Enbridge Line 6B MP 608
Marshall, MI Pipeline Release

Supplement to the Response Plan for Downstream Impacted Areas commonly referred to as the "Quantification of Submerged Oil Report"

Prepared for United States Environmental Protection Agency

Enbridge Energy, Limited Partnership

Originally Submitted: September 2, 2011

Resubmitted: February 8, 2012

Resubmitted: May 4, 2012

Resubmitted: March 21, 2013

FIGURES

TABLES

ATTACHMENT

LIST OF ACRONYMS

2012 CWP	Enbridge Line 6B MP 608 Pipeline Release; Marshall, Michigan; Addendum to the Response *Plan* for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan, and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan Commonly referred to as "Consolidated Work Plan from Fall 2011 through Fall 2012. December 4, 2011. Approved by U.S. EPA on December 21, 2011.
2012 Quantification Report	*Supplement to the Response Plan for Downstream Impacted Areas commonly referred to as the "Quantification of Submerged Oil Report"* submitted to the U.S. EPA on May 24, 2012
Alpha	Alpha Analytical Laboratory
ATS	Ann Arbor Technical Services, Inc.
CL	Cold Lake
Directive	*U.S. EPA Directive to Complete Submerged Oil Quantification in response to the Removal Administrative Order issued by U.S. EPA on July 27, 2010, pursuant to § 311(c) of the Clean Water Act (Docket No. CWA 1321-5-10-001) and Supplement to Order for Compliance issued by U.S. EPA on September 23, 2010* to Enbridge to complete the submerged oil quantification
Enbridge	Enbridge Energy, Limited Partnership
Field Guide 1	*Submerged Oil Volume Quantification (Field Guide)*
Field Guide 2	*Submerged Oil Volume Quantification (Field Guide)*
ft bgs	Feet below ground surface
GC/FID	Gas Chromatography with Flame Ionization Detection
GC/MS-SIM	High Resolution Gas Chromatography with Low Resolution Mass Spectrometry Using Selected Ion Monitoring
GPS	Global Positioning System
g/cm^3	Grams per cubic centimeter
GRTS	Generalized Random Tessellation Survey
IDW	Inverse Distance Weighted
ISM	Incremental Sampling Methodology
Line 6B	The pipeline owned by Enbridge Energy, Limited Partnership that runs just south of Marshall, Michigan
MDL	Minimum Detection Limit
MP	Mile Post
ND	Non-detect
NF 2013	*Technical Memorandum - Determination of Line 6B Oil Concentration in Kalamazoo River Sediments, March 1, 2013*
O&G	Oil and Grease
Pilot Test	*Submerged Oil Volume Quantification (Pilot Test)*
PNA	polynuclear aromatic hydrocarbon
PSD	Particle Size Distribution
QAP	Analytical Quality Assurance Plan
SSCG	Science Support Coordination Group
SOP	Standard Operating Procedure
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
U.S. EPA	United States Environmental Protection Agency
UV	Ultraviolet
WCS	Western Canadian Select

1.0 INTRODUCTION

On July 26, 2010, Enbridge Energy, Limited Partnership (Enbridge) discovered a release of crude oil from Line 6B, in the vicinity of its pump station located in Marshall, Michigan. Crude oil was released below grade level via a break in Line 6B at Mile Post (MP) 608, emerged onto the ground surface, flowed over land following the natural topography downhill into Talmadge Creek, and proceeded to flow downstream into the Kalamazoo River. Crude oil was transported down the Kalamazoo River to Morrow Lake near Kalamazoo, Michigan. Enbridge shut down the pipeline and immediately initiated response activities to remove oil and protect human health and the environment. Some of the oil mixed with debris or sediment and submerged. Following extensive response activities in 2010 and 2011, some residual Line 6B crude oil remains in the sediments within the Kalamazoo River. This report presents an estimate of the quantity of Line 6B crude oil that remains in the sediments of the Kalamazoo River.

In response to the United States Environmental Protection Agency (U.S. EPA) July 15, 2011 *Directive to Modify Work Plan and Quantify Submerged Oil pursuant to Removal Administrative Order issued by U.S. EPA on July 27, 2010, pursuant to section 311(c) of the Clean Water Act (Docket No. CWA 1321-5-10-001) and Amendment to Order for Compliance issued by U.S. EPA on September 23, 2010* (U.S. EPA, 2011), Enbridge prepared a work plan supplement to quantify the volume of submerged oil identified during the Spring 2011 Reassessment of Talmadge Creek and the Kalamazoo River (including the Morrow Lake Delta and Morrow Lake). The *Supplement to the Response Plan for Downstream Impacted Areas commonly referred to as the "Quantification of Submerged Oil Report Work Plan"* (Enbridge, 2011a) approved by U.S. EPA on August 12, 2011 defines the methods for quantifying the amount of Line 6B crude oil within the sediments of Talmadge Creek and the Kalamazoo River. This approved approach to quantify the amount of Line 6B crude oil in the sediment relied on the analysis of total petroleum hydrocarbons (TPH) as a measure of residual submerged oil present in the sediment along with supporting information from the analysis of oil and grease (O&G) and 17 polynuclear aromatic hydrocarbons (PNAs) consisting of 16 parent PNAs and 2-methylnaphthalene. Enbridge worked with the U.S. EPA to implement this plan throughout 2011.

Late in 2011 and early in 2012, it became apparent that analysis of TPH, O&G, and the 17 PNAs did not provide a reliable measure of Line 6B crude oil in sediments due to extensive

historical releases of oil based constituents to the Kalamazoo River system. After the U.S. EPA and Enbridge agreed that TPH did not provide an adequate measure of the amount of submerged oil in the sediment, the *Supplement to the Response Plan for Downstream Impacted Areas commonly referred to as the "Quantification of Submerged Oil Report"* (Enbridge, 2012a) was submitted to the U.S. EPA on May 4, 2012 (2012 Quantification Report).

The revised calculations, which were approved by the U.S. EPA to quantify the amount of Line 6B crude oil in sediments, were presented in the *Addendum to the Response Plan for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan, and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan Commonly referred to as "Consolidated Work Plan from Fall 2011 through Fall 2012* (Enbridge, 2011b) approved by the U.S. EPA on December 21, 2011 (2012 CWP). *Section 4.5* of the 2012 CWP defined the continued actions and methods that Enbridge would use to quantify the volume of submerged oil within the sediments of Talmadge Creek and the Kalamazoo River from the confluence with Talmadge Creek down to Morrow Lake.

The 2012 CWP was approved during the excavation activities conducted along the channel of Talmadge Creek, which was completed in the spring of 2012. The excavation of the channel removed sediments containing submerged oil. Therefore, further efforts to define the amount of Line 6B crude oil remaining in the impacted water way have focused exclusively on the sediments of the Kalamazoo River system.

On November 20, 2012, the U.S. EPA issued the following directive to Enbridge: *U.S. EPA Directive to Complete Submerged Oil Quantification in response to the Removal Administrative Order issued by U.S. EPA on July 27, 2010, pursuant to § 311(c) of the Clean Water Act (Docket No. CWA 1321-5-10-001) and Supplement to Order for Compliance issued by U.S. EPA on September 23, 2010* (U.S. EPA, 2012a) (Directive). This Directive included the following attachments:

- *Attachment 1* of the Directive – the *Submerged Oil Volume Quantification (Field Guide)* (Enbridge, 2012b) (Field Guide 2) describing the field work that had already been completed,

- *Attachment 2* of the Directive – the *Submerged Oil Volume Quantification (Pilot Test)* (Enbridge, 2012c) (Pilot Test) also describing field work that had already been completed,
- *Attachment 3* of the Directive – a description of the pilot test results titled *Pilot Test Results and Submerged Oil Quantification Core Sampling/Analysis* (U.S. EPA, 2012b), and
- *Attachment 7* of the Directive – a series of recommendations from August 8, 2012 for the field work that was completed prior to the Directive in a letter from Thomas Graan of Weston Solutions/START to Ralph Dollhopf, U.S. EPA (U.S. EPA, 2012c).

Throughout 2012 and into 2013, Enbridge worked with the U.S. EPA and the Scientific Support Coordination Group (SSCG), developed to support the U.S. EPA's on-scene coordinator, to evaluate methods to measure the amount of Line 6B crude oil in the sediments. This report presents the results of these efforts to quantify the amount of Line 6B crude oil remaining within the sediments of the Kalamazoo River.

2.0 FIELD METHODS AND RESULTS

Field methods for sediment core collection, core logging and description, and sediment sample collection followed either the July 25, 2012 *Submerged Oil Volume Quantification (Field Guide)* (Enbridge, 2012d) (Field Guide 1) or the August 8, 2012 Field Guide 2. Initially, in July, field work was performed under Field Guide 1 with the objective of collecting appropriate data to be used to quantify the volume of remaining submerged oil originating from the Line 6B crude oil release present within the sediments of the Kalamazoo River from the confluence with Talmadge Creek to Morrow Lake Dam. Field work was conducted from July 23 through and including July 27, 2012, but was temporarily stopped by the U.S. EPA on July 27, 2012 to allow for a validation of data collection procedures.

Field Guide 2 and the Pilot Test were written in response to *Validation of Existing Core Processing Procedure for Identification of Oil in Sediment Cores* (U.S. EPA, 2012d). Two approaches for evaluating the validity of the methods used for oil quantification ("Approach A" and "Approach B") were described in the U.S. EPA validation document (U.S. EPA, 2012d). "Approach B" was similar to the initial procedures from Field Guide 1, and was the approach chosen for activities to proceed.

2.1 Sediment Sampling and Analysis

This section presents the methods used to sample and analyze sediments for the purposes of quantifying the amount of submerged oil. The following topics are addressed in the subsequent subsections:

- Location of sediment cores (*Section 2.1.1*),
- Collection of sediment cores (*Section 2.1.2*),
- Processing of sediment cores (*Section 2.1.3*),
- Logging of sediment cores (*Section 2.1.4*),
- Sampling of sediment cores (*Section 2.1.5*),
- Analysis of sediment samples (*Section 2.1.6*),
- Vertical extent of oil determination based on ultraviolet (UV) and visual observations (*Section 2.1.7*), and
- Sediment bulk density analysis (*Section 2.1.8*).

2.1.1 Location of Sediment Cores

Sediment core locations were pre-determined by U.S. EPA using a Generalized Random Tessellation Survey (GRTS) design, while background sediment core locations were selected by Enbridge. The GRTS methodology was used to develop randomly spaced and statistically sound sampling locations which covered a combination of poling categories and geomorphic strata. A total of 102 sample locations, not including background locations, were pre-determined using the GRTS design. The geomorphic stratum was verified in the field by comparing the proposed stratum type with the existing depositional environment and sediment at the location. Based on the field verification, two locations (S203 and S422) were abandoned and the next pre-determined sites for the geomorphic stratum being characterized were selected.

Pre-determined reference samples were collected by Enbridge from locations prior to commencing field activities (note: data from these samples is not included in the oil quantification calculations). Reference locations were selected from the Kalamazoo River upstream of the confluence with Talmadge Creek (two locations) and from the Battle Creek River (three locations). The core collection and logging, sample collection, and analysis procedures for the reference cores followed the same procedures outlined in the following sections.

The GRTS-selected locations for sediment cores were loaded into a YUMA global positioning system (GPS) unit, which guided the field teams to the appropriate location. Coring teams navigated to sediment coring locations by boat, and in some cases by land. Each location was confirmed in the field by a trained YUMA GPS operator on each team. Sediment core locations are presented on *Figure 1*. GPS coordinates for the sediment boring locations are presented in *Table 1*. Sediment boring location and YUMA GPS operation procedures followed the procedures found in the standard operating procedure (SOP) *Survey - SOP EN-104* (Enbridge, 2011c).

2.1.2 Collection of Sediment Cores

Prior to sampling, field crews verified they were situated within the correct proposed geomorphic stratum. The pre-designated cores (as described below) were then collected at each location. Field observations for core collection and logging are presented in *Table 2*.

Primary and secondary sediment cores were collected at each coring location. A third sediment core for bulk density analysis was collected from pre-determined locations. At some locations, a fourth sediment core was collected as a step-out core from the original core location for additional logging and sampling (refer to *Section 2.1.2.1* for step-out cores). The number of cores collected at each location is presented in *Table 2*. Cores were located side-by-side at each core location with a minimum distance separating the cores (no more than 4 feet).

Sediment core collection followed the procedures described in *Sediment Sampling - SOP EN-202* (Enbridge, 2011d). Additionally:

- The check-valve sampler was inserted slowly to minimize any disturbance of the sediment surface,
- The check-valve sampler was removed at a slow steady rate to minimize mobility of floccules, and
- All cores were maintained in vertical orientation during transport and storage.

Cores did not exceed a single core barrel in length (4 feet). The minimum core length recovery was proposed at two feet unless refusal was reached during coring. Cores were transported vertically to refrigerated storage by a team runner to ensure that cores were chilled soon after collection.

After core collection, poling was performed at the sample location. If the proposed location was dry due to low river levels at the time of core collection, sediment cores were still collected and poling activities were not conducted following core collection. Decontamination of coring equipment was performed as outlined in *Decontamination of Field Equipment - SOP EN-105* (Enbridge, 2011e).

2.1.2.1 Step-out Subsample Core Collection

Step-out sediment cores were collected for quality control purposes at six locations, which are shown in *Table 2* (note: these samples are not included in the oil calculator subset of samples):

- SE1111C704 (Battle Creek River reference),
- SEKR0550C704 (Impoundment),
- SEKR1075C703 (Depositional Bar – core damaged and not sampled),
- SEKR2625C702 (Backwater),
- SEKR2750C702 (Backwater), and
- SEKR3750C710 (Delta).

Step-out sediment cores were collected from each of the poled oil categories ('heavy', 'moderate', 'light', and 'none' and one reference location in the Battle Creek River). At a location where a step-out core was collected the following applied:

- The step-out core was collected within 3 feet of the primary and secondary cores, and within the same geomorphic stratum and poling category polygon.
- The step-out core was split and photographed under visible and UV light. Preliminary visual observations comparing the step-out and primary core lithologies were recorded. Sediment samples from the step-out core were collected only if step-out core lithologies matched the primary core lithologies.

Step-out sediment core SEKR1075C703 was damaged during transport to the C3.2 field station and was not logged or sampled. Step-out core materials were archived in a manner equivalent to the primary and secondary cores.

2.1.3 Processing of Sediment Cores

Upon collection, all sediment cores were capped, labeled, and were vertically wrapped in heavy-duty barrel liners and vertically placed into containers of ice for transporting to the

C3.2 field station for processing. The sediment cores were maintained in a vertical orientation and archived in refrigerated storage prior to logging. Bulk density cores were not refrigerated while at the C3.2 field station prior to shipment for laboratory analysis. All other sediment cores were opened and processed at the C3.2 field station as described below.

Prior to core processing, cores were labeled Primary (Core #1), Secondary (Core #2), Bulk Density (Core #3), and Step-Out cores (not associated by a core number). Primary cores were opened, logged, photographed in visible and UV light, and sampled for fingerprinting. Secondary cores were opened, screened under UV light, and sampled for oil globules (if present). Bulk density cores, when collected, remained capped and were stored vertically prior to submittal for bulk density analysis. Step-out cores, when collected, were processed similar to primary cores.

Prior to opening Core #1, standing water was removed from the top of the core. The following steps were used to remove the standing water, leaving the sediment undisturbed. Prior to removing the standing water, the core was allowed to stabilize for up to one hour which allowed flocculent material to settle. Water from above the sediment was removed using small diameter siphon tubing and a peristaltic pump. Up to 1/4 inch of standing water was allowed to remain, if necessary, based on the presence of flocculent sediment. After water was removed from the top of the cores, they were recapped and kept in a cooler overnight. Sediment cores were allowed to partially freeze prior to logging and sampling activities.

2.1.4 Logging of Sediment Cores

Each core was split according to procedures in *Sediment Sampling SOP EN-202* (Enbridge, 2011d). In the event that Core #1 did not open in even halves, Core #2 was used in its place and Core #1 was used for oil globule sampling (if present).

Core #1 was split lengthwise and both halves were photographed under both visible light and UV illumination with a reference scale. Sediment core photographs are presented as *Attachment A*.

While under UV illumination, intervals containing any apparent oil were noted on the core logging sheet (interval beginning and ending, description of petroleum indicator observed, etc.). Refer to *Section 2.2* for the vertical extent of oil based on visual observations.

One half of the core was logged for the following features per *Sediment Sampling SOP EN-202* (Enbridge, 2011d):

- Munsell Color Values,
- United Soil Classification System Textural Codes per the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)* (ASTM D-2488-00) (ASTM, 2000), and
- Strata specific notes (woody debris, shell material, anthropogenic components).

Core logs of the sediment are presented as *Attachment B*. Three sediment cores were not logged for the following reasons:

- SEKR2100C701 (poor recovery),
- SEKR2725C702 (incorrect geomorphic stratum), and
- SEKR1075C703 (damaged during transport).

2.1.5 Sampling Sediment Cores

Two methods were used to determine the intervals sampled during this sampling event to meet the requirements of the U.S. EPA and Enbridge. The methodologies were presented in Field Guide 2 and the Pilot Test. A single core was used for analytical sampling with one half being designated for each sampling method (U.S. EPA and Enbridge). All samples were submitted for either laboratory analysis or laboratory "hold". The sediment cores were sampled as described in the following sections.

2.1.5.1 Core #1

Core #1 was split lengthwise and both halves were photographed under both visible light and UV illumination. After logging, one of the halves was sampled to meet the U.S. EPA requirements and the other half was sampled per Enbridge requirements. The core halves were sampled per either Field Guide 1 or Field Guide 2 based on the presence or absence of fluoresced and/or visible oil impact as observed during logging. Sediment samples collected from the "Enbridge half" as defined below were labeled with the standard sediment sample name (e.g., SEKR3850C703S072712D002); sediment samples collected from the "U.S. EPA half" as defined below were labeled with the standard sediment sample name with an "-E" suffix (e.g., SEKR3850C703S072712D002-E).

A. Cores with no evidence of impact.

- **"Enbridge half"**
    1. The top 1 inch of sediment was collected for laboratory analysis, and
    2. Each remaining stratigraphic layer (up to 7 inches) was collected into an appropriately sized sample container.

  Samples from the remaining stratigraphic layers were placed on hold.

- **"U.S. EPA half"**
    1. No additional samples collected.

B. Cores with evidence of impact.

- **"Enbridge half"**
    1. The top 1 inch of sediment was collected for laboratory analysis. Where the impacted interval was inclusive of this 1-inch interval and only slightly larger (i.e., 2 inches), the interval was expanded to include the impact.
    2. The impacted stratigraphic layer below the top 1 inch (up to 7 inches) was collected in an appropriately sized sample container and submitted for laboratory analysis.
    3. Each remaining stratigraphic layer (up to 7 inches) was collected into an appropriately sized sample container.
        a. Samples from the remaining stratigraphic layers were placed on hold. (note: All samples designated as "put on hold" in the subsequent discussions were appropriately packaged and frozen.)

- **"U.S. EPA half"**
    1. The top 1 inch of sediment was collected and submitted to the laboratory. The sample was placed on hold at the laboratory.
    2. The bottom 2 1/2 inches of the impacted interval was collected and placed on hold.
    3. The 2 1/2-inch interval exhibiting the greatest impact (visible and/or fluoresced oil) was collected and placed on hold.
    4. The 1 1/2-inch interval immediately below the impacted interval was collected and placed on hold.
    5. Remaining sediment was collected as follows:

a. The sediment between the bottom of the top 1-inch sample and the top of the middle 2 1/2-inch sample was collected,
b. The sediment between the bottom of the middle 2 1/2-inch sample and the top of the bottom 2 1/2-inch sample was collected in 1 1/2-inch intervals, and
c. All samples were placed in an appropriately sized sample container and submitted to the laboratory to be placed on hold.

Sediment samples from the "Enbridge half" of Core #1 were submitted to the laboratory and either analyzed for alkylated PNAs, petroleum biomarkers, saturated hydrocarbons, and percent moisture, or stored at the laboratory on hold. Total organic carbon (TOC) and Particle Size Distribution (PSD) samples were collected and placed on laboratory hold.

2.1.5.2 Core #2 (as necessary)

One half of Core #2 was observed under UV illumination for the presence of oil globules. Oil globules, when present, were collected in accordance with *Recommended Oil Globule Sample Collection Procedure* (U.S. EPA-SSCG, 2012). Oil globule samples contain a "PX" for the suffix as shown below. The following 13 oil globule samples were collected and placed on laboratory hold:

- SEKR1500C701S072612PX,
- SEKR1575C701S072612PX,
- SEKR1575C702S072612PX,
- SEKR2150C701S072512PX,
- SEKR2150C703S072712PX,
- SEKR2150C704S072712PX,
- SEKR2175C701S072712PX,
- SEKR2800C701S072412PX,
- SEKR3750C701S072512PX,
- SEKR3775C701S072712PX,
- SEKR3800C705S072712PX,
- SEKR3825C701S072712PX, and
- SEKR3850C703S072712PX.

2.1.5.3 Core #3

Core #3 was selected from a pre-determined set of cores (representing 40% to 50% of total locations and including four samples from each of the geomorphic stratum, where available) and submitted to the laboratory (Driesenga and Associates) for analysis of bulk density according to *ASTM D7263 - 09 Standard Test Methods for Laboratory Determination of Density (Unit Weight) of Soil Specimens* (ASTM International, 2009) (ASTM D 7263 Method B) from either the impacted interval as dictated from the processing of Core #1, or, if no oil impact was observed, from the 0.0 to 0.5 feet below ground surface (ft bgs) interval. Sediment cores (Core #3) for bulk density analysis were collected and analyzed at predetermined locations. One additional bulk density sample was collected and analyzed from the Battle Creek River (background location; not included in the quantification calculation but presented in *Table 3* for comparison purposes).

2.1.5.4 Duplicate Subsample Collection

Duplicate subsamples were collected for 26 samples and submitted for laboratory analysis. A normal sediment sample was labeled with an "S" after the core location, while duplicate sediment samples were labeled with a "D" after the core location (e.g., SEKR2300C701**S**113012D003 is a normal sample and SEKR2300C701**D**113012D003 is a duplicate sample from the same location and depth).

2.1.6 Analysis of Sediment Samples

Sediment samples were analyzed by Alpha Analytical laboratory (Alpha) for alkylated PNAs, biomarkers, saturated hydrocarbons, and percent moisture (*Section 2.1.6.2*). TOC and PSD sediment analysis was placed on hold.

2.1.6.1 Sample Preparation

Prior to analyses, Alpha homogenized sediment samples submitted for analyses as explained below:

- The top layer of sediment (1 inch), which was submitted for analysis under the *Supplement to the Response Plan for Downstream Impacted Areas commonly referred to as the "Quantification of Submerged Oil Report Work Plan*" (Enbridge, 2011a) approved by the U.S. EPA on August 12, 2011, was homogenized by the laboratory per instructions below. Alpha prepared sufficient volume of soil from the homogenization procedure to complete the fingerprinting analysis. The remainder of

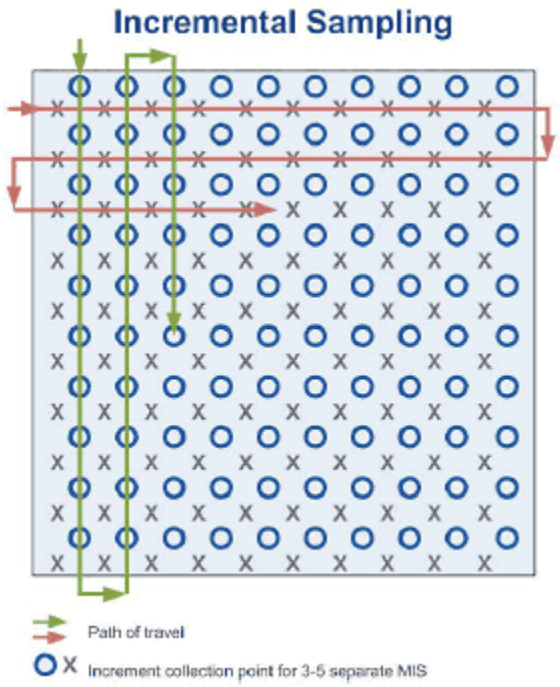
the sample interval was sent to Dr. Kenneth Lee, (Fisheries and Oceans Canada scientist and Executive Director of the Centre for Offshore Oil, Gas, and Energy Research) for epifluorescence evaluation.

- The first depositional layer of sediment located directly below the top layer of sediment was processed for analysis. This depositional layer may be comprised of multiple sample intervals, which were initially submitted to Alpha and placed on hold. These intervals represent the same depositional layer, but were sent to the laboratory in intervals no greater than 0.6 feet. Each specific sediment sample requested for analysis was first homogenized by the laboratory per instructions below. Alpha prepared sufficient volume of soil from the homogenization procedure to complete the fingerprinting analysis. The remainder of the sample interval was sent to Dr. Lee for epifluorescence evaluation. Dr. Lee's findings are reported in the *UV - Epifluorescence Microscopy Analysis of Sediments Recovered from the Kalamazoo River* (Lee, Kenneth et al., 2012) submitted to the U.S. EPA on October 24, 2012 and is included as *Attachment C*.

Individual samples were prepared for analysis (homogenized) by the laboratory using the following Incremental Sampling Methodology (ISM) procedure:

- The entire contents of the sample container (or containers if the intended sample interval from a core was represented in more than one container) were transferred to a clean tray lined with aluminum foil.
- The sediment was spread across the tray to an even depth using a clean spatula for each sample.
- The sample was not dried, sieved, milled, or ground.
- The needed weight for the sample aliquot was determined based upon the total weight required for all requested parameters, including Quality Control.
- The aliquot was collected by compositing between 30 to 100 smaller aliquots using a systemized random sampling pattern as displayed below. The technician moved the spatula for collecting the small aliquots according to the path of travel noted below and stopped at random points to collect the small aliquots. The small aliquots were placed into a new container. The path of travel was either vertical or horizontal or both to generate the 30 to 100 smaller aliquots. The points depicted below may not

have been superimposed on the full sample nor are the locations intended to depict actual sampling points.



- The laboratory prepared any unused portion of the sample to be shipped to Dr. Lee under proper chain of custody documentation. The specifics on container and shipment instructions were provided to Alpha by Dr. Lee.
- Clean reusable tools and trays were used according to laboratory protocol.

After sample homogenization using ISM as described above, sub-aliquots were extracted per the Alpha SOP OP-013 (Shaker Table Extraction), screened for total oil weight in the extract per Alpha SOP OP-017 (Gravimetric Determination), and an appropriate subaliquot of the extract was cleaned up per Alpha SOP 2267 (Silica Gel Cleanup Preparation) to remove polar interferences before analysis.

2.1.6.2 Sample Analysis

Sample extracts were analyzed by high resolution gas chromatography with low resolution mass spectrometry using selected ion monitoring (GC/MS-SIM) for PNAs and sulfur heterocyclic compounds, including alkyl homolog groups, plus selected steranes, triterpanes, and triaromatic steroids (e.g., biomarkers). This analysis is based on U.S. EPA Method 8270D and described in Alpha SOP O-008 (Analysis of Parent and Alkylated

Polynuclear Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by GC/MS-SIM). A portion of the extract was also analyzed by high resolution gas chromatography with flame ionization detection (GC/FID) for saturated hydrocarbons, including n-alkanes, acyclic isoprenoids, a sum of total extract hydrocarbons, and total resolvable hydrocarbons. This analysis is based on U.S. EPA Method 8015 and described in Alpha SOP O-003 (Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector). The combination of GC/MS-SIM and GC/FID data from these tests was used to fingerprint the petroleum hydrocarbons present in samples for source identification.

The analyte lists and quality control requirements for the fingerprinting analyses were specified in the *Draft Analytical Quality Assurance Plan* (U.S. EPA, 2012e), version 2.2, dated February 28, 2012 (QAP v2.2). This version was used for all analyses prior to December 21, 2012. The analyses performed after December 21, 2012 conform to the *Analytical Quality Assurance Plan* (Enbridge, 2012e), version 2.3, dated December 21, 2012 (QAP v2.3). Quantification laboratory data are presented in *Attachment D*.

2.1.7 Vertical Extent of Oil Based on UV and Visual Observations

Oil was observed during UV screening in 25 sediment cores from the Kalamazoo River and one background sediment core (SE1111C703) from the Battle Creek River. Trace UV fluorescence was observed in 22 cores. Fluoresced oil and globules were observed in four cores. The vertical extent of oil ranged from surface occurrences (<0.1 ft bgs) to a maximum of 1.6 ft bgs. Oil was also observed as a visible sheen in sediment core from SEKR3825C701 (0.0 to 0.3 ft bgs) during core logging activities. The observations for each core are summarized in *Table 2.*

2.1.8 Sediment Bulk Density

The bulk density of sediment is a geotechnical (physical) property of sediment that is measured as the mass of solids in a volume of sediment. The wet and dry sediment bulk densities were analyzed in cores collected during the summer of 2012 submerged oil quantification activities. Cores analyzed for sediment bulk density were co-located from 37 locations out of the 102 sediment core locations and were representative of the geomorphic strata on a percentage basis as selected by U.S. EPA.

Bulk density sample depths were typically collected from 0 to 0.5 ft bgs. Dry bulk density ranged from 0.17 grams per cubic centimeter (g/cm^3) to 1.74 g/cm^3, and had a mean value of 0.65 g/cm^3. Wet bulk density ranged from 0.88 g/cm^3 to 2.08 g/cm^3, and had a mean value of 1.35 g/cm^3. The laboratory reports for bulk density analysis are presented as *Attachment E*. The measured dry bulk density values are summarized in *Table 3* and sorted by the geomorphic stratum where the sediment cores were collected. The average dry bulk density for each geomorphic stratum is also presented in *Table 3*.

2.2 Lateral Extent of Oil-Impacted Sediment

The lateral extent of sediment impacted with oil was developed based on visual observations of sheen observed after the sediments were disturbed. Observations at individual points in the Kalamazoo River were collected using a method referenced on this project as "poling". Poling activities followed the procedures presented in *Section 3.2.2* of the 2012 CWP and *Figure 1* of *Attachment B* of the 2012 CWP. At each poled location, sediment in the river was disturbed by agitation with a disk, and the location was categorized as either 'heavy', 'medium', 'light', or 'none' based on the percent sheen per square yard of surface water and the number of observed oil flecks that were observed.

In the spring of 2012, the Kalamazoo River sediments were poled from the confluence with Talmadge Creek downstream and past Morrow Lake Dam. A total of 7,766 points were surveyed by poling and incorporated into a master data set. The submerged oil poling category results were classified as 569 'heavy', 1,266 'moderate', 3,395 'light', and 2,536 'none' locations.

The individual poling observations were utilized to create polygons representing different poling categories for 'heavy', 'moderate', 'light', and 'none'. Polygons representing poling categories were created using Inverse Distance Weighted (IDW) interpolation techniques. The delineation process creates polygons of areas that predominantly fall into each of the submerged oil poling categories ('heavy', 'moderate', 'light', or 'none'). For the IDW interpolation process, each poling point was assigned a numerical value based on the submerged oil poling category result. A submerged oil poling category result of 'heavy' was assigned a value of 7, 'moderate' was assigned a value of '5', 'light' was assigned a value of 3, and 'none' was assigned a value of 1. Odd numbers were chosen so that contours could be generated at even number intervals, indicating the boundary between each of the

categories. The IDW interpolation was performed using ArcGIS® Spatial Analyst. A power setting of 5 and a variable search radius using the nearest 12 points were used. Contours were generated at 6 ('heavy' to 'moderate' boundary), 4 ('moderate' to 'light' boundary), and 2 ('light' to 'none' boundary). Contours were then "closed off" using the river bank boundary and converted to polygons to determine the area within each category. If an area within the river bank boundary was not assessed during the 2012 Spring Reassessment due to dry or inaccessible conditions, the submerged oil poling category results from the most recent reassessment available for the area were utilized.

Total acreage for each poling category by geomorphic stratum for the Spring 2012 poling is presented in *Table 4*. The areas are also subdivided by geomorphic stratum to facilitate use in the equation to quantify the amount of submerged oil in the sediments. The poling categories are also shown on *Figure 1*. The areas reported in *Table 4* cover all of the poling areas shown in *Figure 1* and include the length of the Kalamazoo River from the confluence with Talmadge Creek downstream to Morrow Lake Dam. In addition, approximately 1.5 miles of the Kalamazoo River downstream of the Morrow Lake Dam was included in the Spring 2012 survey and this down-river poling is not included in *Table 4* or *Figure 1*.

The delineation polygons for Spring 2012 poling results, sample locations, and poling observations collected during the sample collection activities are shown in *Figure 1*. Poling observations may not have matched the poling category of the delineation polygons in each and every case (e.g., a 'heavy' delineation polygon may include 'moderate', 'light', and/or 'none' submerged observations as well.). The poling observations collected when the quantification sediment cores were collected closely matched the poling category of the delineation polygon, but may not be an exact match. These slight variations do not violate any assumptions pertaining to the sampling plan.

		Spring 2012 Poling Category			
		'Heavy'	'Moderate'	'Light'	'None'
Poling Observations	'Heavy'	4	4	1	1
	'Moderate'	9	12	8	4
	'Light'	1	5	19	7
	'None'	0	1	2	11
	Dry locations	8	2	1	3

Both the poling category and the poling observations at the time of sediment core collection are presented in *Table 2.*

2.3 Oil Density Measurement

The density of weathered oil ("P_{Oil}") was developed as an adjustment to the assumed density of the crude oil spilled. Based upon a review of Enbridge transportation records and analysis of samples collected by Enbridge after the pipeline restarted, the release appears to have occurred at or about the time that the latter end of a batch of Western Canadian Select (WCS) was passing through the pipeline near Marshall, Michigan and a batch of Cold Lake (CL) crude had begun.

The composition of the oil released was approximately 77.5% CL and 22.5% WCS. Using this composition (77.5% CL and 22.5% WCS), and the 5-year average density for each (0.9283 g/cm^3 for CL and 0.9290 g/cm^3 for WCS from *http://www.crudemonitor.ca/* on August 10, 2011), the estimated combined density for a 77.5% to 22.5% mixture would be 0.9285 g/cm^3, which is equivalent to the CL 5-year average.

3.0 CONCENTRATION OF OIL IN SEDIMENT SAMPLES

The chemical analyses of the sediment samples were utilized to develop an estimate of the concentration of Line 6B crude oil within the sediment of the Kalamazoo River. These estimated Line 6B crude oil concentrations are later directly used in the calculation of the estimated amount of Line 6B crude oil that may remain within the sediments of the Kalamazoo River. The concentration estimates are in milligrams of oil per kilogram of dry sediment, or $mg_{(oil)}/kg_{(sed)}$. *Section 3.1* and *Section 3.2* present two methods used to develop the estimated concentration of Line 6B crude oil in each sediment sample.

3.1 NewFields Model

In the *Letter from Ralph Dollhopf, U.S. EPA to Enbridge Energy, Limited Partnership c/o Mr. Rich Adams dated March 1, 2013* (U.S. EPA, 2013a) an update to the November 20, 2012 Directive, U.S. EPA provided the methodology (*Technical Memorandum - Determination of Line 6B Oil Concentration in Kalamazoo River Sediments, March 1, 2013)* (NewFields, 2013) (NF 2013) to be used to determine the concentration of Line 6B oil in samples analyzed pursuant to the directive. The NF 2013 is provided as *Attachment F*.

The estimated concentration of Line 6B crude oil in each sediment sample that is calculated utilizing the NewFields method is presented in *Table 5* and *Table 6.*

3.2 ATS Model

Upon reviewing the U.S. EPA methodology, Enbridge noted that the methods used rely heavily on the use of distinguishing chemical indicators which can be ubiquitous to many sources of potential contaminants other than Line 6B oil. Such alternate sources of contaminants have been identified in the Kalamazoo River watershed and include both pyrogenic derived sources (e.g., urban runoff, discharges from historic manufactured gas plant operations, etc.) and petrogenic derived sources (e.g., urban runoff, discharges from commercial/municipal/industrial facilities, etc.). In some cases, the pyrogenic derived residuals range in the 1,000s to 10,000 mg/kg (dry weight), while the petrogenic derived residuals were estimated in the 1,000s of mg/kg (dry weight). Thus, use of the U.S. EPA method could cause the concentration to be much higher than actual resulting in the estimated calculated oil volume to be skewed high.

After review and consideration of the U.S. EPA method, Enbridge noted that a modified method would provide a more accurate analysis of the oil concentration. That method, developed by Ann Arbor Technical Services Inc. (ATS) is provided as *Attachment G*. The ATS model identified other chemical indicators (e.g., fluoranthene, pyrene) that can be used to develop a correction factor to correct for pyrogenic background contribution from non-line 6B oil sources that used the U.S. EPA chemical indicators as the basis for oil volume calculations. To differentiate petrogenic residues between Line 6B and non-Line 6B sources, several diagnostic ratio indicators were developed using biomarker data (e.g., TAS1/T30, TAS2/T19, and TAS1/TAS2). Evaluation of this data suggests that these three diagnostic ratios can be used for direct calibration calculations of Line 6B for samples with hydrocarbon levels up to approximately 1,500 mg/kg. Calculated values for samples beyond 1,500 mg/kg can be considered lower bound estimates for Line 6B concentrations to be used with independently calculated Line 6B concentrations using C3DBT and C4DBT.

4.0 ESTIMATE OF SUBMERGED OIL REMAINING

The volume of Line 6B crude oil was estimated using the data presented in *Section 2.0* and *Section 3.0* above. Two different methods, from NewFields and ATS, are presented in

Sections 3.1 and 3.2, respectively, for estimating the concentration of Line 6B crude oil in each sediment sample. The two separate calculations of the estimated amount of Line 6B crude oil in the Kalamazoo River are located in *Section 4.8*.

4.1 Numeric Model for Quantification

The numeric model (oil calculator) used to estimate the amount of submerged oil that may remain within the sediments of the Kalamazoo River (including the Morrow Lake Delta and Morrow Lake) is described below. This model is defined in the 2012 CWP. The model uses five input variables which are differentiated between different poling areas within each type of geomorphic unit:

- Variable 1 – Estimated concentration of Line 6B crude oil in the sediment samples based on the analysis of alkylated PNAs and biomarkers in the sediments,
- Variable 2 – Sediment bulk density,
- Variable 3 – Lateral extent or area of oil-impacted sediment,
- Variable 4 – Vertical extent or depth of oil-impacted sediment, and
- Variable 5 – Density of released oil, adjusted for weathering.

Calculations for the volume of Line 6B crude oil are performed separately for different areas of the total oil-impacted Kalamazoo River system. Individual sub-areas are defined by geomorphic stratum and submerged oil poling category ('heavy', 'moderate', or 'light').

The algorithm used in the model is:

Gallons of Oil in area j =

$$\{[D_j(\text{inches}) \times A_j(\text{acres}) \times 4{,}046.86(\text{meters}^2/\text{acre}) \times 0.0254(\text{meter/inch}) \times P_{Sed\,j}(\text{g/cm}^3) \times 10^6(\text{cm}^3/\text{meters}^3) \times C_{Oil\,j}(\text{mg/kg}) \times 10^{-6}(\text{kg/mg})] / P_{Oil}(\text{g/cm}^3)\} \times 10^{-3}(\text{L/cm}^3) \times 0.2642(\text{gal/L})$$

Where

A_j = Total surface area of area j (acres),

D_j = Thickness of oil impacted sediment layer in area j (inches),

$P_{Sed\,j}$ = Dry bulk density of sediment in area j (g/cm^3),

P_{Oil}= Density of oil (g/cm^3), and

$C_{Oil\,j}$ = Estimated concentration of Line 6B crude oil in the sediment within area j (mg/kg).

The sediment sample data is grouped by sub-area and presents the resulting concentration in *Table 5* through *Table 8*. Each of these variables is discussed in subsections below.

The term P_j (% of area of interest with TPH concentration) was included in *Section 4.5* of the 2012 CWP to represent the fraction of sediments which contain Line 6B crude oil within each area. For this calculation, the fraction is assumed to be 1.00 and the term has been removed from the equation.

4.2 Definition of Areas

The geomorphology of the Kalamazoo River channel was previously mapped and provided to the U.S. EPA. The U.S. EPA utilized the mapping data to divide the Kalamazoo River channel into 13 geomoprhic strata (note: only nine of the geomorphic strata are located within the stretch of the river included in the quantification assessment). The river is divided into 34 different surface area categories based on both poling results ('heavy', 'medium', 'light', and 'none') and geomorphic stratum. The final geomorphic strata is shown in *Figure 2*.

4.3 Surface Area

The surface area for each of the categories is presented in *Table 4*, as discussed in *Section 2.2* above. The surface areas from *Table 4* are presented in *Table 5* through *Table 8,* as Lateral Extent of Impact (acres), where they are used for A_j (Total surface area of area j in acres) in the calculation of the amount of Line 6B crude oil in the sediments.

4.4 Thickness

The estimated concentration of Line 6B crude oil from each sediment sample (presented in *Section 3.0*) was used to determine the thickness of the Line 6B crude oil in each core. The thickness of impact in a core is specific to the method utilized to estimate the concentration of Line 6B crude oil in each sample. Therefore, the thickness term is presented separately in *Table 5* and *Table 6* for the NewFields methods and *Table 7* and *Table 8* for the ATS methods, for calculating the range of concentrations of Line 6B crude oil.

The following set of simple rules was followed to determine the thickness of impact in each individual boring:

- When only one interval contained detectable concentrations of Line 6B crude oil, the thickness of that interval is considered the thickness of the impacted sediment in that sediment core.
- When more than one sample interval in a sediment core contained detectable concentrations of Line 6B crude oil, the total depth from the top of the upper sediment interval to the bottom of the lower sediment interval is considered the thickness of the impacted sediment in that sediment core.
- When no sediment sample intervals contained detectable Line 6B crude oil in a sediment core, then the thickness of the impacted sediment interval is zero feet.

For a given area (combination of geomorphic stratum and poling category), the thickness of the impacted sediment interval for all of the sediment cores collected in that area are averaged to calculate D_j , the thickness of oil impacted sediment layer in area *j*.

4.5 Dry Bulk Density of Sediment

The dry bulk density of the sediment was measured in sediment cores from different geomorphic strata. The data are discussed in *Section 2.1.8* and presented in *Table 3*. Consistent with *Section 4.5* of the 2012 CWP, the mean of the dry bulk density results from each geomorphic category is used. The dry bulk densities assigned to each geomorphic stratum in *Section 2.1.8* and *Table 3* are included in *Table 5* through *Table 8,* as Average Sediment Bulk Density (g/cm^3), where it is used for $P_{Sed\,j}$ (dry bulk density of sediment in area j in g/cm^3).

4.6 Density of Oil

The oil density estimate was developed as described in *Section 2.3* and was established at 0.9285 gm/cm^3. That value was included in *Table 5* through *Table 8* which was then used to estimate the amount of oil that may remain within the sediments of the Kalamazoo River system.

4.7 Concentration of Line 6B Oil in Sediment

4.7.1 Concentration of Line 6B Oil in Sediment (NewFields)

In the March 1, 2013 directive to Enbridge, U.S. EPA provided the methodology to be used to estimate oil concentrations in sediments. That method is described in *Attachment F* and concentration values developed from that process were inserted in the oil calculator (*Table 5* and *Table 6*) which then used the data to estimate the range of oil that may remain within the sediments of the Kalamazoo River system.

4.7.2 Concentration of Line 6B Oil in Sediment (ATS)

An alternate methodology used to develop the oil concentration values for the oil calculator was described in *Attachment G*. Results from that methodology were inserted in the oil calculator (*Table 7* and *Table 8*) which then used the data to estimate the range of oil potentially available in the Kalamazoo River system.

4.8 Estimated Quantity of Line 6B Oil

4.8.1 NewFields Model

The lower bound for the NewFields interpretation of the oil calculator suggests there is approximately 17,963 gallons of Line 6B crude oil remaining in the Kalamazoo River shown in *Table 5*. The lower bound is calculated using a value of zero for non-detect (ND) and less than the Minimum Detection Limit (MDL) values based on Enbridge evaluation of “chemical reasonableness”.

The upper bound for the NewFields interpretation of the oil calculator suggests there is approximately 24,595 gallons of Line 6B crude oil remaining in the Kalamazoo River shown in *Table 6*. The upper bound is calculated using a value of half the MDL for values reported as ND and less than the MDL until there are two consecutive ND or less than the MDL, and subsequent ND or less than MDL values were considered to be zero unless there was a detectable impact after the two consecutive values.

4.8.2 ATS Model

The ATS interpretation of the oil calculator uses all the same parameters as the NewFields interpretation to calculate the oil volume except for the parameter oil concentration. The oil concentration parameter was developed by ATS to accommodate the overestimating effect of using the chemical indicators suggested by the NewFields model due to alternate sources

of background oil containing those same chemical indicators. The development of the oil concentration parameter is explained in *Section 3.2* and then imported into the oil calculator to estimate the amount of oil that may remain within the sediments of the Kalamazoo River system. The imported value represents the lower bound limit for oil concentration. The lower bound for the ATS interpretation of the oil calculator suggests there is approximately 1,528 gallons of Line 6B crude oil remaining in the Kalamazoo River system shown in *Table 7*.

The upper bound for the ATS interpretation of the oil calculator suggests there is approximately 8,012 gallons of Line 6B crude oil remaining in the Kalamazoo River system shown in the *Table 8*. The upper bound is calculated using a value of half the MDL for values reported as ND and less than the MDL until there are two consecutive ND or less than the MDL, and subsequent ND or less than MDL values were considered to be zero unless there was a detectable impact after the two consecutive values.

5.0 REFERENCES

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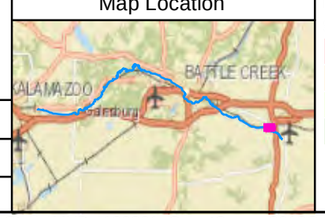
Figures

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 1 OF 53
MP 02.00-MP 02.75

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

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Aerial Photography Date: April 2011

SEKR0325C701

3.50

3.25

3.00

Heather Dr

Friendship Ln

Peter Pan Ln

Kristen Dr

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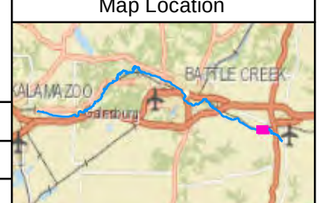
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



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Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 2 OF 53
MP 02.75-MP 03.50

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

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Aerial Photography Date: April 2011

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SEKR0425C701

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SEKR0425C702

4.00

3.75

ENBRIDGE

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Approved:	JT	3/14/2013
Project #:	60284509	

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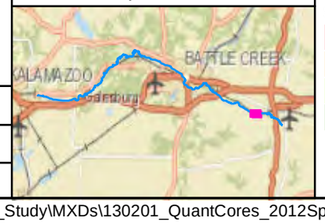

Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 3 OF 53
MP 03.50-MP 04.50

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

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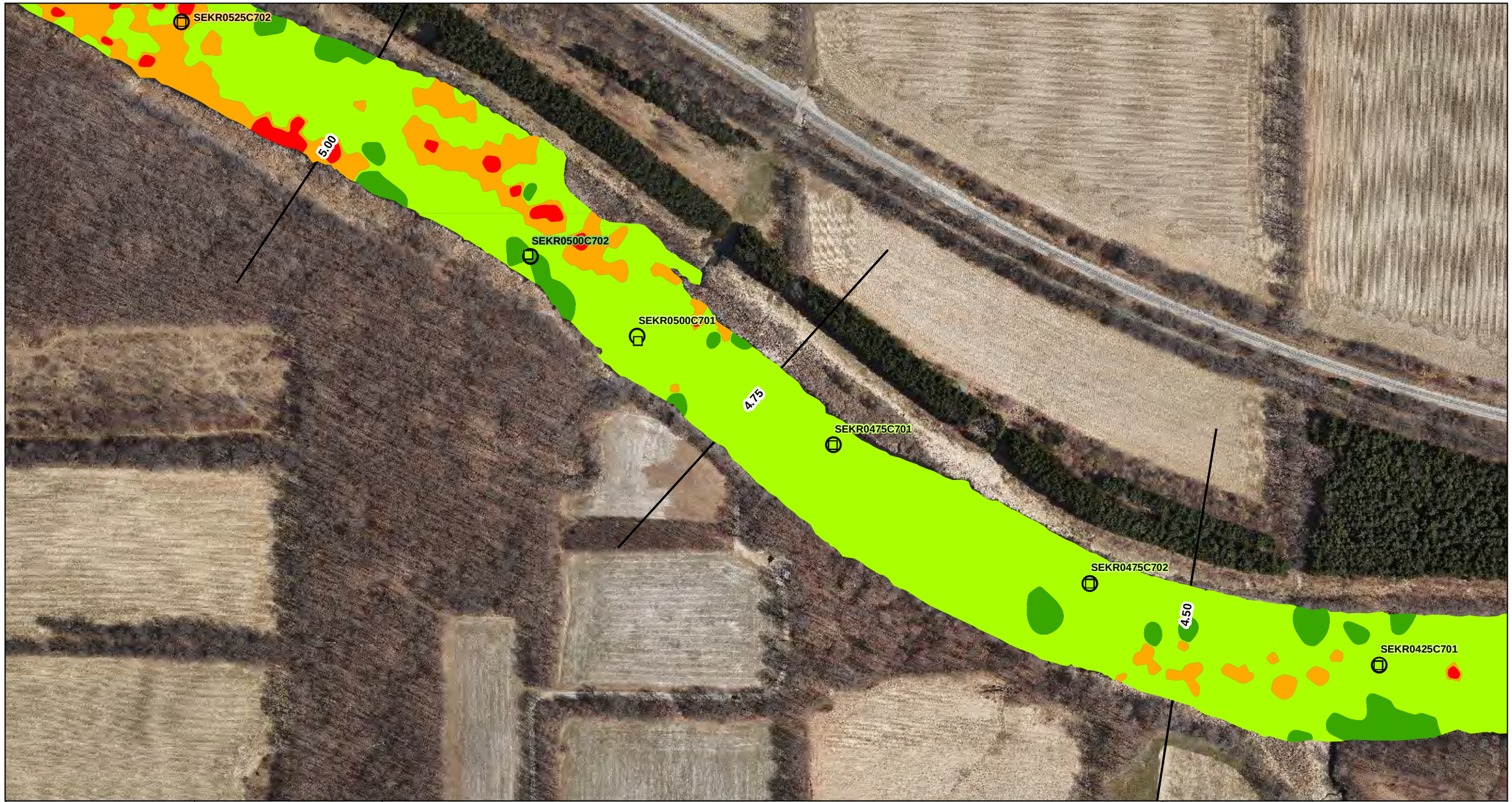

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Approved:	JT	3/14/2013
Project #:	60284509	

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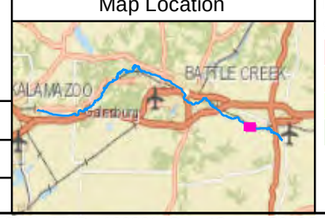

Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 4 OF 53
MP 04.50-MP 05.00

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

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Aerial Photography Date: April 2011

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SEKR0550C705

SEKR0550C702

SEKR0550C701

SEKR0550C703

SEKR0550C704

SEKR0525C702

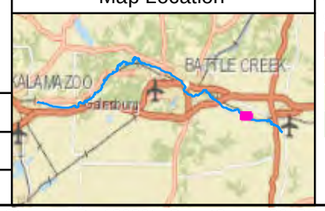
5.50

5.25

5.00

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 5 OF 53
MP 05.00-MP 05.75

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

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Aerial Photography Date: April 2011

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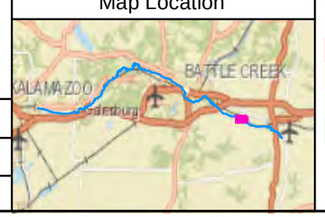
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 6 OF 53
MP 05.50-MP 06.25

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

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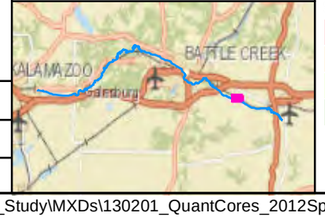
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 7 OF 53
MP 06.25-MP 07.00

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

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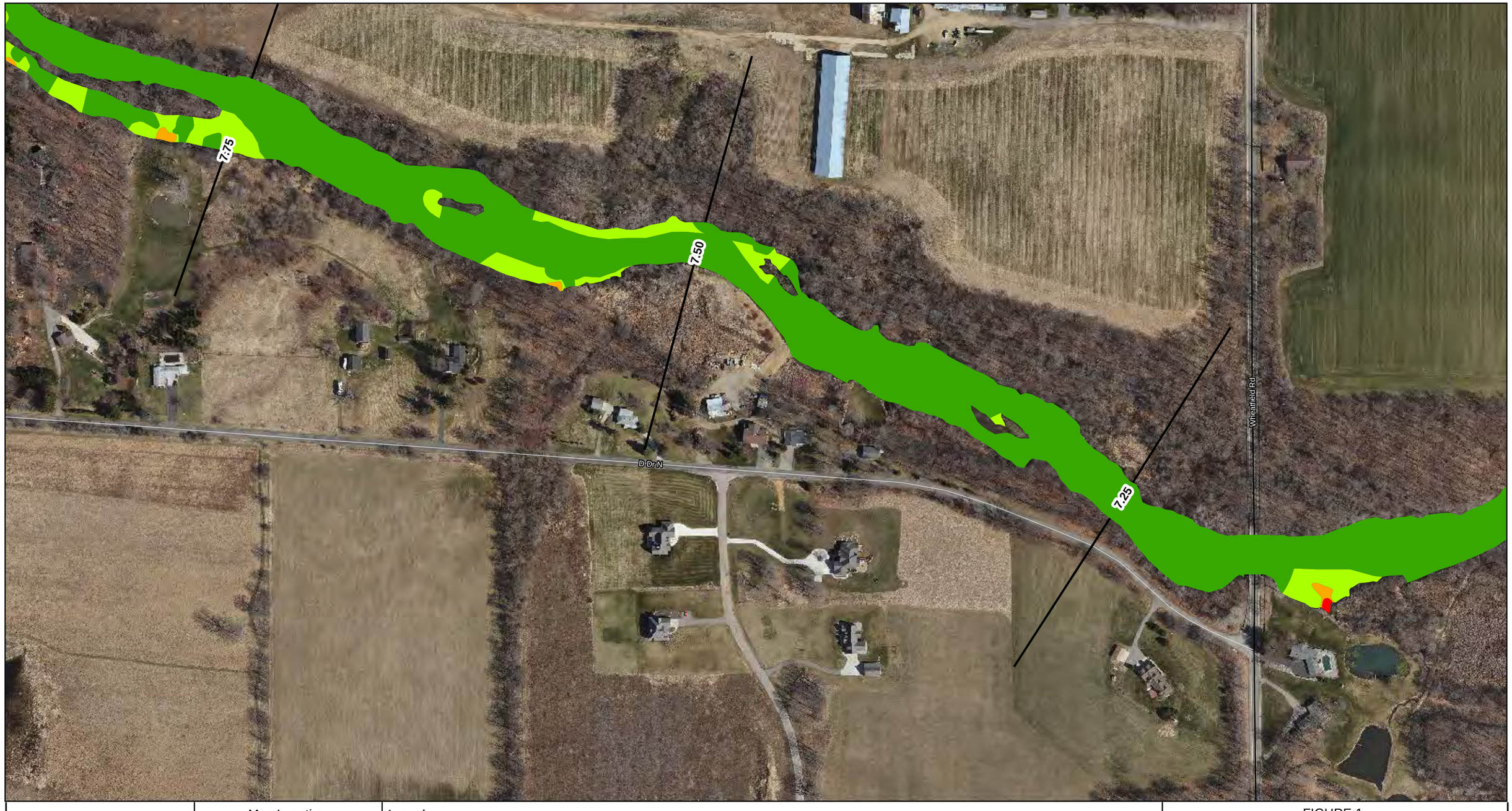
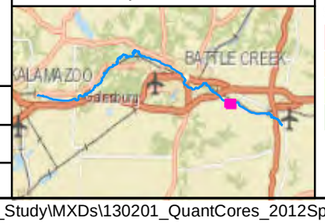
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 8 OF 53
MP 07.00-MP 07.75

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

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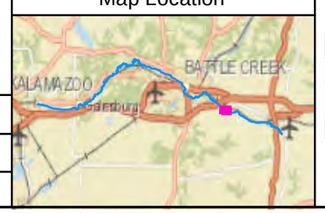
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 9 OF 53
MP 07.75-MP 08.50

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

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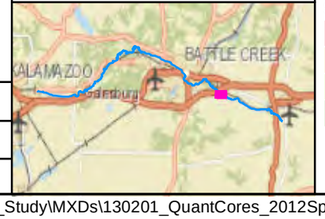
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 10 OF 53
MP 08.50-MP 08.75

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

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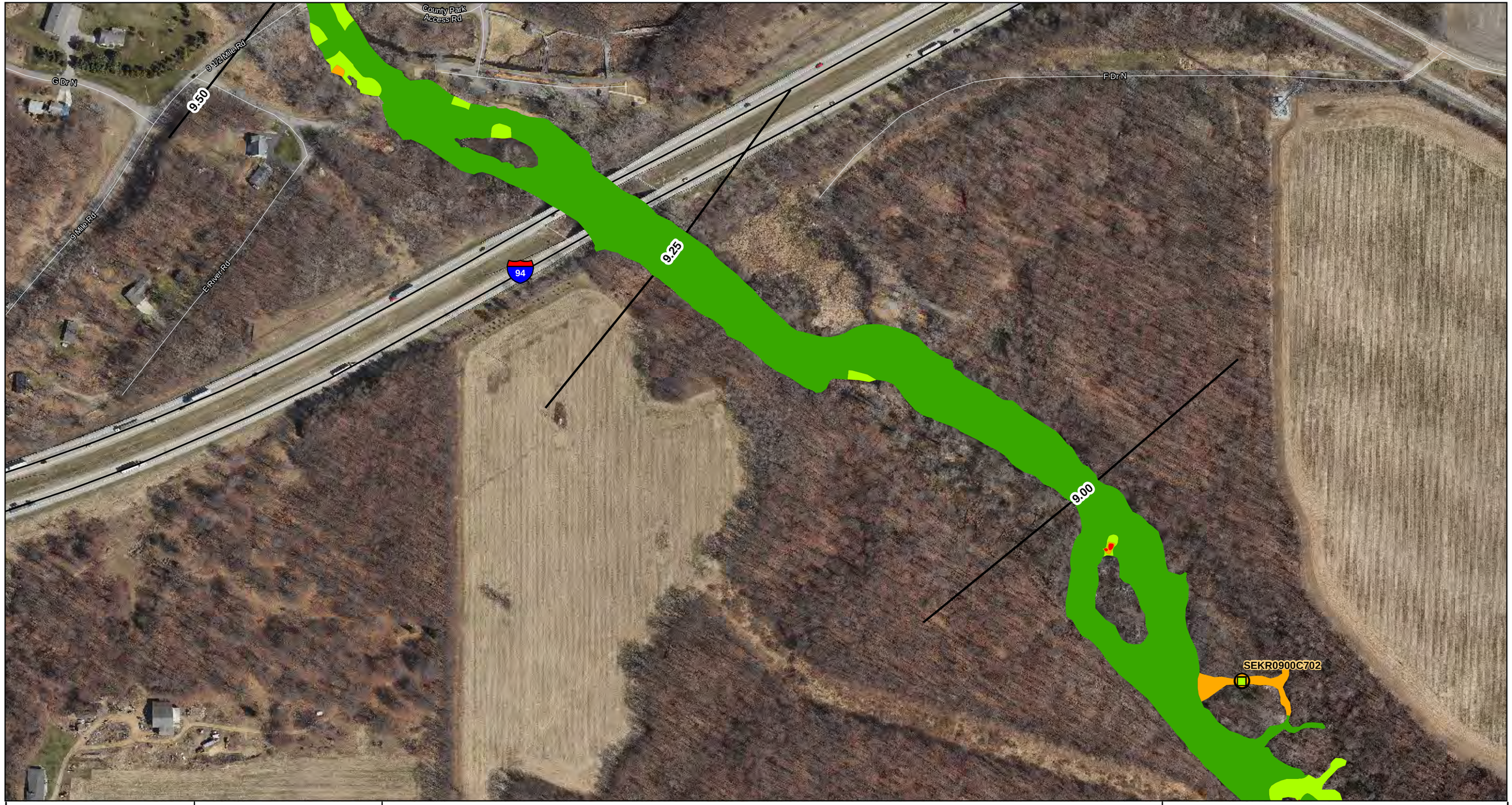
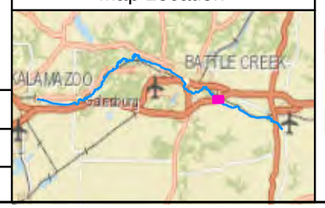
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 11 OF 53
MP 08.75-MP 09.50

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

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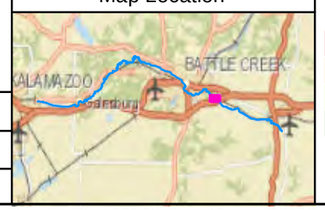
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 12 OF 53
MP 09.50-MP 10.25

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

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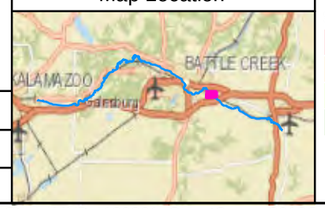
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 13 OF 53
MP 10.25-MP 10.75

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

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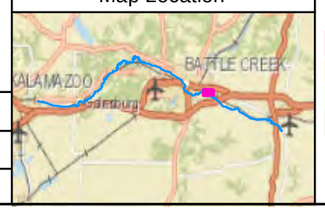
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 14 OF 53
MP 10.75-MP 11.25

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

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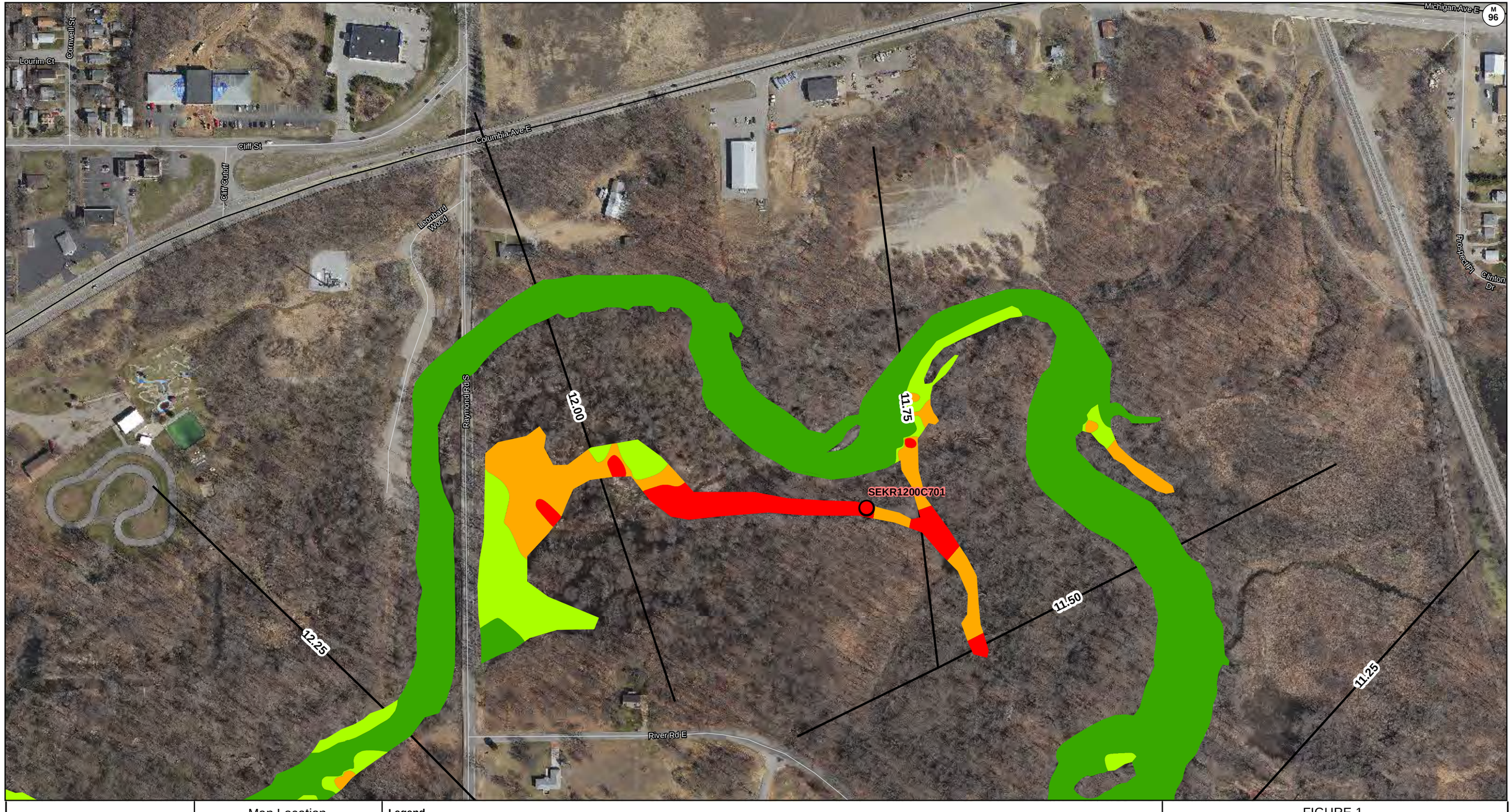
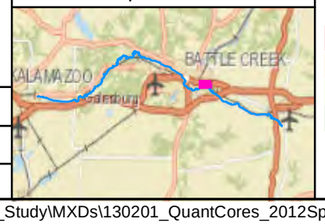
Aerial Photography Date: April 2011



ENBRIDGE		
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 15 OF 53
MP 11.25-MP 12.25

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

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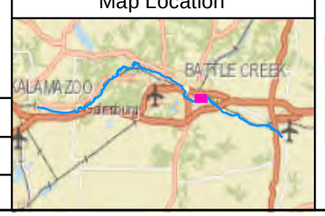
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 16 OF 53
MP 12.25-MP 13.00

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

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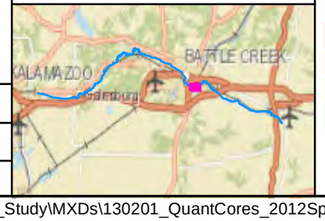
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 17 OF 53
MP 13.00-MP 14.00

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

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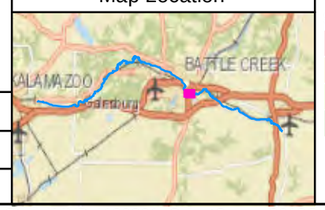
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 18 OF 53
MP 14.00-MP 14.75

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

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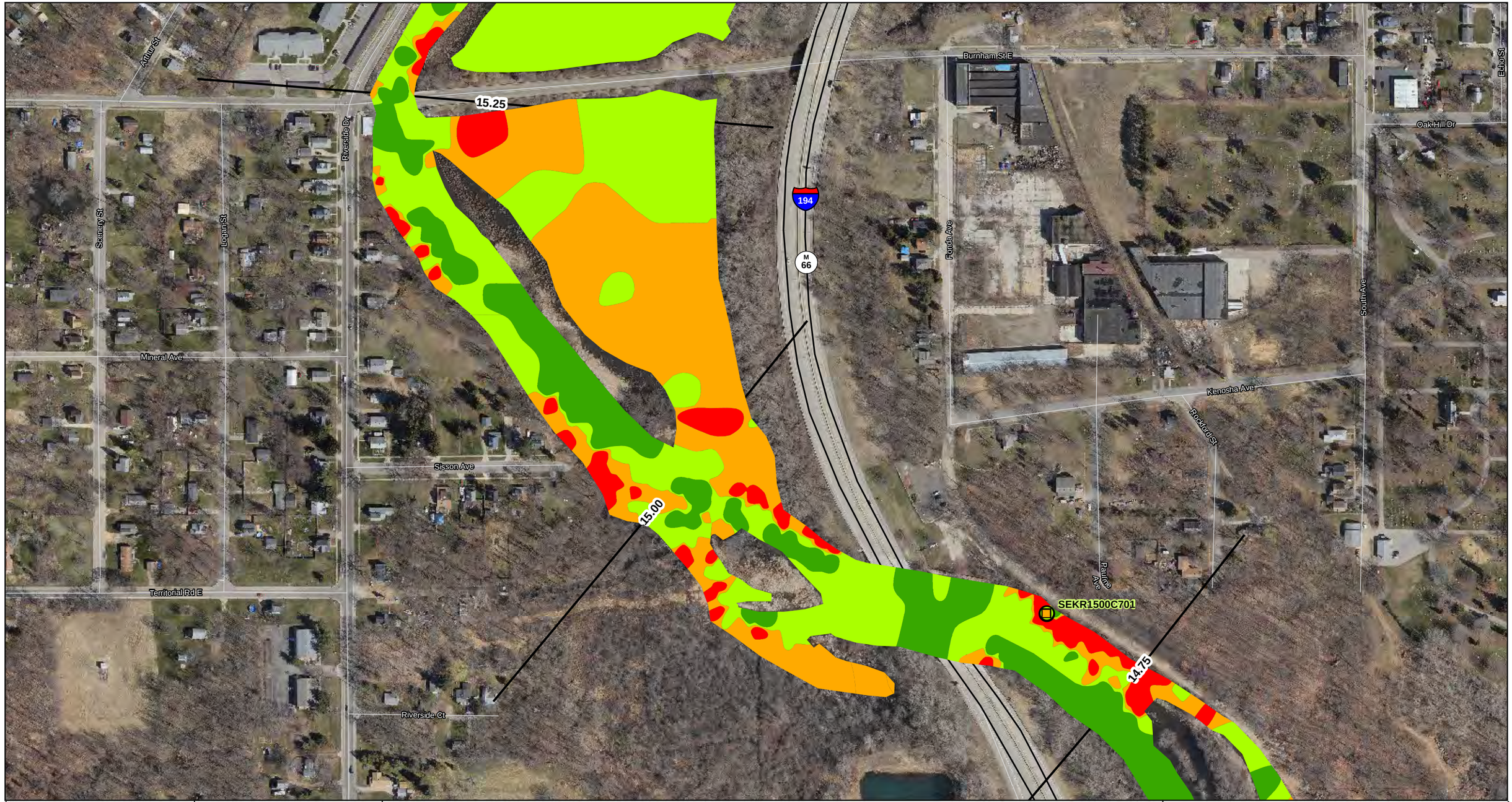
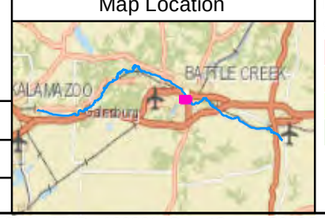
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 19 OF 53
MP 14.75-MP 15.25

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

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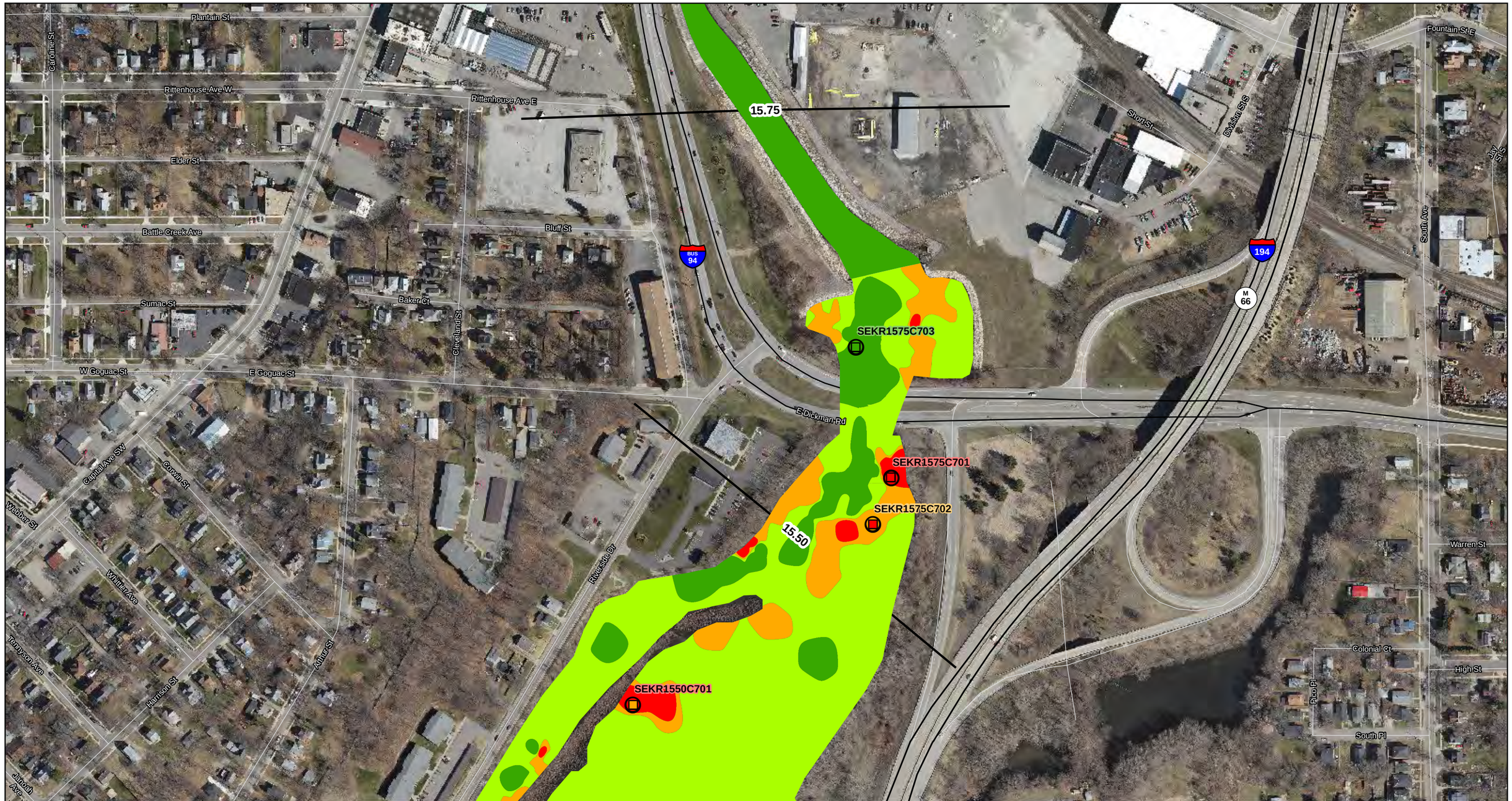
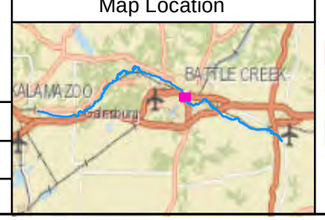
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 20 OF 53
MP 15.25-MP 15.75

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

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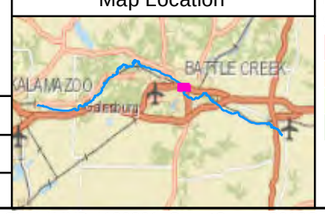
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 21 OF 53
MP 15.75-MP 16.25

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

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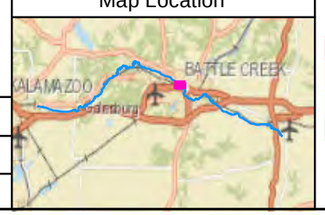
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 22 OF 53
MP 16.25-MP 17.00

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

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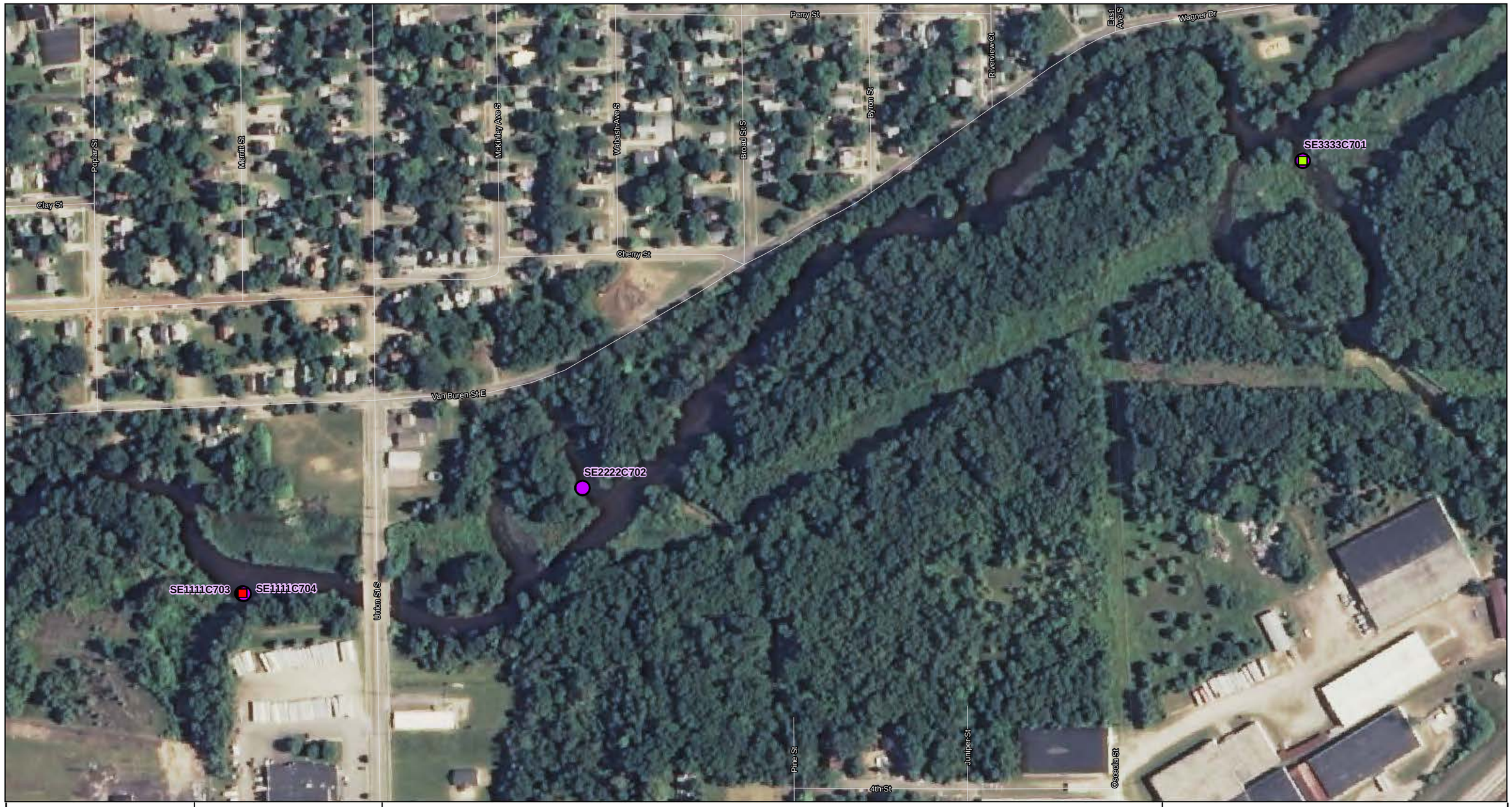
Aerial Photography Date: April 2011



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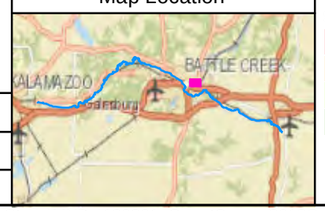
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 23 OF 53
BATTLE CREEK

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

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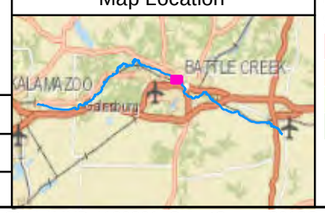
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 24 OF 53
MP 17.00-MP 17.50

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

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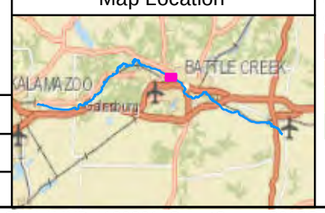
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 25 OF 53
MP 17.50-MP 18.00

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

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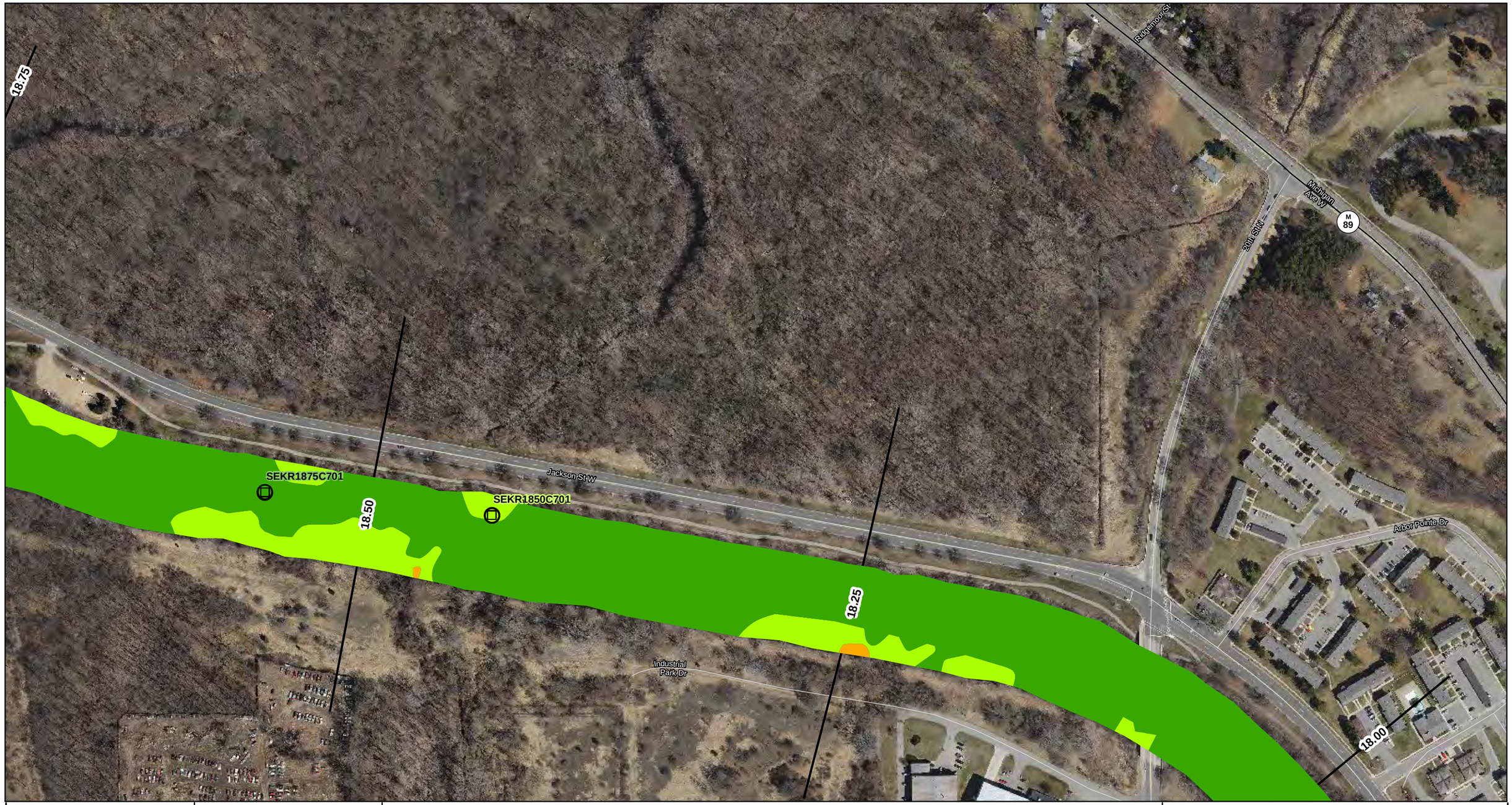
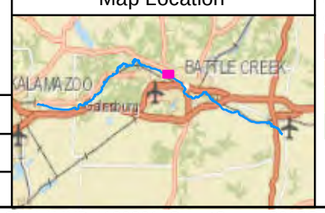
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 26 OF 53
MP 18.00-MP 18.75

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

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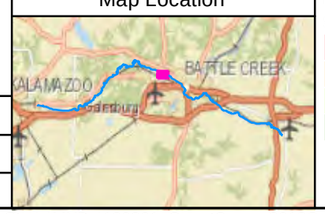
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 27 OF 53
MP 18.75-MP 19.25

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

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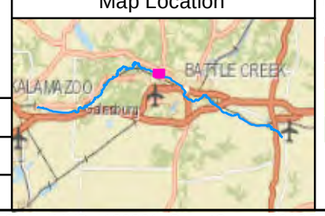
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 28 OF 53
MP 19.25-MP 20.00

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

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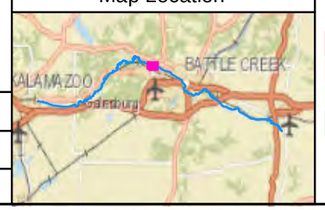
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 29 OF 53
MP 20.00-MP 20.75

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

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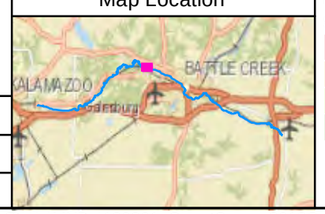
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 30 OF 53
MP 20.50-MP 21.50

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

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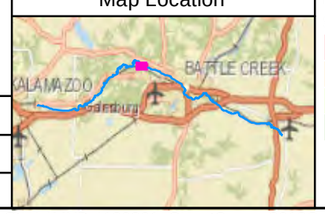
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 31 OF 53
MP 21.25-MP 22.00

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

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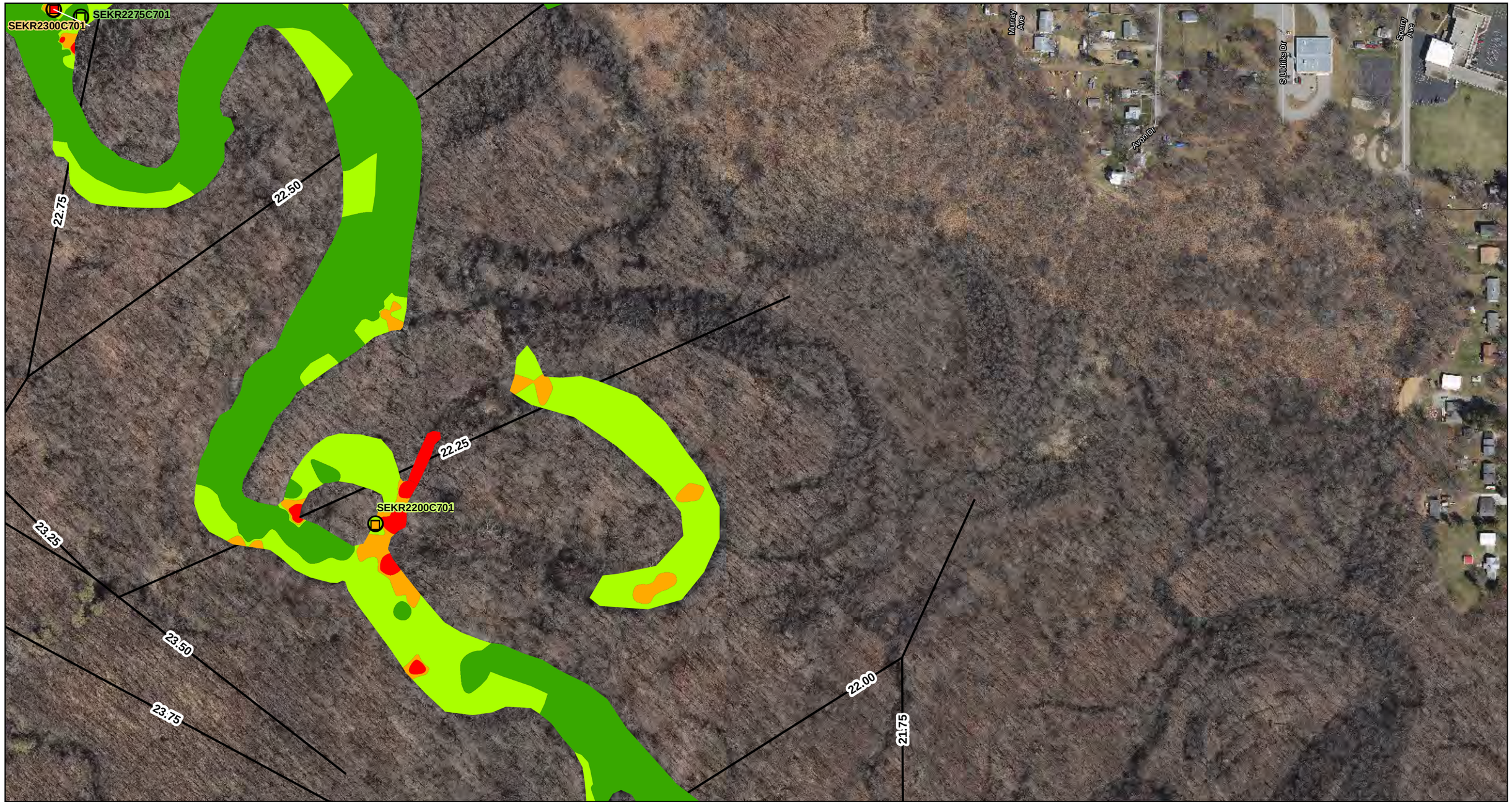
Aerial Photography Date: April 2011



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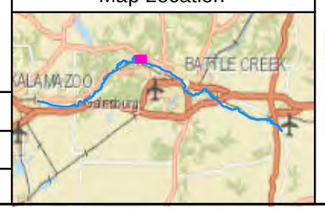
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 32 OF 53
MP 22.00-MP 22.75

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	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 33 OF 53
MP 22.50-MP 23.75

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

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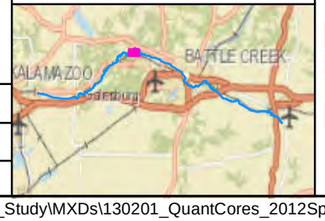
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 34 OF 53
MP 23.50-MP 24.25

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

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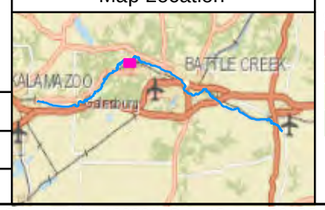
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 35 OF 53
MP 24.75-MP 25.75

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

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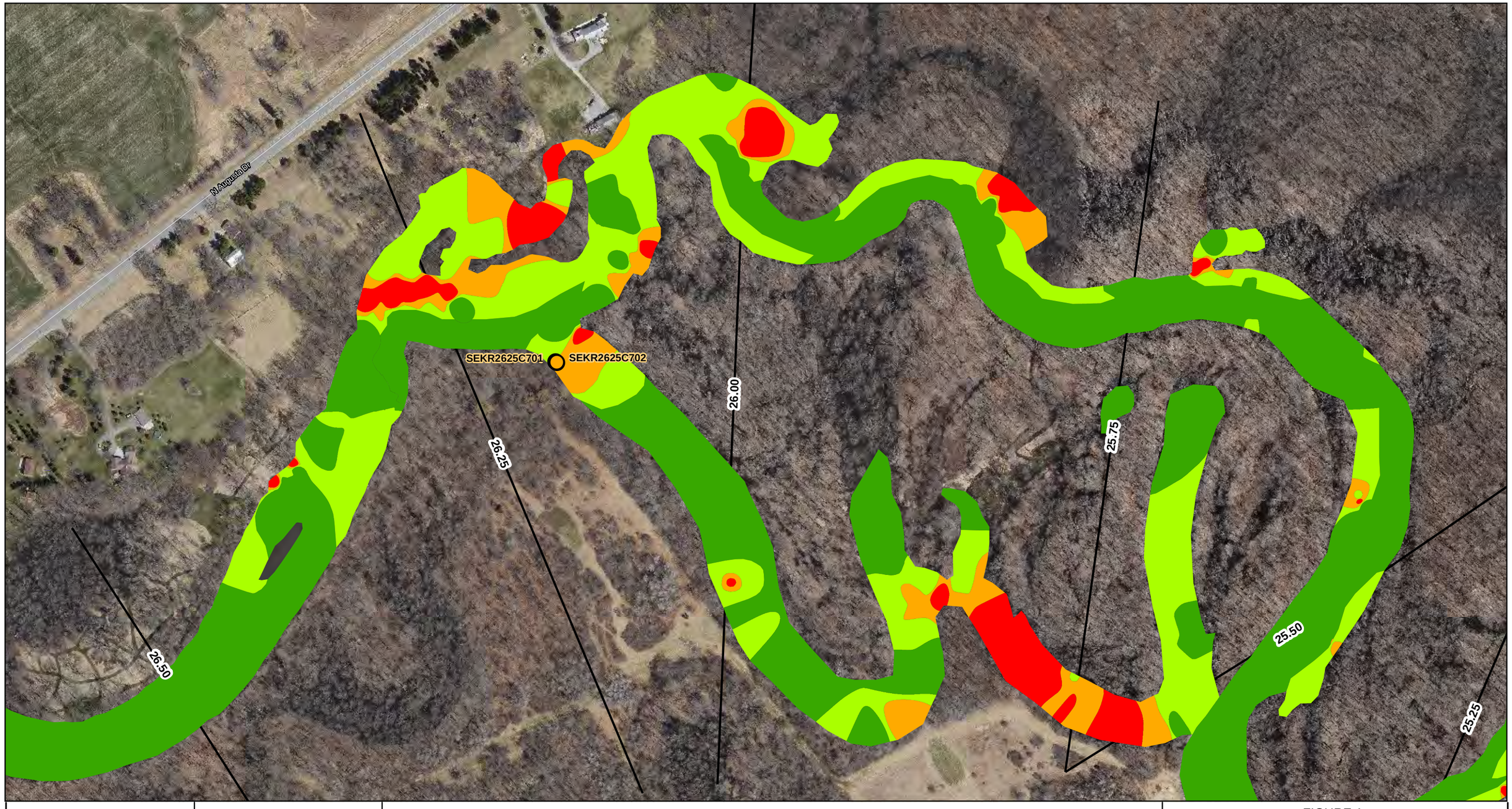
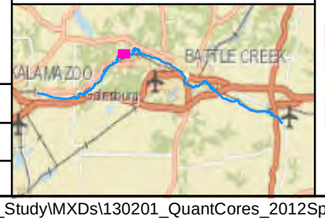
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 36 OF 53
MP 25.50-MP 26.50

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

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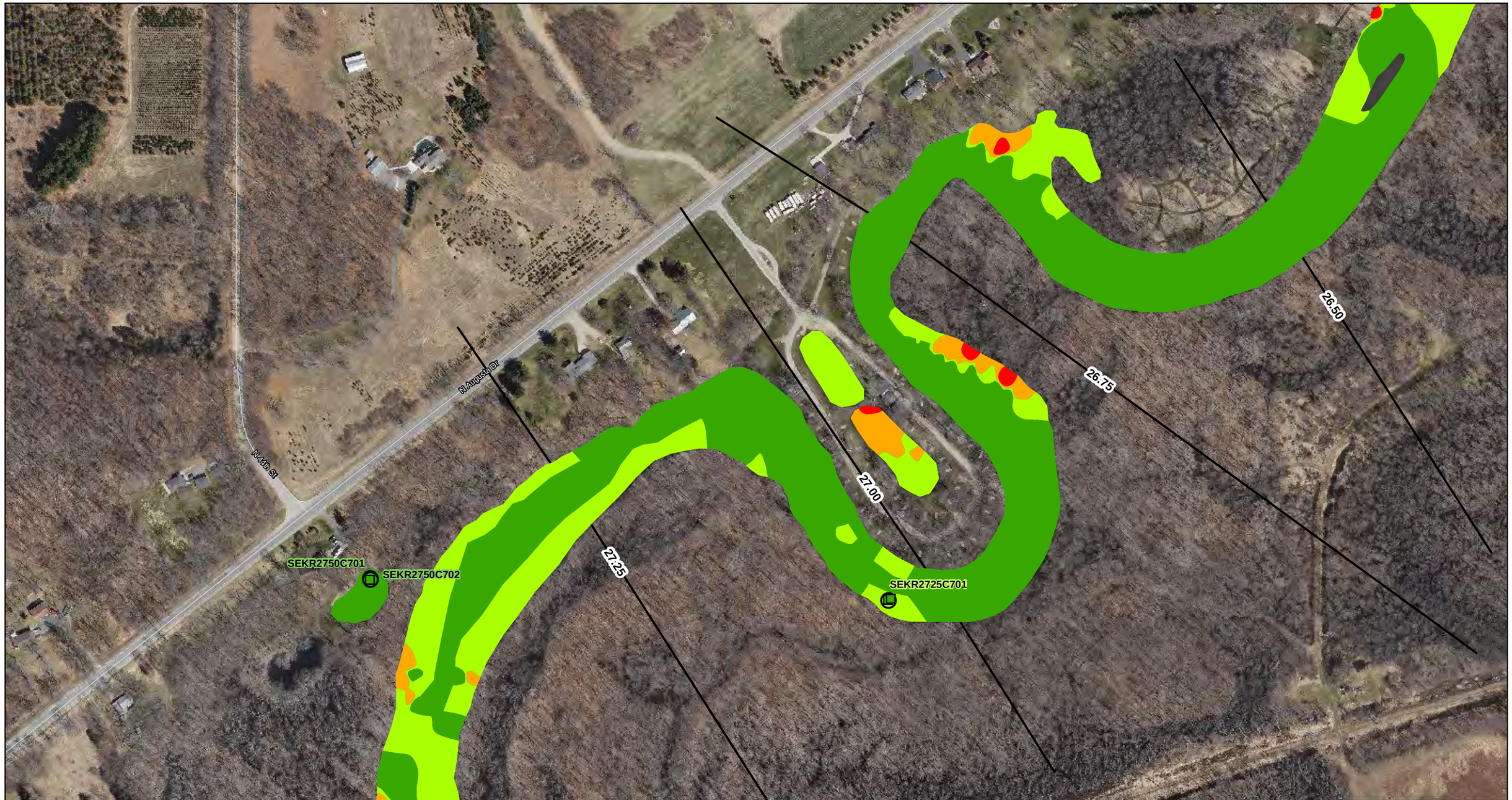
Aerial Photography Date: April 2011



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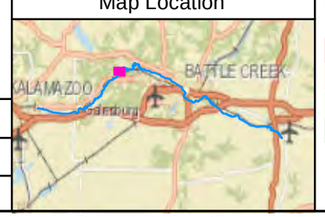
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 37 OF 53
MP 26.50-MP 27.50

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

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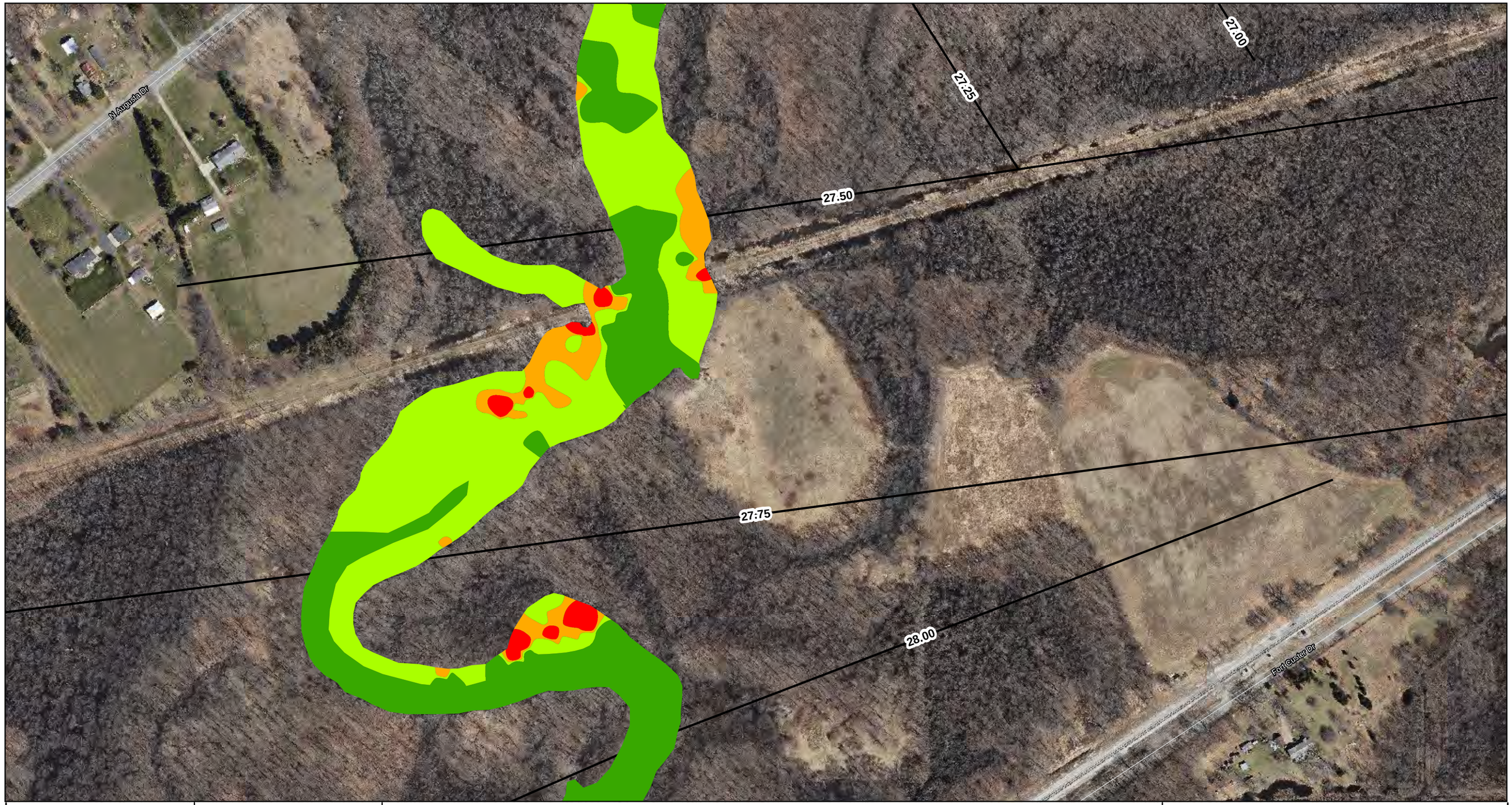
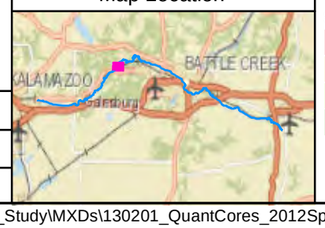
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 38 OF 53
MP 27.50-MP 28.00

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

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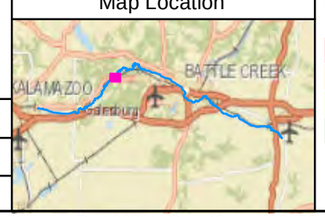
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 39 OF 53
MP 28.00-MP 28.75

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

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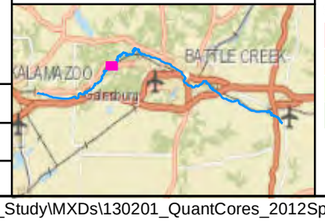
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 40 OF 53
MP 28.75-MP 29.50

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

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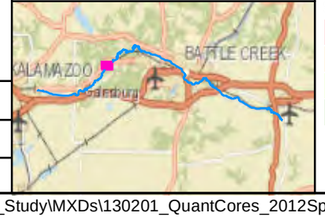
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 41 OF 53
MP 29.50-MP 30.00

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

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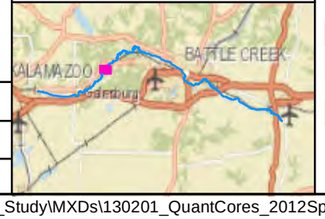
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 42 OF 53
MP 30.00-MP 30.75

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

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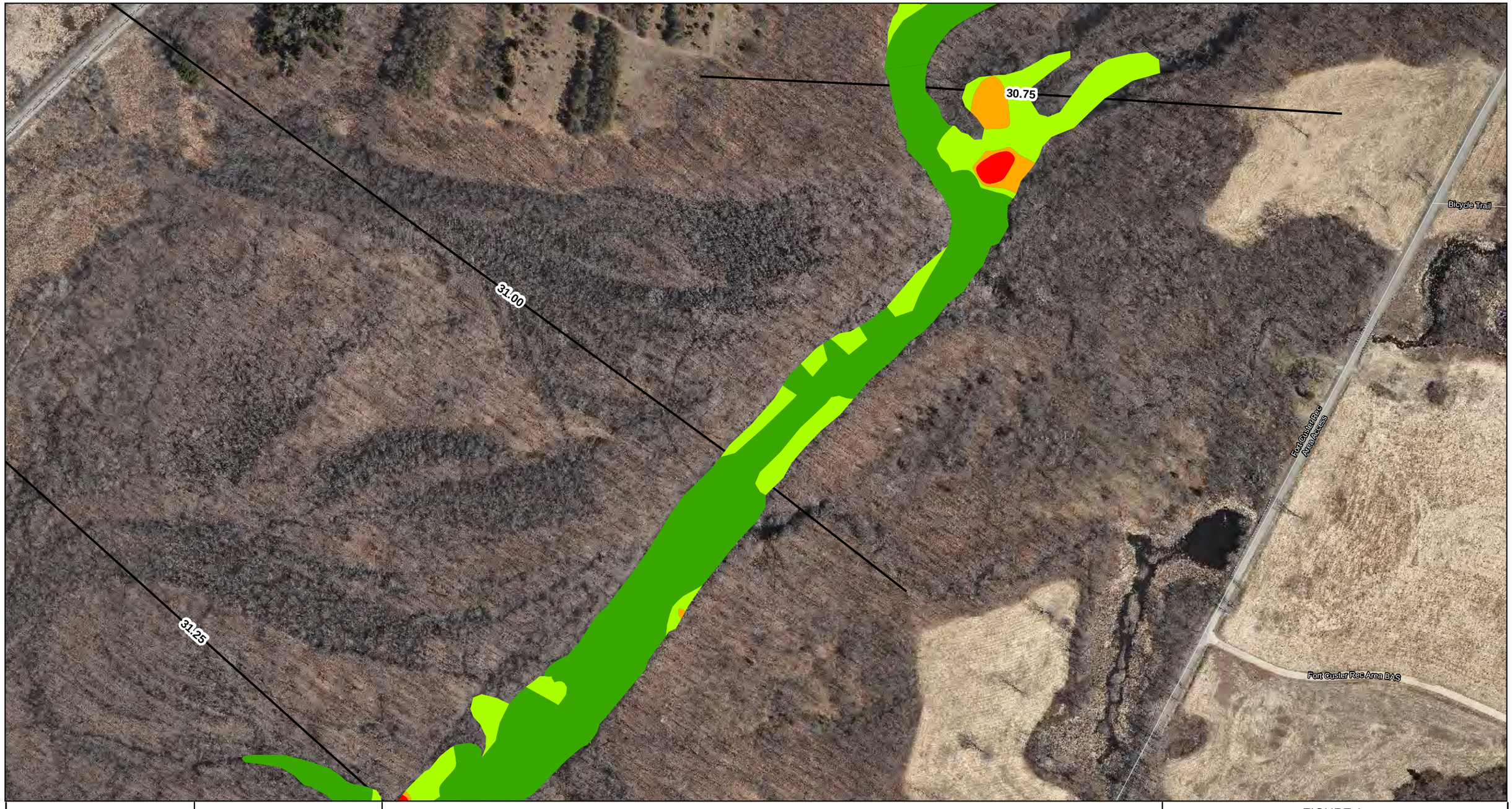
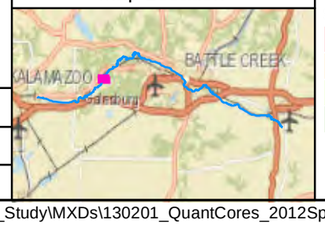
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 43 OF 53
MP 30.75-MP 31.25

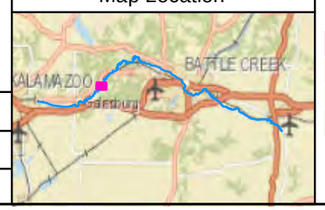
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\2012_Soil_Quantification_Study\MXDs\130201_QuantCores_2012SpringDelins.mxd

Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 44 OF 53
MP 31.25-MP 31.75

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

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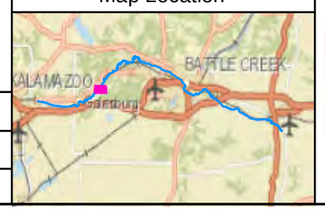
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 45 OF 53
MP 31.75-MP 32.25

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

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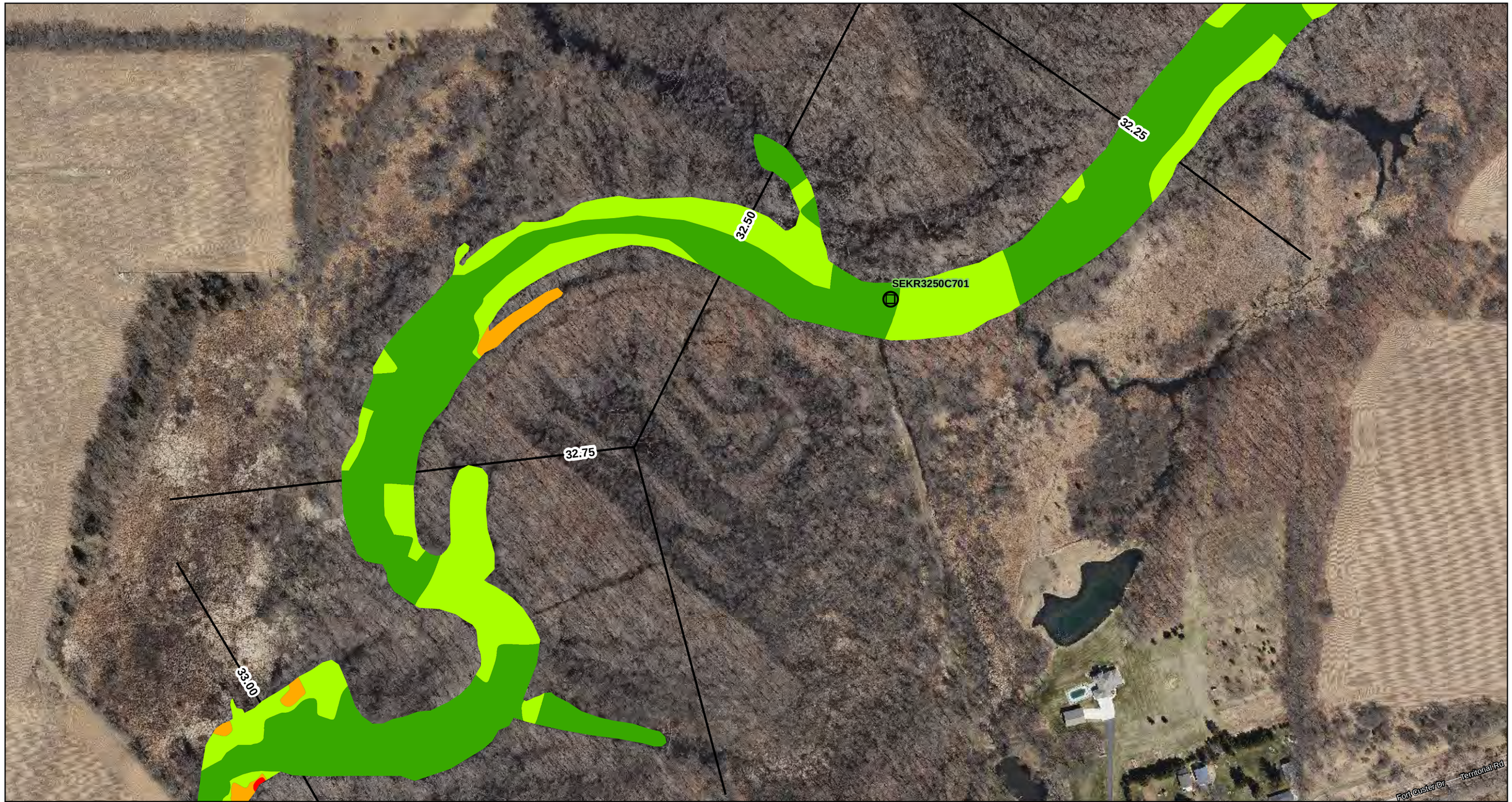
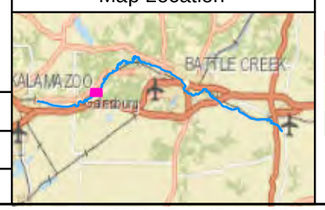
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 46 OF 53
MP 32.25-MP 33.00

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

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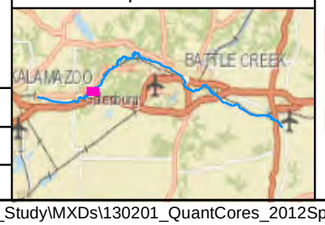
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 47 OF 53
MP 33.00-MP 33.50

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

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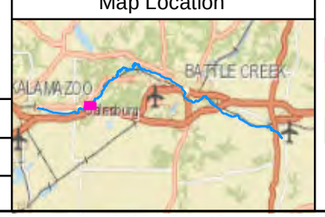
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 48 OF 53
MP 33.50-MP 34.00

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

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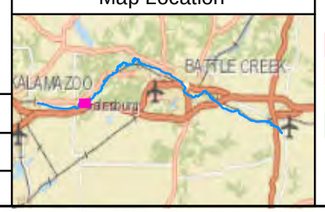
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 49 OF 53
MP 34.00-MP 35.00

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

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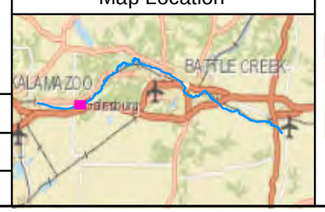
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 50 OF 53
MP 34.75-MP 35.75

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

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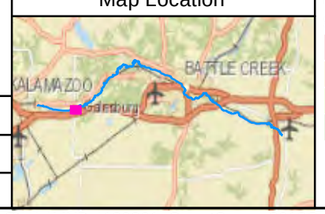
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 51 OF 53
MP 36.00-MP 36.75

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

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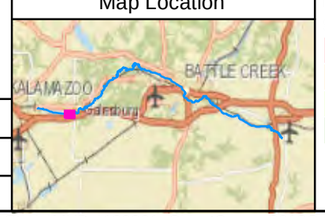
Aerial Photography Date: April 2011

SEKR3725C707
SEKR3725C706
SEKR3750C705
SEKR3725C704
37.50
37.25
37.00
SEKR3750C706
SEKR3700C701
SEKR3750C707
SEKR3750C710
SEKR3750C709
SEKR3750C704
SEKR3725C705
SEKR3750C703
SEKR3750C708
SEKR3725C709
SEKR3725C702
SEKR3750C701
SEKR3725C708
SEKR3725C701
Miller Dr

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 52 OF 53
MP 36.75-MP 37.50

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

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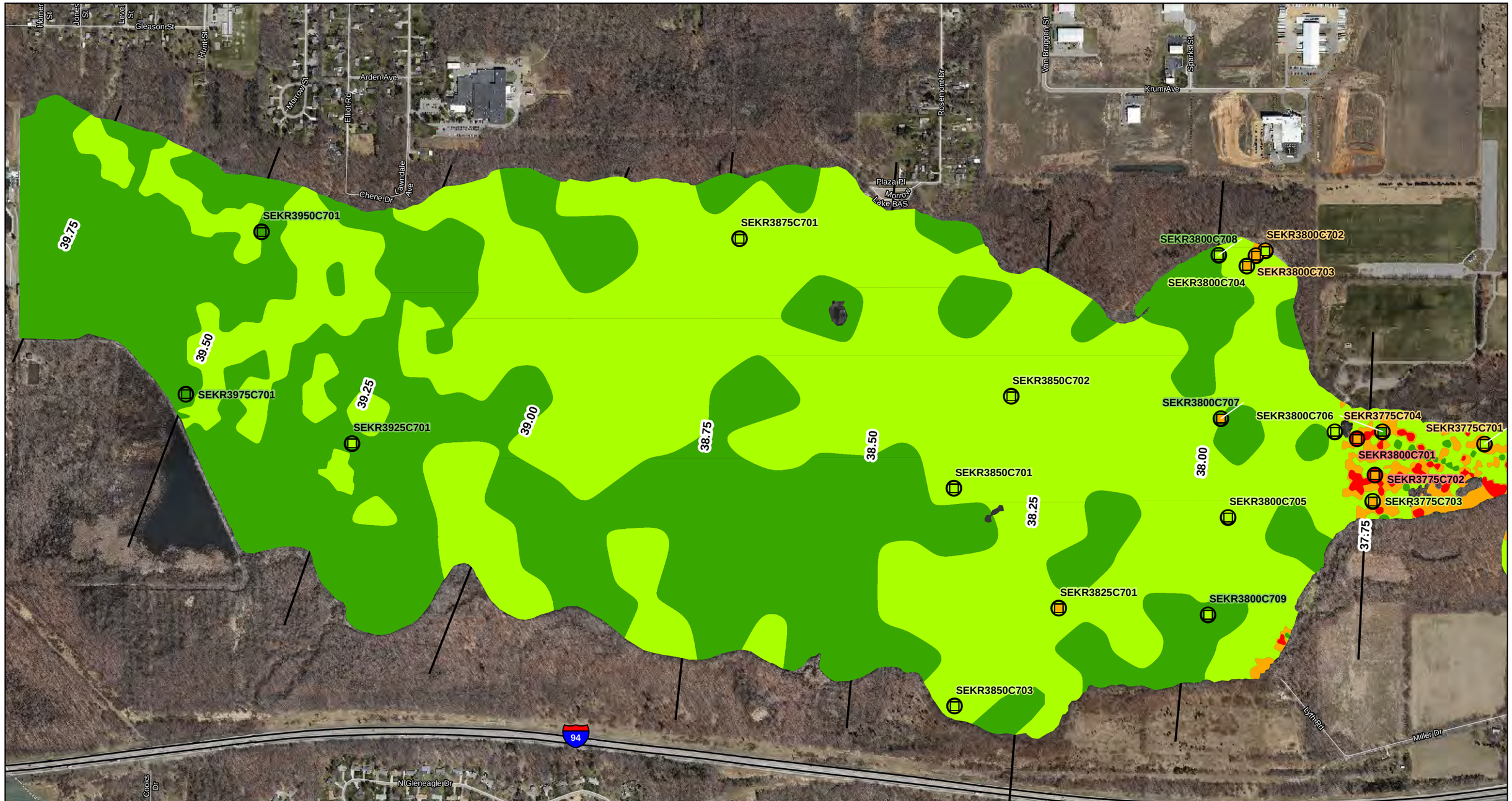
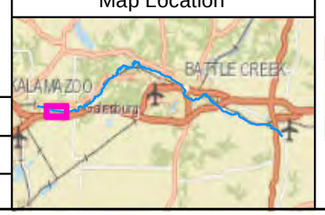
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Spring 2012 SO Delineations
- Heavy
- Moderate
- Light
- None

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 550 1,100

Scale in Feet

FIGURE 1
POLING CATEGORY
AND SEDIMENT BORING LOCATIONS
SHEET 53 OF 53
MP 37.50-MP 39.70

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

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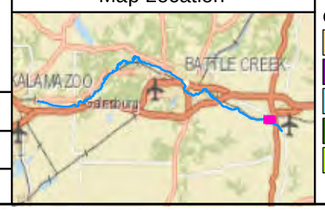
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 1 OF 53
MP 02.00-MP 02.75

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

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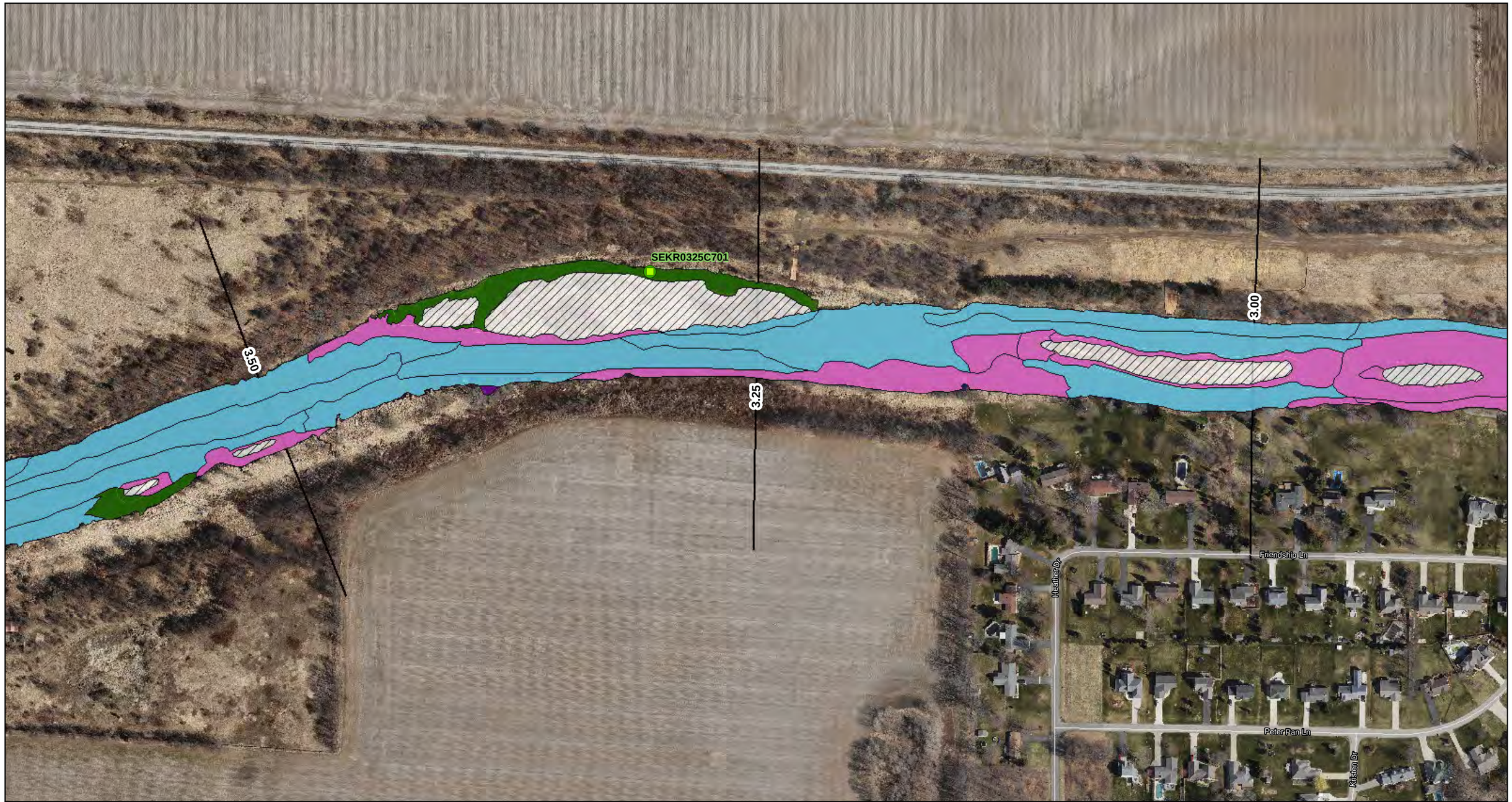
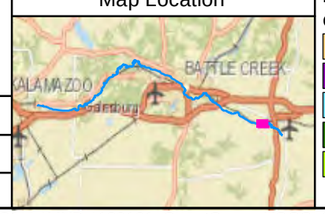
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 2 OF 53
MP 02.75-MP 03.50

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

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Aerial Photography Date: April 2011

SEKR0400C701

SEKR0425C701

SEKR0425C702

4.25

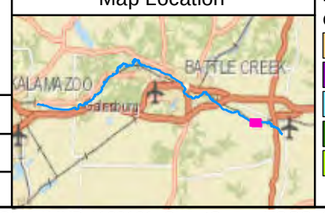
4.00

3.75

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 3 OF 53
MP 03.50-MP 04.50

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

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Aerial Photography Date: April 2011

SEKR0525C702

5.00

SEKR0500C702

SEKR0500C701

4.75

SEKR0475C701

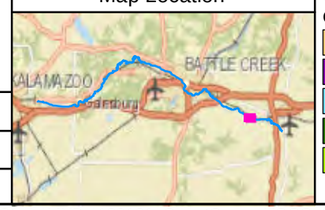
SEKR0475C702

4.50

SEKR0425C701

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 4 OF 53
MP 04.50-MP 05.00

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	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 5 OF 53
MP 05.00-MP 05.75

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

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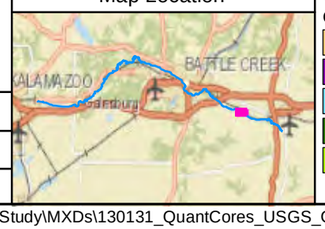
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 6 OF 53
MP 05.50-MP 06.25

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

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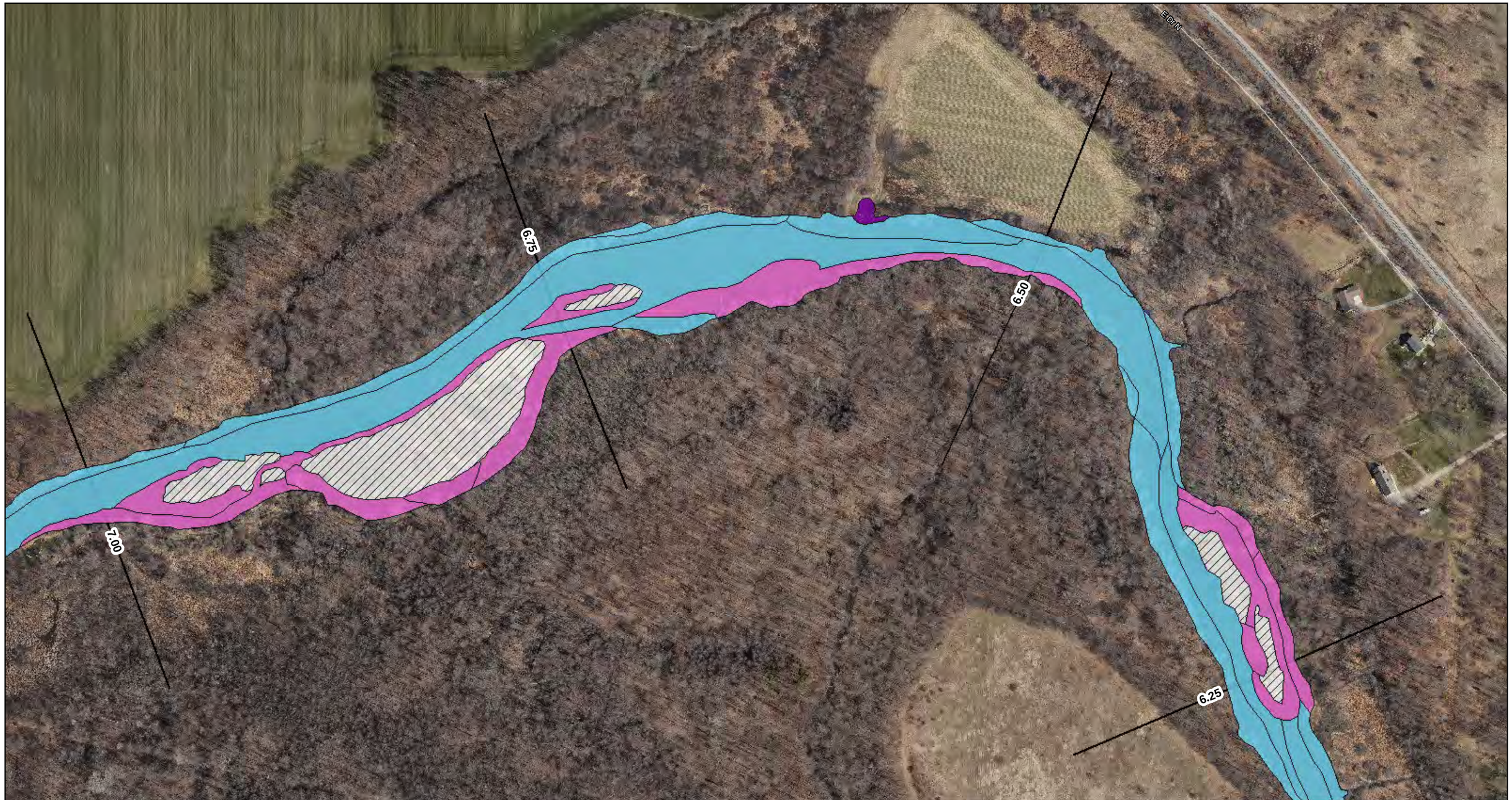
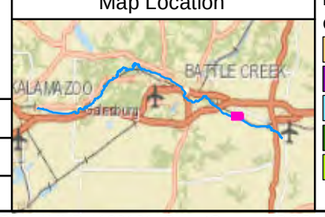
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 7 OF 53
MP 06.25-MP 07.00

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

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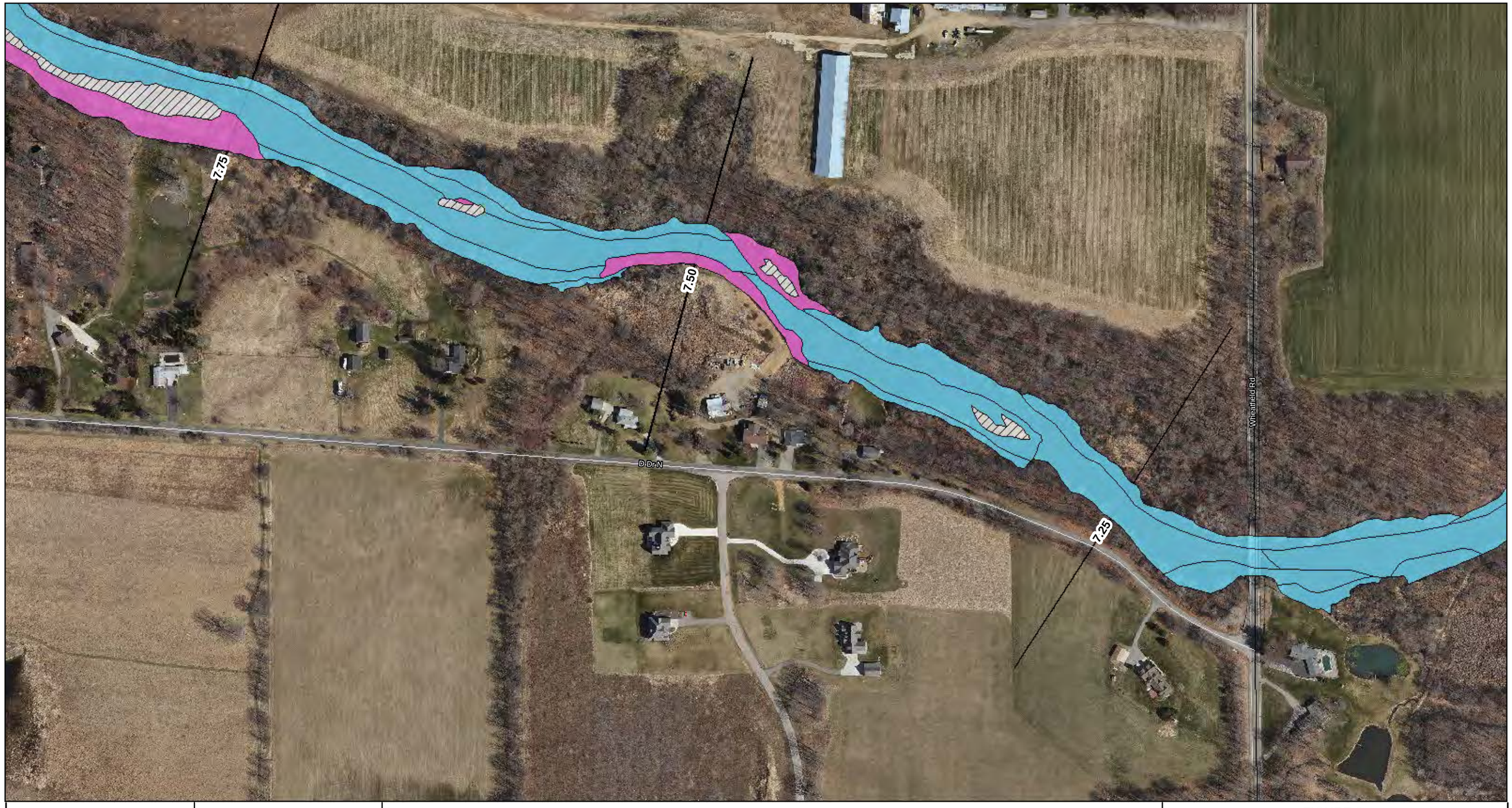
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 8 OF 53
MP 07.00-MP 07.75

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

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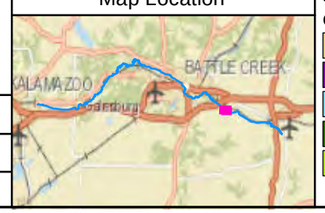
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 9 OF 53
MP 07.75-MP 08.50

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

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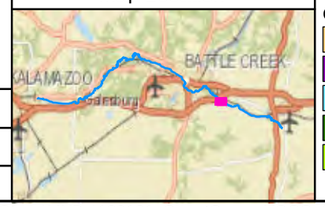
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 10 OF 53
MP 08.50-MP 08.75

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

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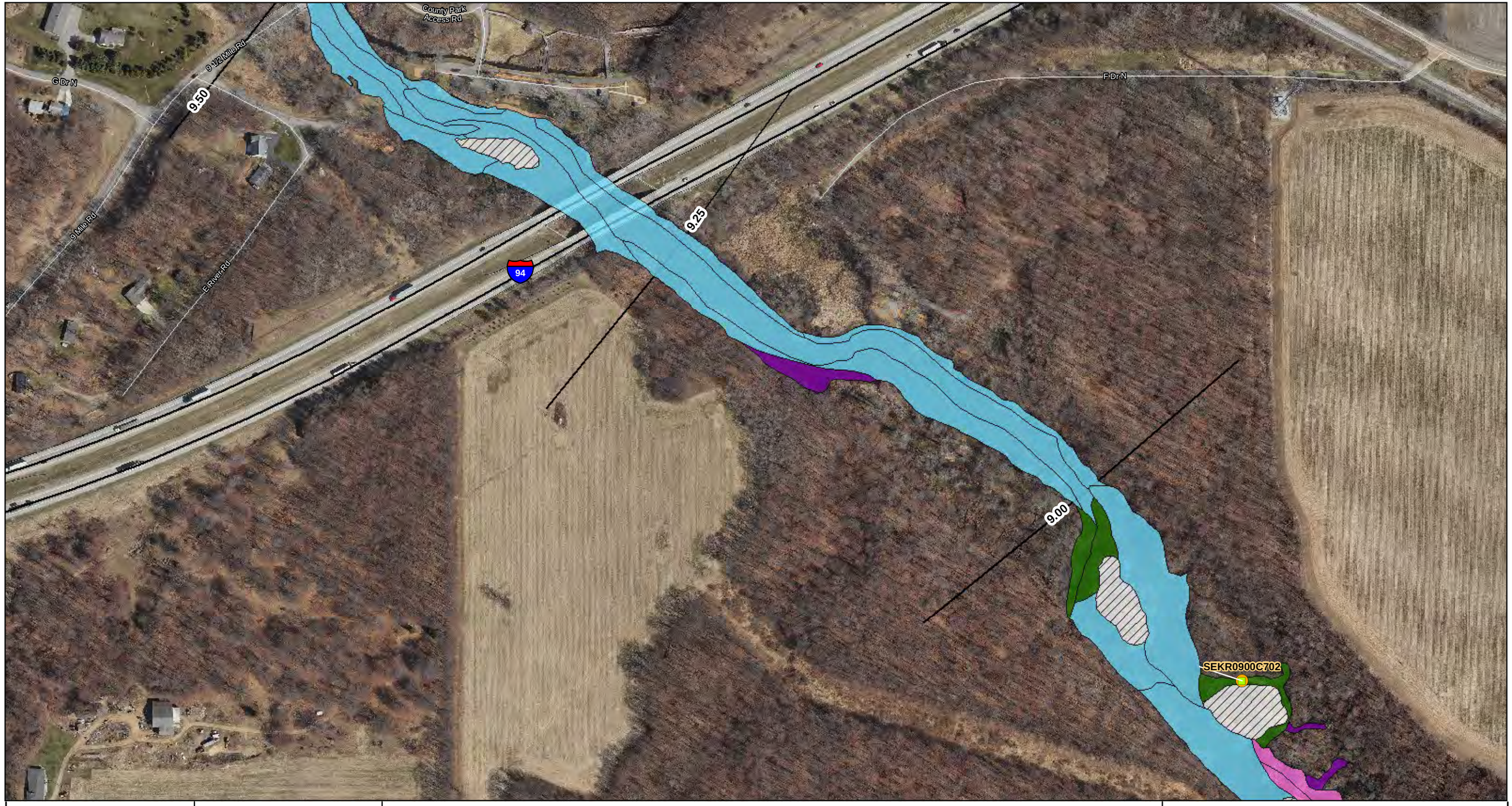
Aerial Photography Date: April 2011



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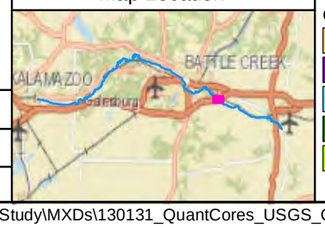
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 11 OF 53
MP 08.75-MP 09.50

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

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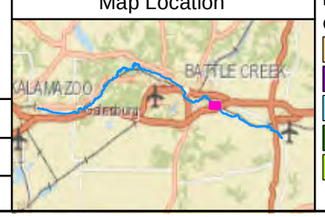
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 12 OF 53
MP 09.50-MP 10.25

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

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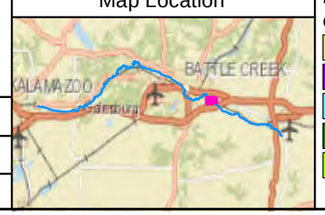
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 13 OF 53
MP 10.25-MP 10.75

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

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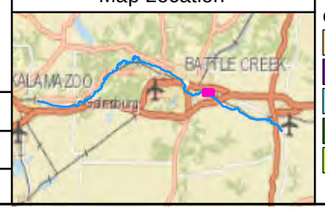
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 14 OF 53
MP 10.75-MP 11.25

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

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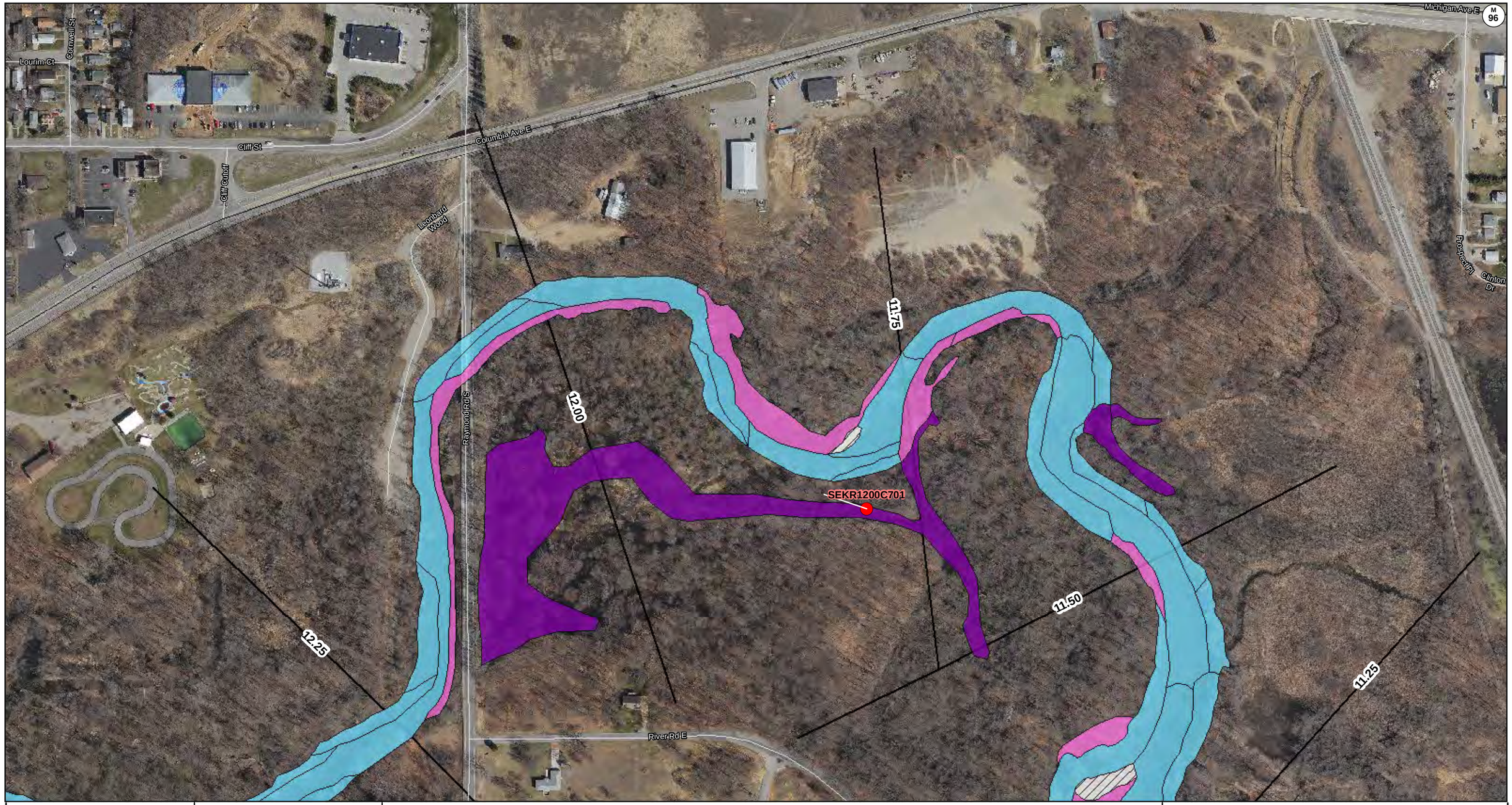
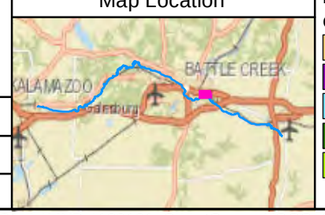
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 15 OF 53
MP 11.25-MP 12.25

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

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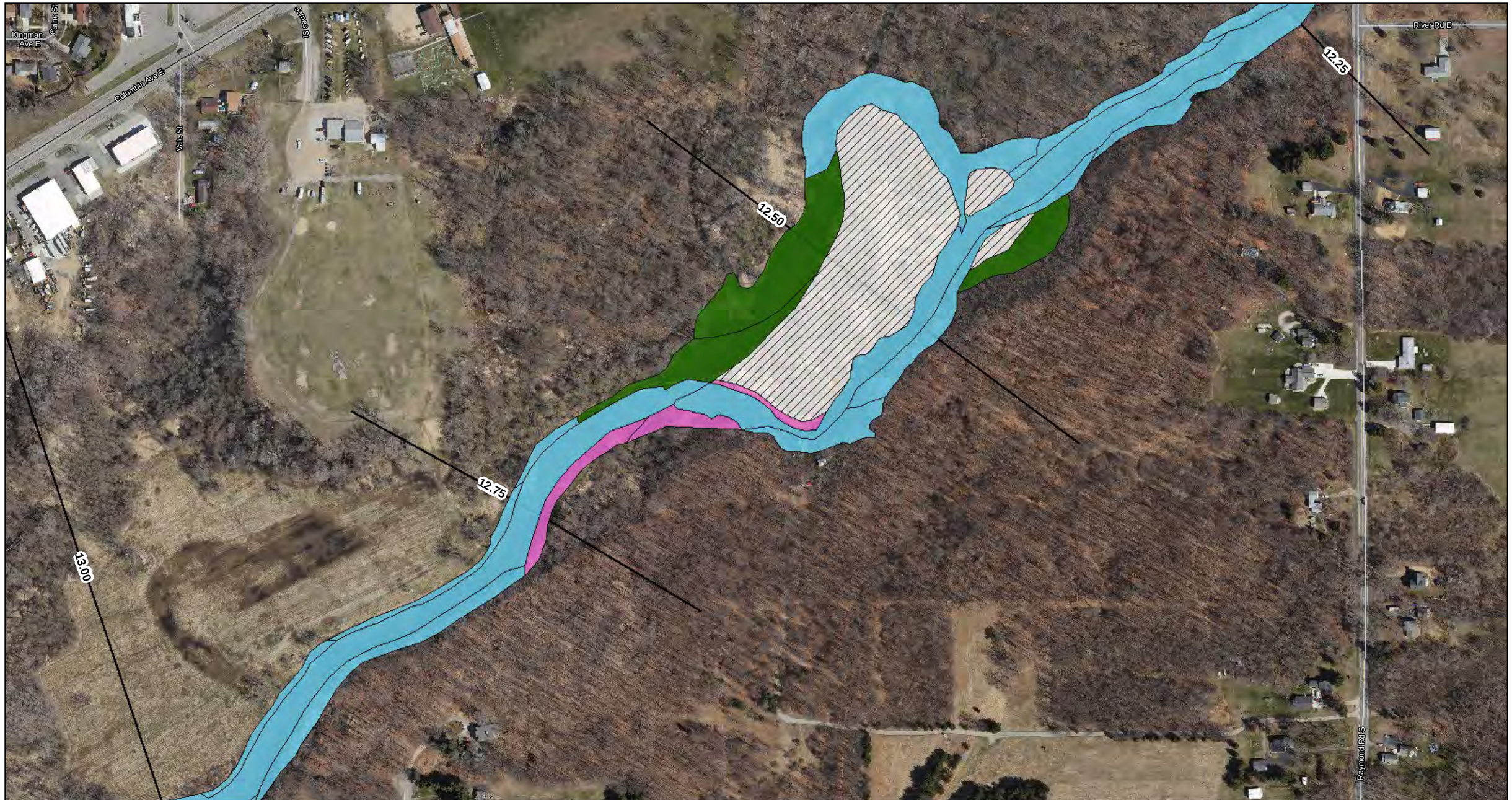
Aerial Photography Date: April 2011



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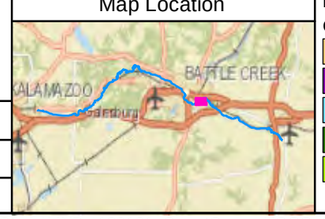
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 16 OF 53
MP 12.25-MP 13.00

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

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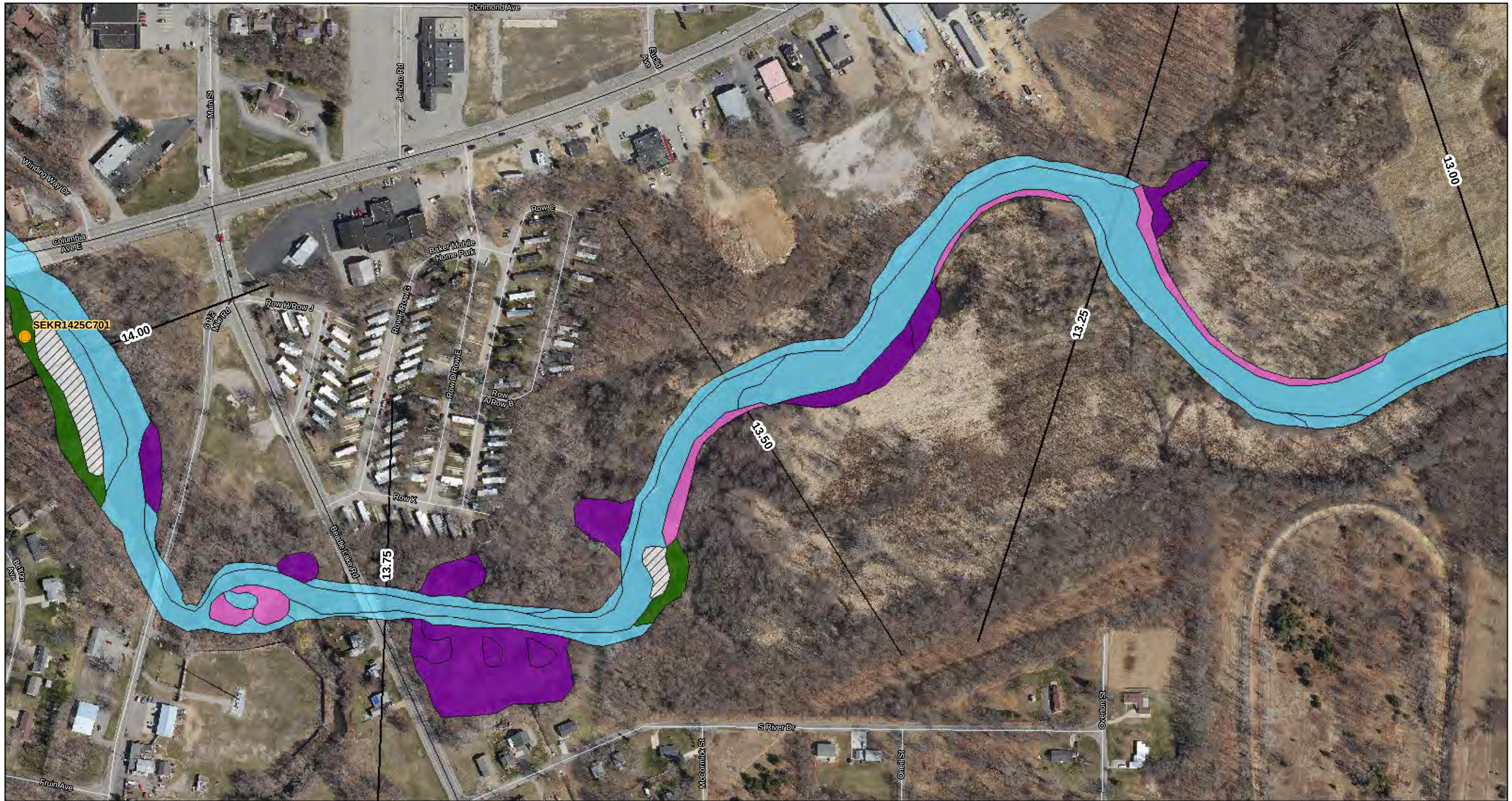
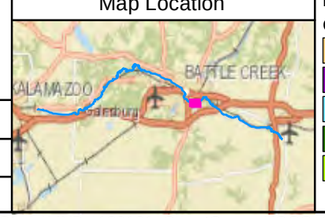
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 17 OF 53
MP 13.00-MP 14.00

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

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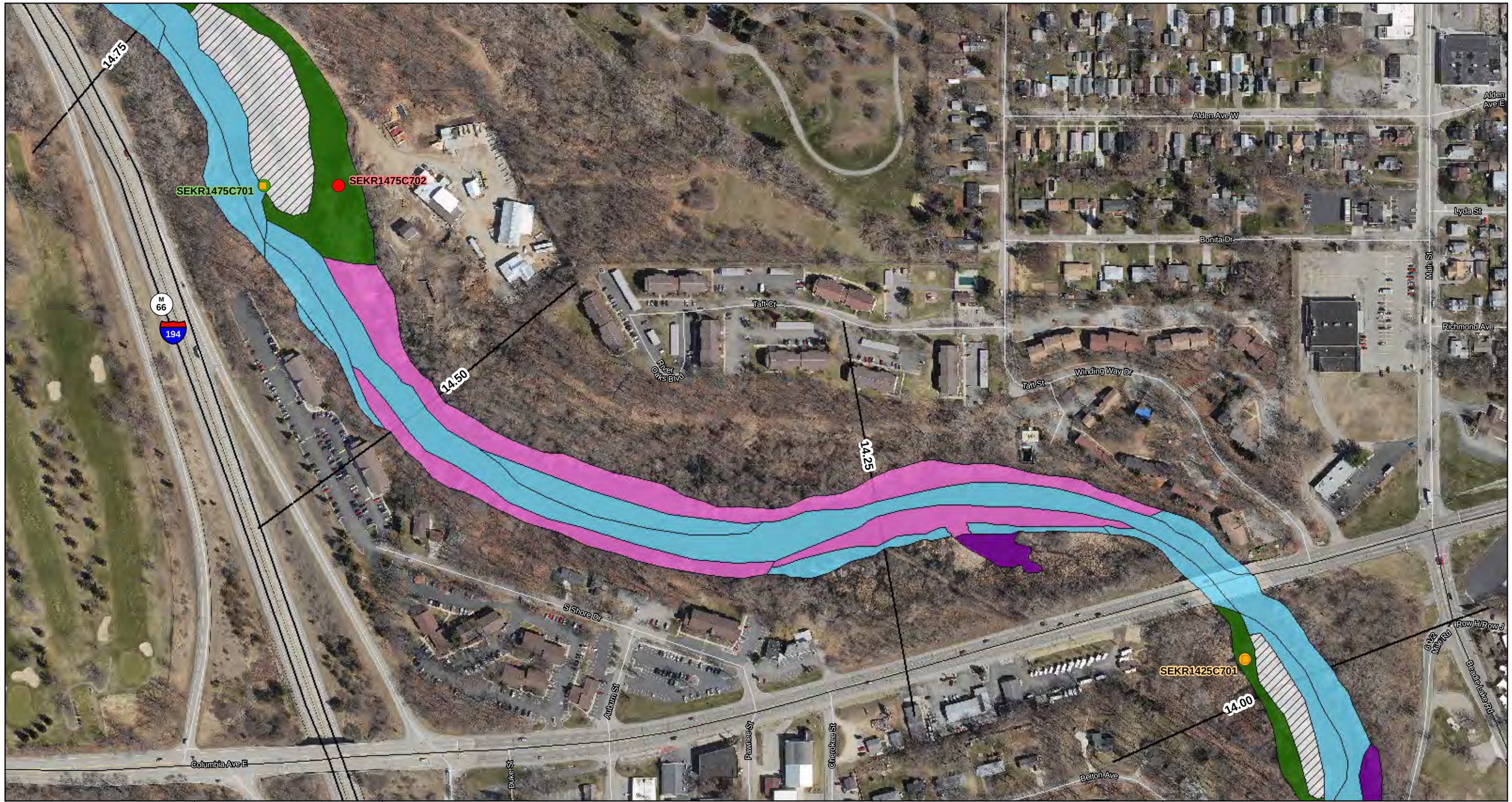
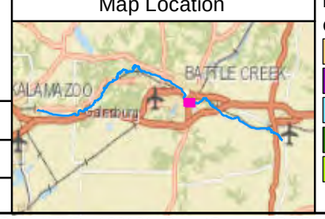
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 18 OF 53
MP 14.00-MP 14.75

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

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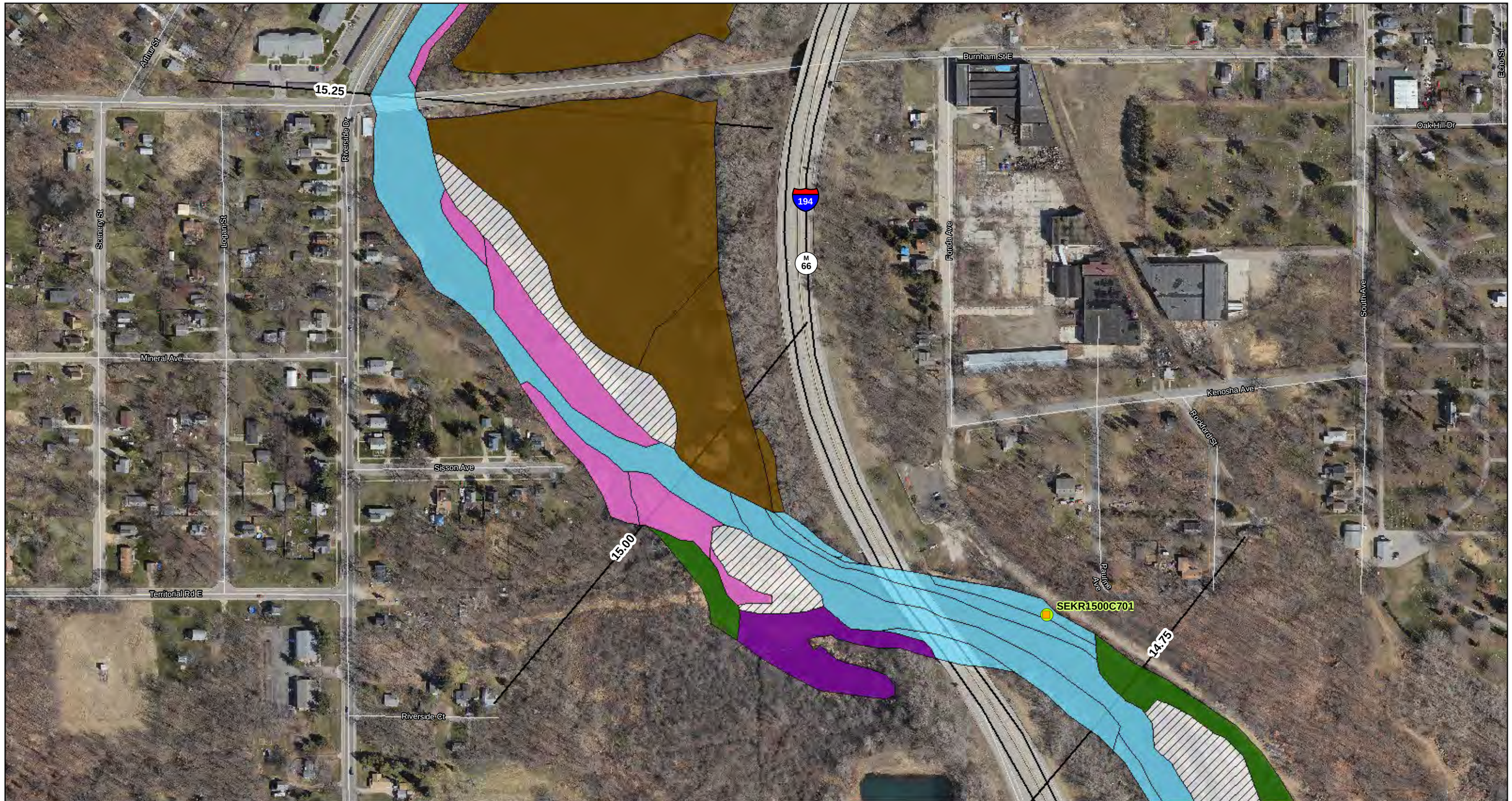
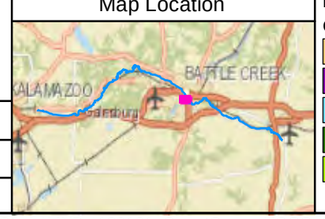
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 19 OF 53
MP 14.75-MP 15.25

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

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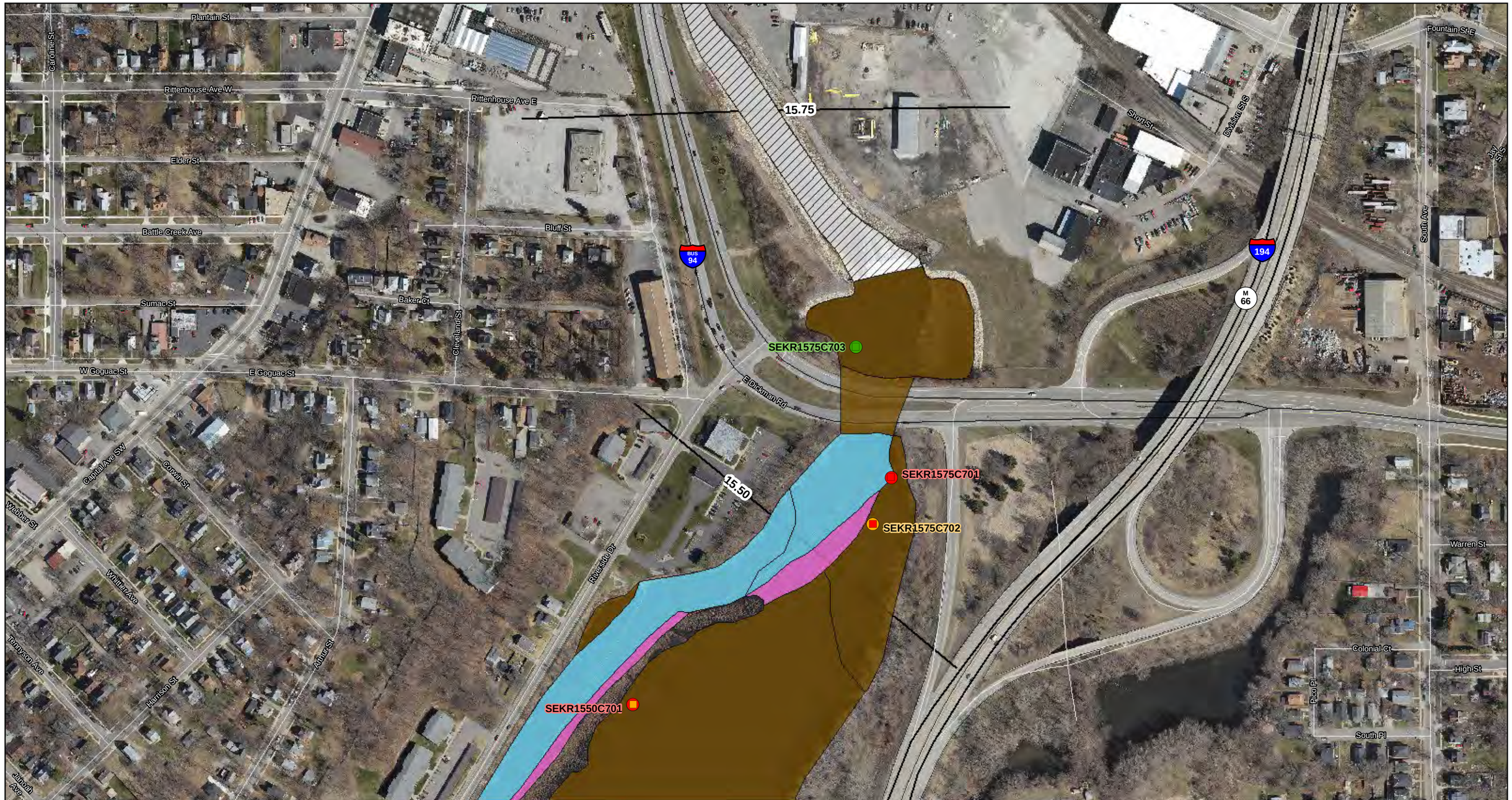

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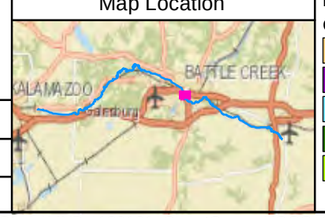
Project #:	60284509	

Map Location



Legend

Geomorphic Strata

- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category

- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling

- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 20 OF 53
MP 15.25-MP 15.75

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

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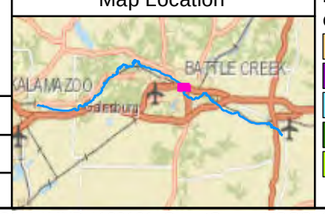
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 21 OF 53
MP 15.75-MP 16.25

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	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 22 OF 53
MP 16.25-MP 17.00

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

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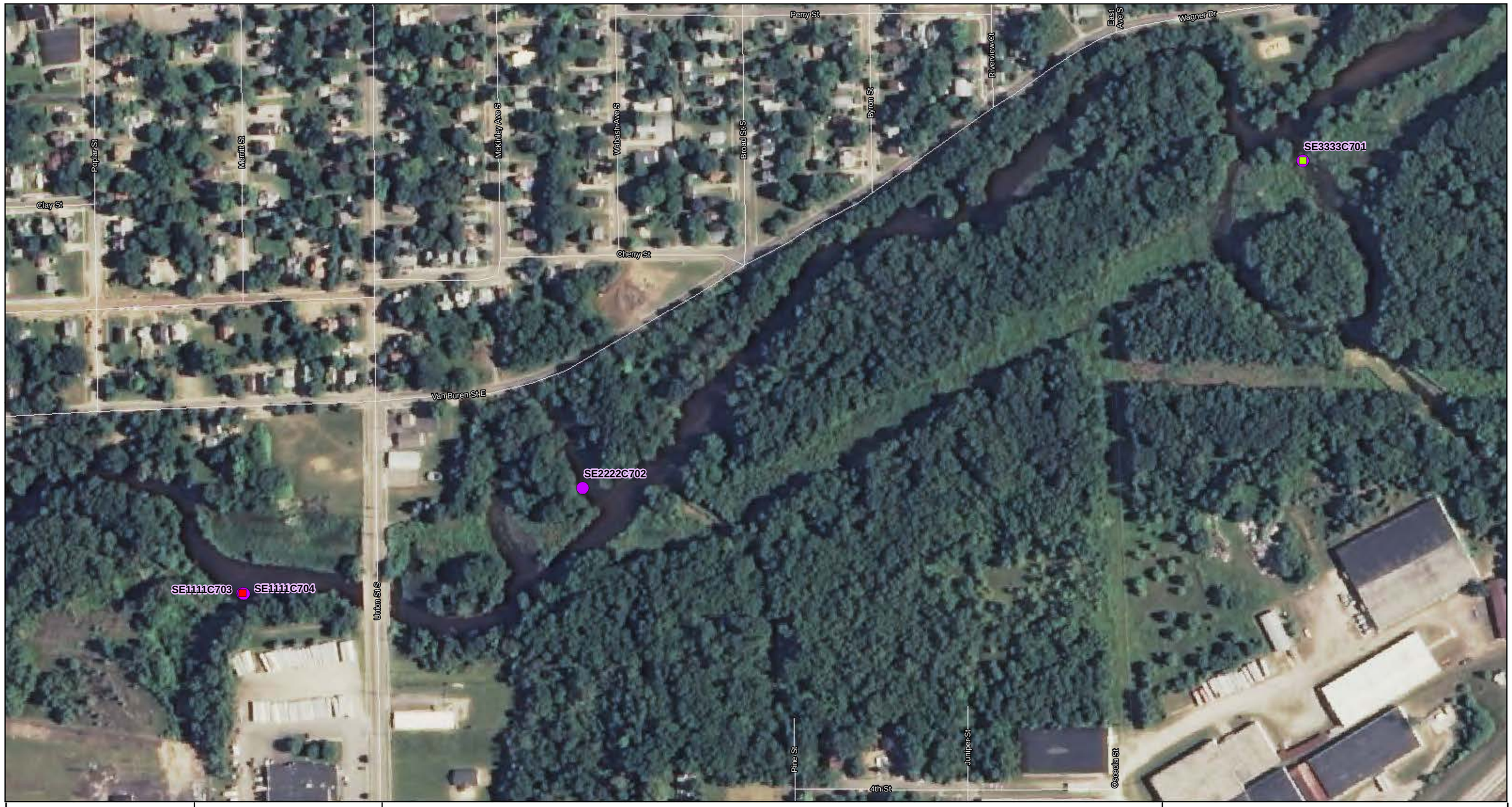
Aerial Photography Date: April 2011



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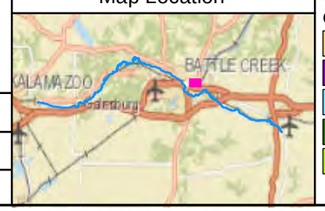
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 23 OF 53
BATTLE CREEK

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

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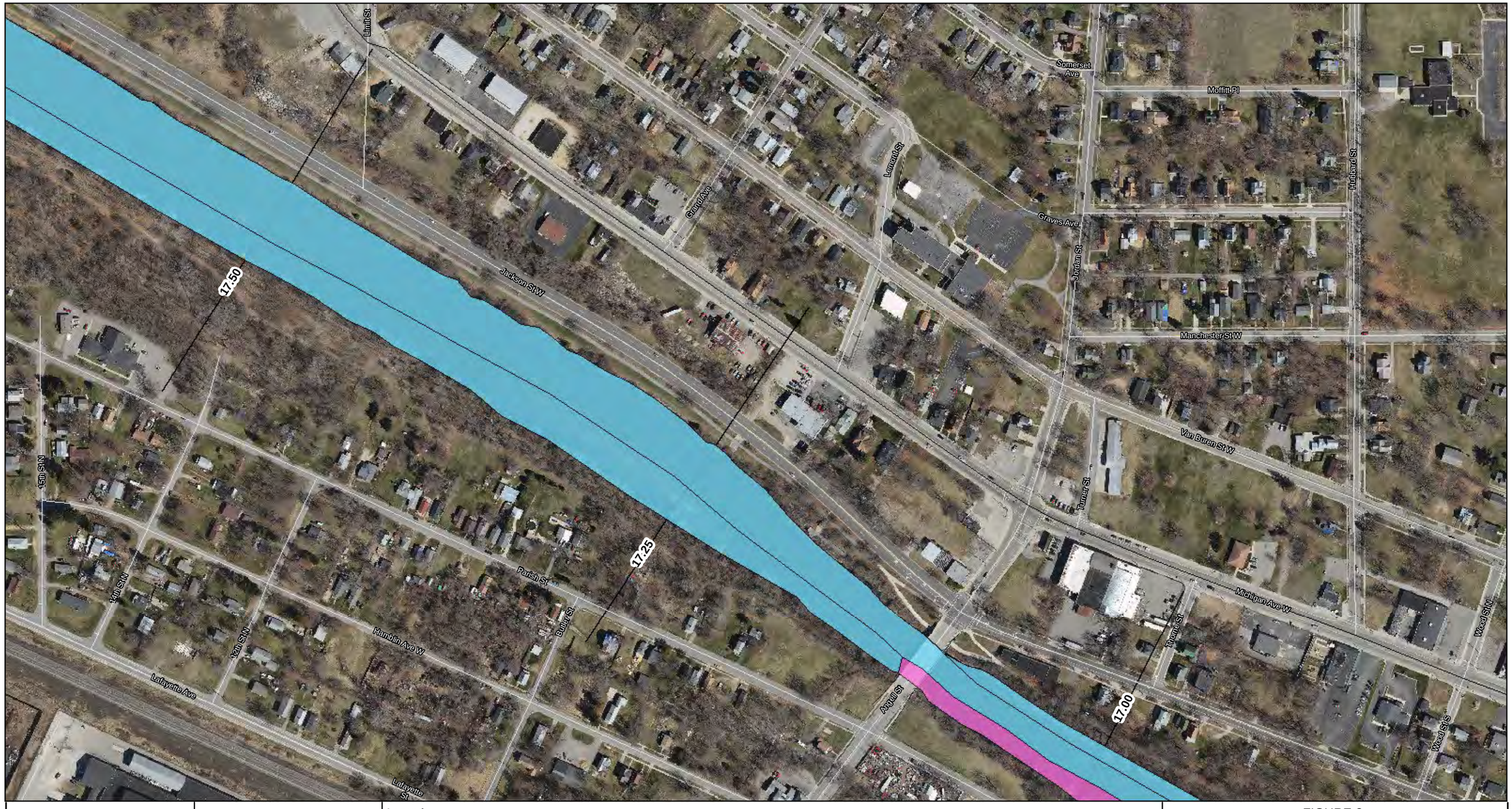
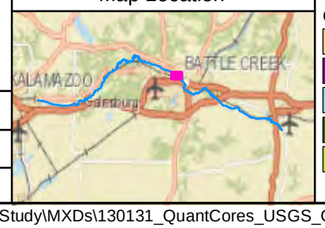
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 24 OF 53
MP 17.00-MP 17.50

ENBRIDGE LINE 6B MP 608
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ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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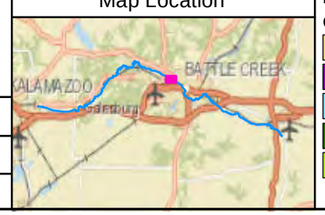
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 25 OF 53
MP 17.50-MP 18.00

ENBRIDGE LINE 6B MP 608
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Aerial Photography Date: April 2011

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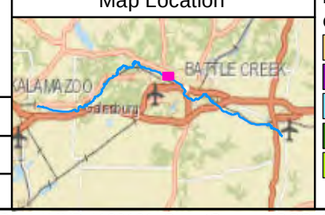
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 26 OF 53
MP 18.00-MP 18.75

ENBRIDGE LINE 6B MP 608
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Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 27 OF 53
MP 18.75-MP 19.25

ENBRIDGE LINE 6B MP 608
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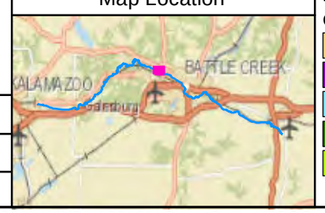
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 28 OF 53
MP 19.25-MP 20.00

ENBRIDGE LINE 6B MP 608
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ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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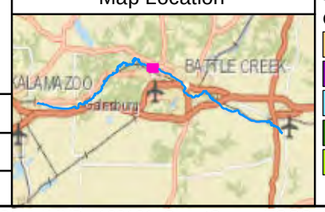
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 29 OF 53
MP 20.00-MP 20.75

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

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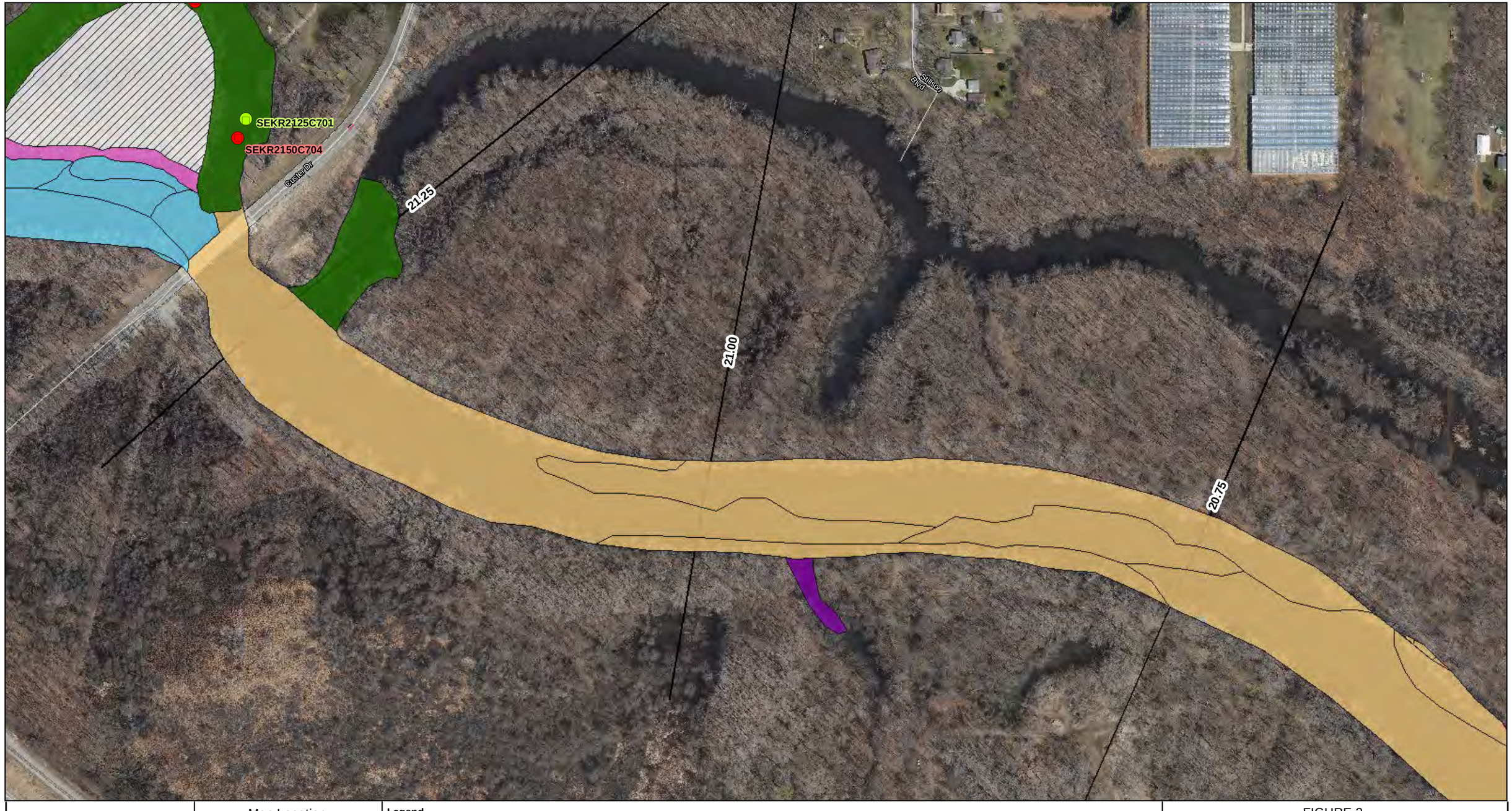
Aerial Photography Date: April 2011



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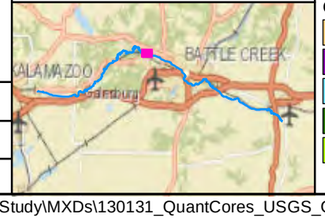
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 30 OF 53
MP 20.50-MP 21.50

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
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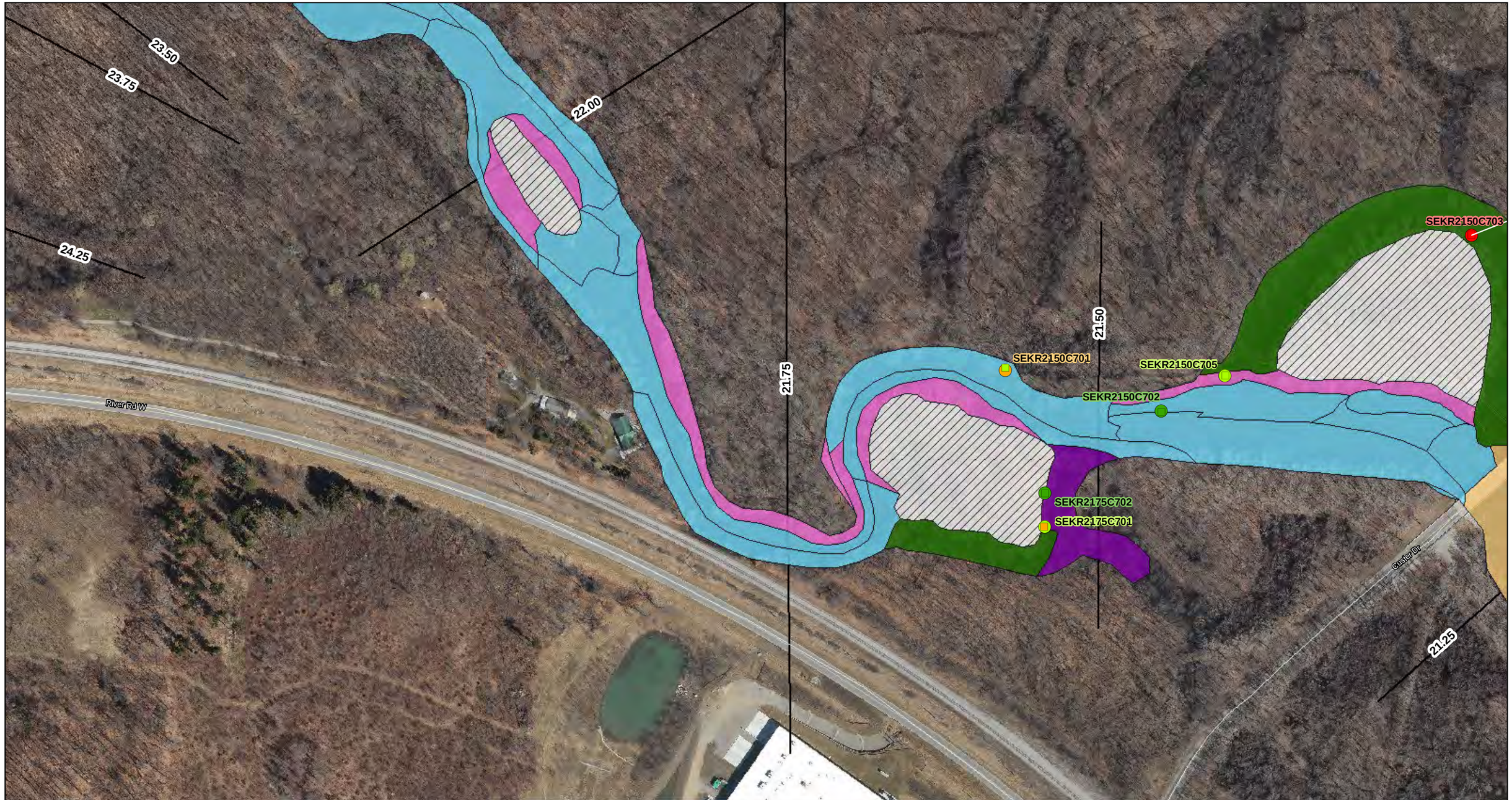
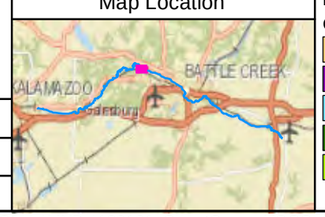
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 31 OF 53
MP 21.25-MP 22.00

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

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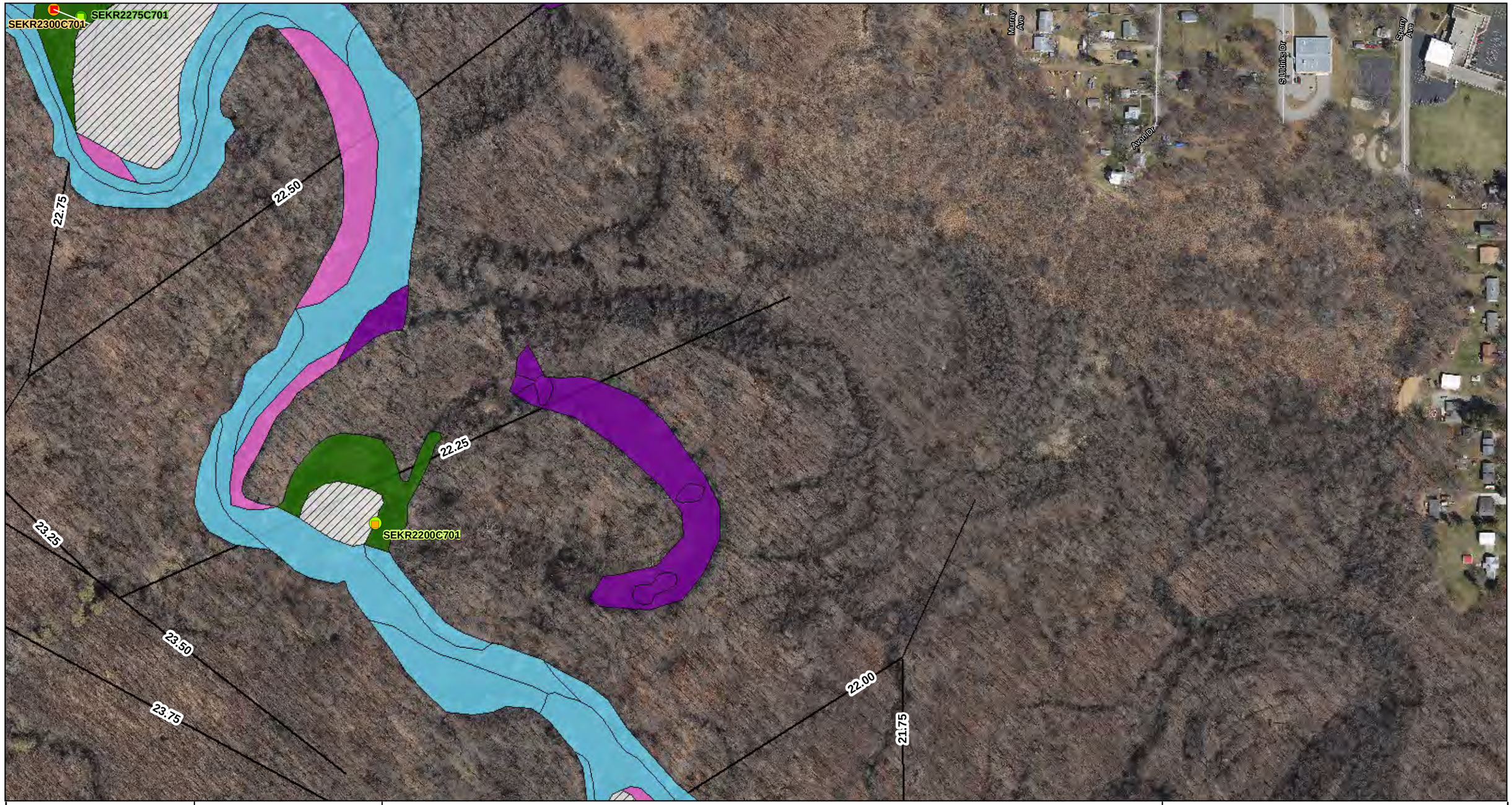
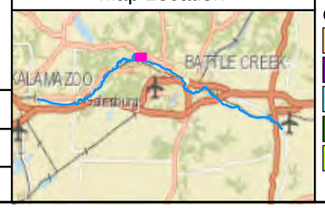
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 32 OF 53
MP 22.00-MP 22.75

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

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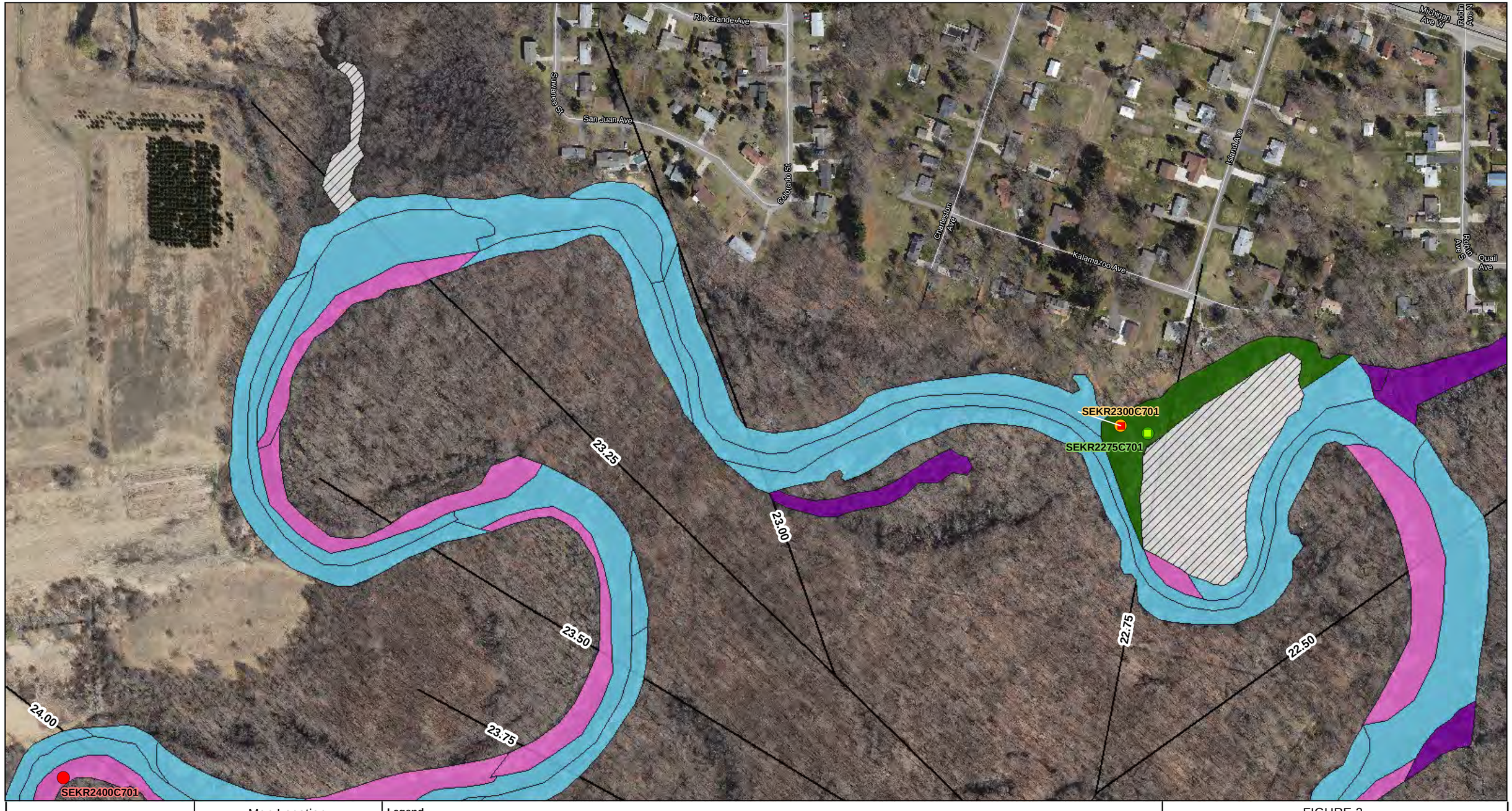
Aerial Photography Date: April 2011



Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 33 OF 53
MP 22.50-MP 23.75

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

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Aerial Photography Date: April 2011

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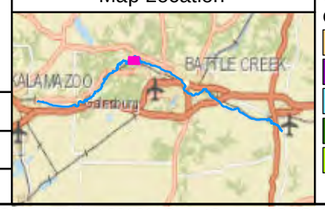
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 34 OF 53
MP 23.50-MP 24.25

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

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Aerial Photography Date: April 2011

25.50
25.00
24.75
25.25
SEKR2475C701
SEKR2525C701
Fort Custer Dr

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 35 OF 53
MP 24.75-MP 25.75

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
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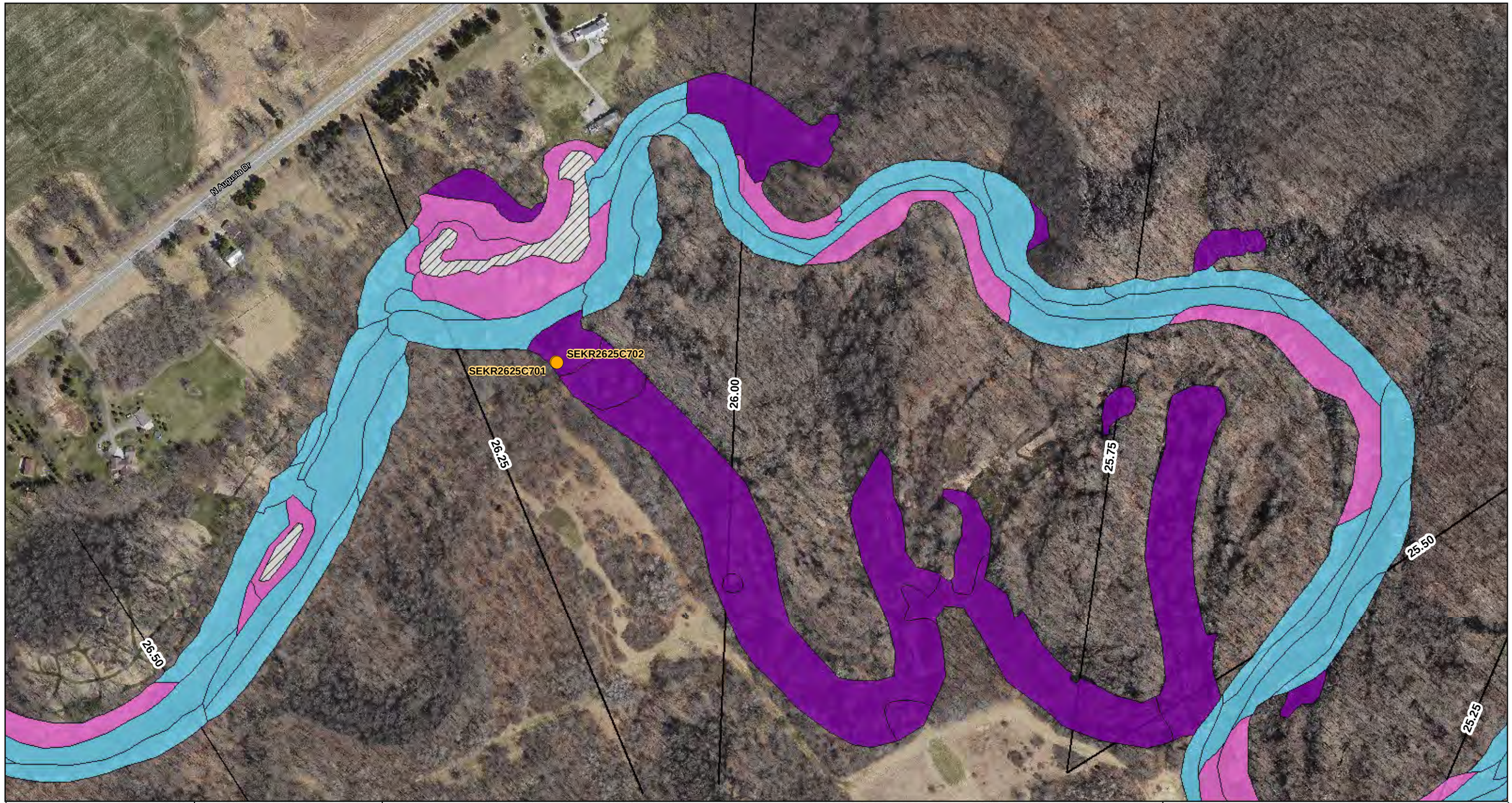
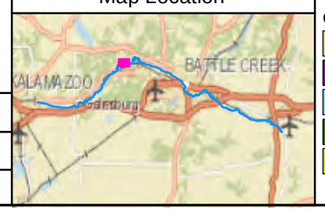


Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 36 OF 53
MP 25.50-MP 26.50

ENBRIDGE LINE 6B MP 608
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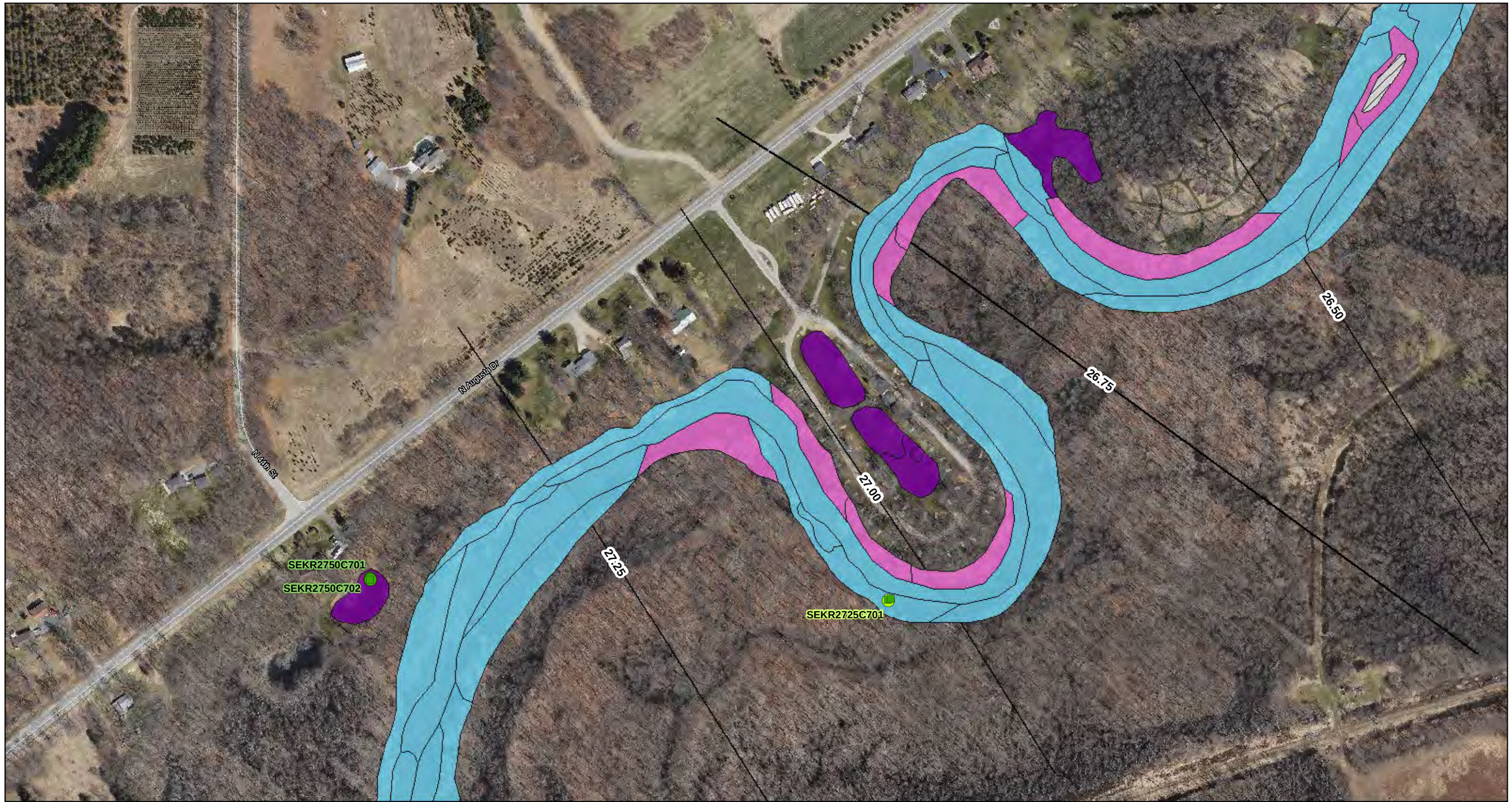
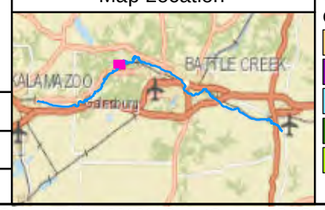


ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 37 OF 53
MP 26.50-MP 27.50

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

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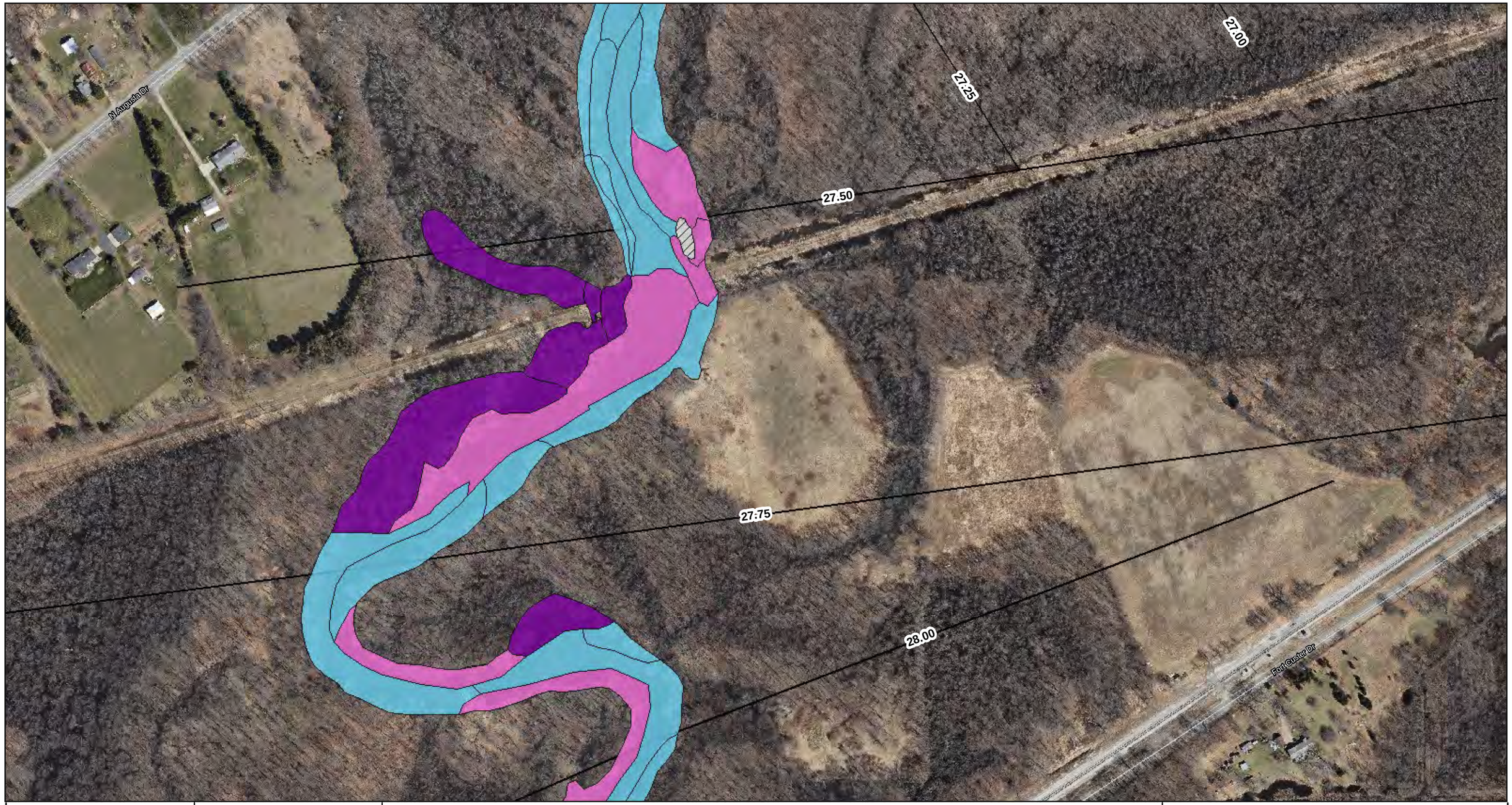
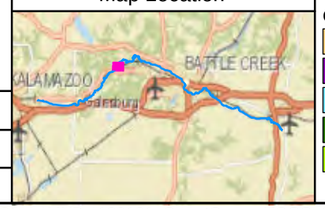


Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 38 OF 53
MP 27.50-MP 28.00

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

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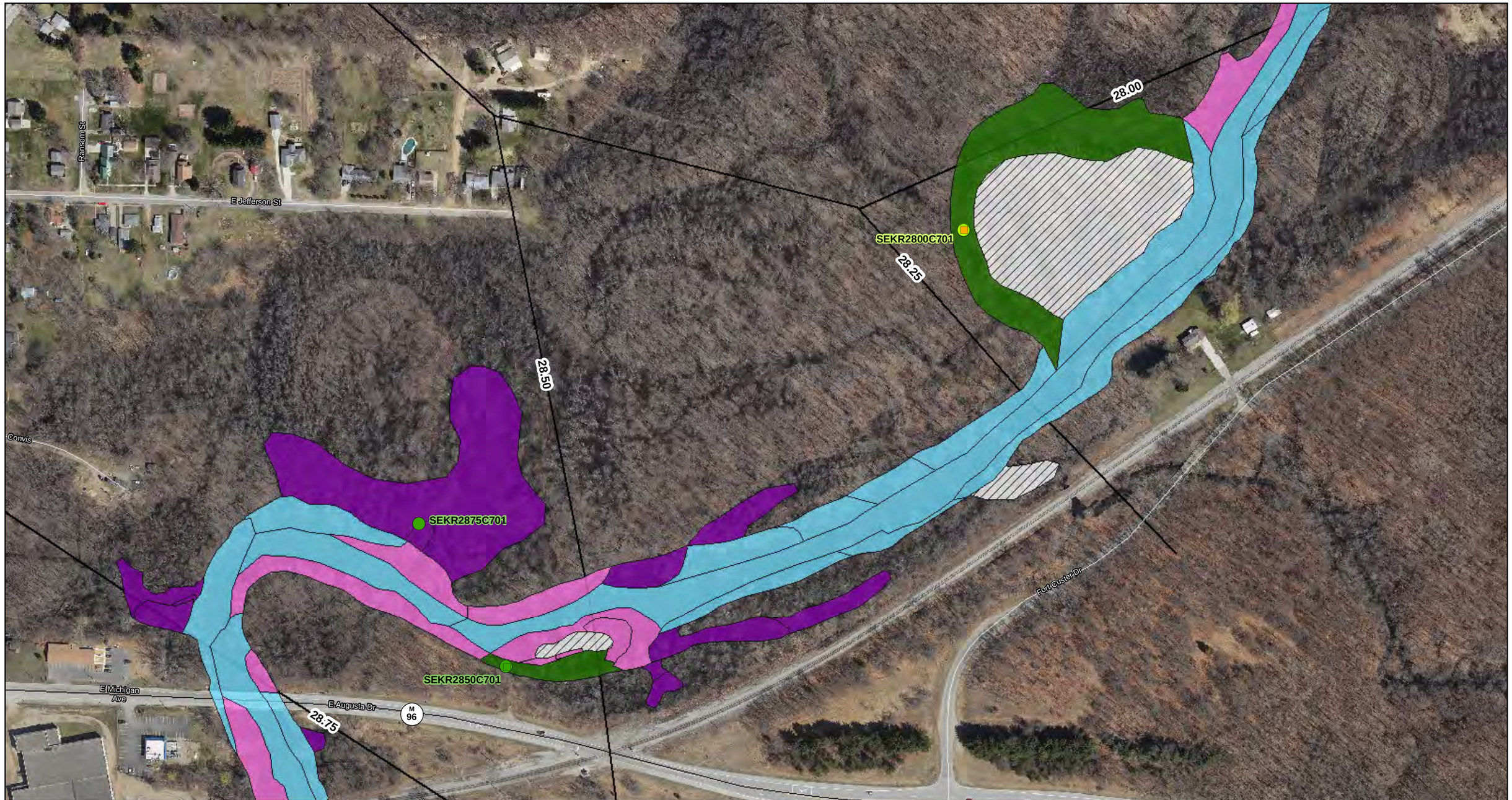
Aerial Photography Date: April 2011



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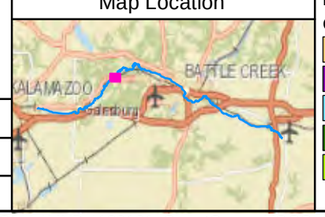
Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 39 OF 53
MP 28.00-MP 28.75

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

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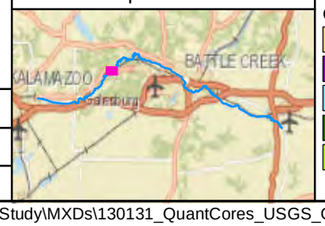
Aerial Photography Date: April 2011

W Clinton St
Wayne Terr Barg St
S Water St
E Clinton St
E Augusta Dr
M 96
28.75
28.50
S Webster St
Fayette St
29.00
S Chestnut St
Cass St
Harmonia Rd
S Church St
29.25
S Cherry St
Fort Custer Rec Area Access
Augusta Climax Rd
29.50

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 40 OF 53
MP 28.75-MP 29.50

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

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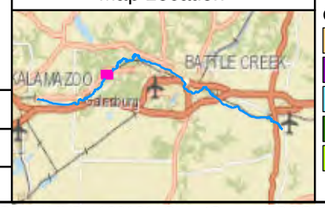
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 41 OF 53
MP 29.50-MP 30.00

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	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 42 OF 53
MP 30.00-MP 30.75

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

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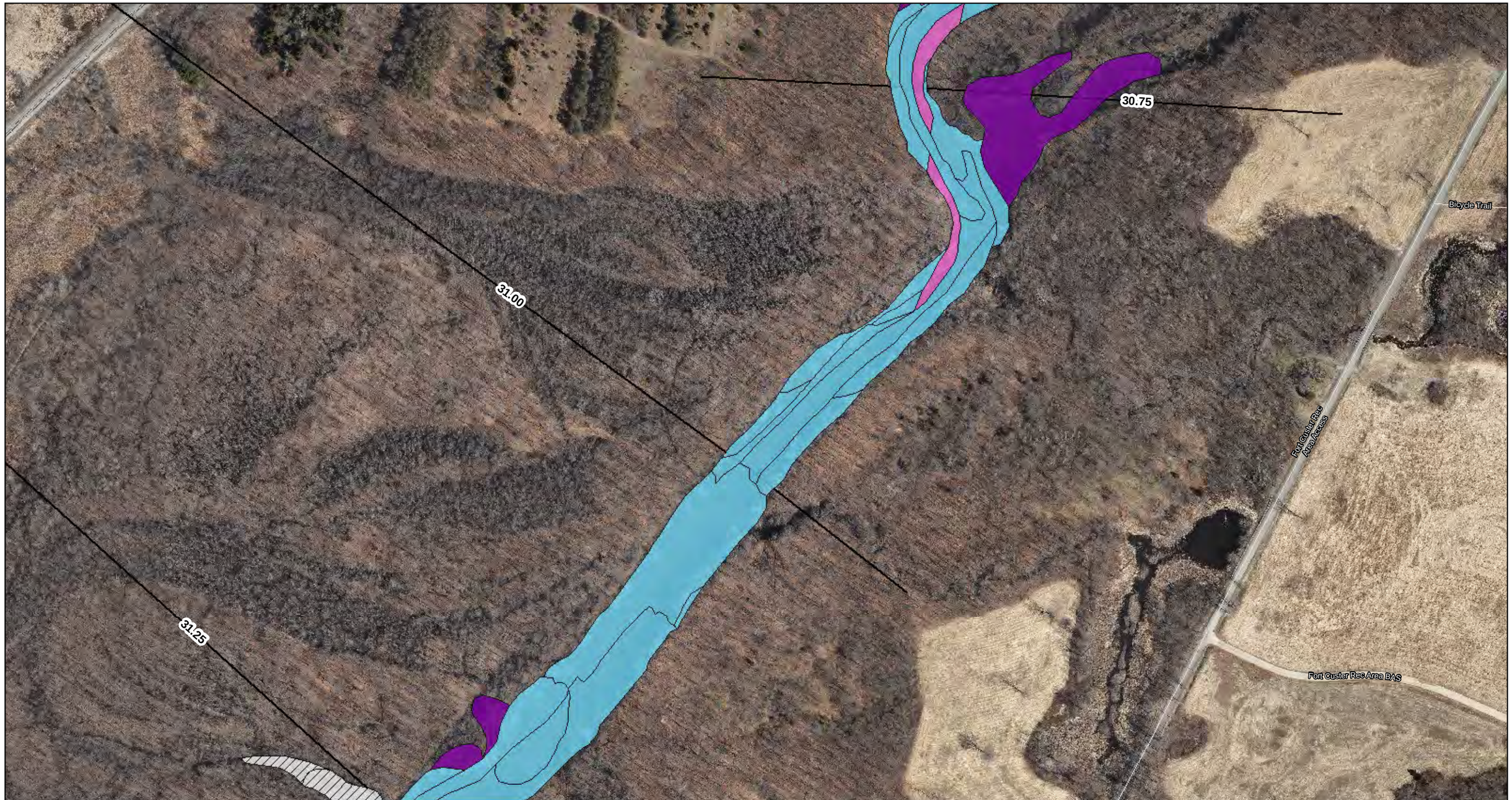
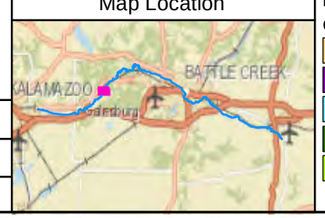
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 43 OF 53
MP 30.75-MP 31.25

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	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 44 OF 53
MP 31.25-MP 31.75

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

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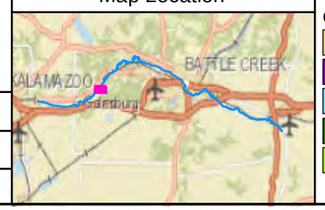
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 45 OF 53
MP 31.75-MP 32.25

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

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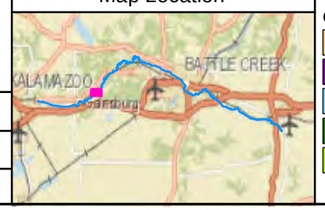
Aerial Photography Date: April 2011

32.25
32.50
SEKR3250C701
32.75
33.00
Fort Custer Dr
Territorial Rd

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 46 OF 53
MP 32.25-MP 33.00

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

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Aerial Photography Date: April 2011

33.00

33.25

33.50

Fort Custer Dr

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location

Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 47 OF 53
MP 33.00-MP 33.50

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

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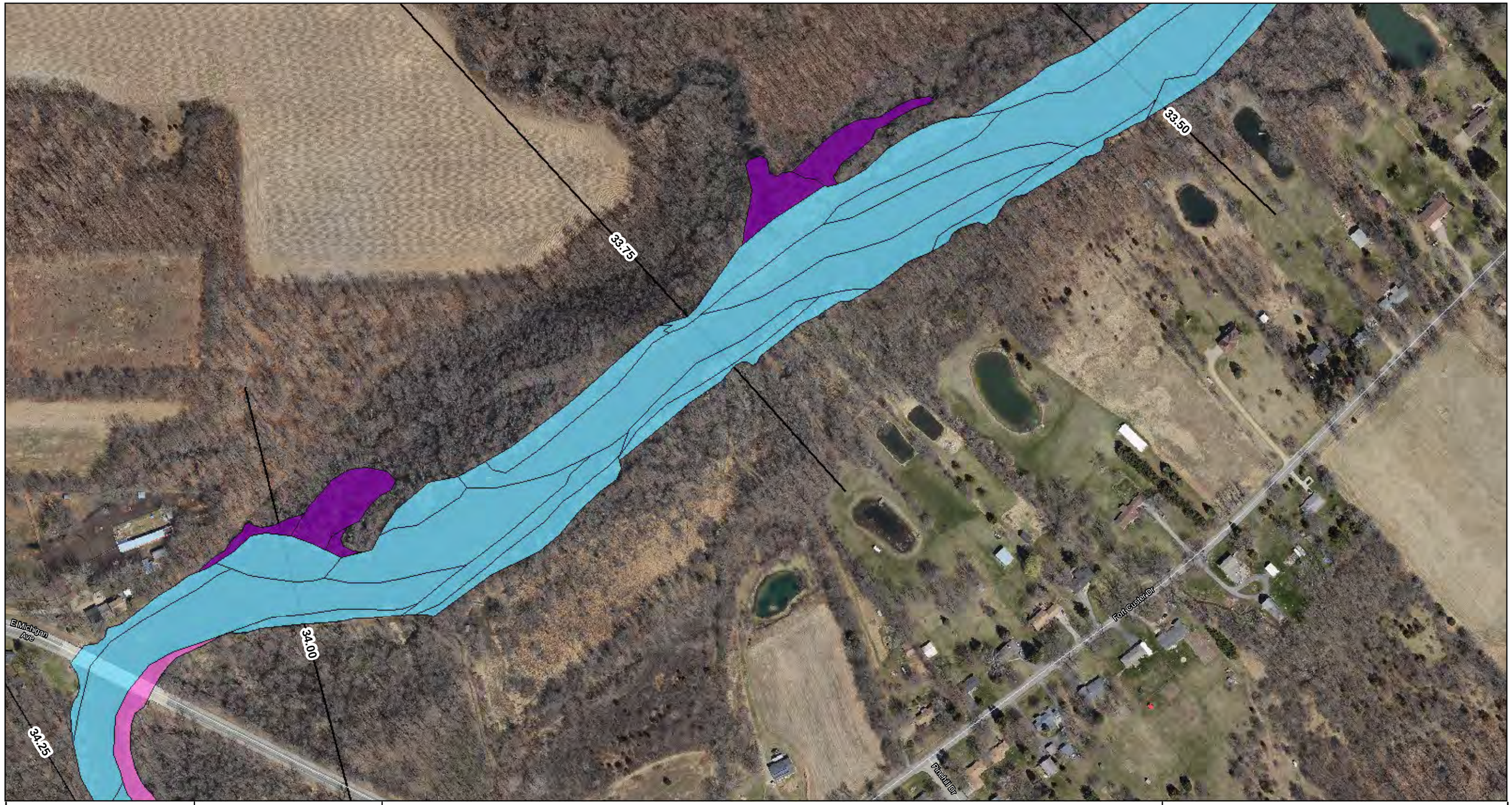
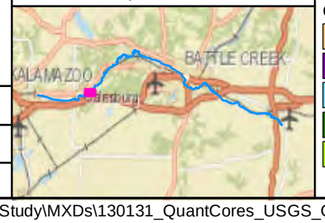
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 48 OF 53
MP 33.50-MP 34.00

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

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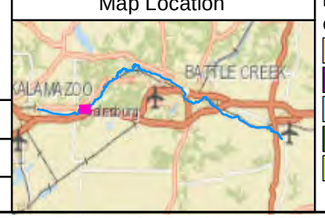
Aerial Photography Date: April 2011

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 49 OF 53
MP 34.00-MP 35.00

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

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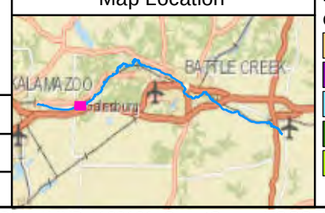
Aerial Photography Date: April 2011

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 50 OF 53
MP 34.75-MP 35.75

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

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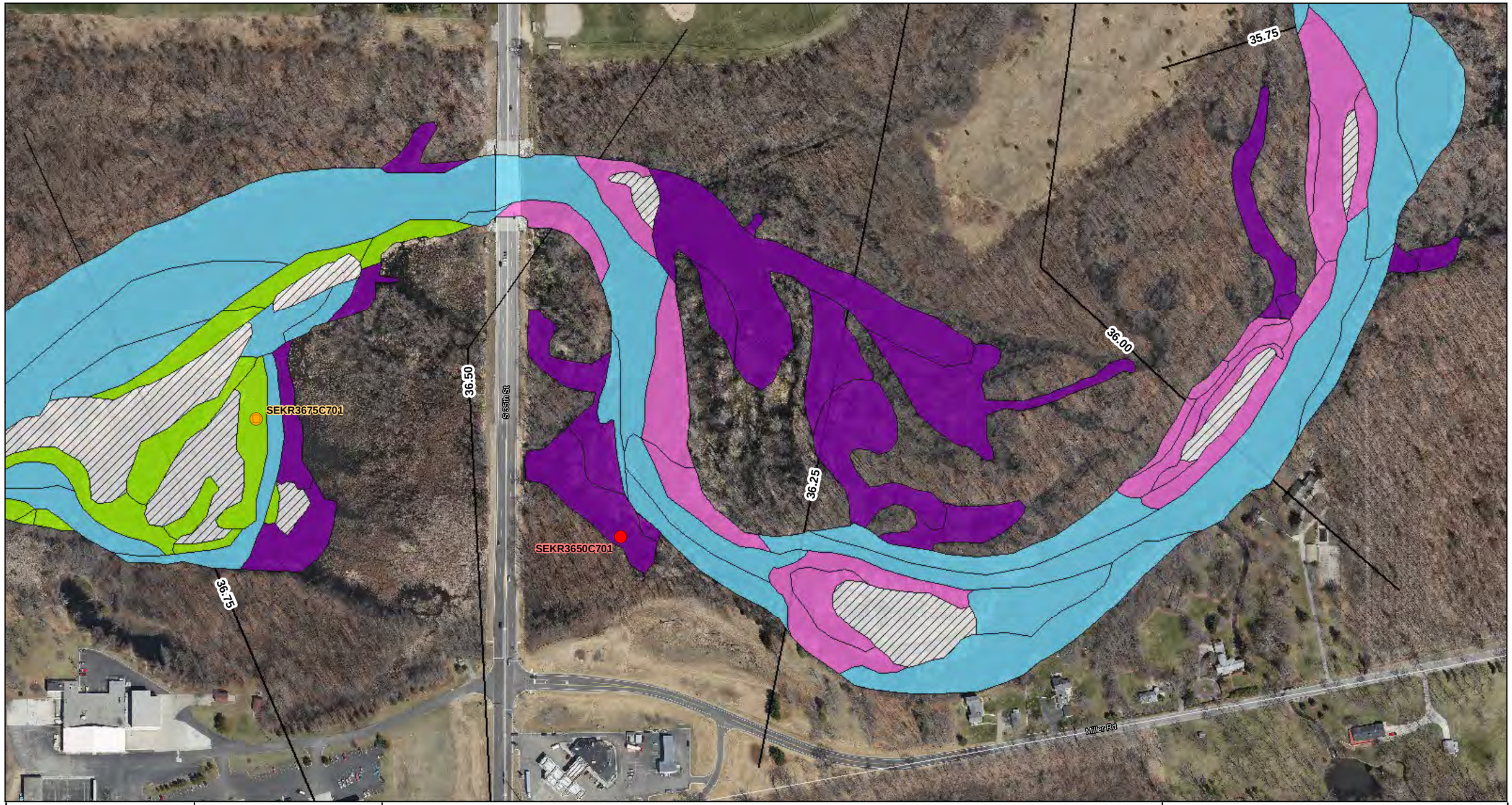
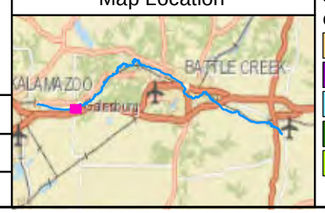
Aerial Photography Date: April 2011



Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400

Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 51 OF 53
MP 36.00-MP 36.75

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

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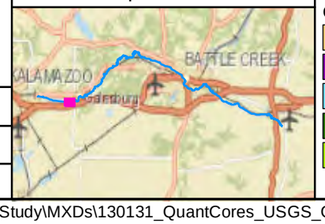
Aerial Photography Date: April 2011

37.50
37.25
37.00
SEKR3725C706
SEKR3725C707
SEKR3750C705
SEKR3725C704
SEKR3750C706
SEKR3700C701
SEKR3750C707
SEKR3750C710
SEKR3750C709
SEKR3750C704
SEKR3725C705
SEKR3750C703
SEKR3750C708
SEKR3725C709
SEKR3725C702
SEKR3725C701
SEKR3725C708
SEKR3750C701
Miller Dr

ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring
Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling
Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 52 OF 53
MP 36.75-MP 37.50

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

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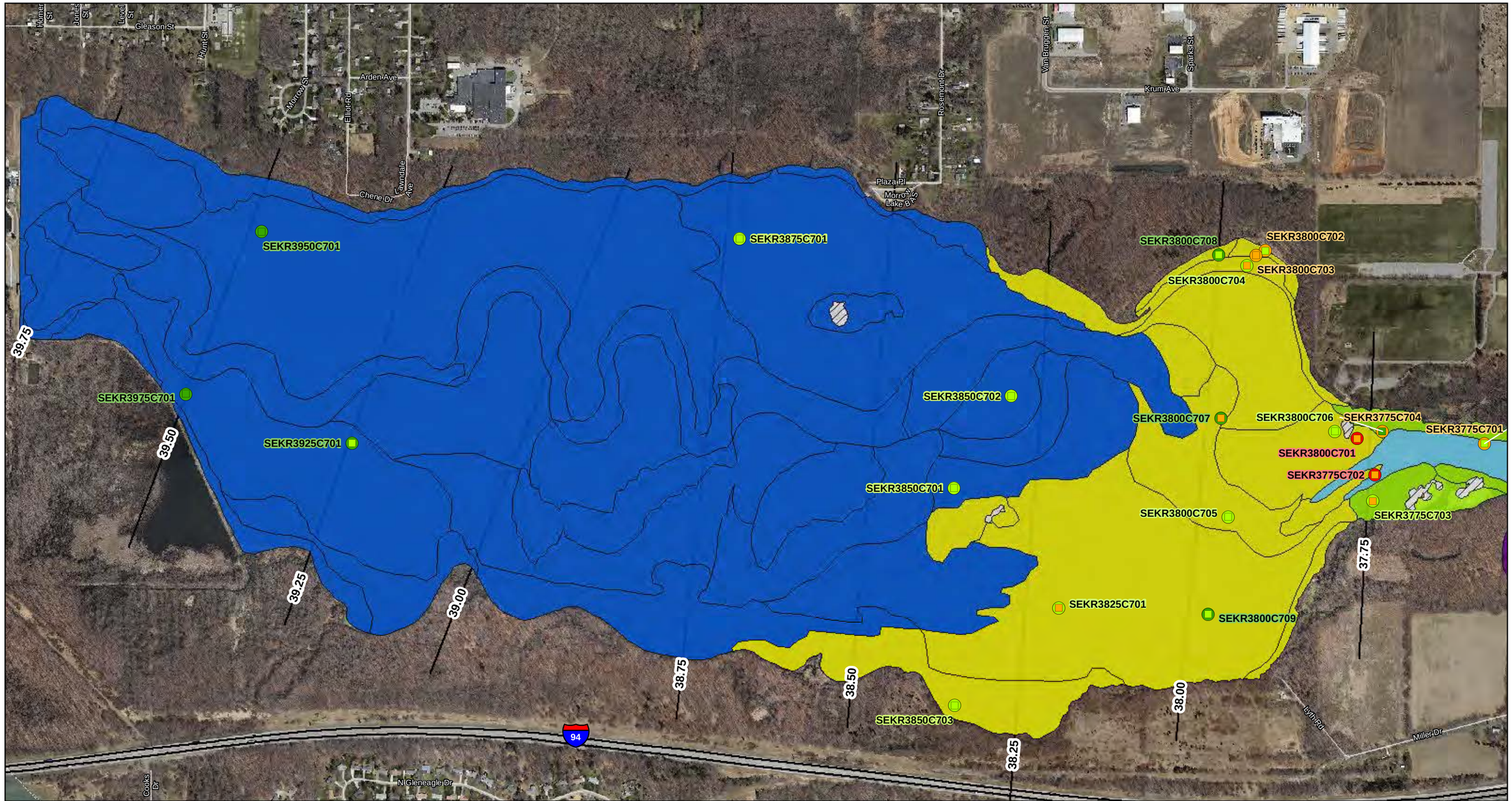
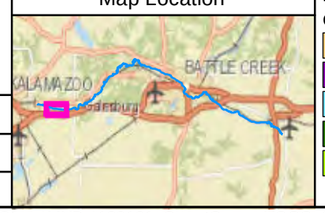
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	3/14/2013
Approved:	JT	3/14/2013
Project #:	60284509	

Map Location



Legend

Geomorphic Strata
- Anthropogenic Channel
- Backwater
- Channel Deposit
- Cutoff/Oxbow
- Delta
- Depositional Bar
- Impoundment
- Morrow Lake Fan
- Lake
- Exclude

Quantification Boring Submerged Oil Category
- Heavy
- Moderate
- Light
- None
- Reference

Poling Submerged Oil Category Observed at Sampling
- Heavy
- Moderate
- Light
- None
- Quarter Mile Grid Segments

N

0 200 400
Scale in Feet

FIGURE 2
GEOMORPHIC STRATA
AND SEDIMENT BORING LOCATIONS
SHEET 53 OF 53
MP 37.50-MP 39.70

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

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Aerial Photography Date: April 2011

Tables

Table 1. Locations of Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Latitude	Longitude	X (international feet)	Y (international feet)
SE1111C703	8/8/2012	42.318439	-85.168872	12906407.7	299296.6
SE1111C704	8/8/2012	42.318437	-85.168861	12906410.6	299296.1
SE2222C702	8/8/2012	42.319233	-85.165534	12907313.0	299577.4
SE3333C701	8/8/2012	42.321676	-85.158471	12909231.4	300449.6
SEBC0000L012	9/21/2012	42.318436	-85.168871	12906407.8	299295.7
SEKR0000R024	9/21/2012	42.258355	-84.993752	12953603.7	276999.9
SEKR0000R024A	9/21/2012	42.258353	-84.993762	12953601.1	276999.1
SEKR0000R024B	9/21/2012	42.258353	-84.993762	12953601.1	276999.1
SEKR0325C701	7/24/2012	42.260138	-85.015956	12947598.1	277695.1
SEKR0400C701	7/24/2012	42.260316	-85.032564	12943102.9	277795.1
SEKR0425C701	7/24/2012	42.260064	-85.036632	12942001.0	277711.8
SEKR0425C702	8/8/2012	42.259035	-85.029154	12944022.3	277320.9
SEKR0475C701	7/25/2012	42.261642	-85.042019	12940547.3	278298.5
SEKR0475C702	7/25/2012	42.260643	-85.039487	12941229.8	277928.9
SEKR0500C701	8/7/2012	42.262423	-85.043957	12940025.0	278587.5
SEKR0500C702	8/8/2012	42.263000	-85.045012	12939741.2	278800.0
SEKR0525C702	8/7/2012	42.264693	-85.048463	12938812.1	279424.3
SEKR0550C701	7/25/2012	42.265843	-85.051830	12937904.2	279851.0
SEKR0550C702	8/7/2012	42.266138	-85.053065	12937570.7	279961.1
SEKR0550C703	8/8/2012	42.265444	-85.051488	12937995.6	279704.6
SEKR0550C704	8/8/2012	42.265445	-85.051472	12937999.8	279705.0
SEKR0550C705	8/8/2012	42.266888	-85.052929	12937609.9	280234.1
SEKR0575C701	7/25/2012	42.268778	-85.059182	12935923.1	280936.7
SEKR0575C702	8/7/2012	42.268022	-85.055661	12936873.8	280653.3
SEKR0900C701	8/6/2012	42.284661	-85.106678	12923118.9	286834.0
SEKR0900C702	8/6/2012	42.286043	-85.107708	12922844.7	287340.1
SEKR1050C701	7/24/2012	42.296839	-85.128905	12917144.7	291325.3
SEKR1075C701	8/6/2012	42.298380	-85.129281	12917048.1	291887.8
SEKR1075C702	8/6/2012	42.300499	-85.130881	12916622.4	292663.9
SEKR1075C703	8/6/2012	42.300491	-85.130864	12916626.9	292660.9
SEKR1100C701	8/6/2012	42.301620	-85.132738	12916123.8	293077.0
SEKR1200C701	7/24/2012	42.307047	-85.141338	12913815.7	295075.7
SEKR1425C701	8/7/2012	42.299265	-85.171417	12905652.6	292316.2
SEKR1475C701	7/25/2012	42.302657	-85.181116	12903040.6	293577.7
SEKR1475C702	7/25/2012	42.302663	-85.180382	12903239.2	293577.7
SEKR1500C701	7/25/2012	42.304620	-85.182838	12902581.8	294297.6
SEKR1550C701	8/7/2012	42.309585	-85.187650	12901297.9	296119.3
SEKR1575C701	7/25/2012	42.311259	-85.185128	12901986.0	296722.9
SEKR1575C702	7/25/2012	42.310920	-85.185306	12901936.5	296599.6
SEKR1575C703	8/7/2012	42.312214	-85.185488	12901892.0	297071.5
SEKR1850C701	7/23/2012	42.336434	-85.225927	12891044.7	306006.6
SEKR1875C701	7/24/2012	42.336587	-85.228166	12890440.1	306068.4
SEKR1900C701	7/24/2012	42.338687	-85.235575	12888444.9	306854.2
SEKR1950C701	7/23/2012	42.342990	-85.242614	12886558.3	308441.8
SEKR2000C701	7/23/2012	42.344978	-85.252300	12883947.4	309193.6
SEKR2000C702	7/24/2012	42.344453	-85.249821	12884615.6	308995.3
SEKR2025C701	7/23/2012	42.345161	-85.255384	12883114.5	309269.0
SEKR2025C702	7/23/2012	42.345285	-85.256980	12882683.6	309318.8
SEKR2025C703	7/23/2012	42.344891	-85.254309	12883404.2	309167.8
SEKR2100C701	7/23/2012	42.349145	-85.273248	12878301.2	310772.4
SEKR2125C701	7/23/2012	42.351823	-85.275503	12877702.3	311754.9
SEKR2150C701	7/24/2012	42.351657	-85.280592	12876325.9	311709.3
SEKR2150C702	7/26/2012	42.351369	-85.279051	12876741.3	311599.7
SEKR2150C703	7/26/2012	42.352679	-85.276015	12877567.2	312068.1
SEKR2150C704	7/26/2012	42.351686	-85.275584	12877679.8	311705.2

Table 1. Locations of Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Latitude	Longitude	X (international feet)	Y (international feet)
SEKR2150C705	8/6/2012	42.351632	-85.278426	12876911.3	311693.8
SEKR2175C701	7/26/2012	42.350517	-85.280188	12876430.8	311292.6
SEKR2175C702	8/6/2012	42.350760	-85.280187	12876431.8	311381.4
SEKR2200C701	7/23/2012	42.355398	-85.288016	12874334.2	313094.3
SEKR2275C701	7/24/2012	42.359075	-85.290973	12873549.7	314443.0
SEKR2300C701	8/7/2012	42.359127	-85.291242	12873477.4	314462.8
SEKR2400C701	7/24/2012	42.356470	-85.301623	12870661.2	313525.6
SEKR2475C701	7/24/2012	42.350665	-85.306148	12869414.6	311423.9
SEKR2525C701	7/27/2012	42.348956	-85.313515	12867416.2	310823.5
SEKR2625C701	8/7/2012	42.351840	-85.323226	12864803.3	311903.8
SEKR2625C702	8/7/2012	42.351835	-85.323214	12864806.5	311902.1
SEKR2725C701	7/26/2012	42.346607	-85.330723	12862755.2	310020.0
SEKR2725C702	7/27/2012	42.346607	-85.330721	12862755.7	310020.2
SEKR2750C701	8/6/2012	42.346726	-85.335830	12861375.3	310079.5
SEKR2750C702	8/6/2012	42.346717	-85.335828	12861375.6	310076.0
SEKR2800C701	7/23/2012	42.338736	-85.338259	12860685.0	307175.6
SEKR2850C701	7/23/2012	42.335511	-85.342715	12859466.6	306014.3
SEKR2875C701	8/6/2012	42.336542	-85.343587	12859235.4	306392.7
SEKR3075C701	7/26/2012	42.320417	-85.364224	12853586.5	300582.3
SEKR3075C702	8/7/2012	42.320477	-85.363633	12853746.6	300602.1
SEKR3250C701	8/7/2012	42.301885	-85.380523	12849097.6	293881.9
SEKR3510R018	9/21/2012	42.284441	-85.412551	12840355.0	287631.5
SEKR3650C701	7/24/2012	42.277670	-85.427653	12836237.6	285215.5
SEKR3675C701	7/27/2012	42.278496	-85.431255	12835266.9	285528.6
SEKR3700C701	7/27/2012	42.275650	-85.435807	12834021.9	284507.2
SEKR3725C701	7/24/2012	42.273898	-85.439675	12832967.0	283882.1
SEKR3725C702	7/26/2012	42.274038	-85.439357	12833053.6	283932.0
SEKR3725C704	7/27/2012	42.276690	-85.441188	12832570.4	284904.9
SEKR3725C705	7/27/2012	42.275007	-85.439904	12832910.0	284287.2
SEKR3725C706	7/27/2012	42.277490	-85.437936	12833454.3	285185.0
SEKR3725C707	7/27/2012	42.277357	-85.441739	12832424.5	285149.7
SEKR3725C708	8/8/2012	42.273818	-85.439809	12832930.3	283853.6
SEKR3725C709	8/8/2012	42.274364	-85.437575	12833537.5	284044.6
SEKR3750C701	7/24/2012	42.273745	-85.443292	12831987.4	283839.0
SEKR3750C703	7/27/2012	42.274956	-85.438022	12833419.3	284261.9
SEKR3750C704	7/27/2012	42.274933	-85.441808	12832394.6	284266.8
SEKR3750C705	7/27/2012	42.276713	-85.444037	12831799.7	284923.1
SEKR3750C706	7/27/2012	42.275794	-85.444017	12831800.9	284588.1
SEKR3750C707	7/27/2012	42.275247	-85.444556	12831652.4	284390.5
SEKR3750C708	8/7/2012	42.274540	-85.442227	12832279.2	284125.1
SEKR3750C709	8/7/2012	42.275018	-85.446156	12831218.2	284312.7
SEKR3750C710	8/7/2012	42.275017	-85.446170	12831214.6	284312.6
SEKR3775C701	7/26/2012	42.277377	-85.448188	12830679.4	285179.5
SEKR3775C702	7/26/2012	42.276659	-85.451413	12829803.4	284928.8
SEKR3775C703	7/27/2012	42.276085	-85.451470	12829785.3	284720.0
SEKR3775C704	7/27/2012	42.277611	-85.451212	12829862.4	285275.1
SEKR3800C701	7/25/2012	42.277450	-85.451955	12829660.4	285218.9
SEKR3800C702	7/25/2012	42.281542	-85.454731	12828928.6	286719.9
SEKR3800C703	7/25/2012	42.281436	-85.455005	12828854.0	286682.2
SEKR3800C704	7/26/2012	42.281201	-85.455274	12828780.0	286597.6
SEKR3800C705	7/26/2012	42.275693	-85.455729	12828630.8	284591.9
SEKR3800C706	7/26/2012	42.277598	-85.452608	12829484.5	285275.4
SEKR3800C707	7/26/2012	42.277858	-85.455981	12828572.9	285381.7
SEKR3800C708	7/26/2012	42.281437	-85.456106	12828556.0	286686.4
SEKR3800C709	7/26/2012	42.273552	-85.456280	12828471.7	283813.8

Table 1. Locations of Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Latitude	Longitude	X (international feet)	Y (international feet)
SEKR3825C701	7/26/2012	42.273653	-85.460691	12827278.5	283866.2
SEKR3850C701	7/25/2012	42.276250	-85.463828	12826441.8	284823.5
SEKR3850C702	7/25/2012	42.278280	-85.462174	12826899.0	285557.4
SEKR3850C703	7/26/2012	42.271480	-85.463727	12826446.4	283084.9
SEKR3875C701	7/25/2012	42.281658	-85.470252	12824729.4	286816.7
SEKR3925C701	7/25/2012	42.277061	-85.481613	12821633.0	285182.0
SEKR3950C701	7/25/2012	42.281670	-85.484362	12820911.5	286871.5
SEKR3975C701	7/25/2012	42.278086	-85.486537	12820305.4	285573.5

Table 2. Field Results for Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Core #1	Core #2	Core #3	Core #4	Geomorphic Stratum	Poling Category	Poling Observed	Logging Date	UV Fluorescence and Core Observations	Depth of Visual Impact (feet)
SE1111C703	8/8/2012	Yes	Yes	No	Yes	Reference	Reference	Heavy	12/7/2012	Trace Fluorescence	0.01
SE1111C704	8/8/2012	SE1111C703 Step-out				Reference			12/10/2012	No Oil Observed	0.00
SE2222C702	8/8/2012	Yes	Yes	No	No	Reference	Reference	No Poling	12/7/2012	No Oil Observed	0.00
SE3333C701	8/8/2012	Yes	Yes	Yes	No	Reference	Reference	Light	12/7/2012	No Oil Observed	0.00
SEKR0000R024A	9/21/2012	Yes	- -	No	No	Reference	Reference	No Poling	12/13/2012	No Oil Observed	0.00
SEKR0000R024B	9/21/2012	- -	Yes	No	No	Reference	Reference	No Poling	11/19/2012	No Oil Observed	0.00
SEKR0325C701	7/24/2012	Yes	Yes	No	No	Cutoff/Oxbow	None	Light	7/25/2012	No Oil Observed	0.00
SEKR0400C701	7/24/2012	Yes	Yes	Yes	No	Channel Deposit	Light	None	7/25/2012	No Oil Observed	0.00
SEKR0425C701	7/24/2012	Yes	Yes	Yes	No	Backwater	Light	Light	7/25/2012	No Oil Observed	0.00
SEKR0425C702	8/8/2012	Yes	Yes	No	No	Depositional Bar	None	No Poling (Dry)	11/28/2012	No Oil Observed	0.00
SEKR0475C701	7/25/2012	Yes	Yes	No	No	Impoundment	Light	Light	7/26/2012	No Oil Observed	0.00
SEKR0475C702	7/25/2012	Yes	Yes	No	No	Depositional Bar	Light	Light	7/26/2012	No Oil Observed	0.00
SEKR0500C701	8/7/2012	Yes	Yes	No	No	Impoundment	Light	Light	11/29/2012	No Oil Observed	0.00
SEKR0500C702	8/8/2012	Yes	Yes	No	No	Impoundment	None	Light	11/28/2012	No Oil Observed	0.00
SEKR0525C702	8/7/2012	Yes	Yes	No	No	Impoundment	Moderate	Moderate	11/28/2012	Trace Fluorescence	1.6
SEKR0550C701	7/25/2012	Yes	Yes	Yes	No	Impoundment	Moderate	Moderate	7/26/2012	No Oil Observed	0.00
SEKR0550C702	8/7/2012	Yes	Yes	No	No	Impoundment	None	Moderate	11/29/2012	No Oil Observed	0.00
SEKR0550C703	8/8/2012	Yes	Yes	No	Yes	Impoundment	Heavy	Moderate	11/27/2012	No Oil Observed	0.00
SEKR0550C704	8/8/2012	SEKR0550C703 Step-out				Impoundment			11/28/2012	Trace Fluorescence	1.50
SEKR0550C705	8/8/2012	Yes	Yes	No	No	Impoundment	Light	Moderate	11/27/2012	No Oil Observed	0.00
SEKR0575C701	7/25/2012	Yes	Yes	No	No	Impoundment	Moderate	Moderate	7/26/2012	No Oil Observed	0.00
SEKR0575C702	8/7/2012	Yes	Yes	Yes	No	Impoundment	Light	Light	11/27/2012	No Oil Observed	0.00
SEKR0900C701	8/6/2012	Yes	Yes	No	No	Depositional Bar	None	Light	11/29/2012	No Oil Observed	0.00
SEKR0900C702	8/6/2012	Yes	Yes	No	No	Cutoff/Oxbow	Moderate	Light	11/27/2012	No Oil Observed	0.00
SEKR1050C701	7/24/2012	Yes	Yes	No	No	Backwater	Moderate	No Poling (Dry)	7/25/2012	No Oil Observed	0.00
SEKR1075C701	8/6/2012	Yes	Yes	No	No	Depositional Bar	Moderate	Moderate	11/28/2012	Trace Fluorescence	0.90
SEKR1075C702	8/6/2012	Yes	Yes	No	Yes	Depositional Bar	Light	Heavy	11/30/2012	Fluoresced Oil	0.90
SEKR1075C703	8/6/2012	SEKR1075C702 Step-out				Depositional Bar				Not Logged	- -
SEKR1100C701	8/6/2012	Yes	Yes	Yes	No	Depositional Bar	Moderate	Heavy	11/29/2012	No Oil Observed	0.00
SEKR1200C701	7/24/2012	Yes	Yes	No	No	Backwater	Heavy	No Poling (Dry)	7/25/2012	No Oil Observed	0.00
SEKR1425C701	8/7/2012	Yes	Yes	No	No	Cutoff/Oxbow	Moderate	Moderate	11/30/2012	No Oil Observed	0.00
SEKR1475C701	7/25/2012	Yes	Yes	Yes	No	Channel Deposit	None	Moderate	7/26/2012	No Oil Observed	0.00
SEKR1475C702	7/25/2012	Yes	Yes	No	No	Cutoff/Oxbow	Heavy	No Poling (Dry)	7/26/2012	No Oil Observed	0.00
SEKR1500C701	7/25/2012	Yes	Yes	No	No	Channel Deposit	Light	Moderate	7/26/2012	Trace Fluorescence	0.90
SEKR1550C701	8/7/2012	Yes	Yes	Yes	No	Impoundment	Heavy	Moderate	11/28/2012	Trace Fluorescence	0.65
SEKR1575C701	7/25/2012	Yes	Yes	Yes	No	Impoundment	Heavy	Heavy	7/29/2012	Trace Fluorescence	0.05
SEKR1575C702	7/25/2012	Yes	Yes	No	No	Impoundment	Moderate	Heavy	7/26/2012	No Oil Observed	0.01
SEKR1575C703	8/7/2012	Yes	Yes	No	No	Impoundment	None	None	11/28/2012	No Oil Observed	0.00
SEKR1850C701	7/23/2012	Yes	Yes	Yes	No	Anthropogenic Channel	Light	Light	7/24/2012	No Oil Observed	0.00

Table 2. Field Results for Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Core #1	Core #2	Core #3	Core #4	Geomorphic Stratum	Poling Category	Poling Observed	Logging Date	UV Fluorescence and Core Observations	Depth of Visual Impact (feet)
SEKR1875C701	7/24/2012	Yes	Yes	No	No	Anthropogenic Channel	None	None	7/25/2012	No Oil Observed	0.00
SEKR1900C701	7/24/2012	Yes	Yes	Yes	No	Anthropogenic Channel	None	None	7/25/2012	No Oil Observed	0.00
SEKR1950C701	7/23/2012	Yes	Yes	No	No	Anthropogenic Channel	Light	Light	7/24/2012	No Oil Observed	0.00
SEKR2000C701	7/23/2012	Yes	Yes	Yes	No	Anthropogenic Channel	Moderate	Moderate	7/24/2012	No Oil Observed	0.00
SEKR2000C702	7/24/2012	Yes	Yes	No	No	Anthropogenic Channel	None	Heavy	7/25/2012	No Oil Observed	0.00
SEKR2025C701	7/23/2012	Yes	Yes	No	No	Anthropogenic Channel	Heavy	Moderate	7/24/2012	Trace Fluorescence	0.17
SEKR2025C702	7/23/2012	Yes	Yes	Yes	No	Anthropogenic Channel	Heavy	Heavy	7/24/2012	No Oil Observed	0.00
SEKR2025C703	7/23/2012	Yes	Yes	No	No	Anthropogenic Channel	Light	Light	7/24/2012	No Oil Observed	0.00
SEKR2100C701	7/23/2012	Yes	Yes	No	No	Anthropogenic Channel	Heavy	Moderate	Not Logged	(not logged)	
SEKR2125C701	7/23/2012	Yes	Yes	No	No	Cutoff/Oxbow	Light	Light	7/24/2012	No Oil Observed	0.00
SEKR2150C701	7/24/2012	Yes	Yes	No	No	Channel Deposit	Moderate	Light	7/25/2012	Fluoresced Oil	0.01
SEKR2150C702	7/26/2012	Yes	Yes	No	No	Channel Deposit	None	None	7/27/2012	No Oil Observed	0.00
SEKR2150C703	7/26/2012	Yes	Yes	No	No	Cutoff/Oxbow	Heavy	Heavy	7/27/2012	Trace Fluorescence	0.50
SEKR2150C704	7/26/2012	Yes	Yes	Yes	No	Cutoff/Oxbow	Heavy	Heavy	7/27/2012	Trace Fluorescence	0.45
SEKR2150C705	8/6/2012	Yes	Yes	Yes	No	Depositional Bar	Light	Light	11/29/2012	No Oil Observed	0.00
SEKR2175C701	7/26/2012	Yes	Yes	No	No	Backwater	Light	Moderate	7/27/2012	Trace Fluorescence	0.50
SEKR2175C702	8/6/2012	Yes	Yes	No	No	Backwater	None	No Poling (Dry)	11/29/2012	No Oil Observed	0.00
SEKR2200C701	7/23/2012	Yes	Yes	No	No	Cutoff/Oxbow	Light	Moderate	7/24/2012	No Oil Observed	0.00
SEKR2275C701	7/24/2012	Yes	Yes	Yes	No	Cutoff/Oxbow	None	Light	7/25/2012	No Oil Observed	0.00
SEKR2300C701	8/7/2012	Yes	Yes	No	No	Cutoff/Oxbow	Moderate	Heavy	11/30/2012	No Oil Observed	0.00
SEKR2400C701	7/24/2012	Yes	Yes	No	No	Depositional Bar	Heavy	No Poling (Dry)	7/25/2012	No Oil Observed	0.00
SEKR2475C701	7/24/2012	Yes	Yes	No	No	Depositional Bar	Heavy	No Poling (Dry)	7/25/2012	No Oil Observed	0.00
SEKR2525C701	7/27/2012	Yes	Yes	No	No	Channel Deposit	Heavy	No Poling (Dry)	11/29/2012	No Oil Observed	0.00
SEKR2625C701	8/7/2012	Yes	Yes	No	Yes	Backwater	Moderate	No Poling (Dry)	11/29/2012	No Oil Observed	0.00
SEKR2625C702	8/7/2012	SEKR2625C701 Step-out				Backwater			11/29/2012	No Oil Observed	0.00
SEKR2725C701	7/26/2012	Yes	Yes	Yes	No	Channel Deposit	Light	None	7/27/2012	No Oil Observed	0.00
SEKR2725C702	7/27/2012	Yes	Yes	No	No				Not Logged	Incorrect Stratum	- -
SEKR2750C701	8/6/2012	Yes	Yes	No	No	Backwater	None	None	11/29/2012	Trace Fluorescence	0.65
SEKR2750C702	8/6/2012	SEKR2750C701 Step-out				Backwater			11/30/2012	No Oil Observed	0.00
SEKR2800C701	7/23/2012	Yes	Yes	Yes	No	Cutoff/Oxbow	Light	Moderate	7/24/2012	Fluoresced Oil	0.10
SEKR2850C701	7/23/2012	Yes	Yes	No	No	Cutoff/Oxbow	None	None	7/24/2012	No Oil Observed	0.00
SEKR2875C701	8/6/2012	Yes	Yes	Yes	No	Backwater	None	No Poling (Dry)	11/28/2012	No Oil Observed	0.00
SEKR3075C701	7/26/2012	Yes	Yes	No	No	Backwater	Light	No Poling (Dry)	7/27/2012	No Oil Observed	0.00
SEKR3075C702	8/7/2012	Yes	Yes	Yes	No	Depositional Bar	None	None	11/27/2012	No Oil Observed	0.00
SEKR3250C701	8/7/2012	Yes	Yes	No	No	Channel Deposit	None	None	11/29/2012	No Oil Observed	0.00
SEKR3650C701	7/24/2012	Yes	Yes	Yes	No	Backwater	Heavy	No Poling (Dry)	7/25/2012	No Oil Observed	0.00
SEKR3675C701	7/27/2012	Yes	Yes	No	No	Delta	Moderate	Moderate	11/27/2012	No Oil Observed	0.00
SEKR3700C701	7/27/2012	Yes	Yes	Yes	No	Channel Deposit	Heavy	Moderate	11/28/2012	No Oil Observed	0.00
SEKR3725C701	7/24/2012	Yes	Yes	Yes	No	Depositional Bar	Heavy	Moderate	7/25/2012	No Oil Observed	0.00

Table 2. Field Results for Submerged Oil Quantification Borings
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Collection Date	Core #1	Core #2	Core #3	Core #4	Geomorphic Stratum	Poling Category	Poling Observed	Logging Date	UV Fluorescence and Core Observations	Depth of Visual Impact (feet)
SEKR3725C702	7/26/2012	Yes	Yes	Yes	No	Channel Deposit	Moderate	Moderate	7/27/2012	Trace Fluorescence	0.40
SEKR3725C704	7/27/2012	Yes	Yes	Yes	No	Delta	Light	Light	11/28/2012	No Oil Observed	0.00
SEKR3725C705	7/27/2012	Yes	Yes	Yes	No	Delta	Light	Light	11/28/2012	Trace Fluorescence	0.30
SEKR3725C706	7/27/2012	Yes	Yes	No	No	Delta	Light	Light	11/29/2012	Fluoresced Oil	1.30
SEKR3725C707	7/27/2012	Yes	Yes	No	No	Delta	None	None	11/27/2012	No Oil Observed	0.00
SEKR3725C708	8/8/2012	Yes	Yes	No	No	Depositional Bar	Moderate	Moderate	11/29/2012	No Oil Observed	0.00
SEKR3725C709	8/8/2012	Yes	Yes	No	No	Backwater	Moderate	Moderate	11/30/2012	No Oil Observed	0.00
SEKR3750C701	7/24/2012	Yes	Yes	Yes	No	Backwater	Heavy	No Poling (Dry)	7/25/2012	No Oil Observed	0.01
SEKR3750C703	7/27/2012	Yes	Yes	No	No	Delta	Heavy	No Poling (Dry)	11/28/2012	No Oil Observed	0.00
SEKR3750C704	7/27/2012	Yes	Yes	Yes	No	Delta	Heavy	Moderate	11/27/2012	No Oil Observed	0.00
SEKR3750C705	7/27/2012	Yes	Yes	No	No	Delta	Heavy	Light	11/28/2012	Trace Fluorescence	0.80
SEKR3750C706	7/27/2012	Yes	Yes	No	No	Delta	Light	Moderate	11/29/2012	No Oil Observed	0.00
SEKR3750C707	7/27/2012	Yes	Yes	Yes	No	Delta	Moderate	Light	11/28/2012	No Oil Observed	0.00
SEKR3750C708	8/7/2012	Yes	Yes	Yes	No	Delta	Moderate	Heavy	11/29/2012	No Oil Observed	0.00
SEKR3750C709	8/7/2012	Yes	Yes	No	Yes	Delta	Moderate	Moderate	11/27/2012	No Oil Observed	0.00
SEKR3750C710	8/7/2012	SEKR3750C709 Step-out				Delta			11/28/2012	No Oil Observed	0.00
SEKR3775C701	7/26/2012	Yes	Yes	No	No	Channel Deposit	Moderate	Light	7/27/2012	Trace Fluorescence	0.60
SEKR3775C702	7/26/2012	Yes	Yes	No	No	Channel Deposit	Heavy	Moderate	7/27/2012	No Oil Observed	0.00
SEKR3775C703	7/27/2012	Yes	Yes	No	No	Delta	Light	Moderate	11/28/2012	Trace Fluorescence	0.20
SEKR3775C704	7/27/2012	Yes	Yes	No	No	Delta	Moderate	None	11/27/2012	No Oil Observed	0.00
SEKR3800C701	7/25/2012	Yes	Yes	Yes	No	Morrow Lake Fan	Heavy	Moderate	7/26/2012	No Oil Observed	0.00
SEKR3800C702	7/25/2012	Yes	Yes	Yes	No	Morrow Lake Fan	Moderate	Light	7/26/2012	No Oil Observed	0.00
SEKR3800C703	7/25/2012	Yes	Yes	No	No	Morrow Lake Fan	Moderate	Moderate	7/26/2012	No Oil Observed	0.00
SEKR3800C704	7/26/2012	Yes	Yes	Yes	No	Morrow Lake Fan	Light	Moderate	7/27/2012	No Oil Observed	0.00
SEKR3800C705	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	Light	Light	7/27/2012	Trace Fluorescence	0.10
SEKR3800C706	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	Light	Light	7/27/2012	No Oil Observed	0.00
SEKR3800C707	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	None	Moderate	7/27/2012	Trace Fluorescence	0.35
SEKR3800C708	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	None	Light	7/27/2012	Trace Fluorescence	0.01
SEKR3800C709	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	None	Light	7/27/2012	No Oil Observed	0.00
SEKR3825C701	7/26/2012	Yes	Yes	No	No	Morrow Lake Fan	None	Moderate	7/27/2012	Sheen	0.00
SEKR3850C701	7/25/2012	Yes	Yes	Yes	No	Lake	Light	Light	7/26/2012	No Oil Observed	0.00
SEKR3850C702	7/25/2012	Yes	Yes	Yes	No	Lake	Light	Light	7/26/2012	No Oil Observed	0.00
SEKR3850C703	7/26/2012	Yes	Yes	Yes	No	Morrow Lake Fan	Light	Light	7/27/2012	Trace Fluorescence	0.20
SEKR3875C701	7/25/2012	Yes	Yes	Yes	No	Lake	Light	Light	7/26/2012	No Oil Observed	0.00
SEKR3925C701	7/25/2012	Yes	Yes	No	No	Lake	None	Light	7/26/2012	No Oil Observed	0.00
SEKR3950C701	7/25/2012	Yes	Yes	No	No	Lake	None	None	7/26/2012	No Oil Observed	0.00
SEKR3975C701	7/25/2012	Yes	Yes	Yes	No	Lake	None	None	7/26/2012	No Oil Observed	0.00

Table 3. Submerged Oil Quantification Bulk Density Results
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Enbridge Sample ID	Geomorphic Strata	Sample Date	Sample Interval Top (feet)	Sample Interval Bottom (feet)	Dry Bulk Density (lbs/ft^3)	Dry Bulk Density (g/cm^3)	Geomorphic Average Dry Bulk Density (g/cm^3)
SEKR1850C701S072412D005	Anthropogenic Channel	07/24/12	0.00	0.50	106.72	1.71	1.14
SEKR1900C701S072512D005	Anthropogenic Channel	07/25/12	0.00	0.50	104.77	1.68	
SEKR2000C701S072412D005	Anthropogenic Channel	07/24/12	0.00	0.50	28.18	0.45	
SEKR2025C702S072412D005	Anthropogenic Channel	07/24/12	0.00	0.50	45.58	0.73	
SEKR0425C701S072512D005	Backwater	07/25/12	0.00	0.50	28.55	0.46	0.38
SEKR2875C701S080612D005	Backwater	11/30/12	0.00	0.50	24.93	0.40	
SEKR3650C701S072512D005	Backwater	07/25/12	0.00	0.50	17.90	0.29	
SEKR3750C701S072512D005	Backwater	07/25/12	0.00	0.50	23.68	0.38	
SEKR0400C701S072512D005	Channel Deposit	07/25/12	0.00	0.50	46.19	0.74	0.69
SEKR1475C701S072612D005	Channel Deposit	07/26/12	0.00	0.50	23.61	0.38	
SEKR2725C701S072712D005	Channel Deposit	07/27/12	0.00	0.50	89.96	1.44	
SEKR3700C701S072712D005	Channel Deposit	11/30/12	0.00	0.50	45.13	0.72	
SEKR3725C702S072712D004	Channel Deposit	07/27/12	0.30	0.40	11.75	0.19	
SEKR2150C704S072712D005	Cutoff/Oxbow	07/27/12	0.35	0.45	48.15	0.77	0.84
SEKR2275C701S072512D005	Cutoff/Oxbow	07/25/12	0.00	0.50	66.90	1.07	
SEKR2800C701S072412D005	Cutoff/Oxbow	07/24/12	0.00	0.50	42.92	0.69	
SEKR3725C704S072712D005	Delta	11/30/12	0.00	0.50	108.69	1.74	0.77
SEKR3725C705S072712D005	Delta	11/30/12	0.00	0.50	57.43	0.92	
SEKR3750C704S072712D005	Delta	11/30/12	0.00	0.50	23.38	0.37	
SEKR3750C707S072712D005	Delta	11/30/12	0.00	0.50	25.33	0.41	
SEKR3750C708S080712D005	Delta	11/30/12	0.00	0.50	24.71	0.40	
SEKR1100C701S080612D005	Depositional Bar	11/30/12	0.00	0.50	41.95	0.67	0.92
SEKR2150C705S080612D005	Depositional Bar	11/30/12	0.00	0.50	74.15	1.19	
SEKR3075C702S080712D005	Depositional Bar	11/30/12	0.00	0.50	94.90	1.52	
SEKR3725C701S072512D005	Depositional Bar	07/25/12	0.00	0.50	18.18	0.29	

Table 3. Submerged Oil Quantification Bulk Density Results
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Enbridge Sample ID	Geomorphic Strata	Sample Date	Sample Interval Top (feet)	Sample Interval Bottom (feet)	Dry Bulk Density (lbs/ft^3)	Dry Bulk Density (g/cm^3)	Geomorphic Average Dry Bulk Density (g/cm^3)
SEKR0550C701S072612D005	Impoundment	07/26/12	0.00	0.50	26.44	0.42	0.34
SEKR0575C702S080712D005	Impoundment	11/30/12	0.00	0.50	19.08	0.31	
SEKR1550C701S080712D007	Impoundment	11/30/12	0.00	0.67	19.81	0.32	
SEKR1575C701S072612D005	Impoundment	07/26/12	0.00	0.50	19.89	0.32	
SEKR3850C701S072612D005	Lake	07/26/12	0.00	0.50	16.06	0.26	0.29
SEKR3850C702S072612D005	Lake	07/26/12	0.00	0.50	23.56	0.38	
SEKR3875C701S072612D005	Lake	07/26/12	0.00	0.50	15.77	0.25	
SEKR3975C701S072612D005	Lake	07/26/12	0.00	0.50	17.15	0.27	
SEKR3800C701S072612D005	Morrow Lake Fan	07/26/12	0.00	0.50	48.97	0.78	0.51
SEKR3800C702S072612D005	Morrow Lake Fan	07/26/12	0.00	0.50	10.80	0.17	
SEKR3800C704S072712D005	Morrow Lake Fan	07/27/12	0.00	0.50	47.08	0.75	
SEKR3850C703S072712D003	Morrow Lake Fan	07/27/12	0.15	0.25	19.49	0.31	
SE3333C701BS120712D006	Battle Creek River	12/10/12	0.00	0.50	28.74	0.46	0.46

Legend: lbs/ft^3 = pounds per cubic foot; g/cm^3 = grams per cubic centimeter

Table 4. Surface Area of Poling Categories by Geomorphic Stratum
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Strata \ Poling Category	'Heavy'	'Moderate'	'Light'	'None'	Total
Anthropogenic Channel	**0.23**	**0.42**	**11.65**	65.66	77.95
Backwater	**5.26**	**12.79**	**49.56**	22.05	89.65
Channel Deposit	**5.42**	**17.17**	**122.21**	403.25	548.05
Cutoff/Oxbow	**2.68**	**2.90**	**10.14**	9.01	24.74
Delta	**7.73**	**26.84**	**36.63**	7.15	78.34
Depositional Bar	**2.58**	**5.37**	**34.51**	76.47	118.94
Impoundment	**2.26**	**14.10**	**41.34**	2.35	60.05
Lake	0.00	0.00	**305.58**	287.09	592.67
Morrow Lake Fan	**0.54**	**1.91**	**118.71**	61.49	182.65
Total	26.69	81.50	730.32	934.53	1773.04

Footnotes:

Areas are in acres

34.5	Bold numbers included in the Quantification Model
5.2	Gray boxes are not included in the Quantification Model

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
2	SEKR2025C701	SEKR2025C701S072412DX	Anthropogenic Channel	Heavy	1.14	0.23	0.6	0.9285	0	424	2
		SEKR2025C701S072412D007									
3	SEKR2025C702	SEKR2025C702S072412DX		Heavy					848		
		SEKR2025C702S072412D005									
		SEKR2025C702S072412D007									
		SEKR2025C702S072412D011									
		SEKR2025C702S072412D017									
		SEKR2025C702S072412D020									
21	SEKR2000C701	SEKR2000C701S072412DX		Moderate		0.42	0		0	0	0
		SEKR2000C701S072412D005									
		SEKR2000C701S072412D010									
		SEKR2000C701S072412D014									
		SEKR2000C701S072412D016									
		SEKR2000C701S072412D020									
		SEKR2000C701S072412D023									
		SEKR2000C701S072412D028									
41	SEKR1850C701	SEKR1850C701S072412DX		Light		11.65	1.2		79	26	12
		SEKR1850C701S072412D003									
		SEKR1850C701S072412D008									
		SEKR1850C701S072412D015									
		SEKR1850C701S072412D020									
		SEKR1850C701S072412D027									
42	SEKR1950C701	SEKR1950C701S072412DX		Light					0		
		SEKR1950C701S072412D006									
		SEKR1950C701S072412D008									
43	SEKR2025C703	SEKR2025C703S072412DX		Light					0		
		SEKR2025C703S072412D004									
		SEKR2025C703S072412D007									
81	SEKR3650C701	SEKR3650C701S072512DX	Backwater	Heavy	0.38	5.26	4.4	0.9285	0	170	44
		SEKR3650C701S072512D006									
		SEKR3650C701S072512D010									
		SEKR3650C701S072512D015									
		SEKR3650C701S072512D019									
		SEKR3650C701S072512D021									
82	SEKR3750C701	SEKR3750C701S072512DX		Heavy					0		
		SEKR3750C701S072512D006									
		SEKR3750C701S072512D010									
		SEKR3750C701S072512D014									
		SEKR3750C701S072512D019									
		SEKR3750C701S072512D022									
83	SEKR1200C701	SEKR1200C701S072512DX		Heavy					510		
		SEKR1200C701S072512D006									
		SEKR1200C701S072512D011									
		SEKR1200C701S072512D016									
101	SEKR1050C701	SEKR1050C701S072512DX		Moderate		12.79	1.8		216	248	63
		SEKR1050C701S072512D003									
		SEKR1050C701S072512D007									
103	SEKR3725C709	SEKR3725C709S113012DX		Moderate					324		
		SEKR3725C709S113012D005									
		SEKR3725C709S113012D008									
		SEKR3725C709D113012D008									
		SEKR3725C709S113012D011									
		SEKR3725C709S113012D015									
		SEKR3725C709S113012D018									
104	SEKR2625C701	SEKR2625C701S112912DX		Moderate					0		
		SEKR2625C701S112912D006									
		SEKR2625C701S112912D011									
DUP OF104	SEKR2625C702	SEKR2625C702S112912DX		Moderate					450		
		SEKR2625C702S112912D005									
		SEKR2625C702S112912D010									
121	SEKR0425C701	SEKR0425C701S072512DX		Light		49.56	3.6		446	262	520
		SEKR0425C701S072512D007									
		SEKR0425C701S072512D011									
		SEKR0425C701S072512D016									
		SEKR0425C701S072512D020									
		SEKR0425C701S072512D022									
122	SEKR3075C701	SEKR3075C701S072712DX		Light					0		
		SEKR3075C701S072712D005									
		SEKR3075C701S072712D009									
		SEKR3075C701S072712D012									
		SEKR3075C701S072712D016									
		SEKR3075C701S072712D021									
		SEKR3075C701S072712D025									
123	SEKR2175C701	SEKR2175C701S072712DX		Light					341		
		SEKR2175C701S072712D002									
		SEKR2175C701S072712D005									
		SEKR2175C701S072712D006									
		SEKR2175C701S072712D010									
		SEKR2175C701S072712D014									
		SEKR2175C701S072712D017									

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
161	SEKR3775C702	SEKR3775C702S072712DX	Channel Deposit	Heavy	0.69	5.42	2.32	0.9285	425	388	98
		SEKR3775C702S072712D005									
		SEKR3775C702S072712D009									
		SEKR3775C702S072712D012									
162	SEKR2525C701	SEKR2525C701S112912DX		Heavy					0		
		SEKR2525C701D112912D006									
		SEKR2525C701S112912D006									
		SEKR2525C701S112912D012									
163	SEKR3700C701	SEKR3700C701S112712DX		Heavy					738		
		SEKR3700C701S112712D005									
		SEKR3700C701S112712D008									
		SEKR3700C701S112712D010									
		SEKR3700C701S112712D015									
		SEKR3700C701S112712D020									
181	SEKR2150C701	SEKR2150C701S072512DX		Moderate		17.17	3.6		0	272	340
		SEKR2150C701S072512D004									
		SEKR2150C701S072512D008									
		SEKR2150C701S072512D012									
		SEKR2150C701S072512D014									
		SEKR2150C701S072512D020									
		SEKR2150C701S072512D026									
182	SEKR3725C702	SEKR3725C702S072712DX		Moderate					304		
		SEKR3725C702S072712D004									
		SEKR3725C702S072712D010									
		SEKR3725C702S072712D015									
		SEKR3725C702S072712D019									
		SEKR3725C702S072712D022									
		SEKR3725C702S072712D026									
183	SEKR3775C701	SEKR3775C701S072712DX		Moderate					513		
		SEKR3775C701S072712D006									
		SEKR3775C701S072712D007									
		SEKR3775C701S072712D009									
		SEKR3775C701S072712D011									
		SEKR3775C701S072712D013									
201	SEKR0400C701	SEKR0400C701S072512DX		Light		122.21	14.56		459	285	10,241
		SEKR0400C701S072512D003									
		SEKR0400C701S072512D008									
		SEKR0400C701S072512D013									
		SEKR0400C701S072512D017									
		SEKR0400C701S072512D021									
202	SEKR1500C701	SEKR1500C701S072612DX		Light					375		
		SEKR1500C701S072612D003									
		SEKR1500C701S072612D006									
		SEKR1500C701S072612D009									
		SEKR1500C701S072612D013									
		SEKR1500C701S072612D019									
		SEKR1500C701S072612D024									
		SEKR1500C701S072612D028									
203	SEKR2725C701	SEKR2725C701S072712DX		Light					22		
		SEKR2725C701S072712D007									
		SEKR2725C701S072712D013									
		SEKR2725C701S072712D019									
		SEKR2725C701S072712D022									
241	SEKR1475C702	SEKR1475C702S072612DX		Heavy		2.68	4.32		818	396	113
		SEKR1475C702S072612D004									
		SEKR1475C702S072612D007									
		SEKR1475C702S072612D009									
		SEKR1475C702S072612D013									
		SEKR1475C702S072612D015									
		SEKR1475C702S072612D019									
		SEKR1475C702S072612D020									
242	SEKR2150C703	SEKR2150C703S072712DX		Heavy					169		
		SEKR2150C703S072712D005									
		SEKR2150C703S072712D010									
243	SEKR2150C704	SEKR2150C704S072712DX		Heavy					200		
		SEKR2150C704S072712D003									
		SEKR2150C704S072712D005									
		SEKR2150C704S072712D010									
		SEKR2150C704S072712D013									
261	SEKR0900C702	SEKR0900C702S112712DX		Moderate					384		
		SEKR0900C702S112712D006									
		SEKR0900C702D112712D011									
		SEKR0900C702S112712D011									
		SEKR0900C702S112712D014									
		SEKR0900C702S112712D017									
		SEKR0900C702S112712D019									

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
262	SEKR1425C701	SEKR1425C701S113012DX	Cutoff/Oxbow	Moderate	0.84	2.90	5.2	0.9285	198	555	205
		SEKR1425C701S113012D004									
		SEKR1425C701S113012D010									
		SEKR1425C701S113012D013									
		SEKR1425C701S113012D016									
		SEKR1425C701S113012D018									
263	SEKR2300C701	SEKR2300C701S113012DX		Moderate					1082		
		SEKR2300C701D113012D003									
		SEKR2300C701S113012D003									
		SEKR2300C701S113012D007									
		SEKR2300C701S113012D011									
281	SEKR2200C701	SEKR2200C701S072412DX		Light		10.14	8		281	286	569
		SEKR2200C701S072412D005									
		SEKR2200C701S072412D008									
		SEKR2200C701S072412D013									
		SEKR2200C701S072412D018									
		SEKR2200C701S072412D022									
		SEKR2200C701S072412D026									
		SEKR2200C701S072412D028									
		SEKR2200C701S072412D034									
282	SEKR2125C701	SEKR2125C701S072412DX		Light					512		
		SEKR2125C701S072412D006									
		SEKR2125C701S072412D010									
		SEKR2125C701S072412D014									
		SEKR2125C701S072412D020									
283	SEKR2800C701	SEKR2800C701S072412DX		Light					64		
		SEKR2800C701S072412D007									
		SEKR2800C701S072412D012									
		SEKR2800C701S072412D017									
321	SEKR3750C704	SEKR3750C704S112712DX	Delta	Heavy	0.77	7.73	4.72	0.9285	213	222	183
		SEKR3750C704S112712D006									
		SEKR3750C704S112712D011									
		SEKR3750C704S112712D016									
		SEKR3750C704S112712D021									
		SEKR3750C704S112712D025									
		SEKR3750C704S112712D029									
		SEKR3750C704S112712D031									
322	SEKR3750C705	SEKR3750C705S112812DX		Heavy					450		
		SEKR3750C705D112812D006									
		SEKR3750C705S112812D006									
		SEKR3750C705S112812D011									
		SEKR3750C705S112812D016									
323	SEKR3750C703	SEKR3750C703S112812DX		Heavy					3		
		SEKR3750C703S112812D007									
		SEKR3750C703D112812D012									
		SEKR3750C703S112812D012									
		SEKR3750C703S112812D017									
		SEKR3750C703S112812D022									
		SEKR3750C703S112812D028									
341	SEKR3675C701	SEKR3675C701S112712DX		Moderate		26.84	6.20		0	274	1,025
		SEKR3675C701D112712D006									
		SEKR3675C701S112712D006									
		SEKR3675C701S112712D011									
		SEKR3675C701S112712D014									
		SEKR3675C701S112712D017									
		SEKR3675C701S112712D021									
342	SEKR3750C707	SEKR3750C707S112812DX		Moderate					73		
		SEKR3750C707D112812D006									
		SEKR3750C707S112812D006									
		SEKR3750C707S112812D010									
		SEKR3750C707S112812D013									
		SEKR3750C707S112812D016									
		SEKR3750C707S112812D021									
343	SEKR3775C704	SEKR3775C704S112712DX		Moderate					931		
		SEKR3775C704S112712D007									
		SEKR3775C704S112712D012									
		SEKR3775C704S112712D016									
		SEKR3775C704S112712D020									
344	SEKR3750C708	SEKR3750C708S112912DX		Moderate					234		
		SEKR3750C708S112912D006									
		SEKR3750C708D112912D011									
		SEKR3750C708S112912D011									
		SEKR3750C708S112912D016									
		SEKR3750C708S112912D021									
		SEKR3750C708S112912D026									
345	SEKR3750C709	SEKR3750C709S112712DX		Moderate					92		
		SEKR3750C709D112712D006									
		SEKR3750C709S112712D006									
		SEKR3750C709S112712D011									
		SEKR3750C709S112712D016									
DUP OF 345	SEKR3750C710	SEKR3750C710S112812DX		Moderate					312		
		SEKR3750C710S112812D005									
		SEKR3750C710S112812D008									
		SEKR3750C710S112812D012									
		SEKR3750C710S112812D018									

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
361	SEKR3725C704	SEKR3725C704S112812DX		Light					15		
		SEKR3725C704S112812D006									
		SEKR3725C704S112812D011									
		SEKR3725C704S112812D017									
		SEKR3725C704S112812D021									
		SEKR3725C704S112812D025									
		SEKR3725C704S112812D030									
362	SEKR3725C705	SEKR3725C705S112812DX		Light					0		
		SEKR3725C705D112812D006									
		SEKR3725C705S112812D006									
		SEKR3725C705S112812D010									
		SEKR3725C705S112812D013									
		SEKR3725C705S112812D019									
363	SEKR3750C706	SEKR3750C706S112912DX		Light		36.63	7.8		89	46	297
		SEKR3750C706S112912D006									
		SEKR3750C706D112912D009									
		SEKR3750C706S112912D009									
		SEKR3750C706S112912D012									
364	SEKR3775C703	SEKR3775C703S112812DX		Light					0		
		SEKR3775C703D112812D006									
		SEKR3775C703S112812D006									
		SEKR3775C703S112812D011									
		SEKR3775C703S112812D015									
365	SEKR3725C706	SEKR3725C706S112912DX		Light					127		
		SEKR3725C706S112912D002									
		SEKR3725C706S112912D004									
		SEKR3725C706S112912D005									
		SEKR3725C706S112912D010									
		SEKR3725C706S112912D013									
		SEKR3725C706S112912D015									
401	SEKR2400C701	SEKR2400C701S072512DX	Depositional Bar	Heavy	0.92	2.58	4.16	0.9285	40	205	59
		SEKR2400C701S072512D004									
		SEKR2400C701S072512D008									
		SEKR2400C701S072512D012									
		SEKR2400C701S072512D015									
402	SEKR2475C701	SEKR2475C701S072512DX		Heavy					487		
		SEKR2475C701S072512D004									
		SEKR2475C701S072512D007									
		SEKR2475C701S072512D010									
403	SEKR3725C701	SEKR3725C701S072512DX		Heavy					87		
		SEKR3725C701S072512D007									
		SEKR3725C701S072512D013									
		SEKR3725C701S072512D015									
		SEKR3725C701S072512D020									
421	SEKR1075C701	SEKR1075C701S112812DX		Moderate		5.38	8.96		2737	1032	1,338
		SEKR1075C701S112812D005									
		SEKR1075C701S112812D009									
		SEKR1075C701S112812D014									
		SEKR1075C701S112812D019									
423	SEKR1100C701	SEKR1100C701S112912DX		Moderate					350		
		SEKR1100C701S112912D005									
		SEKR1100C701S112912D009									
		SEKR1100C701S112912D013									
424	SEKR3725C708	SEKR3725C708S112912DX		Moderate					8		
		SEKR3725C708D112912D005									
		SEKR3725C708S112912D005									
		SEKR3725C708S112912D009									
		SEKR3725C708S112912D011									
441	SEKR0475C702	SEKR0475C702S072612DX		Light		34.51	2.4		0	948	2,113
		SEKR0475C702S072612D005									
		SEKR0475C702S072612D009									
		SEKR0475C702S072612D013									
		SEKR0475C702S072612D019									
		SEKR0475C702S072612D023									
		SEKR0475C702S072612D025									
442	SEKR1075C702	SEKR1075C702S113012DX		Light					2844		
		SEKR1075C702S113012D006									
443	SEKR2150C705	SEKR2150C705S112912DX		Light					0		
		SEKR2150C705S112912D006									
		SEKR2150C705S112912D011									

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
481	SEKR1575C701	SEKR1575C701S072612DX	Impoundment	Heavy	0.34	2.26	10.23	0.9285	887	612	141
		SEKR1575C701S072612D007									
		SEKR1575C701S072612D013									
		SEKR1575C701S072612D019									
482	SEKR1550C701	SEKR1550C701S112812DX		Heavy					597		
		SEKR1550C701S112812D006									
		SEKR1550C701S112812D011									
		SEKR1550C701S112812D016									
		SEKR1550C701S112812D021									
		SEKR1550C701S112812D026									
483	SEKR0550C703	SEKR0550C703S112712DX		Heavy					356		
		SEKR0550C703S112712D006									
		SEKR0550C703S112712D011									
		SEKR0550C703S112712D016									
		SEKR0550C703S112712D019									
		SEKR0550C703S112712D022									
DUP OF 483	SEKR0550C704	SEKR0550C704S112812DX		Heavy					609		
		SEKR0550C704S112812D006									
		SEKR0550C704S112812D011									
		SEKR0550C704S112812D016									
		SEKR0550C704S112812D020									
501	SEKR0550C701	SEKR0550C701D072612DX		Moderate		14.10	8.7		0	335	408
		SEKR0550C701S072612DX									
		SEKR0550C701S072612D005									
		SEKR0550C701S072612D010									
		SEKR0550C701S072612D014									
		SEKR0550C701S072612D019									
502	SEKR0575C701	SEKR0575C701S072612DX		Moderate					0		
		SEKR0575C701S072612D007									
		SEKR0575C701S072612D013									
		SEKR0575C701S072612D019									
503	SEKR1575C702	SEKR1575C702S072612DX		Moderate					930		
		SEKR1575C702S072612D005									
		SEKR1575C702S072612D010									
		SEKR1575C702S072612D015									
		SEKR1575C702S072612D019									
505	SEKR0525C702	SEKR0525C702S112812DX		Moderate					409		
		SEKR0525C702S112812D006									
		SEKR0525C702S112812D011									
		SEKR0525C702S112812D016									
		SEKR0525C702S112812D020									
		SEKR0525C702S112812D024									
521	SEKR0475C701	SEKR0475C701S072612DX		Light		41.34	1.5		0	20	12
		SEKR0475C701S072612D004									
		SEKR0475C701S072612D008									
		SEKR0475C701S072612D012									
		SEKR0475C701S072612D017									
		SEKR0475C701S072612D019									
523	SEKR0575C702	SEKR0575C702S112712DX		Light					0		
		SEKR0575C702S112712D006									
		SEKR0575C702S112712D011									
		SEKR0575C702S112712D016									
		SEKR0575C702S112712D020									
		SEKR0575C702S112712D023									
		SEKR0575C702S112712D027									
		SEKR0575C702S112712D028									
524	SEKR0550C705	SEKR0550C705S112712DX		Light					80		
		SEKR0550C705S112712D006									
		SEKR0550C705S112712D011									
		SEKR0550C705D112712D016									
		SEKR0550C705S112712D016									
		SEKR0550C705S112712D020									
		SEKR0550C705S112712D025									
		SEKR0550C705S112712D028									
		SEKR0550C705S112712D030									
525	SEKR0500C701	SEKR0500C701S112912DX		Light					0		
		SEKR0500C701D112912D006									
		SEKR0500C701S112912D006									
		SEKR0500C701S112912D012									
561	SEKR3850C701	SEKR3850C701S072612DX	Lake	Light	0.29	305.58	0	0.9285	0	0	0
		SEKR3850C701S072612D007									
		SEKR3850C701S072612D013									
		SEKR3850C701S072612D019									
562	SEKR3875C701	SEKR3875C701S072612DX		Light					0		
		SEKR3875C701S072612D006									
		SEKR3875C701S072612D012									
		SEKR3875C701S072612D017									
563	SEKR3850C702	SEKR3850C702S072612DX		Light					0		
		SEKR3850C702S072612D006									
		SEKR3850C702S072612D010									
		SEKR3850C702S072612D014									
		SEKR3850C702S072612D017									
		SEKR3850C702S072612D021									

Table 5. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
601	SEKR3800C701	SEKR3800C701S072612DX	ML Fan	Heavy	0.51	0.54	0	0.9285	0	0	0
		SEKR3800C701S072612D003									
		SEKR3800C701S072612D005									
		SEKR3800C701S072612D010									
		SEKR3800C701S072612D015									
		SEKR3800C701S072612D017									
621	SEKR3800C702	SEKR3800C702D072612DX		Moderate		1.91	0.6		3742	1871	32
		SEKR3800C702S072612DX									
		SEKR3800C702S072612D005									
		SEKR3800C702S072612D009									
622	SEKR3800C703	SEKR3800C703S072612DX		Moderate					0		
		SEKR3800C703S072612D007									
		SEKR3800C703S072612D010									
		SEKR3800C703S072612D014									
641	SEKR3800C704	SEKR3800C704S072712DX		Light		118.71	1.32		0	62	146
		SEKR3800C704S072712D006									
		SEKR3800C704S072712D011									
		SEKR3800C704S072712D014									
642	SEKR3850C703	SEKR3850C703S072712DX		Light					0		
		SEKR3850C703S072712D002									
		SEKR3850C703S072712D005									
		SEKR3850C703S072712D009									
		SEKR3850C703S072712D015									
643	SEKR3800C705	SEKR3800C705S072712DX		Light					272		
		SEKR3800C705S072712D002									
		SEKR3800C705S072712D004									
		SEKR3800C705S072712D009									
		SEKR3800C705S072712D014									
644	SEKR3825C701	SEKR3825C701S072712DX		Light					0		
		SEKR3825C701S072712D003									
		SEKR3825C701S072712D009									
		SEKR3825C701S072712D015									
645	SEKR3800C706	SEKR3800C706S072712DX		Light					40		
		SEKR3800C706S072712D004									
		SEKR3800C706S072712D009									
		SEKR3800C706S072712D014									
		SEKR3800C706S072712D020									
		SEKR3800C706S072712D025									

Total: 17,963

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
2	SEKR2025C701	SEKR2025C701S072412DX	Anthropogenic Channel	Heavy	1.14	0.23	7.2	0.9285	57	136	7
		SEKR2025C701S072412D007									
3	SEKR2025C702	SEKR2025C702S072412DX		Heavy					215		
		SEKR2025C702S072412D005									
		SEKR2025C702S072412D007									
		SEKR2025C702S072412D011									
		SEKR2025C702S072412D017									
		SEKR2025C702S072412D020									
21	SEKR2000C701	SEKR2000C701S072412DX		Moderate		0.42	6		57	57	5
		SEKR2000C701S072412D005									
		SEKR2000C701S072412D010									
		SEKR2000C701S072412D014									
		SEKR2000C701S072412D016									
		SEKR2000C701S072412D020									
		SEKR2000C701S072412D023									
		SEKR2000C701S072412D028									
41	SEKR1850C701	SEKR1850C701S072412DX		Light		11.65	5.2		79	64	129
		SEKR1850C701S072412D003									
		SEKR1850C701S072412D008									
		SEKR1850C701S072412D015									
		SEKR1850C701S072412D020									
		SEKR1850C701S072412D027									
42	SEKR1950C701	SEKR1950C701S072412DX		Light					57		
		SEKR1950C701S072412D006									
		SEKR1950C701S072412D008									
43	SEKR2025C703	SEKR2025C703S072412DX		Light					57		
		SEKR2025C703S072412D004									
		SEKR2025C703S072412D007									
81	SEKR3650C701	SEKR3650C701S072512DX	Backwater	Heavy	0.38	5.26	9.2	0.9285	57	208	112
		SEKR3650C701S072512D006									
		SEKR3650C701S072512D010									
		SEKR3650C701S072512D015									
		SEKR3650C701S072512D019									
		SEKR3650C701S072512D021									
82	SEKR3750C701	SEKR3750C701S072512DX		Heavy					57		
		SEKR3750C701S072512D006									
		SEKR3750C701S072512D010									
		SEKR3750C701S072512D014									
		SEKR3750C701S072512D019									
		SEKR3750C701S072512D022									
83	SEKR1200C701	SEKR1200C701S072512DX		Heavy					510		
		SEKR1200C701S072512D006									
		SEKR1200C701S072512D011									
		SEKR1200C701S072512D016									
101	SEKR1050C701	SEKR1050C701S072512DX		Moderate		12.79	8.1		165	119	137
		SEKR1050C701S072512D003									
		SEKR1050C701S072512D007									
103	SEKR3725C709	SEKR3725C709S113012DX		Moderate					167		
		SEKR3725C709S113012D005									
		SEKR3725C709S113012D008									
		SEKR3725C709D113012D008									
		SEKR3725C709S113012D011									
		SEKR3725C709S113012D015									
		SEKR3725C709S113012D018									
104	SEKR2625C701	SEKR2625C701S112912DX		Moderate					57		
		SEKR2625C701S112912D006									
		SEKR2625C701S112912D011									
DUP OF104	SEKR2625C702	SEKR2625C702S112912DX		Moderate					88		
		SEKR2625C702S112912D005									
		SEKR2625C702S112912D010									
121	SEKR0425C701	SEKR0425C701S072512DX		Light		49.56	7.2		446	218	865
		SEKR0425C701S072512D007									
		SEKR0425C701S072512D011									
		SEKR0425C701S072512D016									
		SEKR0425C701S072512D020									
		SEKR0425C701S072512D022									
122	SEKR3075C701	SEKR3075C701S072712DX		Light					57		
		SEKR3075C701S072712D005									
		SEKR3075C701S072712D009									
		SEKR3075C701S072712D012									
		SEKR3075C701S072712D016									
		SEKR3075C701S072712D021									
		SEKR3075C701S072712D025									
123	SEKR2175C701	SEKR2175C701S072712DX		Light					151		
		SEKR2175C701S072712D002									
		SEKR2175C701S072712D005									
		SEKR2175C701S072712D006									
		SEKR2175C701S072712D010									
		SEKR2175C701S072712D014									
		SEKR2175C701S072712D017									

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
161	SEKR3775C702	SEKR3775C702S072712DX	Channel Deposit	Heavy	0.69	5.42	9.2	0.9285	261	148	148
		SEKR3775C702S072712D005									
		SEKR3775C702S072712D009									
		SEKR3775C702S072712D012									
162	SEKR2525C701	SEKR2525C701S112912DX		Heavy					57		
		SEKR2525C701D112912D006									
		SEKR2525C701S112912D006									
		SEKR2525C701S112912D012									
163	SEKR3700C701	SEKR3700C701S112712DX		Heavy					125		
		SEKR3700C701S112712D005									
		SEKR3700C701S112712D008									
		SEKR3700C701S112712D010									
		SEKR3700C701S112712D015									
		SEKR3700C701S112712D020									
181	SEKR2150C701	SEKR2150C701S072512DX		Moderate		17.17	10.4		57	187	675
		SEKR2150C701S072512D004									
		SEKR2150C701S072512D008									
		SEKR2150C701S072512D012									
		SEKR2150C701S072512D014									
		SEKR2150C701S072512D020									
		SEKR2150C701S072512D026									
182	SEKR3725C702	SEKR3725C702S072712DX		Moderate					123		
		SEKR3725C702S072712D004									
		SEKR3725C702S072712D010									
		SEKR3725C702S072712D015									
		SEKR3725C702S072712D019									
		SEKR3725C702S072712D022									
		SEKR3725C702S072712D026									
183	SEKR3775C701	SEKR3775C701S072712DX		Moderate					383		
		SEKR3775C701S072712D006									
		SEKR3775C701S072712D007									
		SEKR3775C701S072712D009									
		SEKR3775C701S072712D011									
		SEKR3775C701S072712D013									
201	SEKR0400C701	SEKR0400C701S072512DX		Light		122.21	15.2		344	249	9,344
		SEKR0400C701S072512D003									
		SEKR0400C701S072512D008									
		SEKR0400C701S072512D013									
		SEKR0400C701S072512D017									
		SEKR0400C701S072512D021									
202	SEKR1500C701	SEKR1500C701S072612DX		Light					378		
		SEKR1500C701S072612D003									
		SEKR1500C701S072612D006									
		SEKR1500C701S072612D009									
		SEKR1500C701S072612D013									
		SEKR1500C701S072612D019									
		SEKR1500C701S072612D024									
		SEKR1500C701S072612D028									
203	SEKR2725C701	SEKR2725C701S072712DX		Light					26		
		SEKR2725C701S072712D007									
		SEKR2725C701S072712D013									
		SEKR2725C701S072712D019									
		SEKR2725C701S072712D022									
241	SEKR1475C702	SEKR1475C702S072612DX		Heavy		2.68	8.8		116	138	80
		SEKR1475C702S072612D004									
		SEKR1475C702S072612D007									
		SEKR1475C702S072612D009									
		SEKR1475C702S072612D013									
		SEKR1475C702S072612D015									
		SEKR1475C702S072612D019									
		SEKR1475C702S072612D020									
242	SEKR2150C703	SEKR2150C703S072712DX		Heavy					169		
		SEKR2150C703S072712D005									
		SEKR2150C703S072712D010									
243	SEKR2150C704	SEKR2150C704S072712DX		Heavy					128		
		SEKR2150C704S072712D003									
		SEKR2150C704S072712D005									
		SEKR2150C704S072712D010									
		SEKR2150C704S072712D013									
261	SEKR0900C702	SEKR0900C702S112712DX		Moderate					179		
		SEKR0900C702S112712D006									
		SEKR0900C702D112712D011									
		SEKR0900C702S112712D011									
		SEKR0900C702S112712D014									
		SEKR0900C702S112712D017									
		SEKR0900C702S112712D019									

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
262	SEKR1425C701	SEKR1425C701S113012DX	Cutoff/Oxbow	Moderate	0.84	2.90	8.4	0.9285	198	486	291
		SEKR1425C701S113012D004									
		SEKR1425C701S113012D010									
		SEKR1425C701S113012D013									
		SEKR1425C701S113012D016									
		SEKR1425C701S113012D018									
263	SEKR2300C701	SEKR2300C701S113012DX		Moderate					1082		
		SEKR2300C701D113012D003									
		SEKR2300C701S113012D003									
		SEKR2300C701S113012D007									
		SEKR2300C701S113012D011									
281	SEKR2200C701	SEKR2200C701S072412DX		Light		10.14	10.4		281	284	737
		SEKR2200C701S072412D005									
		SEKR2200C701S072412D008									
		SEKR2200C701S072412D013									
		SEKR2200C701S072412D018									
		SEKR2200C701S072412D022									
		SEKR2200C701S072412D026									
		SEKR2200C701S072412D028									
		SEKR2200C701S072412D034									
282	SEKR2125C701	SEKR2125C701S072412DX		Light					512		
		SEKR2125C701S072412D006									
		SEKR2125C701S072412D010									
		SEKR2125C701S072412D014									
		SEKR2125C701S072412D020									
283	SEKR2800C701	SEKR2800C701S072412DX		Light					60		
		SEKR2800C701S072412D007									
		SEKR2800C701S072412D012									
		SEKR2800C701S072412D017									
321	SEKR3750C704	SEKR3750C704S112712DX	Delta	Heavy	0.77	7.73	15.6	0.9285	213	112	305
		SEKR3750C704S112712D006									
		SEKR3750C704S112712D011									
		SEKR3750C704S112712D016									
		SEKR3750C704S112712D021									
		SEKR3750C704S112712D025									
		SEKR3750C704S112712D029									
		SEKR3750C704S112712D031									
322	SEKR3750C705	SEKR3750C705S112812DX		Heavy					85		
		SEKR3750C705D112812D006									
		SEKR3750C705S112812D006									
		SEKR3750C705S112812D011									
		SEKR3750C705S112812D016									
323	SEKR3750C703	SEKR3750C703S112812DX		Heavy					38		
		SEKR3750C703S112812D007									
		SEKR3750C703D112812D012									
		SEKR3750C703S112812D012									
		SEKR3750C703S112812D017									
		SEKR3750C703S112812D022									
		SEKR3750C703S112812D028									
341	SEKR3675C701	SEKR3675C701S112712DX		Moderate		26.84	11.60		57	128	896
		SEKR3675C701D112712D006									
		SEKR3675C701S112712D006									
		SEKR3675C701S112712D011									
		SEKR3675C701S112712D014									
		SEKR3675C701S112712D017									
		SEKR3675C701S112712D021									
342	SEKR3750C707	SEKR3750C707S112812DX		Moderate					81		
		SEKR3750C707D112812D006									
		SEKR3750C707S112812D006									
		SEKR3750C707S112812D010									
		SEKR3750C707S112812D013									
		SEKR3750C707S112812D016									
		SEKR3750C707S112812D021									
343	SEKR3775C704	SEKR3775C704S112712DX		Moderate					115		
		SEKR3775C704S112712D007									
		SEKR3775C704S112712D012									
		SEKR3775C704S112712D016									
		SEKR3775C704S112712D020									
344	SEKR3750C708	SEKR3750C708S112912DX		Moderate					69		
		SEKR3750C708S112912D006									
		SEKR3750C708D112912D011									
		SEKR3750C708S112912D011									
		SEKR3750C708S112912D016									
		SEKR3750C708S112912D021									
		SEKR3750C708S112912D026									
345	SEKR3750C709	SEKR3750C709S112712DX		Moderate					133		
		SEKR3750C709D112712D006									
		SEKR3750C709S112712D006									
		SEKR3750C709S112712D011									
		SEKR3750C709S112712D016									
DUP OF 345	SEKR3750C710	SEKR3750C710S112812DX		Moderate					312		
		SEKR3750C710S112812D005									
		SEKR3750C710S112812D008									
		SEKR3750C710S112812D012									
		SEKR3750C710S112812D018									

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
361	SEKR3725C704	SEKR3725C704S112812DX		Light					33		
		SEKR3725C704S112812D006									
		SEKR3725C704S112812D011									
		SEKR3725C704S112812D017									
		SEKR3725C704S112812D021									
		SEKR3725C704S112812D025									
		SEKR3725C704S112812D030									
362	SEKR3725C705	SEKR3725C705S112812DX		Light					57		
		SEKR3725C705D112812D006									
		SEKR3725C705S112812D006									
		SEKR3725C705S112812D010									
		SEKR3725C705S112812D013									
		SEKR3725C705S112812D019									
363	SEKR3750C706	SEKR3750C706S112912DX		Light		36.63	13.32		72	73	803
		SEKR3750C706S112912D006									
		SEKR3750C706D112912D009									
		SEKR3750C706S112912D009									
		SEKR3750C706S112912D012									
364	SEKR3775C703	SEKR3775C703S112812DX		Light					57		
		SEKR3775C703D112812D006									
		SEKR3775C703S112812D006									
		SEKR3775C703S112812D011									
		SEKR3775C703S112812D015									
365	SEKR3725C706	SEKR3725C706S112912DX		Light					148		
		SEKR3725C706S112912D002									
		SEKR3725C706S112912D004									
		SEKR3725C706S112912D005									
		SEKR3725C706S112912D010									
		SEKR3725C706S112912D013									
		SEKR3725C706S112912D015									
401	SEKR2400C701	SEKR2400C701S072512DX	Depositional Bar	Heavy	0.92	2.58	8.4	0.9285	40	121	71
		SEKR2400C701S072512D004									
		SEKR2400C701S072512D008									
		SEKR2400C701S072512D012									
		SEKR2400C701S072512D015									
402	SEKR2475C701	SEKR2475C701S072512DX		Heavy					253		
		SEKR2475C701S072512D004									
		SEKR2475C701S072512D007									
		SEKR2475C701S072512D010									
403	SEKR3725C701	SEKR3725C701S072512DX		Heavy					71		
		SEKR3725C701S072512D007									
		SEKR3725C701S072512D013									
		SEKR3725C701S072512D015									
		SEKR3725C701S072512D020									
421	SEKR1075C701	SEKR1075C701S112812DX		Moderate		5.38	9.60		2582	990	1,376
		SEKR1075C701S112812D005									
		SEKR1075C701S112812D009									
		SEKR1075C701S112812D014									
		SEKR1075C701S112812D019									
423	SEKR1100C701	SEKR1100C701S112912DX		Moderate					350		
		SEKR1100C701S112912D005									
		SEKR1100C701S112912D009									
		SEKR1100C701S112912D013									
424	SEKR3725C708	SEKR3725C708S112912DX		Moderate					39		
		SEKR3725C708D112912D005									
		SEKR3725C708S112912D005									
		SEKR3725C708S112912D009									
		SEKR3725C708S112912D011									
441	SEKR0475C702	SEKR0475C702S072612DX		Light		34.51	6.8		26	976	6,161
		SEKR0475C702S072612D005									
		SEKR0475C702S072612D009									
		SEKR0475C702S072612D013									
		SEKR0475C702S072612D019									
		SEKR0475C702S072612D023									
		SEKR0475C702S072612D025									
442	SEKR1075C702	SEKR1075C702S113012DX		Light					2844		
		SEKR1075C702S113012D006									
443	SEKR2150C705	SEKR2150C705S112912DX		Light					57		
		SEKR2150C705S112912D006									
		SEKR2150C705S112912D011									

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
481	SEKR1575C701	SEKR1575C701S072612DX	Impoundment	Heavy	0.34	2.26	19.95	0.9285	329	262	118
		SEKR1575C701S072612D007									
		SEKR1575C701S072612D013									
		SEKR1575C701S072612D019									
482	SEKR1550C701	SEKR1550C701S112812DX		Heavy					602		
		SEKR1550C701S112812D006									
		SEKR1550C701S112812D011									
		SEKR1550C701S112812D016									
		SEKR1550C701S112812D021									
		SEKR1550C701S112812D026									
483	SEKR0550C703	SEKR0550C703S112712DX		Heavy					50		
		SEKR0550C703S112712D006									
		SEKR0550C703S112712D011									
		SEKR0550C703S112712D016									
		SEKR0550C703S112712D019									
		SEKR0550C703S112712D022									
DUP OF 483	SEKR0550C704	SEKR0550C704S112812DX		Heavy					68		
		SEKR0550C704S112812D006									
		SEKR0550C704S112812D011									
		SEKR0550C704S112812D016									
		SEKR0550C704S112812D020									
501	SEKR0550C701	SEKR0550C701D072612DX		Moderate		14.10	13.8		26	237	459
		SEKR0550C701S072612DX									
		SEKR0550C701S072612D005									
		SEKR0550C701S072612D010									
		SEKR0550C701S072612D014									
		SEKR0550C701S072612D019									
502	SEKR0575C701	SEKR0575C701S072612DX		Moderate					26		
		SEKR0575C701S072612D007									
		SEKR0575C701S072612D013									
		SEKR0575C701S072612D019									
503	SEKR1575C702	SEKR1575C702S072612DX		Moderate					478		
		SEKR1575C702S072612D005									
		SEKR1575C702S072612D010									
		SEKR1575C702S072612D015									
		SEKR1575C702S072612D019									
505	SEKR0525C702	SEKR0525C702S112812DX		Moderate					420		
		SEKR0525C702S112812D006									
		SEKR0525C702S112812D011									
		SEKR0525C702S112812D016									
		SEKR0525C702S112812D020									
		SEKR0525C702S112812D024									
521	SEKR0475C701	SEKR0475C701S072612DX		Light		41.34	10.8		26	29	130
		SEKR0475C701S072612D004									
		SEKR0475C701S072612D008									
		SEKR0475C701S072612D012									
		SEKR0475C701S072612D017									
		SEKR0475C701S072612D019									
523	SEKR0575C702	SEKR0575C702S112712DX		Light					26		
		SEKR0575C702S112712D006									
		SEKR0575C702S112712D011									
		SEKR0575C702S112712D016									
		SEKR0575C702S112712D020									
		SEKR0575C702S112712D023									
		SEKR0575C702S112712D027									
		SEKR0575C702S112712D028									
524	SEKR0550C705	SEKR0550C705S112712DX		Light					40		
		SEKR0550C705S112712D006									
		SEKR0550C705S112712D011									
		SEKR0550C705D112712D016									
		SEKR0550C705S112712D016									
		SEKR0550C705S112712D020									
		SEKR0550C705S112712D025									
		SEKR0550C705S112712D028									
		SEKR0550C705S112712D030									
525	SEKR0500C701	SEKR0500C701S112912DX		Light					26		
		SEKR0500C701D112912D006									
		SEKR0500C701S112912D006									
		SEKR0500C701S112912D012									
561	SEKR3850C701	SEKR3850C701S072612DX	Lake	Light	0.29	305.58	7.6	0.9285	57	57	1,113
		SEKR3850C701S072612D007									
		SEKR3850C701S072612D013									
		SEKR3850C701S072612D019									
562	SEKR3875C701	SEKR3875C701S072612DX		Light					57		
		SEKR3875C701S072612D006									
		SEKR3875C701S072612D012									
		SEKR3875C701S072612D017									
563	SEKR3850C702	SEKR3850C702S072612DX		Light					57		
		SEKR3850C702S072612D006									
		SEKR3850C702S072612D010									
		SEKR3850C702S072612D014									
		SEKR3850C702S072612D017									
		SEKR3850C702S072612D021									

Table 6. Quantification of Line 6B Oil in Kalamazoo River Sediment (NewFields) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
601	SEKR3800C701	SEKR3800C701S072612DX	ML Fan	Heavy	0.51	0.54	3.6	0.9285	57	57	2
		SEKR3800C701S072612D003									
		SEKR3800C701S072612D005									
		SEKR3800C701S072612D010									
		SEKR3800C701S072612D015									
		SEKR3800C701S072612D017									
621	SEKR3800C702	SEKR3800C702D072612DX		Moderate		1.91	9.6		466	261	71
		SEKR3800C702S072612DX									
		SEKR3800C702S072612D005									
		SEKR3800C702S072612D009									
622	SEKR3800C703	SEKR3800C703S072612DX		Moderate					57		
		SEKR3800C703S072612D007									
		SEKR3800C703S072612D010									
		SEKR3800C703S072612D014									
641	SEKR3800C704	SEKR3800C704S072712DX		Light		118.71	4.56		57	69	560
		SEKR3800C704S072712D006									
		SEKR3800C704S072712D011									
		SEKR3800C704S072712D014									
642	SEKR3850C703	SEKR3850C703S072712DX		Light					57		
		SEKR3850C703S072712D002									
		SEKR3850C703S072712D005									
		SEKR3850C703S072712D009									
		SEKR3850C703S072712D015									
643	SEKR3800C705	SEKR3800C705S072712DX		Light					137		
		SEKR3800C705S072712D002									
		SEKR3800C705S072712D004									
		SEKR3800C705S072712D009									
		SEKR3800C705S072712D014									
644	SEKR3825C701	SEKR3825C701S072712DX		Light					57		
		SEKR3825C701S072712D003									
		SEKR3825C701S072712D009									
		SEKR3825C701S072712D015									
645	SEKR3800C706	SEKR3800C706S072712DX		Light					40		
		SEKR3800C706S072712D004									
		SEKR3800C706S072712D009									
		SEKR3800C706S072712D014									
		SEKR3800C706S072712D020									
		SEKR3800C706S072712D025									

Total: 24,595

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
2	SEKR2025C701	SEKR2025C701S072412DX	Anthropogenic Channel	Heavy	1.14	0.23	0	0.9285	0	0	0
		SEKR2025C701S072412D007									
3	SEKR2025C702	SEKR2025C702S072412DX		Heavy					0		
		SEKR2025C702S072412D005									
		SEKR2025C702S072412D007									
		SEKR2025C702S072412D011									
		SEKR2025C702S072412D017									
		SEKR2025C702S072412D020									
21	SEKR2000C701	SEKR2000C701S072412DX		Moderate		0.42	0		0	0	0
		SEKR2000C701S072412D005									
		SEKR2000C701S072412D010									
		SEKR2000C701S072412D014									
		SEKR2000C701S072412D016									
		SEKR2000C701S072412D020									
		SEKR2000C701S072412D023									
		SEKR2000C701S072412D028									
41	SEKR1850C701	SEKR1850C701S072412DX		Light		11.65	0		0	0	0
		SEKR1850C701S072412D003									
		SEKR1850C701S072412D008									
		SEKR1850C701S072412D015									
		SEKR1850C701S072412D020									
		SEKR1850C701S072412D027									
42	SEKR1950C701	SEKR1950C701S072412DX		Light					0		
		SEKR1950C701S072412D006									
		SEKR1950C701S072412D008									
43	SEKR2025C703	SEKR2025C703S072412DX		Light					0		
		SEKR2025C703S072412D004									
		SEKR2025C703S072412D007									
81	SEKR3650C701	SEKR3650C701S072512DX	Backwater	Heavy	0.38	5.26	4	0.9285	0	34	8
		SEKR3650C701S072512D006									
		SEKR3650C701S072512D010									
		SEKR3650C701S072512D015									
		SEKR3650C701S072512D019									
		SEKR3650C701S072512D021									
82	SEKR3750C701	SEKR3750C701S072512DX		Heavy					0		
		SEKR3750C701S072512D006									
		SEKR3750C701S072512D010									
		SEKR3750C701S072512D014									
		SEKR3750C701S072512D019									
		SEKR3750C701S072512D022									
83	SEKR1200C701	SEKR1200C701S072512DX		Heavy					102		
		SEKR1200C701S072512D006									
		SEKR1200C701S072512D011									
		SEKR1200C701S072512D016									
101	SEKR1050C701	SEKR1050C701S072512DX		Moderate		12.79	1.56		58	44	10
		SEKR1050C701S072512D003									
		SEKR1050C701S072512D007									
103	SEKR3725C709	SEKR3725C709S113012DX		Moderate					120		
		SEKR3725C709S113012D005									
		SEKR3725C709S113012D008									
		SEKR3725C709D113012D008									
		SEKR3725C709S113012D011									
		SEKR3725C709S113012D015									
		SEKR3725C709S113012D018									
104	SEKR2625C701	SEKR2625C701S112912DX		Moderate					0		
		SEKR2625C701S112912D006									
		SEKR2625C701S112912D011									
DUP OF104	SEKR2625C702	SEKR2625C702S112912DX		Moderate					0		
		SEKR2625C702S112912D005									
		SEKR2625C702S112912D010									
121	SEKR0425C701	SEKR0425C701S072512DX		Light		49.56	0.4		0	114	25
		SEKR0425C701S072512D007									
		SEKR0425C701S072512D011									
		SEKR0425C701S072512D016									
		SEKR0425C701S072512D020									
		SEKR0425C701S072512D022									
122	SEKR3075C701	SEKR3075C701S072712DX		Light					0		
		SEKR3075C701S072712D005									
		SEKR3075C701S072712D009									
		SEKR3075C701S072712D012									
		SEKR3075C701S072712D016									
		SEKR3075C701S072712D021									
		SEKR3075C701S072712D025									
123	SEKR2175C701	SEKR2175C701S072712DX		Light					342		
		SEKR2175C701S072712D002									
		SEKR2175C701S072712D005									
		SEKR2175C701S072712D006									
		SEKR2175C701S072712D010									
		SEKR2175C701S072712D014									
		SEKR2175C701S072712D017									

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
161	SEKR3775C702	SEKR3775C702S072712DX	Channel Deposit	Heavy	0.69	5.42	1.68	0.9285	174	58	11
		SEKR3775C702S072712D005									
		SEKR3775C702S072712D009									
		SEKR3775C702S072712D012									
162	SEKR2525C701	SEKR2525C701S112912DX		Heavy					0		
		SEKR2525C701D112912D006									
		SEKR2525C701S112912D006									
		SEKR2525C701S112912D012									
163	SEKR3700C701	SEKR3700C701S112712DX		Heavy					0		
		SEKR3700C701S112712D005									
		SEKR3700C701S112712D008									
		SEKR3700C701S112712D010									
		SEKR3700C701S112712D015									
		SEKR3700C701S112712D020									
181	SEKR2150C701	SEKR2150C701S072512DX		Moderate		17.17	0		0	0	0
		SEKR2150C701S072512D004									
		SEKR2150C701S072512D008									
		SEKR2150C701S072512D012									
		SEKR2150C701S072512D014									
		SEKR2150C701S072512D020									
		SEKR2150C701S072512D026									
182	SEKR3725C702	SEKR3725C702S072712DX		Moderate					0		
		SEKR3725C702S072712D004									
		SEKR3725C702S072712D010									
		SEKR3725C702S072712D015									
		SEKR3725C702S072712D019									
		SEKR3725C702S072712D022									
		SEKR3725C702S072712D026									
183	SEKR3775C701	SEKR3775C701S072712DX		Moderate					0		
		SEKR3775C701S072712D006									
		SEKR3775C701S072712D007									
		SEKR3775C701S072712D009									
		SEKR3775C701S072712D011									
		SEKR3775C701S072712D013									
201	SEKR0400C701	SEKR0400C701S072512DX		Light		122.21	3.28		216	112	907
		SEKR0400C701S072512D003									
		SEKR0400C701S072512D008									
		SEKR0400C701S072512D013									
		SEKR0400C701S072512D017									
		SEKR0400C701S072512D021									
202	SEKR1500C701	SEKR1500C701S072612DX_reanalyzed		Light					120		
		SEKR1500C701S072612D003									
		SEKR1500C701S072612D006									
		SEKR1500C701S072612D009									
		SEKR1500C701S072612D013									
		SEKR1500C701S072612D019									
		SEKR1500C701S072612D024									
		SEKR1500C701S072612D028									
203	SEKR2725C701	SEKR2725C701S072712DX		Light					0		
		SEKR2725C701S072712D007									
		SEKR2725C701S072712D013									
		SEKR2725C701S072712D019									
		SEKR2725C701S072712D022									
241	SEKR1475C702	SEKR1475C702S072612DX_reanalyzed		Heavy		2.68	0		0	0	0
		SEKR1475C702S072612D004									
		SEKR1475C702S072612D007									
		SEKR1475C702S072612D009									
		SEKR1475C702S072612D013									
		SEKR1475C702S072612D015									
		SEKR1475C702S072612D019									
		SEKR1475C702S072612D020									
242	SEKR2150C703	SEKR2150C703S072712DX		Heavy					0		
		SEKR2150C703S072712D005									
		SEKR2150C703S072712D010									
243	SEKR2150C704	SEKR2150C704S072712DX		Heavy					0		
		SEKR2150C704S072712D003									
		SEKR2150C704S072712D005									
		SEKR2150C704S072712D010									
		SEKR2150C704S072712D013									
261	SEKR0900C702	SEKR0900C702S112712DX		Moderate					120		
		SEKR0900C702S112712D006									
		SEKR0900C702D112712D011									
		SEKR0900C702S112712D011									
		SEKR0900C702S112712D014									
		SEKR0900C702S112712D017									
		SEKR0900C702S112712D019									

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
262	SEKR1425C701	SEKR1425C701S113012DX	Cutoff/Oxbow	Moderate	0.84	2.90	3.12	0.9285	109	126	28
		SEKR1425C701S113012D004									
		SEKR1425C701S113012D010									
		SEKR1425C701S113012D013									
		SEKR1425C701S113012D016									
		SEKR1425C701S113012D018									
263	SEKR2300C701	SEKR2300C701S113012DX		Moderate					149		
		SEKR2300C701D113012D003									
		SEKR2300C701S113012D003									
		SEKR2300C701S113012D007									
		SEKR2300C701S113012D011									
281	SEKR2200C701	SEKR2200C701S072412DX		Light		10.14	2.4		0	77	46
		SEKR2200C701S072412D005									
		SEKR2200C701S072412D008									
		SEKR2200C701S072412D013									
		SEKR2200C701S072412D018									
		SEKR2200C701S072412D022									
		SEKR2200C701S072412D026									
		SEKR2200C701S072412D028									
		SEKR2200C701S072412D034									
282	SEKR2125C701	SEKR2125C701S072412DX		Light					231		
		SEKR2125C701S072412D006									
		SEKR2125C701S072412D010									
		SEKR2125C701S072412D014									
		SEKR2125C701S072412D020									
283	SEKR2800C701	SEKR2800C701S072412DX		Light					0		
		SEKR2800C701S072412D007									
		SEKR2800C701S072412D012									
		SEKR2800C701S072412D017									
321	SEKR3750C704	SEKR3750C704S112712DX	Delta	Heavy	0.77	7.73	0	0.9285	0	0	0
		SEKR3750C704S112712D006									
		SEKR3750C704S112712D011									
		SEKR3750C704S112712D016									
		SEKR3750C704S112712D021									
		SEKR3750C704S112712D025									
		SEKR3750C704S112712D029									
		SEKR3750C704S112712D031									
322	SEKR3750C705	SEKR3750C705S112812DX		Heavy					0		
		SEKR3750C705D112812D006									
		SEKR3750C705S112812D006									
		SEKR3750C705S112812D011									
		SEKR3750C705S112812D016									
323	SEKR3750C703	SEKR3750C703S112812DX		Heavy					0		
		SEKR3750C703S112812D007									
		SEKR3750C703D112812D012									
		SEKR3750C703S112812D012									
		SEKR3750C703S112812D017									
		SEKR3750C703S112812D022									
		SEKR3750C703S112812D028									
341	SEKR3675C701	SEKR3675C701S112712DX		Moderate		26.84	0.16		0	174	17
		SEKR3675C701D112712D006									
		SEKR3675C701S112712D006									
		SEKR3675C701S112712D011									
		SEKR3675C701S112712D014									
		SEKR3675C701S112712D017									
		SEKR3675C701S112712D021									
342	SEKR3750C707	SEKR3750C707S112812DX		Moderate					0		
		SEKR3750C707D112812D006									
		SEKR3750C707S112812D006									
		SEKR3750C707S112812D010									
		SEKR3750C707S112812D013									
		SEKR3750C707S112812D016									
		SEKR3750C707S112812D021									
343	SEKR3775C704	SEKR3775C704S112712DX		Moderate					1043		
		SEKR3775C704S112712D007									
		SEKR3775C704S112712D012									
		SEKR3775C704S112712D016									
		SEKR3775C704S112712D020									
344	SEKR3750C708	SEKR3750C708S112912DX		Moderate					0		
		SEKR3750C708S112912D006									
		SEKR3750C708D112912D011									
		SEKR3750C708S112912D011									
		SEKR3750C708S112912D016									
		SEKR3750C708S112912D021									
		SEKR3750C708S112912D026									
345	SEKR3750C709	SEKR3750C709S112712DX		Moderate					0		
		SEKR3750C709D112712D006									
		SEKR3750C709S112712D006									
		SEKR3750C709S112712D011									
		SEKR3750C709S112712D016									
DUP OF 345	SEKR3750C710	SEKR3750C710S112812DX		Moderate					0		
		SEKR3750C710S112812D005									
		SEKR3750C710S112812D008									
		SEKR3750C710S112812D012									
		SEKR3750C710S112812D018									

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
361	SEKR3725C704	SEKR3725C704S112812DX	Depositional Bar	Light	0.92	36.63	3.12	0.9285	0	27	70
		SEKR3725C704S112812D006									
		SEKR3725C704S112812D011									
		SEKR3725C704S112812D017									
		SEKR3725C704S112812D021									
		SEKR3725C704S112812D025									
		SEKR3725C704S112812D030									
362	SEKR3725C705	SEKR3725C705S112812DX		Light					0		
		SEKR3725C705D112812D006									
		SEKR3725C705S112812D006									
		SEKR3725C705S112812D010									
		SEKR3725C705S112812D013									
		SEKR3725C705S112812D019									
363	SEKR3750C706	SEKR3750C706S112912DX		Light					0		
		SEKR3750C706S112912D006									
		SEKR3750C706D112912D009									
		SEKR3750C706S112912D009									
		SEKR3750C706S112912D012									
364	SEKR3775C703	SEKR3775C703S112812DX		Light					0		
		SEKR3775C703D112812D006									
		SEKR3775C703S112812D006									
		SEKR3775C703S112812D011									
		SEKR3775C703S112812D015									
365	SEKR3725C706	SEKR3725C706S112912DX		Light					136		
		SEKR3725C706S112912D002									
		SEKR3725C706S112912D004									
		SEKR3725C706S112912D005									
		SEKR3725C706S112912D010									
		SEKR3725C706S112912D013									
		SEKR3725C706S112912D015									
401	SEKR2400C701	SEKR2400C701S072512DX		Heavy		2.58	1.28		0	67	6
		SEKR2400C701S072512D004									
		SEKR2400C701S072512D008									
		SEKR2400C701S072512D012									
		SEKR2400C701S072512D015									
402	SEKR2475C701	SEKR2475C701S072512DX		Heavy					201		
		SEKR2475C701S072512D004									
		SEKR2475C701S072512D007									
		SEKR2475C701S072512D010									
403	SEKR3725C701	SEKR3725C701S072512DX		Heavy					0		
		SEKR3725C701S072512D007									
		SEKR3725C701S072512D013									
		SEKR3725C701S072512D015									
		SEKR3725C701S072512D020									
421	SEKR1075C701	SEKR1075C701S112812DX		Moderate		5.38	5.28		426	142	108
		SEKR1075C701S112812D005									
		SEKR1075C701S112812D009									
		SEKR1075C701S112812D014									
		SEKR1075C701S112812D019									
423	SEKR1100C701	SEKR1100C701S112912DX		Moderate					0		
		SEKR1100C701S112912D005									
		SEKR1100C701S112912D009									
		SEKR1100C701S112912D013									
424	SEKR3725C708	SEKR3725C708S112912DX		Moderate					0		
		SEKR3725C708D112912D005									
		SEKR3725C708S112912D005									
		SEKR3725C708S112912D009									
		SEKR3725C708S112912D011									
441	SEKR0475C702	SEKR0475C702S072612DX_reanalyzed		Light		34.51	2.4		0	113	251
		SEKR0475C702S072612D005									
		SEKR0475C702S072612D009									
		SEKR0475C702S072612D013									
		SEKR0475C702S072612D019									
		SEKR0475C702S072612D023									
		SEKR0475C702S072612D025									
442	SEKR1075C702	SEKR1075C702S113012DX		Light					338		
		SEKR1075C702S113012D006									
443	SEKR2150C705	SEKR2150C705S112912DX		Light					0		
		SEKR2150C705S112912D006									
		SEKR2150C705S112912D011									

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
481	SEKR1575C701	SEKR1575C701S072612DX	Impoundment	Heavy	0.34	2.26	5.55	0.9285	74	75	9
		SEKR1575C701S072612D007									
		SEKR1575C701S072612D013									
		SEKR1575C701S072612D019									
482	SEKR1550C701	SEKR1550C701S112812DX		Heavy					164		
		SEKR1550C701S112812D006									
		SEKR1550C701S112812D011									
		SEKR1550C701S112812D016									
		SEKR1550C701S112812D021									
		SEKR1550C701S112812D026									
483	SEKR0550C703	SEKR0550C703S112712DX		Heavy					0		
		SEKR0550C703S112712D006									
		SEKR0550C703S112712D011									
		SEKR0550C703S112712D016									
		SEKR0550C703S112712D019									
		SEKR0550C703S112712D022									
DUP OF 483	SEKR0550C704	SEKR0550C704S112812DX		Heavy					60		
		SEKR0550C704S112812D006									
		SEKR0550C704S112812D011									
		SEKR0550C704S112812D016									
		SEKR0550C704S112812D020									
501	SEKR0550C701	SEKR0550C701D072612DX		Moderate		14.10	7.5		0	20	21
		SEKR0550C701S072612DX_reanalyzed									
		SEKR0550C701S072612D005									
		SEKR0550C701S072612D010									
		SEKR0550C701S072612D014									
		SEKR0550C701S072612D019									
502	SEKR0575C701	SEKR0575C701S072612DX_reanalyzed		Moderate					0		
		SEKR0575C701S072612D007									
		SEKR0575C701S072612D013									
		SEKR0575C701S072612D019									
503	SEKR1575C702	SEKR1575C702S072612DX		Moderate					65		
		SEKR1575C702S072612D005									
		SEKR1575C702S072612D010									
		SEKR1575C702S072612D015									
		SEKR1575C702S072612D019									
505	SEKR0525C702	SEKR0525C702S112812DX		Moderate					16		
		SEKR0525C702S112812D006									
		SEKR0525C702S112812D011									
		SEKR0525C702S112812D016									
		SEKR0525C702S112812D020									
		SEKR0525C702S112812D024									
521	SEKR0475C701	SEKR0475C701S072612DX_reanalyzed		Light		41.34	0		0	0	0
		SEKR0475C701S072612D004									
		SEKR0475C701S072612D008									
		SEKR0475C701S072612D012									
		SEKR0475C701S072612D017									
		SEKR0475C701S072612D019									
523	SEKR0575C702	SEKR0575C702S112712DX		Light					0		
		SEKR0575C702S112712D006									
		SEKR0575C702S112712D011									
		SEKR0575C702S112712D016									
		SEKR0575C702S112712D020									
		SEKR0575C702S112712D023									
		SEKR0575C702S112712D027									
		SEKR0575C702S112712D028									
524	SEKR0550C705	SEKR0550C705S112712DX		Light					0		
		SEKR0550C705S112712D006									
		SEKR0550C705S112712D011									
		SEKR0550C705D112712D016									
		SEKR0550C705S112712D016									
		SEKR0550C705S112712D020									
		SEKR0550C705S112712D025									
		SEKR0550C705S112712D028									
		SEKR0550C705S112712D030									
525	SEKR0500C701	SEKR0500C701S112912DX		Light					0		
		SEKR0500C701D112912D006									
		SEKR0500C701S112912D006									
		SEKR0500C701S112912D012									
561	SEKR3850C701	SEKR3850C701S072612DX_reanalyzed	Lake	Light	0.29	305.58	0	0.9285	0	0	0
		SEKR3850C701S072612D007									
		SEKR3850C701S072612D013									
		SEKR3850C701S072612D019									
562	SEKR3875C701	SEKR3875C701S072612DX_reanalyzed		Light					0		
		SEKR3875C701S072612D006									
		SEKR3875C701S072612D012									
		SEKR3875C701S072612D017									
563	SEKR3850C702	SEKR3850C702S072612DX_reanalyzed		Light					0		
		SEKR3850C702S072612D006									
		SEKR3850C702S072612D010									
		SEKR3850C702S072612D014									
		SEKR3850C702S072612D017									
		SEKR3850C702S072612D021									

Table 7. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Lower Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
601	SEKR3800C701	SEKR3800C701S072612DX_reanalyzed	ML Fan	Heavy	0.51	0.54	0	0.9285	0	0	0
		SEKR3800C701S072612D003									
		SEKR3800C701S072612D005									
		SEKR3800C701S072612D010									
		SEKR3800C701S072612D015									
		SEKR3800C701S072612D017									
621	SEKR3800C702	SEKR3800C702D072612DX_reanalyzed		Moderate		1.91	0		0	0	0
		SEKR3800C702S072612DX_reanalyzed									
		SEKR3800C702S072612D005									
		SEKR3800C702S072612D009									
622	SEKR3800C703	SEKR3800C703S072612DX_reanalyzed		Moderate					0		
		SEKR3800C703S072612D007									
		SEKR3800C703S072612D010									
		SEKR3800C703S072612D014									
641	SEKR3800C704	SEKR3800C704S072712DX		Light		118.71	0.192		0	28	10
		SEKR3800C704S072712D006									
		SEKR3800C704S072712D011									
		SEKR3800C704S072712D014									
642	SEKR3850C703	SEKR3850C703S072712DX		Light					0		
		SEKR3850C703S072712D002									
		SEKR3850C703S072712D005									
		SEKR3850C703S072712D009									
		SEKR3850C703S072712D015									
643	SEKR3800C705	SEKR3800C705S072712DX		Light					140		
		SEKR3800C705S072712D002									
		SEKR3800C705S072712D004									
		SEKR3800C705S072712D009									
		SEKR3800C705S072712D014									
644	SEKR3825C701	SEKR3825C701S072712DX		Light					0		
		SEKR3825C701S072712D003									
		SEKR3825C701S072712D009									
		SEKR3825C701S072712D015									
645	SEKR3800C706	SEKR3800C706S072712DX		Light					0		
		SEKR3800C706S072712D004									
		SEKR3800C706S072712D009									
		SEKR3800C706S072712D014									
		SEKR3800C706S072712D020									
		SEKR3800C706S072712D025									

Total: 1,528

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
2	SEKR2025C701	SEKR2025C701S072412DX	Anthropogenic Channel	Heavy	1.14	0.23	7.2	0.9285	57	57	3
		SEKR2025C701S072412D007									
3	SEKR2025C702	SEKR2025C702S072412DX		Heavy					57		
		SEKR2025C702S072412D005									
		SEKR2025C702S072412D007									
		SEKR2025C702S072412D011									
		SEKR2025C702S072412D017									
		SEKR2025C702S072412D020									
21	SEKR2000C701	SEKR2000C701S072412DX		Moderate		0.42	6		57	57	5
		SEKR2000C701S072412D005									
		SEKR2000C701S072412D010									
		SEKR2000C701S072412D014									
		SEKR2000C701S072412D016									
		SEKR2000C701S072412D020									
		SEKR2000C701S072412D023									
		SEKR2000C701S072412D028									
41	SEKR1850C701	SEKR1850C701S072412DX		Light		11.65	5.2		57	57	114
		SEKR1850C701S072412D003									
		SEKR1850C701S072412D008									
		SEKR1850C701S072412D015									
		SEKR1850C701S072412D020									
		SEKR1850C701S072412D027									
42	SEKR1950C701	SEKR1950C701S072412DX		Light					57		
		SEKR1950C701S072412D006									
		SEKR1950C701S072412D008									
43	SEKR2025C703	SEKR2025C703S072412DX		Light					57		
		SEKR2025C703S072412D004									
		SEKR2025C703S072412D007									
81	SEKR3650C701	SEKR3650C701S072512DX	Backwater	Heavy	0.38	5.26	9.2	0.9285	57	69	37
		SEKR3650C701S072512D006									
		SEKR3650C701S072512D010									
		SEKR3650C701S072512D015									
		SEKR3650C701S072512D019									
		SEKR3650C701S072512D021									
82	SEKR3750C701	SEKR3750C701S072512DX		Heavy					57		
		SEKR3750C701S072512D006									
		SEKR3750C701S072512D010									
		SEKR3750C701S072512D014									
		SEKR3750C701S072512D019									
		SEKR3750C701S072512D022									
83	SEKR1200C701	SEKR1200C701S072512DX		Heavy					95		
		SEKR1200C701S072512D006									
		SEKR1200C701S072512D011									
		SEKR1200C701S072512D016									
101	SEKR1050C701	SEKR1050C701S072512DX		Moderate		12.79	6.6		49	63	59
		SEKR1050C701S072512D003									
		SEKR1050C701S072512D007									
103	SEKR3725C709	SEKR3725C709S113012DX		Moderate					91		
		SEKR3725C709S113012D005									
		SEKR3725C709S113012D008									
		SEKR3725C709D113012D008									
		SEKR3725C709S113012D011									
		SEKR3725C709S113012D015									
		SEKR3725C709S113012D018									
104	SEKR2625C701	SEKR2625C701S112912DX		Moderate					57		
		SEKR2625C701S112912D006									
		SEKR2625C701S112912D011									
DUP OF104	SEKR2625C702	SEKR2625C702S112912DX		Moderate					57		
		SEKR2625C702S112912D005									
		SEKR2625C702S112912D010									
121	SEKR0425C701	SEKR0425C701S072512DX		Light		49.56	7.2		26	62	247
		SEKR0425C701S072512D007									
		SEKR0425C701S072512D011									
		SEKR0425C701S072512D016									
		SEKR0425C701S072512D020									
		SEKR0425C701S072512D022									
122	SEKR3075C701	SEKR3075C701S072712DX		Light					57		
		SEKR3075C701S072712D005									
		SEKR3075C701S072712D009									
		SEKR3075C701S072712D012									
		SEKR3075C701S072712D016									
		SEKR3075C701S072712D021									
		SEKR3075C701S072712D025									
123	SEKR2175C701	SEKR2175C701S072712DX		Light					104		
		SEKR2175C701S072712D002									
		SEKR2175C701S072712D005									
		SEKR2175C701S072712D006									
		SEKR2175C701S072712D010									
		SEKR2175C701S072712D014									
		SEKR2175C701S072712D017									

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
161	SEKR3775C702	SEKR3775C702S072712DX	Channel Deposit	Heavy	0.69	5.42	7.68	0.9285	111	78	66
		SEKR3775C702S072712D005									
		SEKR3775C702S072712D009									
		SEKR3775C702S072712D012									
162	SEKR2525C701	SEKR2525C701S112912DX		Heavy					57		
		SEKR2525C701D112912D006									
		SEKR2525C701S112912D006									
		SEKR2525C701S112912D012									
163	SEKR3700C701	SEKR3700C701S112712DX		Heavy					67		
		SEKR3700C701S112712D005									
		SEKR3700C701S112712D008									
		SEKR3700C701S112712D010									
		SEKR3700C701S112712D015									
		SEKR3700C701S112712D020									
181	SEKR2150C701	SEKR2150C701S072512DX		Moderate		17.17	5.6		57	57	110
		SEKR2150C701S072512D004									
		SEKR2150C701S072512D008									
		SEKR2150C701S072512D012									
		SEKR2150C701S072512D014									
		SEKR2150C701S072512D020									
		SEKR2150C701S072512D026									
182	SEKR3725C702	SEKR3725C702S072712DX		Moderate					57		
		SEKR3725C702S072712D004									
		SEKR3725C702S072712D010									
		SEKR3725C702S072712D015									
		SEKR3725C702S072712D019									
		SEKR3725C702S072712D022									
		SEKR3725C702S072712D026									
183	SEKR3775C701	SEKR3775C701S072712DX		Moderate					57		
		SEKR3775C701S072712D006									
		SEKR3775C701S072712D007									
		SEKR3775C701S072712D009									
		SEKR3775C701S072712D011									
		SEKR3775C701S072712D013									
201	SEKR0400C701	SEKR0400C701S072512DX		Light		122.21	15.2		166	86	3,224
		SEKR0400C701S072512D003									
		SEKR0400C701S072512D008									
		SEKR0400C701S072512D013									
		SEKR0400C701S072512D017									
		SEKR0400C701S072512D021									
202	SEKR1500C701	SEKR1500C701S072612DX_reanalyzed		Light					36		
		SEKR1500C701S072612D003									
		SEKR1500C701S072612D006									
		SEKR1500C701S072612D009									
		SEKR1500C701S072612D013									
		SEKR1500C701S072612D019									
		SEKR1500C701S072612D024									
		SEKR1500C701S072612D028									
203	SEKR2725C701	SEKR2725C701S072712DX		Light					57		
		SEKR2725C701S072712D007									
		SEKR2725C701S072712D013									
		SEKR2725C701S072712D019									
		SEKR2725C701S072712D022									
241	SEKR1475C702	SEKR1475C702S072612DX_reanalyzed		Heavy		2.68	4.8		26	46	15
		SEKR1475C702S072612D004									
		SEKR1475C702S072612D007									
		SEKR1475C702S072612D009									
		SEKR1475C702S072612D013									
		SEKR1475C702S072612D015									
		SEKR1475C702S072612D019									
		SEKR1475C702S072612D020									
242	SEKR2150C703	SEKR2150C703S072712DX		Heavy					57		
		SEKR2150C703S072712D005									
		SEKR2150C703S072712D010									
243	SEKR2150C704	SEKR2150C704S072712DX		Heavy					57		
		SEKR2150C704S072712D003									
		SEKR2150C704S072712D005									
		SEKR2150C704S072712D010									
		SEKR2150C704S072712D013									
261	SEKR0900C702	SEKR0900C702S112712DX		Moderate					33		
		SEKR0900C702S112712D006									
		SEKR0900C702D112712D011									
		SEKR0900C702S112712D011									
		SEKR0900C702S112712D014									
		SEKR0900C702S112712D017									
		SEKR0900C702S112712D019									

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
262	SEKR1425C701	SEKR1425C701S113012DX	Cutoff/Oxbow	Moderate	0.84	2.90	7.2	0.9285	109	104	53
		SEKR1425C701S113012D004									
		SEKR1425C701S113012D010									
		SEKR1425C701S113012D013									
		SEKR1425C701S113012D016									
		SEKR1425C701S113012D018									
263	SEKR2300C701	SEKR2300C701S113012DX		Moderate					169		
		SEKR2300C701D113012D003									
		SEKR2300C701S113012D003									
		SEKR2300C701S113012D007									
		SEKR2300C701S113012D011									
281	SEKR2200C701	SEKR2200C701S072412DX		Light		10.14	7.2		57	115	206
		SEKR2200C701S072412D005									
		SEKR2200C701S072412D008									
		SEKR2200C701S072412D013									
		SEKR2200C701S072412D018									
		SEKR2200C701S072412D022									
		SEKR2200C701S072412D026									
		SEKR2200C701S072412D028									
		SEKR2200C701S072412D034									
282	SEKR2125C701	SEKR2125C701S072412DX		Light					231		
		SEKR2125C701S072412D006									
		SEKR2125C701S072412D010									
		SEKR2125C701S072412D014									
		SEKR2125C701S072412D020									
283	SEKR2800C701	SEKR2800C701S072412DX		Light					57		
		SEKR2800C701S072412D007									
		SEKR2800C701S072412D012									
		SEKR2800C701S072412D017									
321	SEKR3750C704	SEKR3750C704S112712DX	Delta	Heavy	0.77	7.73	7.6	0.9285	57	57	75
		SEKR3750C704S112712D006									
		SEKR3750C704S112712D011									
		SEKR3750C704S112712D016									
		SEKR3750C704S112712D021									
		SEKR3750C704S112712D025									
		SEKR3750C704S112712D029									
		SEKR3750C704S112712D031									
322	SEKR3750C705	SEKR3750C705S112812DX		Heavy					57		
		SEKR3750C705D112812D006									
		SEKR3750C705S112812D006									
		SEKR3750C705S112812D011									
		SEKR3750C705S112812D016									
323	SEKR3750C703	SEKR3750C703S112812DX		Heavy					57		
		SEKR3750C703S112812D007									
		SEKR3750C703D112812D012									
		SEKR3750C703S112812D012									
		SEKR3750C703S112812D017									
		SEKR3750C703S112812D022									
		SEKR3750C703S112812D028									
341	SEKR3675C701	SEKR3675C701S112712DX		Moderate		26.84	8.20		57	67	334
		SEKR3675C701D112712D006									
		SEKR3675C701S112712D006									
		SEKR3675C701S112712D011									
		SEKR3675C701S112712D014									
		SEKR3675C701S112712D017									
		SEKR3675C701S112712D021									
342	SEKR3750C707	SEKR3750C707S112812DX		Moderate					57		
		SEKR3750C707D112812D006									
		SEKR3750C707S112812D006									
		SEKR3750C707S112812D010									
		SEKR3750C707S112812D013									
		SEKR3750C707S112812D016									
		SEKR3750C707S112812D021									
343	SEKR3775C704	SEKR3775C704S112712DX		Moderate					122		
		SEKR3775C704S112712D007									
		SEKR3775C704S112712D012									
		SEKR3775C704S112712D016									
		SEKR3775C704S112712D020									
344	SEKR3750C708	SEKR3750C708S112912DX		Moderate					57		
		SEKR3750C708S112912D006									
		SEKR3750C708D112912D011									
		SEKR3750C708S112912D011									
		SEKR3750C708S112912D016									
		SEKR3750C708S112912D021									
		SEKR3750C708S112912D026									
345	SEKR3750C709	SEKR3750C709S112712DX		Moderate					57		
		SEKR3750C709D112712D006									
		SEKR3750C709S112712D006									
		SEKR3750C709S112712D011									
		SEKR3750C709S112712D016									
DUP OF 345	SEKR3750C710	SEKR3750C710S112812DX		Moderate					57		
		SEKR3750C710S112812D005									
		SEKR3750C710S112812D008									
		SEKR3750C710S112812D012									
		SEKR3750C710S112812D018									

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
361	SEKR3725C704	SEKR3725C704S112812DX	Depositional Bar	Light	0.92	36.63	9.36	0.9285	57	75	578
		SEKR3725C704S112812D006									
		SEKR3725C704S112812D011									
		SEKR3725C704S112812D017									
		SEKR3725C704S112812D021									
		SEKR3725C704S112812D025									
		SEKR3725C704S112812D030									
362	SEKR3725C705	SEKR3725C705S112812DX		Light					57		
		SEKR3725C705D112812D006									
		SEKR3725C705S112812D006									
		SEKR3725C705S112812D010									
		SEKR3725C705S112812D013									
		SEKR3725C705S112812D019									
363	SEKR3750C706	SEKR3750C706S112912DX		Light					57		
		SEKR3750C706S112912D006									
		SEKR3750C706D112912D009									
		SEKR3750C706S112912D009									
		SEKR3750C706S112912D012									
364	SEKR3775C703	SEKR3775C703S112812DX		Light					57		
		SEKR3775C703D112812D006									
		SEKR3775C703S112812D006									
		SEKR3775C703S112812D011									
		SEKR3775C703S112812D015									
365	SEKR3725C706	SEKR3725C706S112912DX		Light					148		
		SEKR3725C706S112912D002									
		SEKR3725C706S112912D004									
		SEKR3725C706S112912D005									
		SEKR3725C706S112912D010									
		SEKR3725C706S112912D013									
		SEKR3725C706S112912D015									
401	SEKR2400C701	SEKR2400C701S072512DX		Heavy		2.58	6		57	78	33
		SEKR2400C701S072512D004									
		SEKR2400C701S072512D008									
		SEKR2400C701S072512D012									
		SEKR2400C701S072512D015									
402	SEKR2475C701	SEKR2475C701S072512DX		Heavy					122		
		SEKR2475C701S072512D004									
		SEKR2475C701S072512D007									
		SEKR2475C701S072512D010									
403	SEKR3725C701	SEKR3725C701S072512DX		Heavy					57		
		SEKR3725C701S072512D007									
		SEKR3725C701S072512D013									
		SEKR3725C701S072512D015									
		SEKR3725C701S072512D020									
421	SEKR1075C701	SEKR1075C701S112812DX		Moderate		5.38	9.60		403	162	225
		SEKR1075C701S112812D005									
		SEKR1075C701S112812D009									
		SEKR1075C701S112812D014									
		SEKR1075C701S112812D019									
423	SEKR1100C701	SEKR1100C701S112912DX		Moderate					26		
		SEKR1100C701S112912D005									
		SEKR1100C701S112912D009									
		SEKR1100C701S112912D013									
424	SEKR3725C708	SEKR3725C708S112912DX		Moderate					57		
		SEKR3725C708D112912D005									
		SEKR3725C708S112912D005									
		SEKR3725C708S112912D009									
		SEKR3725C708S112912D011									
441	SEKR0475C702	SEKR0475C702S072612DX_reanalyzed		Light		34.51	6.8		26	140	886
		SEKR0475C702S072612D005									
		SEKR0475C702S072612D009									
		SEKR0475C702S072612D013									
		SEKR0475C702S072612D019									
		SEKR0475C702S072612D023									
		SEKR0475C702S072612D025									
442	SEKR1075C702	SEKR1075C702S113012DX		Light					338		
		SEKR1075C702S113012D006									
443	SEKR2150C705	SEKR2150C705S112912DX		Light					57		
		SEKR2150C705S112912D006									
		SEKR2150C705S112912D011									

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
481	SEKR1575C701	SEKR1575C701S072612DX	Impoundment	Heavy	0.34	2.26	16.95	0.9285	43	46	18
		SEKR1575C701S072612D007									
		SEKR1575C701S072612D013									
		SEKR1575C701S072612D019									
482	SEKR1550C701	SEKR1550C701S112812DX		Heavy					78		
		SEKR1550C701S112812D006									
		SEKR1550C701S112812D011									
		SEKR1550C701S112812D016									
		SEKR1550C701S112812D021									
		SEKR1550C701S112812D026									
483	SEKR0550C703	SEKR0550C703S112712DX		Heavy					26		
		SEKR0550C703S112712D006									
		SEKR0550C703S112712D011									
		SEKR0550C703S112712D016									
		SEKR0550C703S112712D019									
		SEKR0550C703S112712D022									
DUP OF 483	SEKR0550C704	SEKR0550C704S112812DX		Heavy					39		
		SEKR0550C704S112812D006									
		SEKR0550C704S112812D011									
		SEKR0550C704S112812D016									
		SEKR0550C704S112812D020									
501	SEKR0550C701	SEKR0550C701D072612DX		Moderate		14.10	9.9		26	33	46
		SEKR0550C701S072612DX_reanalyzed									
		SEKR0550C701S072612D005									
		SEKR0550C701S072612D010									
		SEKR0550C701S072612D014									
		SEKR0550C701S072612D019									
502	SEKR0575C701	SEKR0575C701S072612DX_reanalyzed		Moderate					26		
		SEKR0575C701S072612D007									
		SEKR0575C701S072612D013									
		SEKR0575C701S072612D019									
503	SEKR1575C702	SEKR1575C702S072612DX		Moderate					46		
		SEKR1575C702S072612D005									
		SEKR1575C702S072612D010									
		SEKR1575C702S072612D015									
		SEKR1575C702S072612D019									
505	SEKR0525C702	SEKR0525C702S112812DX		Moderate					34		
		SEKR0525C702S112812D006									
		SEKR0525C702S112812D011									
		SEKR0525C702S112812D016									
		SEKR0525C702S112812D020									
		SEKR0525C702S112812D024									
521	SEKR0475C701	SEKR0475C701S072612DX_reanalyzed		Light		41.34	6.6		26	26	71
		SEKR0475C701S072612D004									
		SEKR0475C701S072612D008									
		SEKR0475C701S072612D012									
		SEKR0475C701S072612D017									
		SEKR0475C701S072612D019									
523	SEKR0575C702	SEKR0575C702S112712DX		Light					26		
		SEKR0575C702S112712D006									
		SEKR0575C702S112712D011									
		SEKR0575C702S112712D016									
		SEKR0575C702S112712D020									
		SEKR0575C702S112712D023									
		SEKR0575C702S112712D027									
		SEKR0575C702S112712D028									
524	SEKR0550C705	SEKR0550C705S112712DX		Light					26		
		SEKR0550C705S112712D006									
		SEKR0550C705S112712D011									
		SEKR0550C705D112712D016									
		SEKR0550C705S112712D016									
		SEKR0550C705S112712D020									
		SEKR0550C705S112712D025									
		SEKR0550C705S112712D028									
		SEKR0550C705S112712D030									
525	SEKR0500C701	SEKR0500C701S112912DX		Light					26		
		SEKR0500C701D112912D006									
		SEKR0500C701S112912D006									
		SEKR0500C701S112912D012									
561	SEKR3850C701	SEKR3850C701S072612DX_reanalyzed	Lake	Light	0.29	305.58	7.6	0.9285	57	57	1,113
		SEKR3850C701S072612D007									
		SEKR3850C701S072612D013									
		SEKR3850C701S072612D019									
562	SEKR3875C701	SEKR3875C701S072612DX_reanalyzed		Light					57		
		SEKR3875C701S072612D006									
		SEKR3875C701S072612D012									
		SEKR3875C701S072612D017									
563	SEKR3850C702	SEKR3850C702S072612DX_reanalyzed		Light					57		
		SEKR3850C702S072612D006									
		SEKR3850C702S072612D010									
		SEKR3850C702S072612D014									
		SEKR3850C702S072612D017									
		SEKR3850C702S072612D021									

Table 8. Quantification of Line 6B Oil in Kalamazoo River Sediment (ATS) (Upper Bound)
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Site ID	Location ID	Sample ID	Stratum	Category	Average Sediment Bulk Density (g/cm3)	Lateral Extent of Impact (acres)	Average Vertical Extent of Oil (inches)	Density of Oil (g/cm3)	Layer Weighted Average Core Concentration (mg/kg)	Average Line 6B Oil Concentration (mg/kg)	Volume of Line 6B Oil (gallons)
601	SEKR3800C701	SEKR3800C701S072612DX_reanalyzed	ML Fan	Heavy	0.51	0.54	3.6	0.9285	57	57	2
		SEKR3800C701S072612D003									
		SEKR3800C701S072612D005									
		SEKR3800C701S072612D010									
		SEKR3800C701S072612D015									
		SEKR3800C701S072612D017									
621	SEKR3800C702	SEKR3800C702D072612DX_reanalyzed		Moderate		1.91	7.2		57	57	12
		SEKR3800C702S072612DX_reanalyzed									
		SEKR3800C702S072612D005									
		SEKR3800C702S072612D009									
622	SEKR3800C703	SEKR3800C703S072612DX_reanalyzed		Moderate					57		
		SEKR3800C703S072612D007									
		SEKR3800C703S072612D010									
		SEKR3800C703S072612D014									
641	SEKR3800C704	SEKR3800C704S072712DX		Light		118.71	4.56		57	60	483
		SEKR3800C704S072712D006									
		SEKR3800C704S072712D011									
		SEKR3800C704S072712D014									
642	SEKR3850C703	SEKR3850C703S072712DX		Light					57		
		SEKR3850C703S072712D002									
		SEKR3850C703S072712D005									
		SEKR3850C703S072712D009									
		SEKR3850C703S072712D015									
643	SEKR3800C705	SEKR3800C705S072712DX		Light					73		
		SEKR3800C705S072712D002									
		SEKR3800C705S072712D004									
		SEKR3800C705S072712D009									
		SEKR3800C705S072712D014									
644	SEKR3825C701	SEKR3825C701S072712DX		Light					57		
		SEKR3825C701S072712D003									
		SEKR3825C701S072712D009									
		SEKR3825C701S072712D015									
645	SEKR3800C706	SEKR3800C706S072712DX		Light					57		
		SEKR3800C706S072712D004									
		SEKR3800C706S072712D009									
		SEKR3800C706S072712D014									
		SEKR3800C706S072712D020									
		SEKR3800C706S072712D025									

Total: 8,012