TRG		TPH (C10-C38)	2700		mg/Kg	357	8/25/2010	8/26/2010	8/26/2010	SO	1	29.7	5	14.1					SW8270C	NALX4962	X082510ATAS
NAL10067B-664	A3-3L	SUR	4165-60-0	Nitrobenzene-d5	2.5		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	29.7	5	14.1	20	13%			SW8270C	NALX4962	X082510ATAS
NAL10067B-664	A3-3L	SUR	321-60-8	2-Fluorobiphenyl	6.4		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	29.7	5	14.1	20	32%			SW8270C	NALX4962	X082510ATAS
NAL10067B-664	A3-3L	SUR	1718-51-0	p-Terphenyl-d14	6.6		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	29.7	5	14.1	20	33%			SW8270C	NALX4962	X082510ATAS

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Lab ID:	Sample ID:		CAS #	ANALYTES	Results	QC	Units	RL	Sample Date	Prep. Date	Analysis Date	Matrix	Dil.	Weigh t(g)	Vol.(ml)	% Solid	Spike	% Rec	% RPD	Parent	Method	Data file	Batch ID
NAL10067B-665	A3-4L	TRG	71-43-2	Benzene		U	ug/Kg	110	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG	108-88-3	Toluene		U	ug/Kg	110	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	110	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	220	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG	95-47-6	o-Xylene		U	ug/Kg	110	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG		GRO (C5-C10)		U	mg/Kg	5.5	8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0					SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	SUR	1868-53-7	Dibromofluoromethane	50				8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0	50	100%			SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	SUR	17060-07-0	1,2-Dichloroethane d4	53				8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0	50	106%			SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	SUR	2037-26-5	Toluene d8	56				8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0	50	112%			SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	SUR	460-00-4	Bromofluorobenzene	45				8/25/2010	8/26/2010	8/26/2010	SO	50	9.9	10.0	45.0	50	90%			SW8260B	NALJ5788	J082510BEEB
NAL10067B-665	A3-4L	TRG		TPH (C10-C38)	680		mg/Kg	110	8/25/2010	8/26/2010	8/26/2010	SO	1	30.4	5	45.0					SW8270C	NALX4964	X082510ATAS
NAL10067B-665	A3-4L	SUR	4165-60-0	Nitrobenzene-d5	5.6		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.4	5	45.0	20	28%			SW8270C	NALX4964	X082510ATAS
NAL10067B-665	A3-4L	SUR	321-60-8	2-Fluorobiphenyl	7.5		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.4	5	45.0	20	38%			SW8270C	NALX4964	X082510ATAS
NAL10067B-665	A3-4L	SUR	1718-51-0	p-Terphenyl-d14	5.2		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30.4	5	45.0	20	26%			SW8270C	NALX4964	X082510ATAS

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ANALYTICAL REPORT

Superior Environmental
1680 Marquette Ave.
Bay City, MI 48706
ATTN: Todd White

Project #: NAL10-067
Project Site: Enbridge Pipeline Release
Marshall, Michigan

Analytical results meet the requirements of NELAC Standards. The results reported apply solely to the sample analyzed and all results are reported on a dry weight basis unless stated otherwise. Any questions concerning this report should be directed to Scott D. Wall, President
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NAL10067B-666	A4-1L	TRG	71-43-2	Benzene		U	ug/Kg	209	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG	108-88-3	Toluene		U	ug/Kg	209	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG	100-41-4	Ethylbenzene		U	ug/Kg	209	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG	XYLMP	p&m-Xylene		U	ug/Kg	418	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG	95-47-6	o-Xylene		U	ug/Kg	209	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG		GRO (C5-C10)		U	mg/Kg	10.5	8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7					SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	SUR	1868-53-7	Dibromofluoromethane	54				8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7	50	108%			SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	SUR	17060-07-0	1,2-Dichloroethane d4	59				8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7	50	118%			SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	SUR	2037-26-5	Toluene d8	56				8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7	50	112%			SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	SUR	460-00-4	Bromofluorobenzene	45				8/25/2010	8/26/2010	8/26/2010	SO	50	9.5	10.0	22.7	50	90%			SW8260B	NALJ5789	J082510BEEB
NAL10067B-666	A4-1L	TRG		TPH (C10-C38)	940		mg/Kg	220	8/25/2010	8/26/2010	8/26/2010	SO	1	30	5	22.7					SW8270C	NALX4965	X082510ATAS
NAL10067B-666	A4-1L	SUR	4165-60-0	Nitrobenzene-d5	20		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30	5	22.7	20	100%			SW8270C	NALX4965	X082510ATAS
NAL10067B-666	A4-1L	SUR	321-60-8	2-Fluorobiphenyl	20		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30	5	22.7	20	100%			SW8270C	NALX4965	X082510ATAS
NAL10067B-666	A4-1L	SUR	1718-51-0	p-Terphenyl-d14	20		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	30	5	22.7	20	100%			SW8270C	NALX4965	X082510ATAS

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NAL10067B-667	BG-1	TRG	71-43-2	Benzene		U	ug/Kg	243	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG	108-88-3	Toluene		U	ug/Kg	243	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG	100-41-4	Ethylbenzene		U	ug/Kg	243	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG	XYLMP	p&m-Xylene		U	ug/Kg	486	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG	95-47-6	o-Xylene		U	ug/Kg	243	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG		GRO (C5-C10)		U	mg/Kg	12.2	8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1					SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	SUR	1868-53-7	Dibromofluoromethane	54				8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1	50	108%			SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	SUR	17060-07-0	1,2-Dichloroethane d4	61				8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1	50	122%			SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	SUR	2037-26-5	Toluene d8	56				8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1	50	112%			SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	SUR	460-00-4	Bromofluorobenzene	44				8/25/2010	8/26/2010	8/26/2010	SO	50	9.8	10.0	20.1	50	88%			SW8260B	NALJ5792	J082510BEEB
NAL10067B-667	BG-1	TRG		TPH (C10-C38)	980		mg/Kg	211	8/25/2010	8/26/2010	8/26/2010	SO	1	35.3	5	20.1					SW8270C	NALX4966	X082510ATAS
NAL10067B-667	BG-1	SUR	4165-60-0	Nitrobenzene-d5	4.7		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	35.3	5	20.1	20	24%			SW8270C	NALX4966	X082510ATAS
NAL10067B-667	BG-1	SUR	321-60-8	2-Fluorobiphenyl	9.4		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	35.3	5	20.1	20	47%			SW8270C	NALX4966	X082510ATAS
NAL10067B-667	BG-1	SUR	1718-51-0	p-Terphenyl-d14	5.2		ng		8/25/2010	8/26/2010	8/26/2010	SO	1	35.3	5	20.1	20	26%			SW8270C	NALX4966	X082510ATAS

Attachment D

Field Photo Log

Photo 1: Vacuum ops 100 yds S of release. (08/01/2010)

Photo 2: Source area response (facing W) showing scraped areas. (08/03/2010)

Photo 3: Initial source area response facing N. (08/04/2010)

Photo 4: Source area facing NE. (08/06/2010)

Photo 5: Source area response facing NE. (08/07/2010)

Photo 6: Source area oil/water removal and Talmadge Creek. (08/07/2010)

Photo 7: Source area facing S/SW. (08/07/2010)

Photo 8: Source area facing W. (08/14/2010)

Photo 9: Source area scrape facing E. (08/25/2010)

Photo 10: Current site conditions facing S as of 8/27/2010.