Approved

Enbridge Line 6B MP 608
Marshall, MI Pipeline Release

Remedial Investigation Work Plan for
Kalamazoo River (MP 2.25 to MP 3.14)

Prepared for Michigan Department of Environmental Quality

Enbridge Energy, Limited Partnership

Submitted: November 9, 2011

Approved: November 18, 2011

Approved

FIGURES

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LIST OF ACRONYMS

COC	Chain of Custody
Enbridge	Enbridge Energy, Limited Partnership
DRO	Diesel Range Organics
GRO	Gasoline Range Organics
GPS	Global Positioning System
LDB	Left Descending Bank
Line 6B	The pipeline owned by Enbridge Energy, Limited Partnership that runs just south of Marshall, Michigan
MDEQ	Michigan Department of Environmental Quality
MDEQ Order	Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed November 1, 2010
MP	Mile Post
ORO	Oil Range Organics
OSCAR	Outstanding Site Characterization and Reconciliation
Part 201	Part 201 of Michigan's Act 451 of 1994 as amended
PNAs	Polynuclear Aromatic Hydrocarbons
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RDB	Right Descending Bank
RI	Remedial Investigation
SCAT	Shoreline Cleanup Assessment Technique
SOP	Standard Operating Procedure
SORT	Shoreline and Overbank Reassessment Technique
SPLP	Synthetic Precipitation Leaching Procedure
TPH	Total Petroleum Hydrocarbons
USCS	Unified Soil Classification System
U.S. EPA	United States Environmental Protection Agency
UV	Ultraviolet
VOCs	Volatile Organic Compounds

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1.0 INTRODUCTION

On July 26, 2010, Enbridge Energy, Limited Partnership (Enbridge) discovered a release of crude oil from the pipeline owned by Enbridge that runs just south of Marshall, Michigan (Line 6B) in the vicinity of its pump station. The crude oil was released below grade level via a break in Line 6B, emerged onto the ground surface, flowed over land following the natural topography downhill and into Talmadge Creek, and proceeded to flow downstream into the Kalamazoo River. Following the release, Enbridge performed response activities under the direction of the United States Environmental Protection Agency (U.S. EPA) and the Michigan Department of Environmental Quality (MDEQ) to remove oil from the system and respond to the release.

During the Spring of 2011, as a continuation of the response activities, Shoreline and Overbank Reassessment Technique (SORT) teams surveyed the shoreline and overbank of Talmadge Creek and the Kalamazoo River by boat and/or foot to visually identify the degree and characteristics of surface conditions and delineated the impacts by creating polygons, lines, or points utilizing a global positioning system (GPS) unit with sub-meter accuracy. Cleanup of some of these sites was completed throughout the summer using approved toolbox methods.

This Remedial Investigation (RI) Work Plan has been developed to encompass the overbank area of the Kalamazoo River from the Talmadge Creek confluence, from Mile Post (MP) 2.25 to MP 3.14. The purpose of this work plan is to describe the general procedures to be used to characterize soil, sediment, surface water, and groundwater quality at remaining SORT locations, previously uninvestigated Shoreline Cleanup Assessment Technique (SCAT) locations, and unverified excavation/oil removal areas within this section of the Kalamazoo River. Information obtained from these activities will be used to prepare a remedial investigation report for the Kalamazoo River, MP 2.25 to 3.14. This report will compare analytical results to Part 201 of Michigan's Act 451 of 1994, as amended (Part 201) Cleanup Criteria and propose additional response activities if necessary.

Existing information used for the development of this work plan included:

- Lessons learned during implementation of the RI Work Plan for Talmadge Creek (Enbridge, 2011a) including refinement of the sampling methods and procedures,
- SCAT activities that were performed in and along the Kalamazoo River in 2010,
- 2010 and 2011 response activities that were performed in and along the Kalamazoo River,
- SORT 2011 and Outstanding Site Characterization and Reconciliation (OSCAR) activities, and
- Information contained in the *Conceptual Site Model* (Enbridge, 2011b).

The proposed investigation activities in this Work Plan are being performed for the MDEQ under the Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed November 1, 2010 (MDEQ Order). An estimated schedule of the implementation of field activities is attached as *Figure 1*.

1.1 Objective

The objective of this Work Plan is to gather sufficient information to define the nature and extent of any remaining petroleum impacts from the release of crude oil from Line 6B. Information collected will be used to evaluate the risk to human health and the environment posed by any remaining residual oil impact. An evaluation of the risk verses ecological sensitivity will be considered when proposing additional cleanup of remaining residual oil along this section of the Kalamazoo River to satisfy the requirements of the MDEQ Order.

1.2 Remedial Investigation Field Approach

Implementation of the RI will be completed on the Left Descending and Right Descending Banks (LDB and RDB, respectively) of the Kalamazoo River, from the Talmadge Creek confluence (roughly MP 2.10) to MP 3.14.

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Work components in the field will include the following tasks:

- Use of GPS to locate pre-determined sample locations,
- Visual identification and location of remaining residual oil impact (i.e., tar patties),
- Drilling of soil borings at pre-determined and field-selected locations,
- Installation, development, and surveying of temporary monitoring wells,
- Collection of soil, sediment, surface water, and groundwater samples for laboratory analysis, and
- Removal of temporary wells and abandonment of soil borings.

The following paragraphs present the sequencing of field activities, the organization of RI sampling teams, media to be sampled, and sampling methods.

Field work will be generally sequenced at each of the proposed boring locations as follows:

1. Delineate areas of suspected residual oil impacts in the stream bank, sediments, and overbank, relying mainly on historic information (SCAT, SORT and OSCAR observations, and previous RI activities) and visual observations of current field conditions.
2. Initiate drilling of soil borings, collection of soil cores, core logging, and soil sample collection.
3. If necessary, drilling of sediment borings, collection of sediment cores, sediment core logging, and sediment collection.
4. Use GPS instruments to collect horizontal coordinates of all field-selected boring locations. Record the ground surface elevation for all installed soil and sediment borings.
5. Collection of surface water samples, if necessary.
6. Installation of temporary monitoring wells, well development, and low-flow groundwater sample collection.
7. Temporary well removal and soil boring abandonment.

The RI will be conducted using a team approach in which teams will be assigned specific subsections of the investigation area. Team organization and responsibilities include:

1. Team Lead/Geologist: Supervises work at site, directs team, makes field decisions, logs soil/sediment cores.
2. Yuma Operator: Locates pre-determined soil boring locations, captures geo-reference (ground elevation and horizontal coordinate) data of pre-determined and field-selected borings, and takes photographs (general locations and cores).
3. Soil boring contractor or hand auger team: Utilizes equipment to collect soil cores.
4. Core Preparer/Sampler: Retrieves core from drill crew, cuts core, collects field ultraviolet (UV) light screen info, collects appropriate samples from core for laboratory analysis, and collects surface water samples, if necessary.
5. Groundwater Sampler: Measures depth to groundwater in temporary monitoring wells, and completes groundwater sampling utilizing low-flow techniques.

Actual team responsibilities will be dependent on field conditions and will be at the discretion of the Team Lead/Geologist. All team activities will be coordinated with MDEQ personnel to allow for oversight and the collection of split samples.

Activities and observations made by each team will be thoroughly documented in log books, and on field forms and/or electronic capture. Field sampling locations will be geo-referenced for incorporation into the comprehensive Geographic Information System that exists for this project.

2.0 REMEDIAL INVESTIGATION OF MEDIA

This section describes the methods and approaches that will be used to collect representative samples from soil, sediment, surface water, and groundwater. For this RI, investigation methods will include visual observation, field screening, and quantitative analysis. Samples will be collected using *Standard Operating Procedures (*SOP*s)* provided in the *Sampling and Analysis Plan* (Enbridge, 2011c) and the *Quality Assurance Project Plan* (QAPP) (Enbridge, 2011d). Additional investigative approaches (e.g., test pits, trenches, larger soil borings, etc.) will be considered as warranted by field conditions and results. If necessary, an addendum to this work plan will be prepared and submitted for approval that will detail the locations and additional procedures to be utilized.

2.1 Soil Boring Drilling

Initial soil borings will be drilled at pre-determined locations in the investigation area where an observance of residual oil was documented by SORT teams or where other historic information (SCAT, unverified excavations, etc.) represents a concern. Where residual oil was not observed historically or during the SCAT or SORT processes, boring locations are proposed within the inundation model line. Additional activities pursuant to Part 201 in areas where no visual surface impacts are or were observed will be evaluated at a later date pending results. A frequency of at least one boring per parcel is proposed on the LDB of this section of the river due to the prevalence of residential properties. On the RDB of this section of the river, which is predominately undeveloped or agricultural in nature, a frequency of one boring per 300 feet (including previously installed borings) is proposed. Proposed soil boring locations are presented in *Figure 2*. The spacing between soil borings for delineating petroleum impacts will be dependent on field conditions and decided in the field by the Team Lead/Geologist. Field decisions on soil boring locations will be biased toward visual observations of residual oil and areas of previous investigations.

2.1.1 Soil Coring

Soil cores will be collected utilizing direct push sampling method by a track mounted or marsh buggy Geoprobe® drilling rig, a hand probe, or other similar device. The drilling method for each location is dependent on access and site conditions, and will be drilled in accordance with *SOP EN-301* (Enbridge, 2011c). Soil cores will be collected in 4-foot long intervals to the desired termination depth. The termination depth for each soil boring will be at a depth sufficient to define the vertical extent of contamination which may be either boring refusal (bedrock, confining layer, etc) or 1 foot below observed petroleum impacts and 1 foot below the water table. The boring may be offset and re-installed if necessary based on subsurface conditions.

2.1.2 Soil Logging and Screening

After the soil core is removed from the borehole, it will be opened, visually evaluated, viewed under a UV light, measured for recovery and then logged using the Unified Soil Classification System (USCS) by the Team Lead/Geologist. Discrete soil samples will be collected from the cores for subsequent laboratory analysis from the interval with the greatest potential for petroleum hydrocarbon impact.

The observations made during this process for the presence of petroleum hydrocarbon impacts, UV fluorescence, and lithology will be recorded and the real-time data will be used to assist the

Team Lead/Geologist in determining if further advancement of the soil boring is required or additional borings are required to achieve the RI objectives.

2.1.3 Soil Sampling for Analysis

Up to three soil samples will be collected for chemical analysis from each field sampling location. As a general guideline, samples will be collected as follows:

- One sample will be collected from above the water table that shows the highest potential for petroleum hydrocarbon impact (visual or UV observation). If no petroleum hydrocarbon impact is observed, the sample will be collected from the interval just above the water table or from an interval to be determined by the Team Lead/Geologist based on lithology, adjacent borings, etc.
- To define vertical extent, one sample, that shows no petroleum hydrocarbon impact (visual or UV observation) will be collected from the interval directly below the interval that exhibits the highest potential for impact.
- At the discretion of the Team Lead/Geologist, one sample may also be collected from below the water table for subsequent lab analysis.

Sampling for analysis will be conducted in accordance with *SOP EN-301* (Enbridge, 2011c) and the QAPP (Enbridge, 2011d).

2.1.4 Soil Analyses

Discrete soil samples will be collected from the core and sent to the laboratory for analysis. Soils will be analyzed for residual oil-related parameters which include volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PNAs), the select metals beryllium, molybdenum, nickel, and vanadium. Total petroleum hydrocarbons (TPH) which includes gasoline range organics (GRO), diesel range organics (DRO), and oil range organics (ORO) will also be collected. Hold times and sample preservation methods will be followed as presented in the QAPP (Enbridge, 2011d). Additional analysis (such as synthetic precipitation leaching procedure (SPLP) analysis, organic carbon content, bulk density, etc. may also be conducted as appropriate.

The soil samples will be transported under chain of custody (COC) control in accordance with *SOP EN-102* (Enbridge, 2011c) to ALS Laboratory Services, Holland, Michigan.

2.2 Groundwater

Groundwater will be sampled through the use of temporary monitoring wells. If required, permanent monitoring wells will be installed once remedial actions are complete and appropriate locations identified. An addendum to this work plan will be prepared and submitted for approval that will detail the locations and installation procedures to be used for permanent well installation and groundwater sampling.

2.2.1 Temporary Well Installation

Temporary monitoring wells will be constructed in select boreholes showing the greatest petroleum hydrocarbon impact. In addition and as appropriate, groundwater will be collected from temporary wells in an upgradient borehole and two downgradient boreholes from the area. (For the purposes of this RI, it is assumed that groundwater flow is a subdued mimic of topography and groundwater flow is towards the river). If all downgradient boreholes exhibit petroleum hydrocarbon impact, the temporary wells will be constructed in the boreholes closest to the river.

The temporary wells will be constructed of 1-inch diameter, schedule 40 polyvinyl chloride (PVC) riser with 10-slot (0.010-inch) PVC well screen, and an end cap. The well screen will be set at the bottom of the borehole with the screen set to straddle the water table. If field conditions require, a sand pack may be placed around the screen and bentonite chips will extend from the top of the filter pack to ground surface to ensure that surface water is not entering the well through the screened interval.

Field procedures for temporary well installation will include:

- Measure the depth to groundwater in the borehole once the boring termination is reached.
- Assemble the temporary well and install it so that the PVC screen straddles the water table by approximately 1 foot. If depth to groundwater is less than 1 foot, the well screen will be set a minimum of 0.5 feet below ground surface.
- If necessary, place a sand/gravel pack in annular space between screen and borehole to a level of approximately several inches above the top of screen. A bentonite seal will be placed on top of the sand/gravel pack to grade.
- Develop the temporary well until visibly clear of sediment or until dry.

Once groundwater samples are collected, the temporary wells will be removed and the borehole will be backfilled with bentonite pellets to the ground surface.

2.2.2 Groundwater Sampling for Analysis

Groundwater samples will be obtained utilizing low flow sampling methods in accordance with the *SOP EN-406* (Enbridge 2011c).

2.2.3 Groundwater Analysis

Groundwater samples will be transported under COC control to ALS Laboratory Services, Holland, Michigan. The samples will be analyzed for VOCs, PNAs, TPH (GRO, DRO, and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. The applicability of TPH sampling and analysis will be evaluated as the remedial investigation progresses. Hold times and sample preservation methods will be followed that are presented in the QAPP (Enbridge, 2011d).

2.3 Survey of Temporary Wells

The locations of all temporary wells will be recorded using the sub meter accuracy GPS unit. If deemed appropriate, temporary wells may be surveyed to the Michigan State Plane Coordinate System and the North American Datum 1983 international feet. The top of casing elevation will be determined to the nearest 0.01-foot and the horizontal location and the ground surface will be determined to the nearest 0.1-foot.

2.4 Surface Water

If ponded surface water is located within the suspected crude oil impacted area of a SORT polygon site or within the inundation model of a non-impacted site, surface water samples may be collected to evaluate surface water quality.

2.4.1 Surface Water Sampling

Sample locations will be determined in the field by the Team Lead/Geologist. Surface water sampling will be completed in accordance with *SOP EN-201* (Enbridge 2011c).

2.4.2 Surface Water Sample Analysis

Surface water samples will be analyzed for the same parameters proposed for groundwater sampling: VOCs, PNAs, TPH (GRO, DRO, and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. Hold times and sample preservation methods will be

followed that are presented in the QAPP (Enbridge, 2011d). Surface water samples will be transported under COC control (*SOP EN-102* (Enbridge 2011c)) to ALS Laboratory Services, Holland, Michigan.

2.5 Sediment

If present within the crude oil impacted area of a SORT polygon, submerged or previously submerged sediments will be evaluated for the presence of crude oil impacts by collecting sediment samples for analysis.

2.5.1 Sediment Sample Locations

Sample locations will be selected during the RI based on field observations. Specific sediment coring locations will be determined in the field by the Team Lead/Geologist.

2.5.2 Sediment Coring

Sediment cores will be collected utilizing direct push sampling method by a track mounted or marsh buggy Geoprobe® drilling rig, a hand probe, or other method. The drilling method will be dependent on access and site conditions, and will be drilled in accordance with *SOP EN-301* (Enbridge 2011c). Soil cores will be collected in 4-foot long intervals to the desired termination depth. The termination depth for each soil boring will be at a depth sufficient to define the vertical extent of contamination which may be either boring refusal (bedrock, confining layer, etc) or 1 foot below observed petroleum impacts and 1 foot below the water table. The boring may be offset and re-installed if necessary based on subsurface conditions.

2.5.3 Sediment Logging and Screening

After the sediment core is removed from the borehole, it will be opened, visually assessed, viewed under a UV light within a UV box, sampled for VOCs from the interval with the greatest potential for petroleum hydrocarbon impact, measured for recovery/settling and then logged using the USCS by the Team Lead/Geologist in accordance with *SOP EN-301* (Enbridge 2011c).

The observations made during this process for the presence of petroleum hydrocarbon impacts, fluorescence from UV light screening, and lithology will be recorded and the real-time data will be used to assist the Team Lead/Geologist in determining if further advancement of the sediment cores is required or additional borings are required for lateral delineation.

2.5.4 Sediment Sampling for Analyses

As many as three sediment samples will be collected for chemical analysis from each field sampling location:

- One sample will be collected that shows the highest potential for petroleum hydrocarbon impact.
- To define vertical extent, one sample, that shows no petroleum hydrocarbon impact (visual or UV observation), will be collected from the interval directly below the interval that exhibits the highest potential for impact.
- One additional sample may also be collected at the discretion of the Team Lead/Geologist based on field observations of lithology, groundwater level, or adjacent impacts.

The selection of sampling locations may be modified in the field by the Team Lead. Sampling for analysis will be conducted in accordance with *SOP EN-301* (Enbridge 2011c) and the QAPP (Enbridge, 2011d).

2.5.5 Sediment Analyses

Discrete samples will be collected from the sediment core and sent to the laboratory for analysis. Soils will be analyzed for residual oil-related parameters which include VOCs, PNAs, TPH (GRO, DRO, and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. Hold times and sample preservation methods will be followed as presented in the QAPP (Enbridge, 2011d). Additional analysis (such as SPLP analysis, organic carbon content, bulk density, etc. may also be conducted as appropriate).

3.0 DATA EVALUATION AND REPORTING

The results of the work specified in this work plan will be presented in a Remedial Investigation Report. The report will include an introduction, objectives, methods, data evaluation, sample location map, cross sections (as appropriate), figures showing extent of contamination (as appropriate), data tables, sample location coordinates, data interpretation, recommendations, and a summary and conclusions section.

The methods section will present methods used or refer to standard methods or methods previously approved for this project. Deviations from the work plan will be identified and reasons for the deviations will be presented. For example, sample locations may need to be

adjusted based on field conditions. Generic Part 201 Residential Cleanup Criteria will be used to evaluate the unsaturated soil, surface water, and groundwater data. The residential criteria will be used as a baseline for evaluation and may not be appropriate cleanup criteria at select areas. The results of the sediment analysis will be compared to Region 5 U.S. EPA Tier 1 Ecological Screening levels as well as Tier 2 threshold, midlevel, and probable effect levels. These criteria/screening values will be included in the data tables and concentrations that exceed criteria will be identified.

The analytical data will be compiled and compared to relevant Part 201 or Part 31 criteria or screening levels. The risk to human health and the environment will be evaluated. The mobility and toxicity of any remaining residual oil will also be evaluated. Locations where criteria or screening levels are exceeded will be identified. Exposure pathways with applicable criteria that are exceeded will be identified. Response recommendations will be evaluated against the ecological sensitivity of the area. The data will be reviewed to identify data gaps. The laboratory data reports will be included as an attachment to the report in the form of a data disk. No further action will be pursued for any parcel or area that is determined through the RI process to not be part of the Facility as defined by Part 201.

4.0 SCHEDULE

A schedule of field activity implementation and projected time requirements to complete associated tasks is attached as *Figure 1.* Completion of the proposed activity will ultimately be determined by weather and seasonal river conditions. Should weather or river conditions create an adverse obstacle to completion of the field activities, MDEQ will be notified of such conditions and their impact upon completion. When work activities are shut down due to lightning, activities will begin again following the site-specific health and safety procedures. When work cannot proceed due to high water conditions, an attempt will be made to schedule work in areas where water is not a limitation and work shall begin again when water levels recede.

5.0 REFERENCES

Enbridge, 2011a. Enbridge Energy, Limited Partnership Line 6B Incident Marshall, Michigan; *Remedial Investigation Work Plan for Talmadge Creek from MP 0.00 to MP 0.50*, July 31, 2011.

Enbridge, 2011b. *Conceptual Site Model,* July 8, 2011 (As Amended).

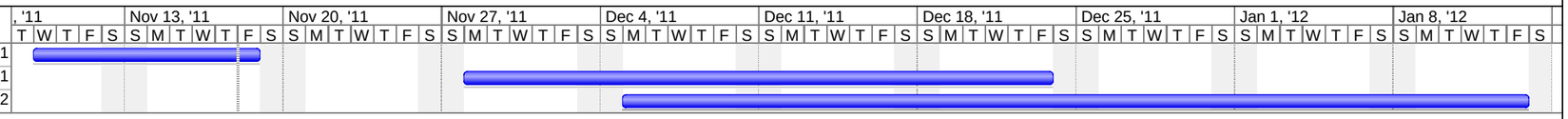
Enbridge, 2011c. Enbridge Line 6B MP 608 Release; Marshall, Michigan; *Sampling and Analysis Plan*. August 30, 2011.

Enbridge, 2011d. Enbridge Line 6B MP 608 Release; Marshall, Michigan; *Quality Assurance Project Plan*. August 19, 2011.

Figures

Figure 1. Proposed Kalamazoo River RI Schedule
Enbridge Energy Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge ENergy, Limited Partnership

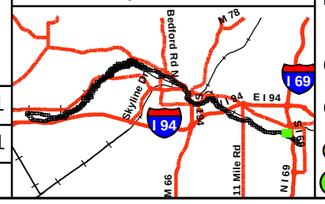
ID	Task Name	Duration	Start	Finish
1	Work Plan Submittal/Review/Approval	8 days	Wed 11/9/11	Fri 11/18/11
2	Kalamazoo River RI Implementation	20 days	Mon 11/28/11	Fri 12/23/11
3	Data Review and Compilation	30 days	Mon 12/5/11	Fri 1/13/12



ENBRIDGE

Drawn:	NS	11/16/2011
Approved:	JK	11/16/2011
Project #:	60162778	

Map Location



Legend

2011 Reassessment - SORT

- 2 RDB — Pooled Oil
- 2 RDB — Film (Sheen)
- 2 RDB — Remaining Observations
- SCAT

Existing Sample Locations

- Monitoring Well
- Sediment Sample
- Soil Boring
- Surface Water Sample
- Surface Soil Sample

LDB - Left Descending Bank

Submerged Oil Delineations

- Heavy
- Moderate
- Excavated Area
- Decommissioning Site
- Final Inundation Model

RDB - Right Descending Bank

- Proposed Soil Boring Location
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 2.00 - MP 2.25
SHEET 1 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011

KN-C-087
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KN-C-088
KN-C-085
TC-B-078
TC-B-078.001
KS-C-090
2.75
2.50
2.25
4 RDB
6 RDB
7 RDB
8 RDB
12 RDB
10 RDB
5 RDB
1 I
2 I
3 LDB
9 LDB
2 LDB
8 LDB
4 LDB
1 LDB
7 LDB
6 LDB
5 LDB

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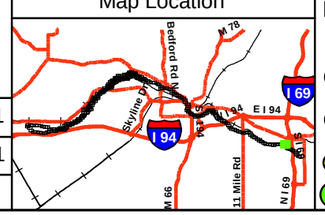
Map Location



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- Proposed Soil Boring Location
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 2.25 - MP 2.50
SHEET 2 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011

ENBRIDGE

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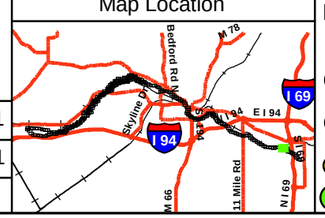

Legend

2011 Reassessment - SORT

- 2 RDB
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- Final Inundation Model

RDB - Right Descending Bank

- Proposed Soil Boring Location
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 2.50 - MP 2.75
SHEET 3 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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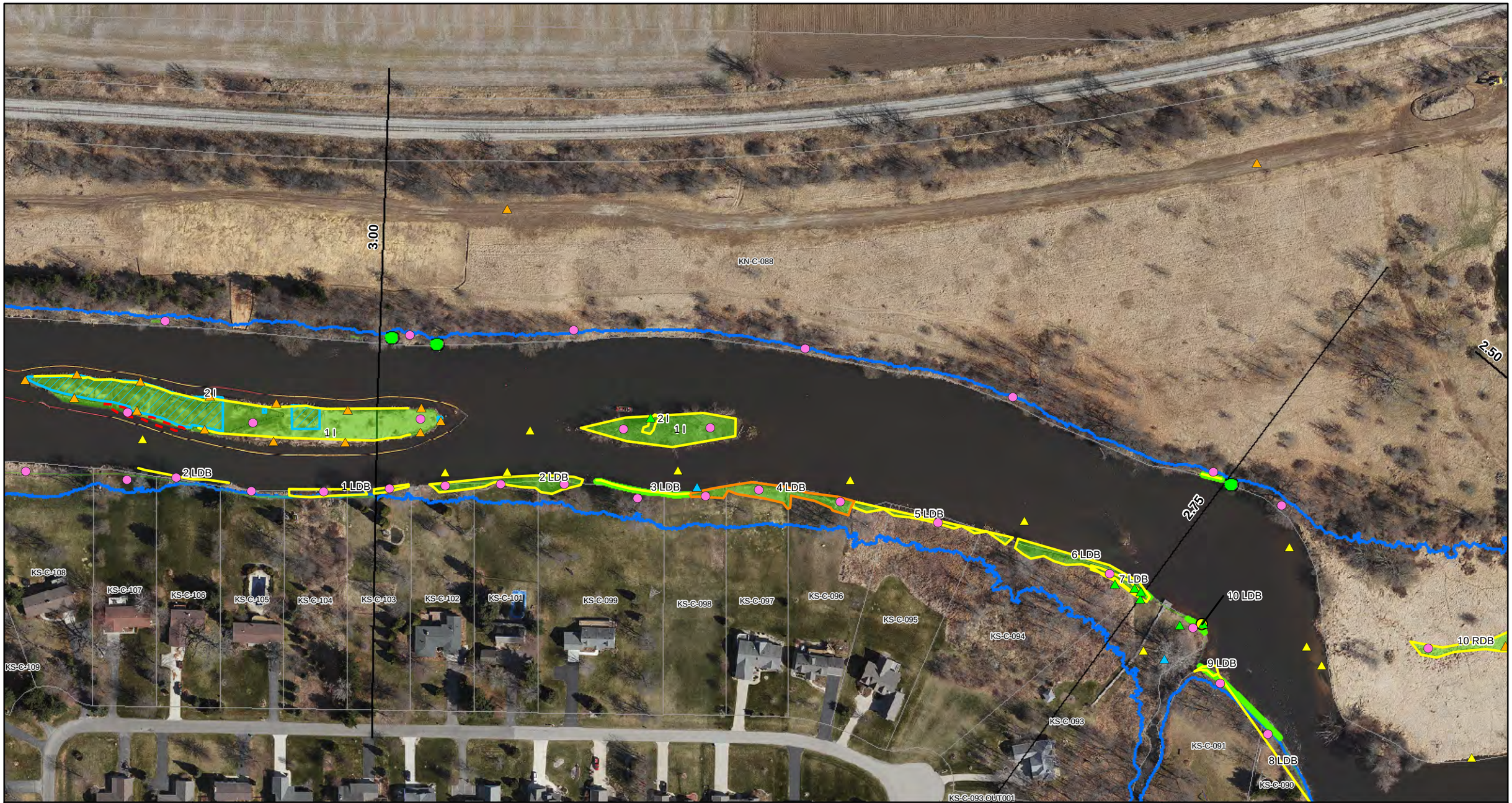

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Map Location

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- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 2.75 - MP 3.00
SHEET 4 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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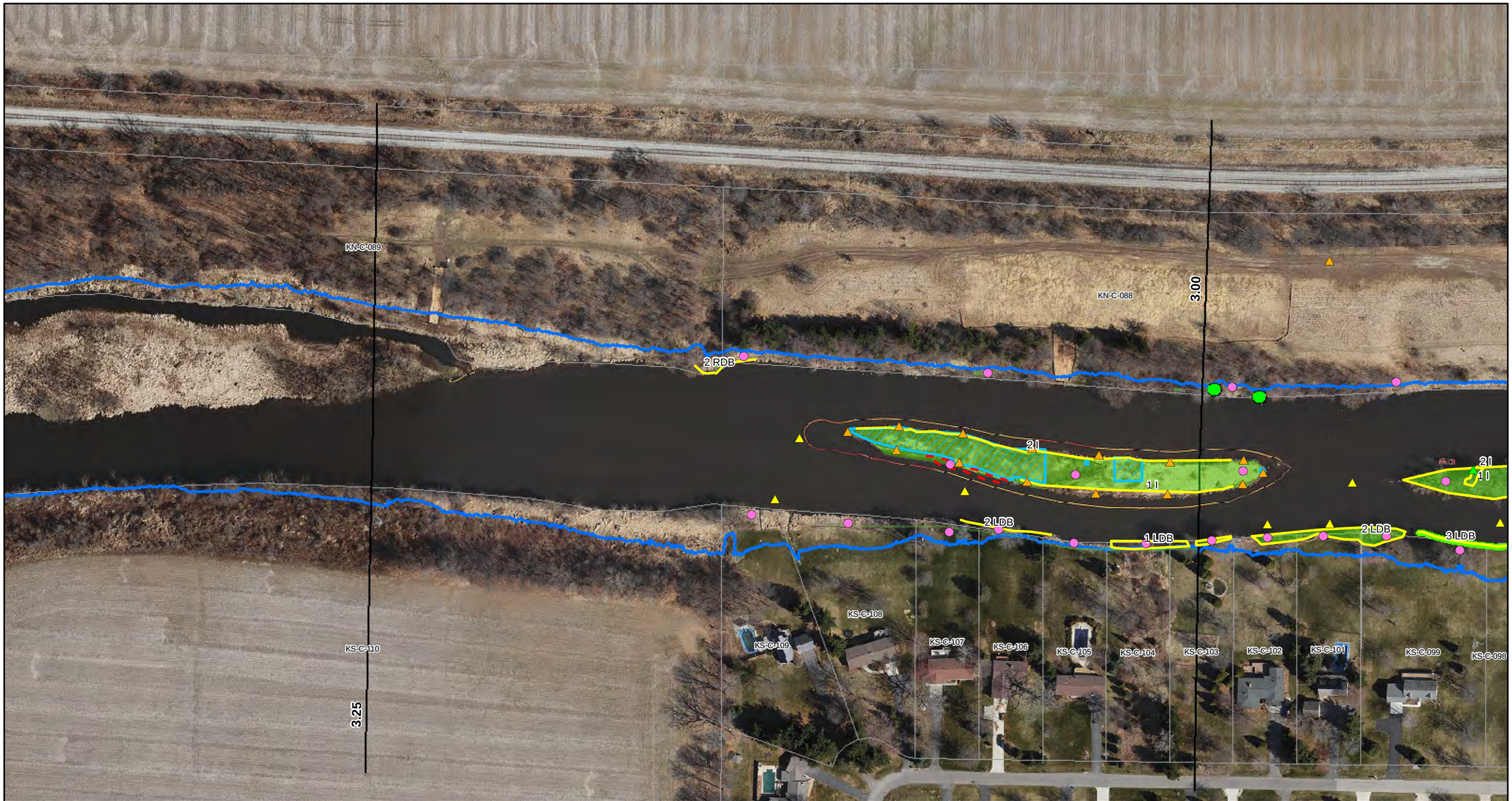
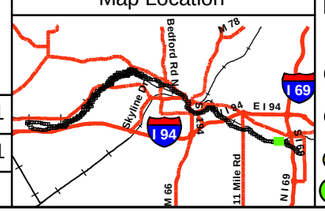
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/16/2011
Approved:	JK	11/16/2011
Project #:	60162778	

Map Location



Legend

2011 Reassessment - SORT

- 2 RDB — Pooled Oil
- 2 RDB — Film (Sheen)
- 2 RDB — Remaining Observations
- SCAT

Existing Sample Locations

- Monitoring Well
- Sediment Sample
- Soil Boring
- Surface Water Sample
- Surface Soil Sample

LDB - Left Descending Bank

Submerged Oil Delineations

- Heavy
- Moderate
- Excavated Area
- Decommissioning Site
- Final Inundation Model

RDB - Right Descending Bank

- Proposed Soil Boring Location
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 3.00 - MP 3.14
SHEET 5 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011