

APPROVED

**Enbridge Line 6B MP 608
Marshall, Michigan Pipeline Release**

**Supplement to the
Response Plan for Downstream Impacted Areas
and the
Source Area Response Plan**

**Commonly Referred to as the
“Overbank and Poling Reassessment Work Plan”**

Enbridge Energy, Limited Partnership

**March 14, 2011
Revised March 31, 2011
Revised April 6, 2011
Revised April 15, 2011**

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SECTION 1 INTRODUCTION

This Supplement to the Response Plan for Downstream Impacted Areas and the Source Area Response Plan (Overbank and Poling Reassessment Work Plan) is in response to the requirements of the United States Environmental Protection Agency (U.S. EPA) Notice to Enbridge dated March 7, 2011. The notice directs Enbridge to perform assessment activities pursuant to the Administrative Order issued by the U.S. EPA on July 27, 2010 and a Supplement to Order for Compliance under Section 311(c) of the Clean Water Act issued (“Supplement”) by the U.S. EPA on September 23, 2010. Paragraph 6 (Item 18.k) of the Supplement requires that Enbridge submit a detailed plan to the U.S. EPA for reassessment of the source area, Talmadge Creek, Kalamazoo River and downstream impacted areas for the presence of oil, sheen, and/or oil/sheen that threatens navigable waterways.

This Work Plan includes a detailed methodology (e.g., visual assessment/inspection, poling, etc.) to evaluate the impacted waterways (including sediment and soil), shorelines and downstream impacted areas. The work plan also includes a proposed schedule for plan implementation. The provisions and details for collecting aerial imagery data of areas affected or suspected to be affected by the spill will be provided to U.S. EPA as a separate work plan. Together, the work plans will meet the directives as detailed in the Notice.

SECTION 2 SUBMERGED OIL AND SEDIMENT REASSESSMENT

2.1 Objectives

Poling in 2010 was used in both pre-remediation and post-remediation activities. Poling was used to characterize pre-remediation areas with a focus on depositional areas defined during the geomorphic analysis and also selected river section areas that are representative of no or slight impact from the oil release. During remediation, poling was used to assess the progress and effectiveness of the remediation techniques. After remediation, poling (and visual observations) was the primary method of determining if remediation work in a given area was complete. Poling work will be used in a similar fashion in 2011, and will include the following objectives:

- Determine the 2011 submerged oil deposition pattern.
- Determine the observed physical characteristics of submerged oil (e.g. sheen, globules) relative to submerged oil observed during the 2010 field season.
- Compare the 2010 and 2011 submerged oil deposition pattern.

Several information sources will be used to determine areas for reassessment. These sources include:

- Geomorphic setting.
- Operations and Maintenance (O&M) tracking table.
- 2010 Submerged Oil Recovery Summary Report.

- Qualitative coring data results, including historic data and the February 2011 Talmadge Creek assessment data.
- Existing ecological assessment data.

The poling and surveying methods used to achieve these objectives are provided in the Assessment Procedures section. The Data Analysis section describes how this poling data will be used to select additional sediment sampling locations for the 2011 field season.

2.2 Locations

A fluvial geomorphic approach considers those processes that are associated with the evolution, formation, and function of river systems to assess contaminant distribution. Such an approach has been utilized to select appropriate poling areas for reassessment.

In a geomorphic approach, the river is divided into segments called river reaches. A river reach is a section of river that has similar channel characteristics. Geomorphic interpretation, based on multiple lines of evidence, is used to support reach delineation. Task and/or parameter descriptions that are typically associated with geomorphic interpretation and reach delineation are described below:

Initial Geomorphic Analysis ('Desktop'): Review of aerial photographs and/or available resource maps to characterize potential degree and variability of reach contamination based on geomorphic setting, channel width, and anthropogenic structures.

Channel Longitudinal Profile: The channel longitudinal profile is determined from site poling bathymetric data. The longitudinal profile is related to potential flow velocity (energy). The longitudinal profile provides a basis, along with other parameters (e.g. base geology) for defining relative stability of reach sections and those subject to deposition and erosion.

Channel Bed Characteristics: The physical characteristics of the channel bed are used to support the geomorphic interpretation since bed composition (sediment particle size such as gravel, sand, silt, or clay) often correlates to geomorphic setting and stability (e.g. deposition or erosion).

Water Depth: There is often a relationship between water depth, channel configuration, and flow velocity. Deep water is often associated with more channel volume (capacity) and lower flow velocities that represent potential deposition areas.

Submerged Oil Distribution: The submerged oil distribution data from 2010 that categorized observed conditions (e.g. none, slight, moderate, heavy) will be used to support geomorphic interpretation and submerged oil occurrence.

High sinuosity areas have a greater number of river reaches because there is more variability associated with the channel characteristics. Reach divisions of the Kalamazoo River and associated statistics are shown in Attachment A.

The design of the poling reassessment, including establishment of transects, number of poling locations, and selection of locations along a transect to assess oil occurrence within each reach, is

based on geomorphic analysis of the river system (i.e. fluvial geomorphic approach) and other pertinent data. The occurrence of submerged oil is typically associated with soft sediment (e.g. fine-grained sediment-silt) and is subject to fluvial processes including erosion and deposition. Therefore geomorphic variability within each reach has been considered in defining the number of poling transects within each reach. For example, a relatively straight channel with no indication of deposition due to gradient and flow velocity would require fewer poling locations than a meandering section with both erosional and depositional areas.

Likewise, geomorphic interpretation has been used to select poling locations within each reach. Poling locations will be selected in areas subject to submerged oil occurrence, such as depositional areas. Poling locations will also be selected in areas not subject to submerged oil occurrence, such as erosional areas, to verify the geomorphic interpretive model.

Following are factors, in addition to geomorphic analysis, that have been used to define transects and poling locations in river reaches for the poling reassessment:

- Sufficient minimum distribution to characterize spatial conditions and support geomorphic analysis and interpretation.
- Poling transects that compliment the Fall 2010 Poling Assessment.
- Poling in areas where moderate or heavy submerged oil was identified during the 2010 emergency response period, including all Submerged Oil Task Force Priority Areas, O&M submerged oil sites, and submerged oil winter work sites.
- Poling transects in the low and high sinuosity areas as defined in the Conceptual Site Model. River reaches are used to define these transect locations.
- Additional poling in river areas with minimal or no submerged oil reported in 2010, but where submerged oil may have accumulated (e.g. backwaters, oxbows, low gradient areas such as MP 4.25 to Ceresco Dam and MP 14.2 to Kalamazoo River Dam).
- Poling in bridge and park/launch public access areas.

For all these areas, crews will visually assess the area and select representative poling locations. The attached table (Attachment A) shows the minimum number of poling locations for each area. Additional locations will be poled if moderate or heavy submerged oil is detected during the initial assessment (Table, Attachment A). An approximate number of poling locations for delineation of moderate and heavy submerged oil are included for each area. This number of poling locations will vary based on field conditions. Because geomorphic conditions differ between Talmadge Creek, the Kalamazoo River, and Morrow Lake, slightly different methods are required to assess oil deposition for each area. The following section describes these methods.

Talmadge Creek

Desktop mapping alone is not sufficient to characterize deposition areas in Talmadge Creek using aerial photographs due to the limited area (small scale) associated with the tributary. Therefore, a crew

wearing waders will walk the channel and delineate geomorphic surfaces using GPS technology. This will allow a qualified geomorphologist to determine where concurrent poling activities should be conducted to assess the spatial distribution of submerged oil.

Kalamazoo River

Detailed geomorphic mapping of the Kalamazoo River, using aerial photographs and the 2010 poling data, will be completed prior to 2011 sample location selection. Geomorphic mapping of in-channel geomorphic surfaces is integral in determining where sampling activities will be conducted in 2011 because efforts are focused on depositional areas. The poling activities will be conducted using air boats and 2-person crews. (Attachment A).

Morrow Lake

Geomorphic mapping of Morrow Lake, using bathymetry, aerial photographs, and poling data, was completed in 2010. The 2011 poling activities will determine the presence and relative amount of submerged oil at the mouth of the Kalamazoo River into Morrow Lake (Attachment A). The collected data will be compared to the 2010 results from this area.

Figures illustrating the locations of the anticipated poling are presented in Attachment A. The table presented in Attachment A shows the minimum number of proposed poling locations for each area. Each poling transect will have a minimum of three poling locations.

2.3 Staff

Tetra Tech will have 3 or more airboat teams, on the Kalamazoo River, a 2 person team on the Talmadge Creek and a GIS team. Team members were on previous submerged oil assessment teams. For example, one airboat team consists of an airboat captain, two Tetra Tech personnel, and two regulatory agency oversight personnel (USEPA and MDEQ).

2.4 Assessment Procedures

Global Positioning System (GPS) coordinates, water depth, advancement depth, soft sediment thickness, bed characteristics, presence/absence of oil, and relative amount of oil will be documented at each location. The following procedures will be followed:

Water depth (i.e. depth to sediment surface) is the first measurement at each poling location. To measure water depth, a 6-inch diameter disk is attached to the end of a pole graduated with 0.1-foot intervals. The pole is gradually lowered to the top of the sediment bed. Next, the thickness of soft sediment is measured. A pole without a disk (approximately 2 inches in diameter) with maximum graduations of 0.1 feet will be pushed vertically through the sediment until advancement is restricted. The depth to sediment surface (water depth) and maximum poling depth into the soft sediment will determine the soft sediment thickness at each location.

To determine the amount of submerged oil at each location, a pole with a 6-inch diameter disk attached at the base will be used to agitate the soft sediment. The degree of oil observed at the water surface after agitation will be described using the same categories as the established 2010 classification

process (heavy, moderate, slight, or none). These categories are outlined in the classification flow chart presented in Attachment A.

The extent of submerged oil will be delineated when moderate or heavy sheen is observed in a target depositional area. The delineation will extend until none or slight sheen is observed. The field crew will use the following criteria to determine the number of poling locations to sufficiently describe the area:

- Geomorphic river setting
- Size of area
- Amount of observed sheen

In the event that oil and/or sheen is generated during reassessment activities, the following procedures will be used:

- In Talmadge Creek, a two-person oil collection crew will accompany each poling crew. The collection crew will be positioned downstream of all poling activities with absorbent pads and boom to deploy if recoverable oil is released.
- In the Kalamazoo River, each poling airboat will be accompanied by a second airboat with a similar oil collection crew.

Electronic field data forms will serve as a daily record of events, observations, and measurements during all field activities for the poling assessment. All information relevant to poling activities will be recorded electronically on these forms. Entries on these forms will include:

- Names of field crew
- Location of poling activity
- Area Description
- Field measurements
- Field observations
- Photographs

Paper copies of the field forms will be printed and filed for hard copy backup of all data collected. In addition, all electronic data will be added to a database at the end of each work day and stored in a Geographic Information System (GIS) database.

A series of maps will be developed to display the results of poling data. Poling locations and the associated relative oil concentrations will be plotted on the maps. The maps will allow a comparison of the observed 2010 and 2011 depositional patterns.

2.5 Data Analysis

A 2011 Submerged Oil Reassessment Report will be prepared to document the poling locations, assessment procedures used, and submerged oil presence results.

The report will include a series of maps that display the results of poling activities. The poling locations and the associated relative oil concentrations will be plotted on the maps. The maps will allow a comparison of the observed 2010 and 2011 depositional patterns. This comparison may provide an understanding of the relationship between river stage and the transport of submerged oil and will be used to update the conceptual site model.

The physical characteristics of the submerged oil (observed during poling activities) will be documented and communicated to the Operations group, since changes in the physical characteristics of the oil may influence remediation techniques.

SECTION 3 OVERBANK AND SHORELINE REASSESSMENT

3.1 Objectives

The shorelines and floodplains within the Talmadge Creek and Kalamazoo River downstream impacted areas will be reassessed. The assessment area will encompass all areas inundated at the time of the spill as defined by the United States Geological Survey (USGS) Inundation Model (for most of Calhoun County) and the Federal Emergency Management Agency 100 year flood elevation (for the portion of Calhoun County and Kalamazoo County not included in the USGS model). In addition, previous SCAT data, aerial photography (both existing and proposed), and the new LIDAR information proposed will be used to define the area boundaries to be assessed. The objective is to determine the presence of oil along the shoreline and overbank area from Talmadge Creek (starting at MP 0) to the dam at Morrow Lake. Reassessment activities will include the following objectives:

- To verify previously identified Shoreline Cleanup Assessment Technique (SCAT) points identified between the initial release and September 27, 2010 that have remained in the signatory sign-off process.
- To assess areas/locations identified using the Fluorescent LIDAR System, if any. Assessment of areas identified by FLS shall be performed by different personnel with the intent of performing a biased assessment in areas of identified oil.
- To assess areas / locations that do not contain previously identified SCAT points that are found to have been inundated through the Light Detection and Ranging (LIDAR) Imagery data that will be collected to complete the United State Geological Survey (USGS) Inundation Model.
- Existing documentation for the river cleanup including:
 - The current Operations and Maintenance (O&M) tracking table.
 - 2010 Submerged Oil Recovery Summary Report
 - 2010 SCAT Assessment Data and Report

- Qualitative coring data results including historic data as well as February 2011 Talmadge Creek assessment data.
- Other data sources (e.g., winter work site reports)

3.2 Assessment Metrics

Metrics of successful cleanup for a contaminated SCAT point or zone vary depending on bank or habitat type and degree of oiling. They are defined as follows:

- Riparian Zones and Stream Banks
 - Shorelines no longer release sheens that affect navigable waterways
 - Oil no longer removes readily on contact
 - Oil removal to the point where recovery/re-colonization can occur without causing more harm than leaving the oil in place
- Soil, Sand and Gravel
 - Oil no longer visible on surface
- Man-Made Structures
 - Structure no longer generates liquid oil or sheen
 - Oil no longer removes readily on contact

These metrics will be assessed by visual field screening for the presence of materials capable of producing a release of oil or oil sheen. Visual screening does not include additional screening tests, such as organic headspace (using a photo-ionization detector [PID]) or detecting a petroleum odor. Residual impacts will be addressed as part of a long-term assessment and remediation effort (conducted pursuant to the State of Michigan Consent Order) for the site.

3.3 Staff and Training

An anticipated 5 to 6 teams of 3 to 4 individuals (Enbridge personnel and contractors) are being assembled to complete these activities. In addition, provisions for up to 2 agency representative personnel team will be coordinated by Enbridge. Teams will consist of individuals either familiar with petroleum cleanup activities to include the initial SCAT process. In addition, a 2 day training event is being planned prior to initiating the assessments activities which will be open to the agencies. The training will encompass water safety, objectives, data collection procedures, quality control, documentation, and other aspects related to the re-assessment process.

3.4 Assessment Procedures

National Oceanic and Atmospheric Administration (NOAA) devised the SCAT survey system for rapid assessment of oil impact to shoreline habitats in a marine setting, and the assessment procedure will

be based on the SCAT process utilized for this assessment of a riverine environment. Surveys will be conducted by boat and/or foot and target shoreline and accessible overbank areas. Shorelines will be identified in the cleanup reports as “Left Descending Bank (LDB)”, or “Right Descending Bank (RDB)”. All previously identified SCAT points currently are marked with a wooden stake with a multitude of colored flagging (including red, yellow, green, blue and pink). Reassessment activities were developed using previously collected information including the 2010 SCAT Assessment Data and Report, the Operations and Maintenance (O&M) tracking table, the February 2011 Talmadge Creek assessment data, and O&M Excavation work plan assessment.

The following procedures will be followed:

- Identify and estimate the areas (labeled numerically so not to conflict with initial SCAT efforts in 2010) of specific oiling and substrate conditions found at each previously identified SCAT point or area.
- Areas found to have been inundated by the USGS Inundation Model that does not contain previously identified SCAT points within each 0.25-mile segment of river.
- Characterize oiling conditions and substrate types using a standardized terminology (Shoreline Oil Terminology / Codes for Oil Spills of Black Oil included in Attachment B).
- Characterize shoreline and overbank habitat types and the degree and characteristics of any oiling conditions.
- Assess islands containing previously identified SCAT points; and other islands which do not contain previously identified SCAT points, but have the potential for oil.
- Record percent cover of a specific oiling condition within a SCAT point/zone on SCAT field maps and data collection forms.
- Collect a waypoint and/or polygon, using a GPS unit with sub-meter accuracy, for each of the oiled points/zones identified as having visible oil and/or sheen that is affecting or threatening navigable waterways. The extent of residual oil will be flagged for ease of future identification.

Unlike the previous SCAT effort which limited their assessment to a set distance back from the shoreline, the proposed assessment area will encompass all areas inundated at the time of the spill as defined by the USGS Inundation Model (for most of Calhoun County) and the Federal Emergency Management Agency 100 year flood elevation (for the portion of Calhoun County and Kalamazoo County not included in the USGS model). In addition, previous SCAT data, aerial photography (both existing and proposed), and the new LIDAR information proposed will be used to define the area boundaries to be assessed.

Cleanup recommendations will not be provided at this time; this is strictly reassessment of the shoreline and overbank that has been affected by the release. If an area is found to contain contamination, an evaluation will be made whether the area can be addressed using the approved O&M tool box methods or an area specific work plan will be developed.

Observations may be captured on field forms or in digital tablets (Trimble YUMA), as well as on hand-drawn field sketches. Assessment procedures will reference the 2010 SCAT Assessment Data and Report and the Downstream Impacted Area Response Plan as applicable. The field form will contain a signatory area for the Enbridge representative and U.S. EPA representative to verify the data collected on the sheet is accurate. Assessment data will be provided as a deliverable document. The reassessment deliverable document will provide the following:

- Aerial maps with GPS points and polygons collected by the assessment teams.
- A table describing the SCAT points / zones and degree of oiling, if any.
- Field data sheets and field sketches showing the area of the assessment point / zone.

Site sign off will be documented through the field data sheets. At the end of each working day, the assessment team will verify that all data collected on the field forms for each 0.25 mile segment is accurate. Each member will then sign in their respective space. These signatures are only to verify the information gathered during the assessment (whether an area or point contains oil or not). Any areas or points that need to be further evaluated or remediated will be completed using the approved O&M tool box methods or a work plan will be developed for agency approval.

SECTION 4 SCHEDULE

The work outlined above is proposed to commence after receipt of an approved work plan. The U.S. EPA will be notified of the specific start date and time per Gantt Chart acceptance at the operations meeting. Agencies (including the U.S. EPA, Michigan Department of Environmental Quality (DEQ), U.S. Fish and Wildlife, and the National Oceanic and Atmospheric Association (NOAA), will be given at least 7 day notification of the start of the assessment. In addition, open lines of communication will be maintained, through regular daily meetings. Commencement of the proposed activity will ultimately be determined by weather and seasonal river conditions. Should weather or river conditions create an adverse obstacle to completion of the subject activities, the agencies will be notified of such conditions and their impact on completion of proposed activities. The goal is to complete the shoreline assessment prior to Spring 2011 vegetation/leaf growth. Submerged oil and sediment schedule is projected to start at a later date to allow sufficient time to achieve an optimal water temperature to conduct poling activities. A proposed schedule is attached in Attachment B. A report documenting reassessment activities shall be submitted within 7 business days of completing reassessment activities or by May 20, 2011, whichever occurs first.

ATTACHMENT A

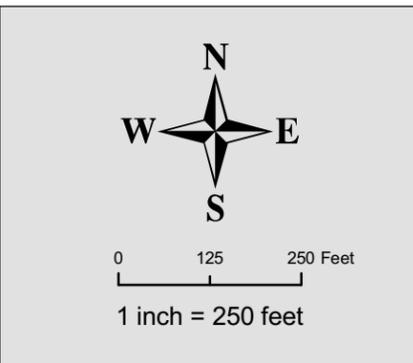


Talmadge Creek - Source to I-69

0.5

0.25

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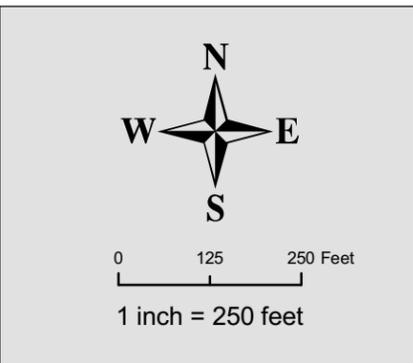
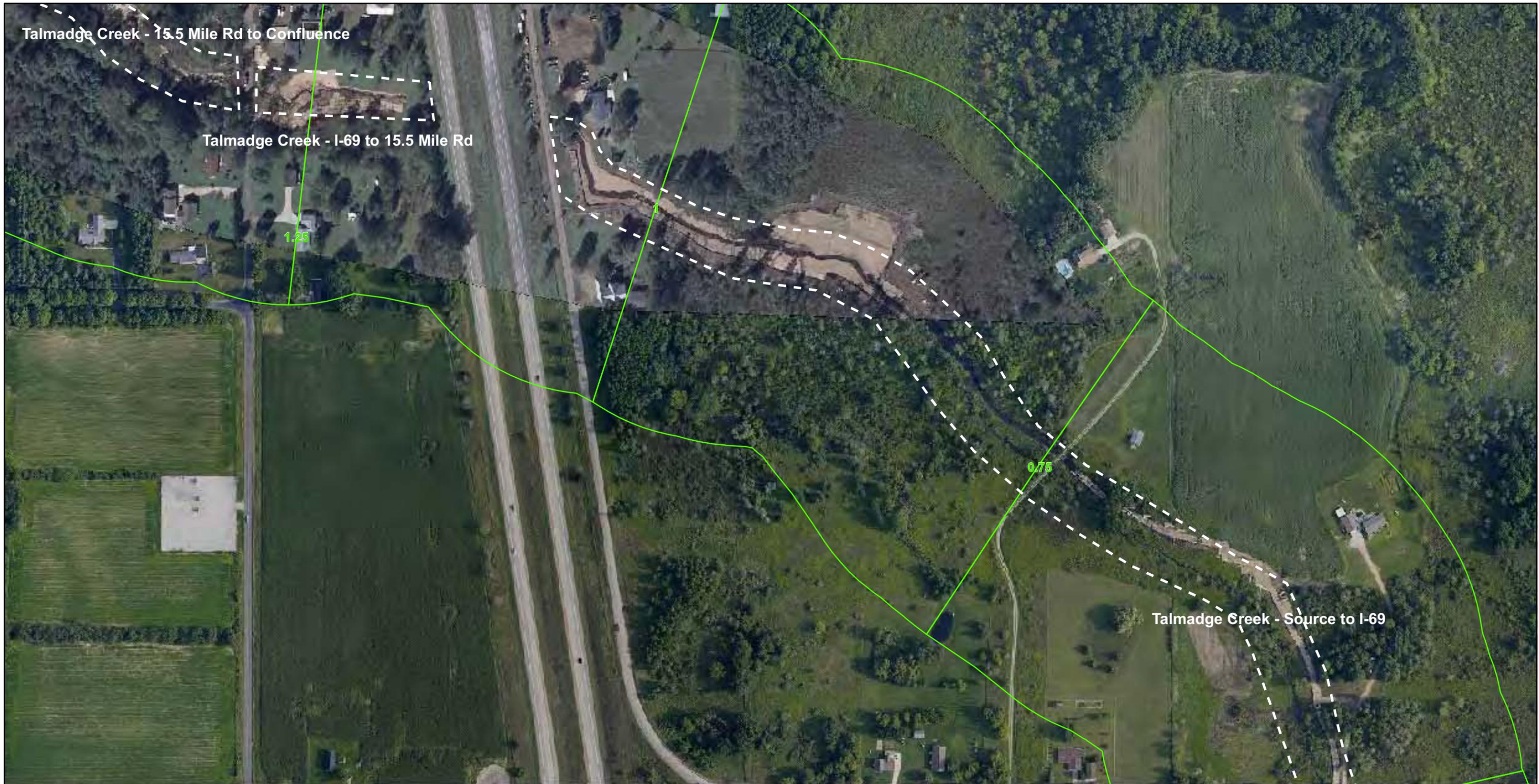
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- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
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 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

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 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010





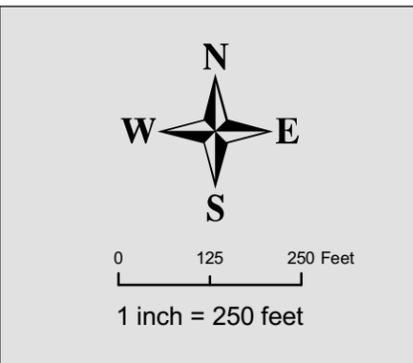
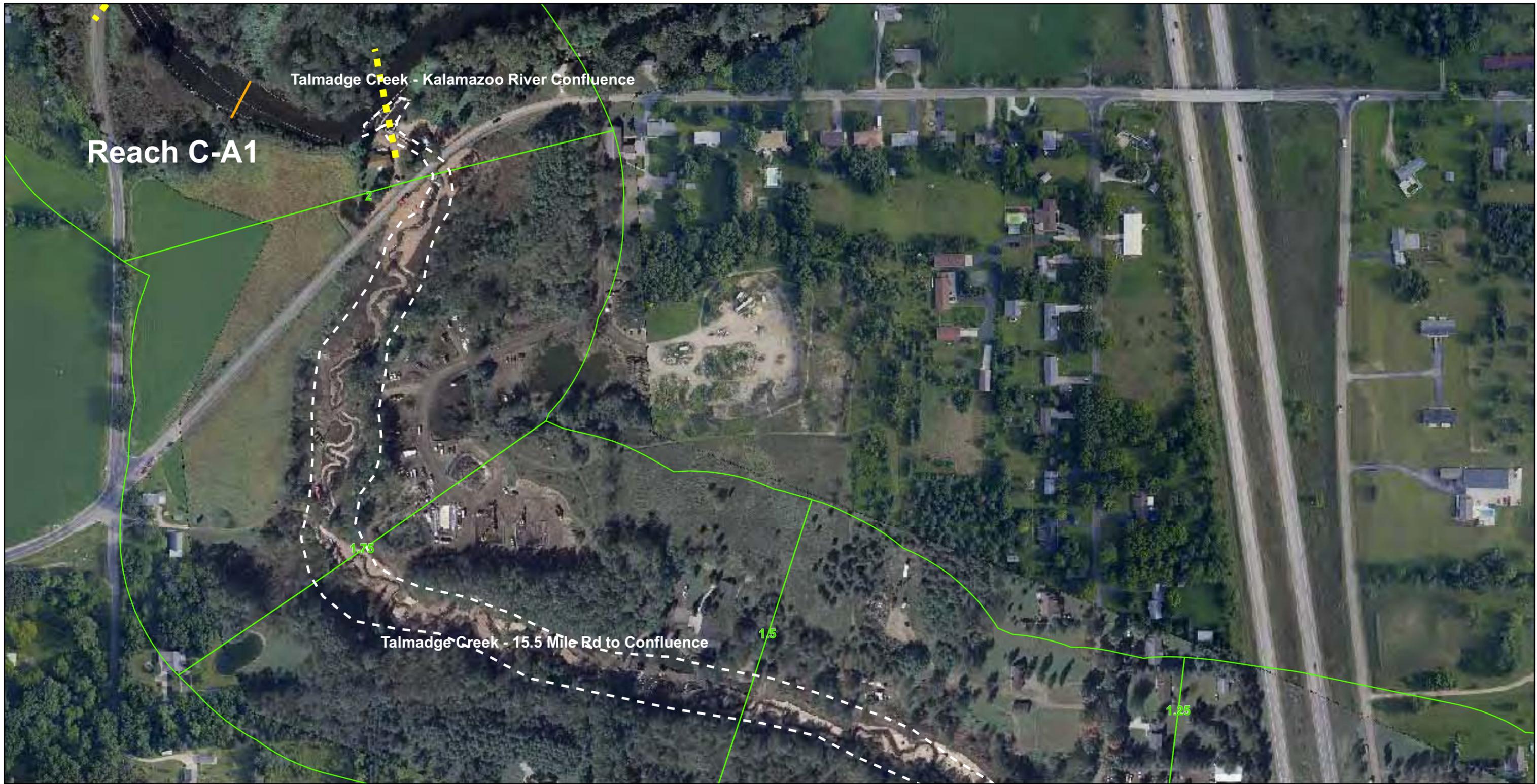
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Reassessment Poling Areas
 MP00.50-MP01.25
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


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Coordinate System: Michigan State Plane South
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 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
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- Quarter Mile Section

Reassessment Poling Areas
MP01.25-MP02.00

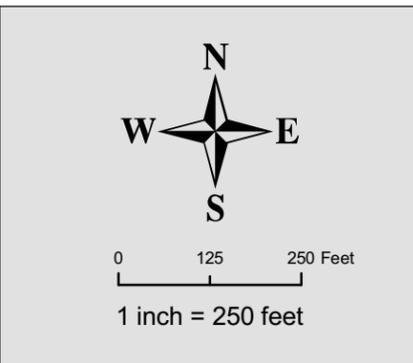
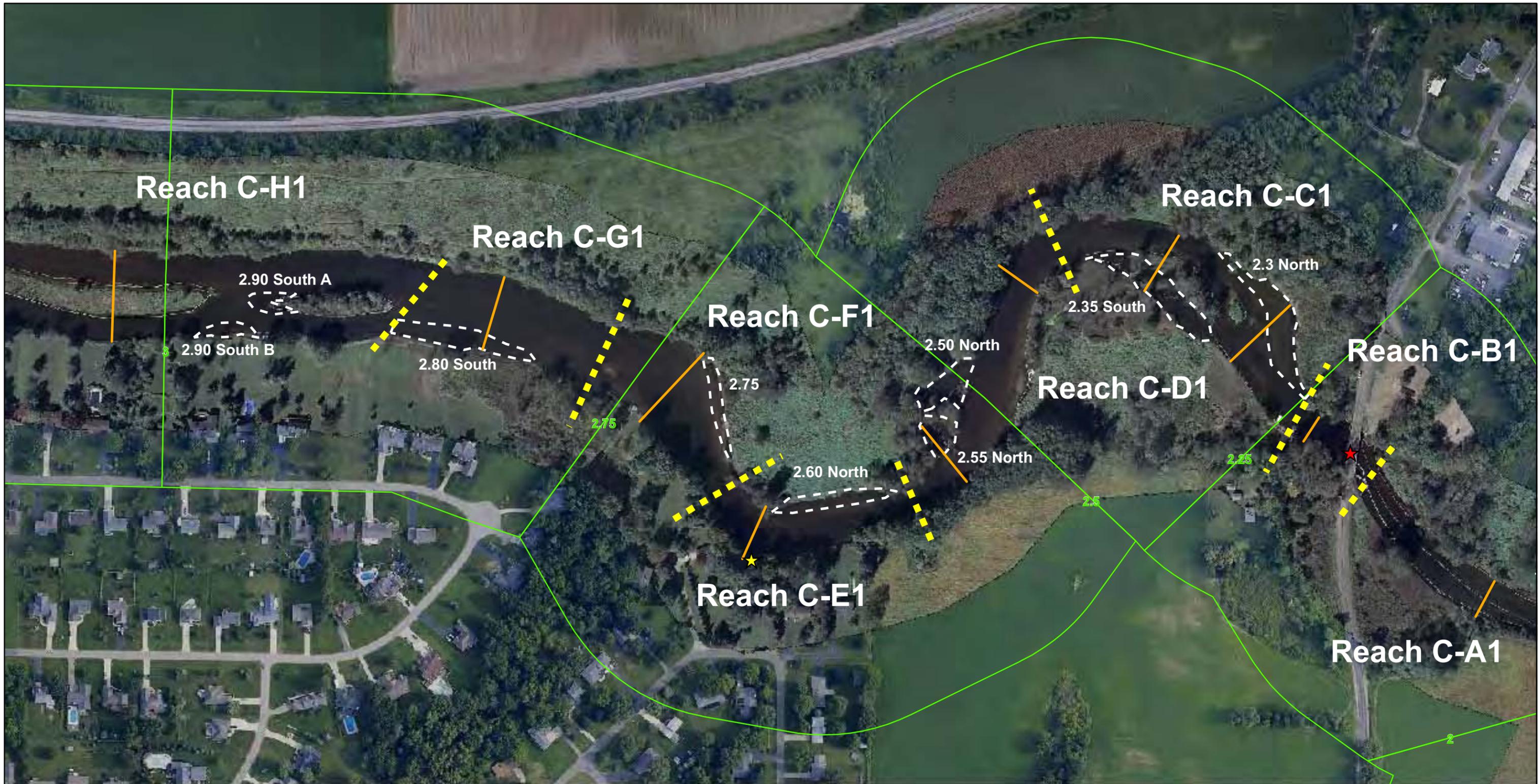
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MICHIGAN

Apr 15, 2011

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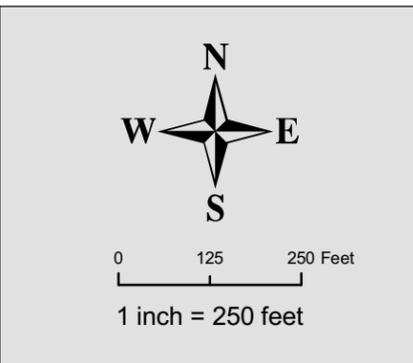
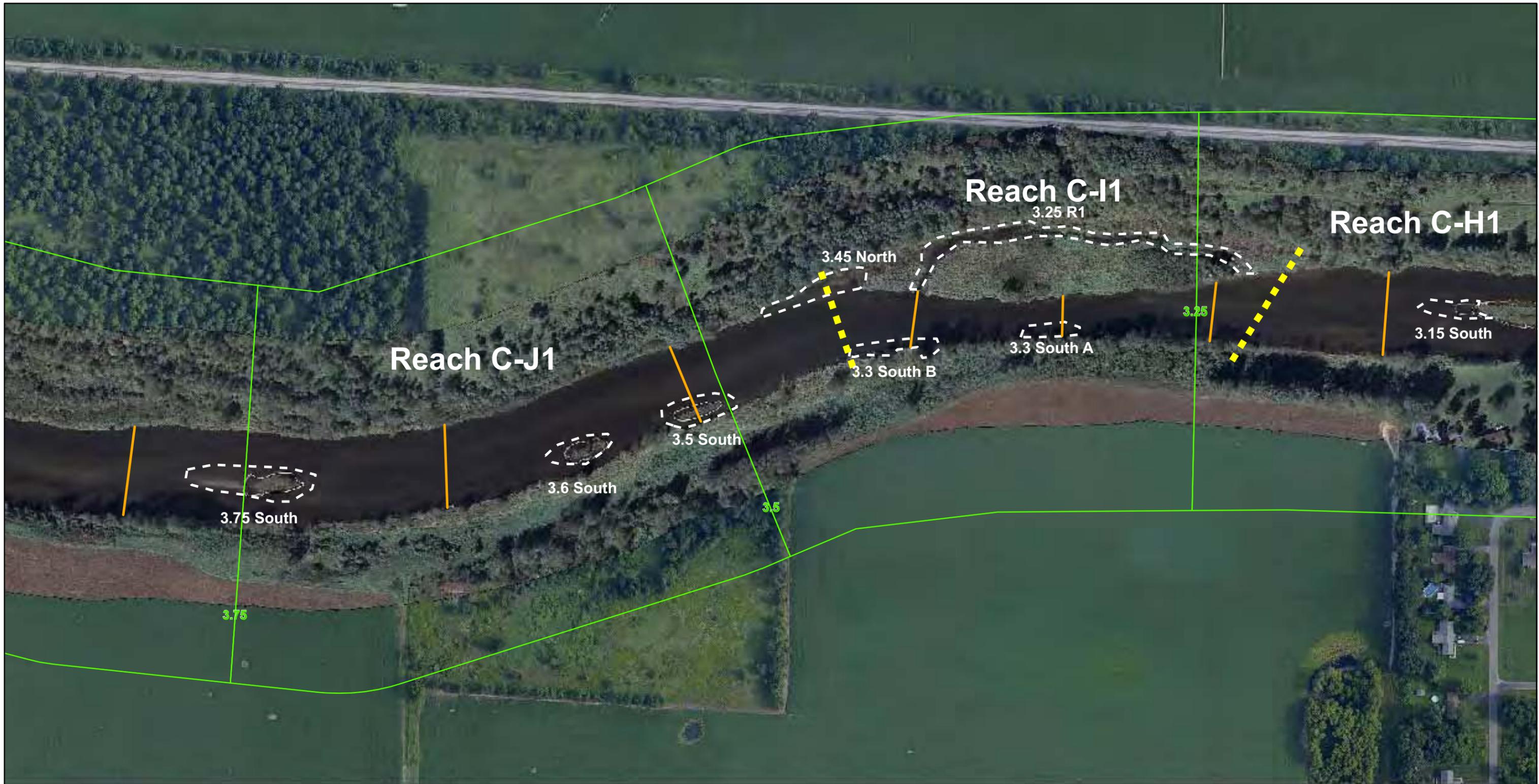
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- Poling Focus Areas
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Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
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ENBRIDGE LINE 6B RESPONSE
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Apr 15, 2011

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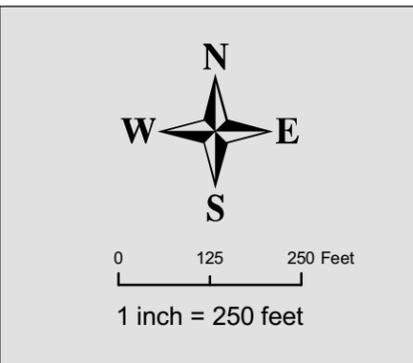
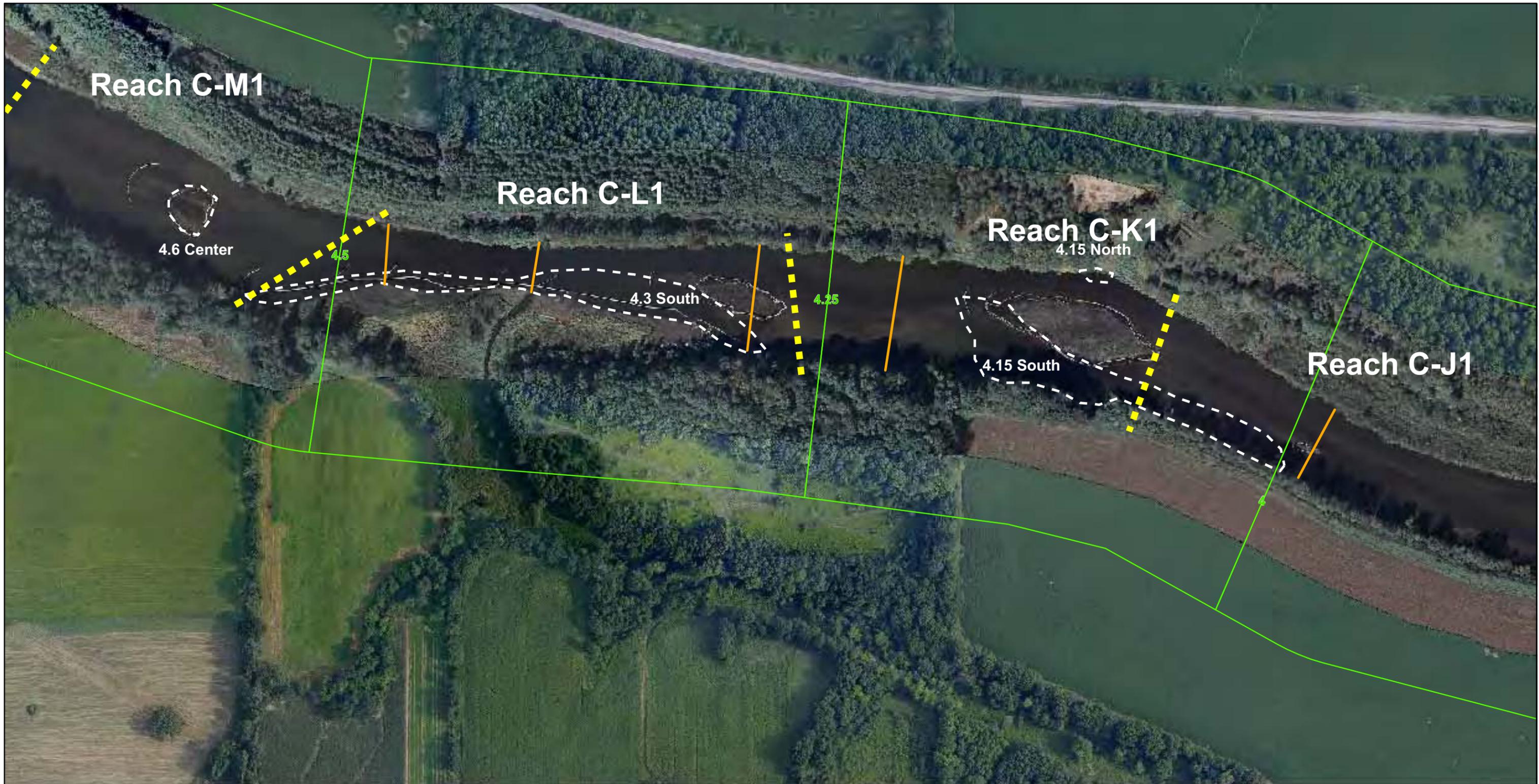
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- Poling Focus Areas
- Quarter Mile Section
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- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP03.00-MP04.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
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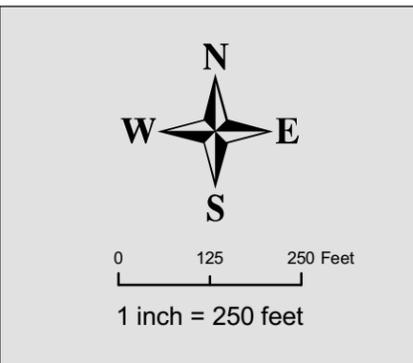
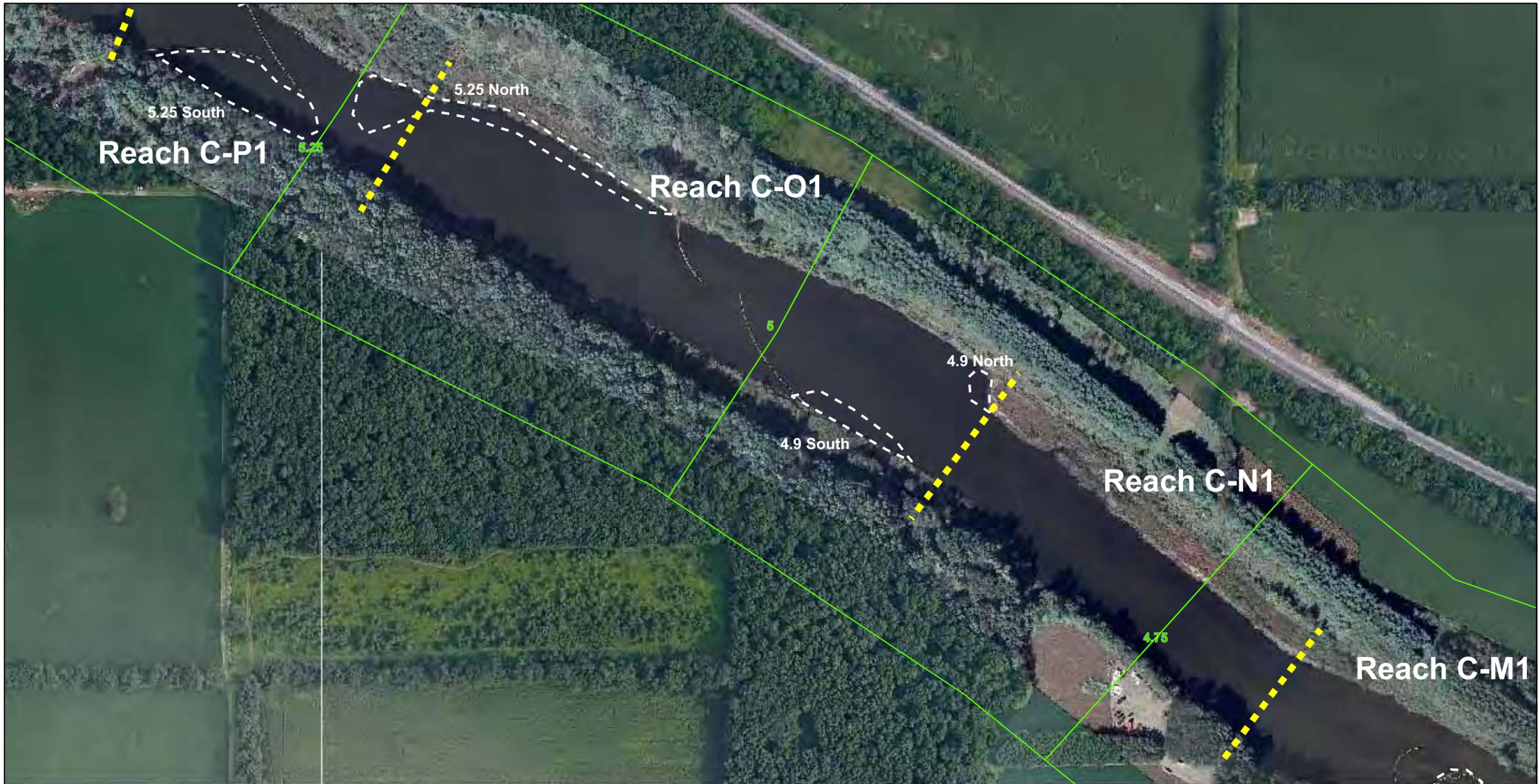
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Reassessment Poling Areas
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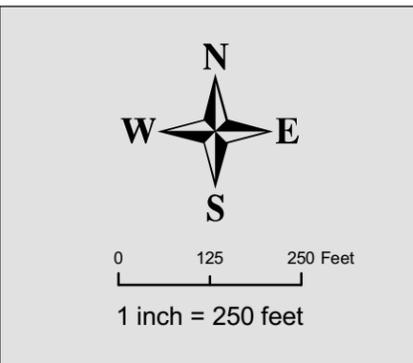
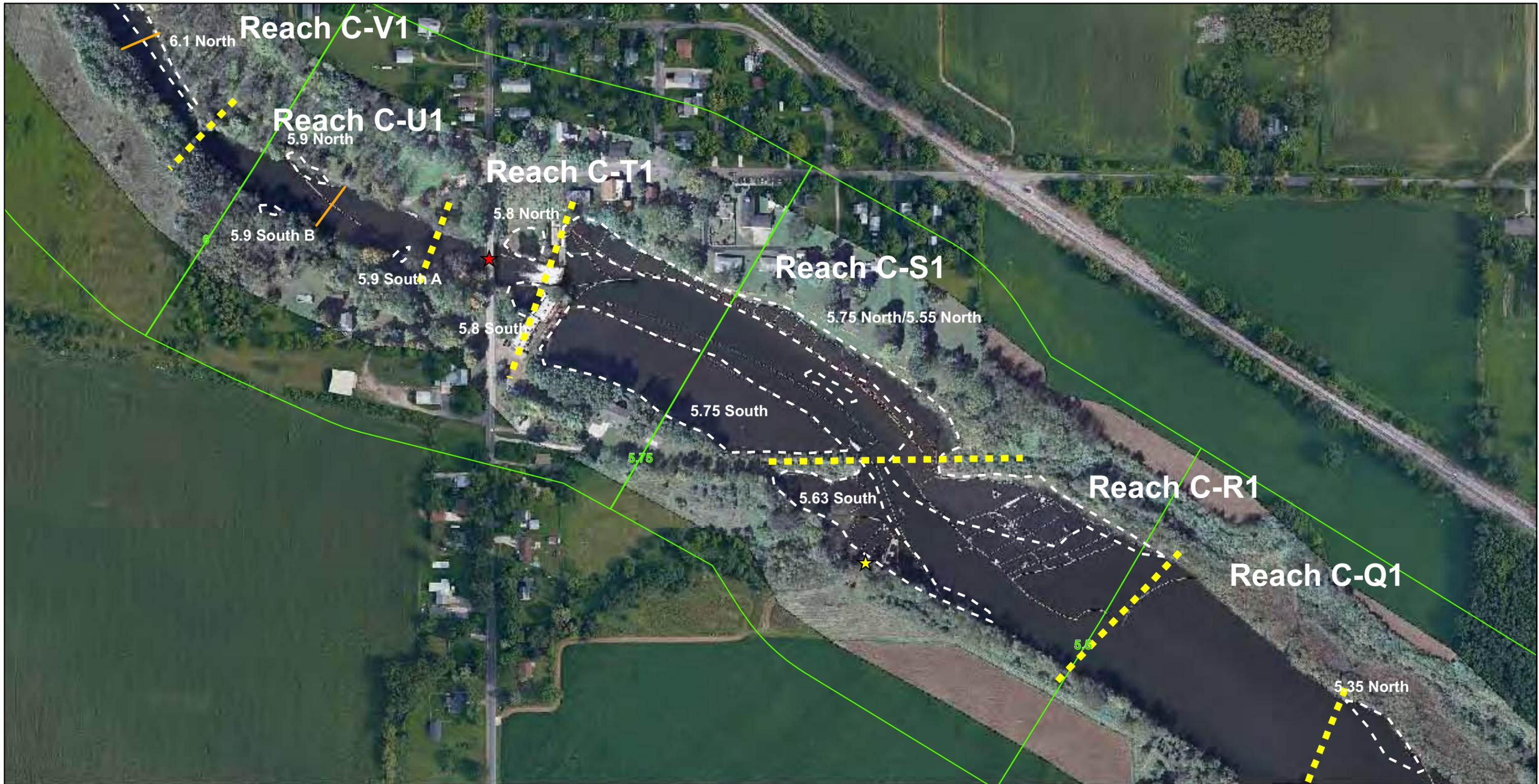
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Reassessment Poling Areas
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Legend

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Reassessment Poling Areas
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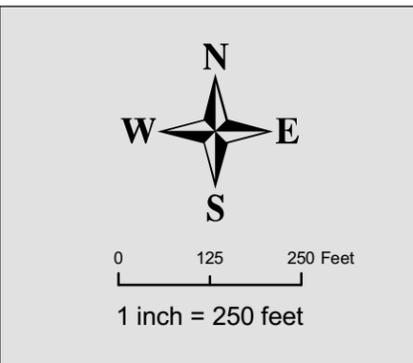
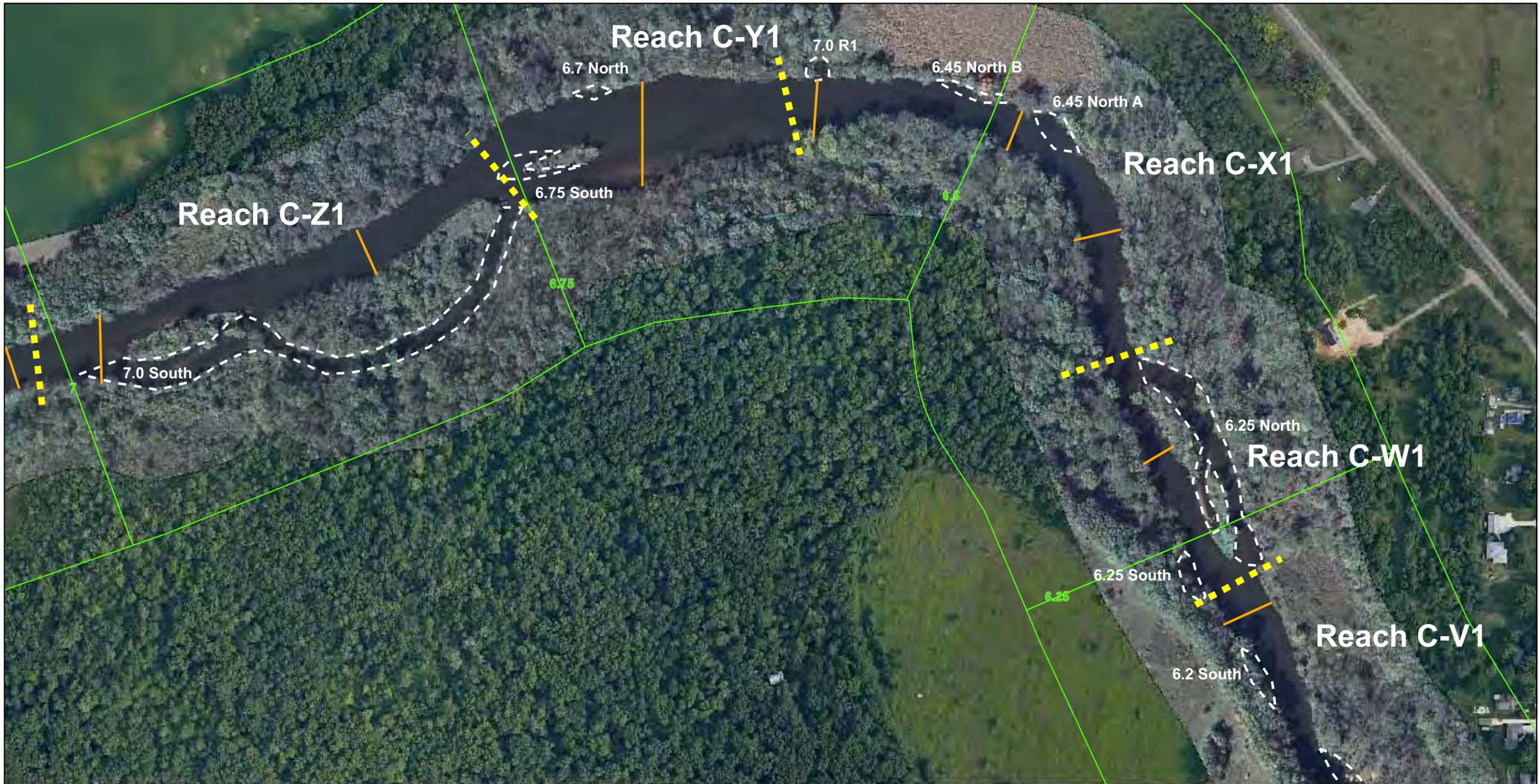
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- Geomorphic Reaches
- Quarter Mile Section

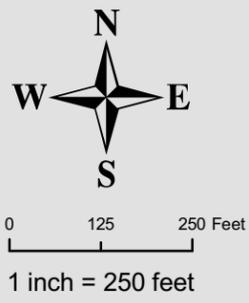
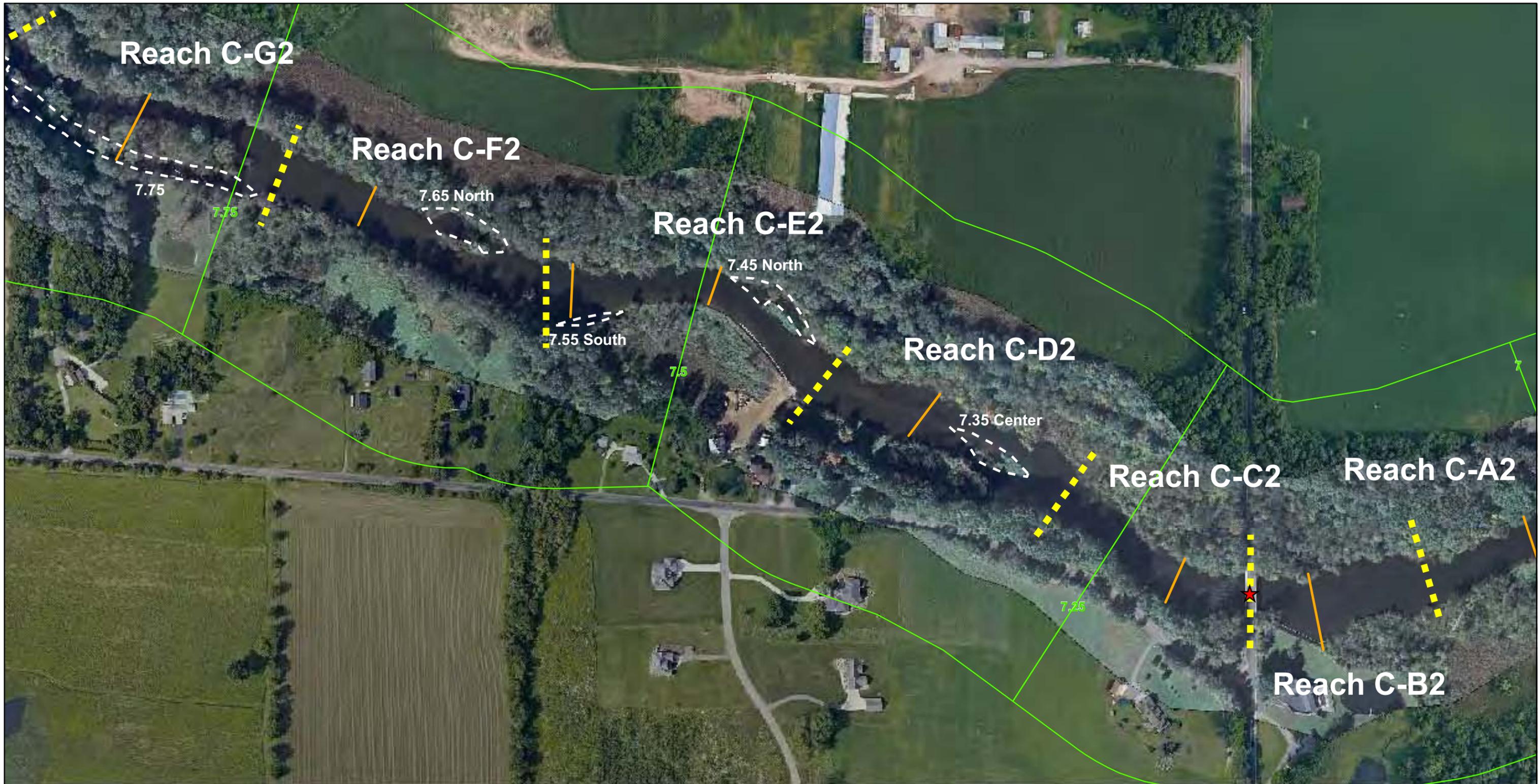
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Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
MP06.00-MP07.00

ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN

Apr 15, 2011

TETRA TECH EC, INC.



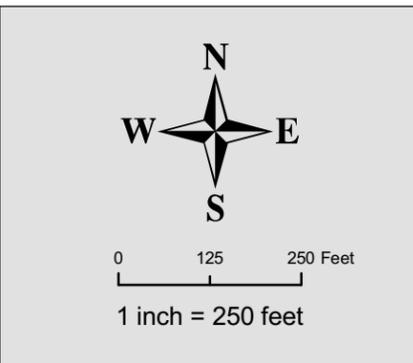
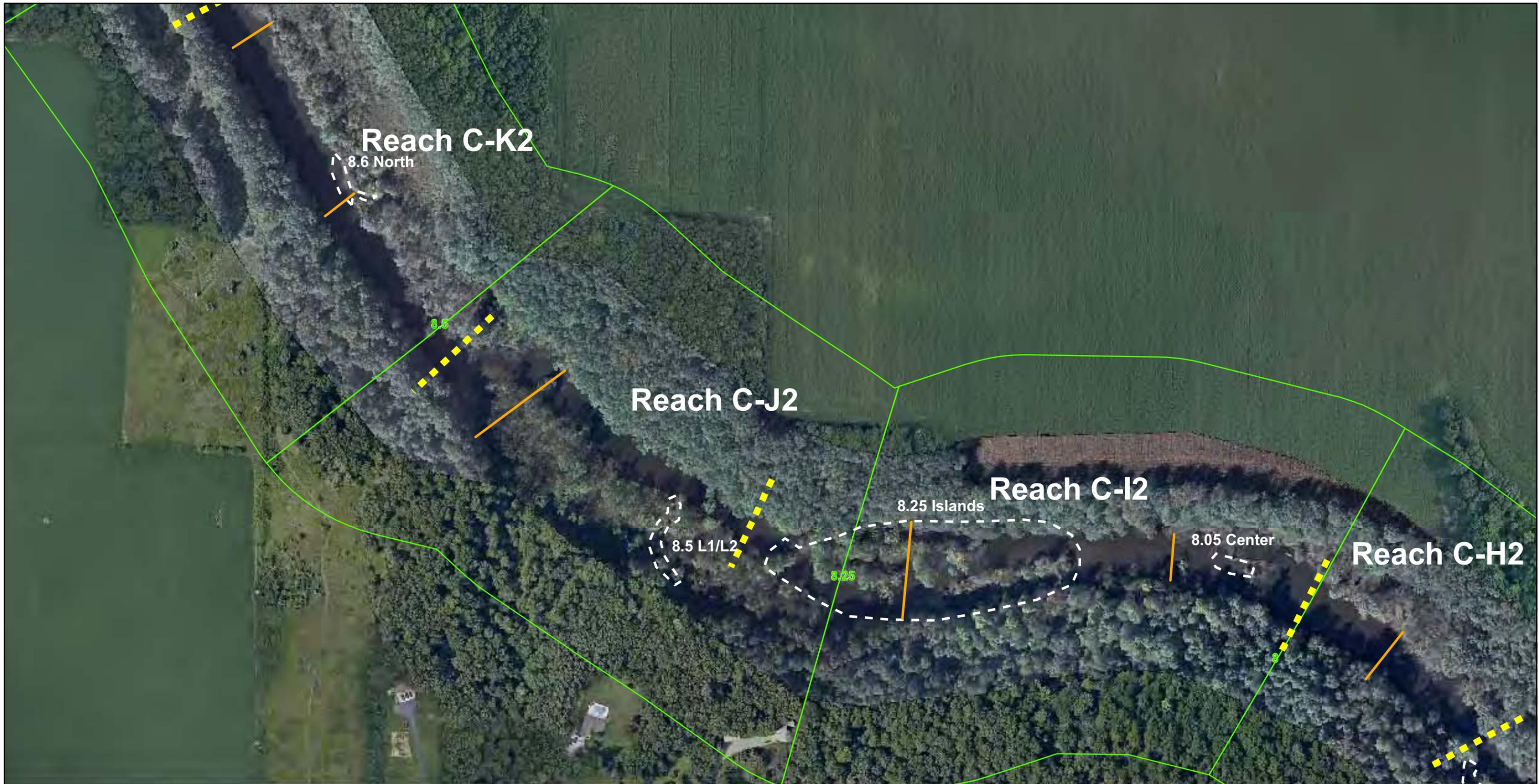
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
 MP07.00-MP08.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

Tt TETRA TECH EC, INC.



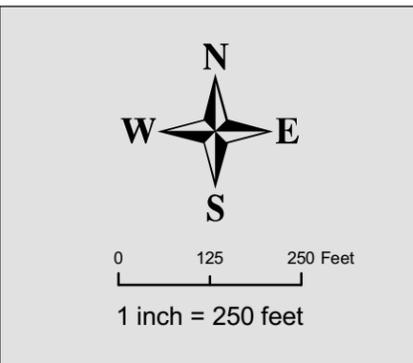
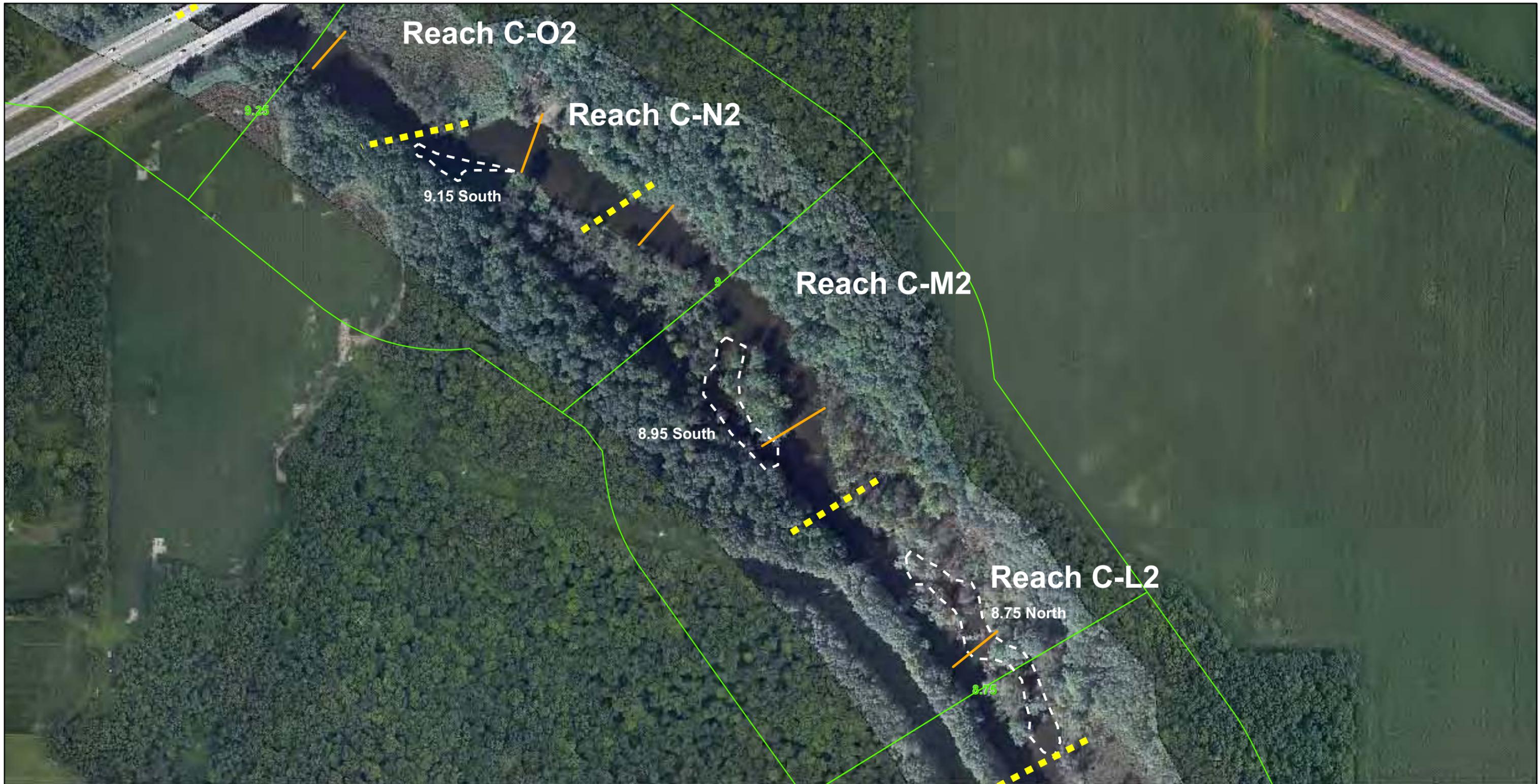
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP08.00-MP08.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



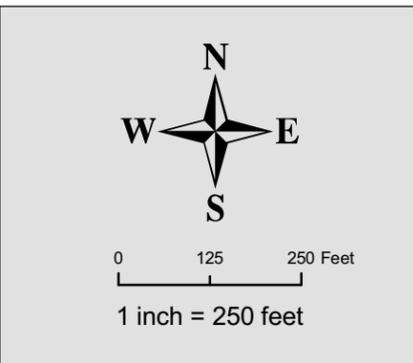
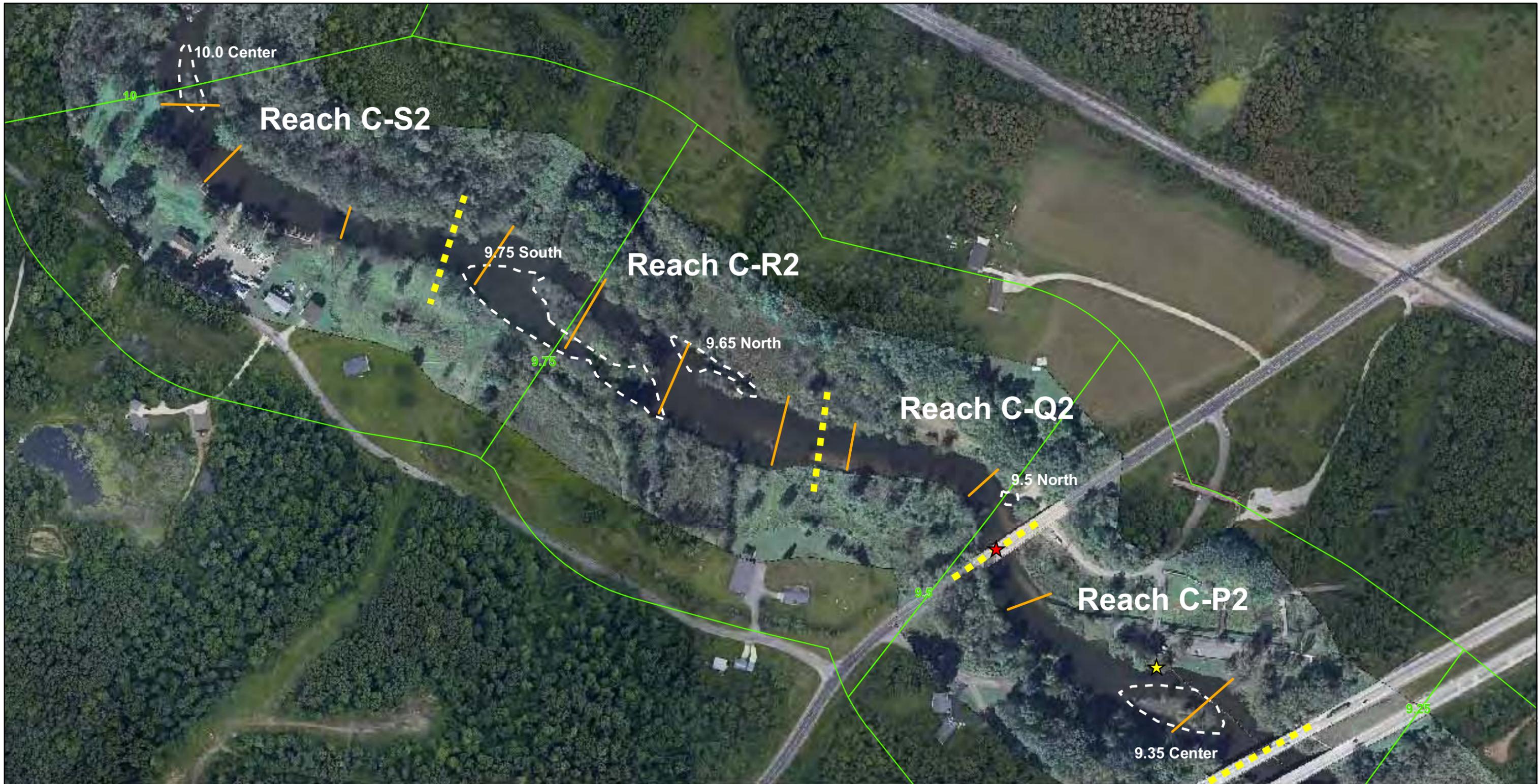
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP08.75-MP09.25
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
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 Enbridge Aerial Photography from August 26, 2010



Legend

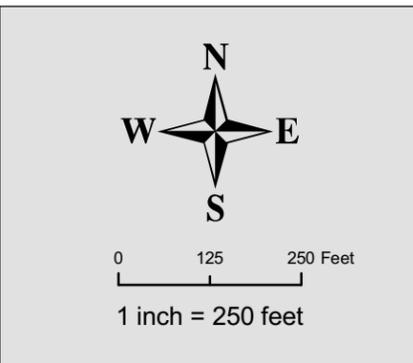
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- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
MP09.25-MP10.00
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011



TETRA TECH EC, INC.



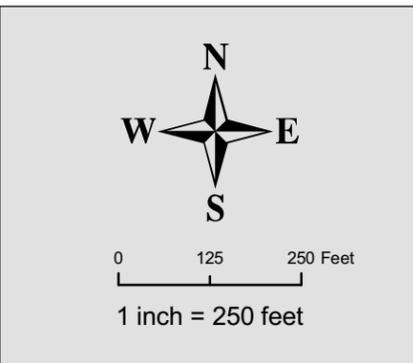
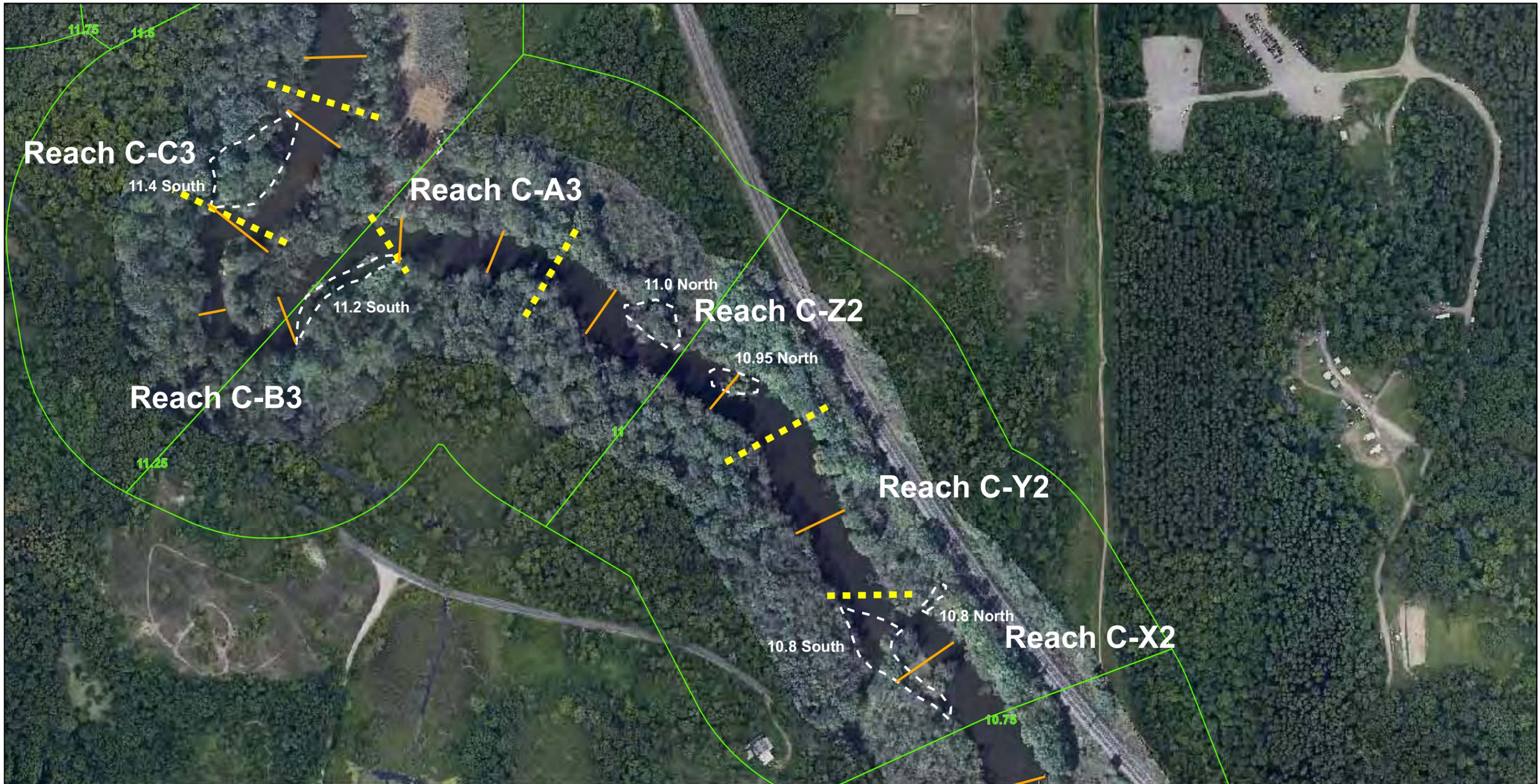
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP10.00-MP10.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010

TETRA TECH EC, INC.



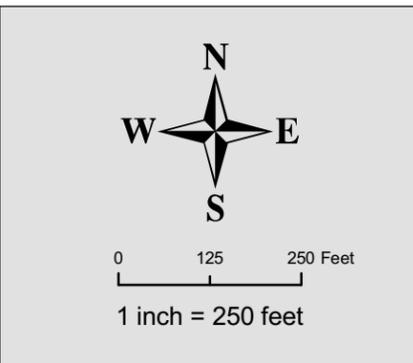
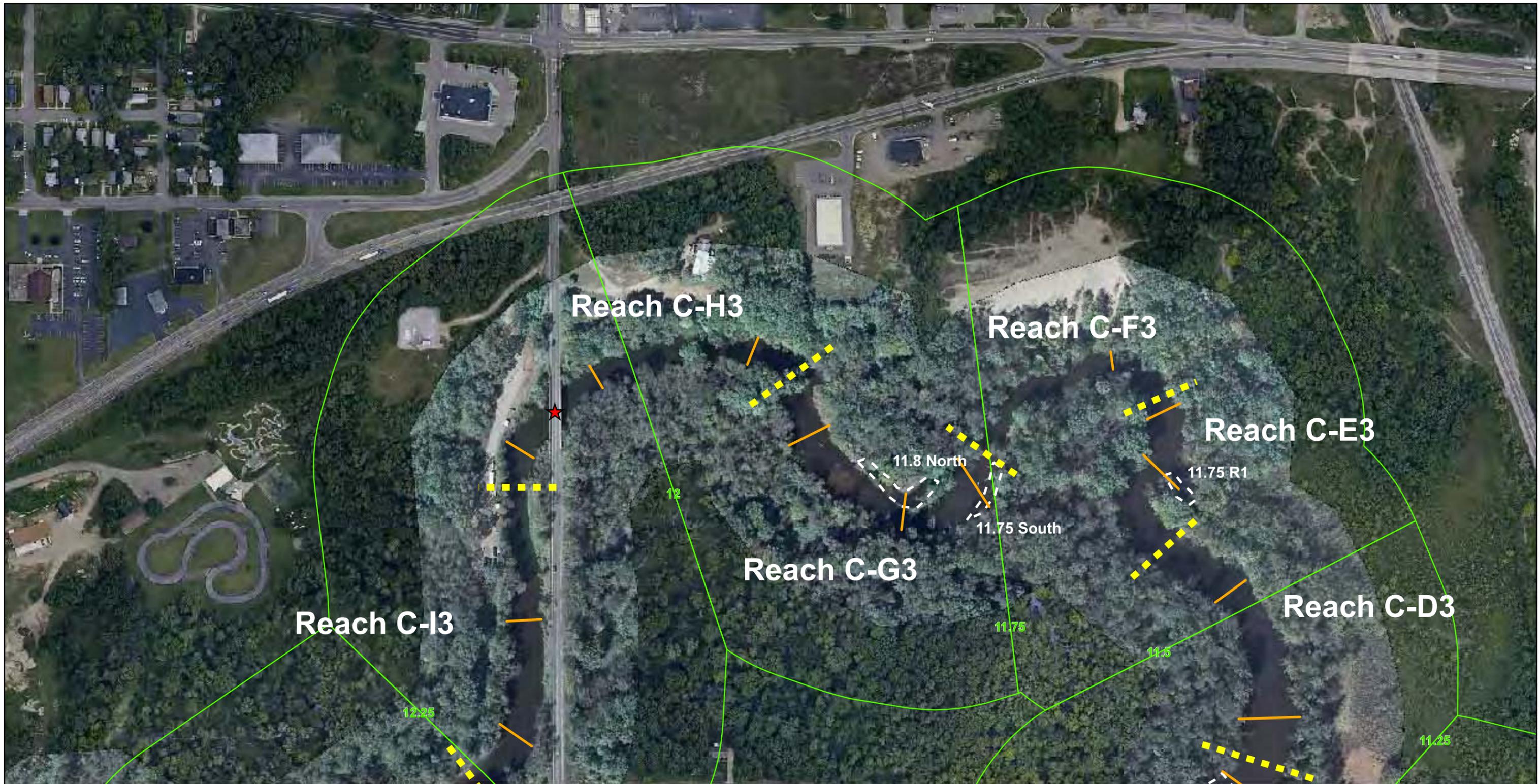
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP10.75-MP11.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



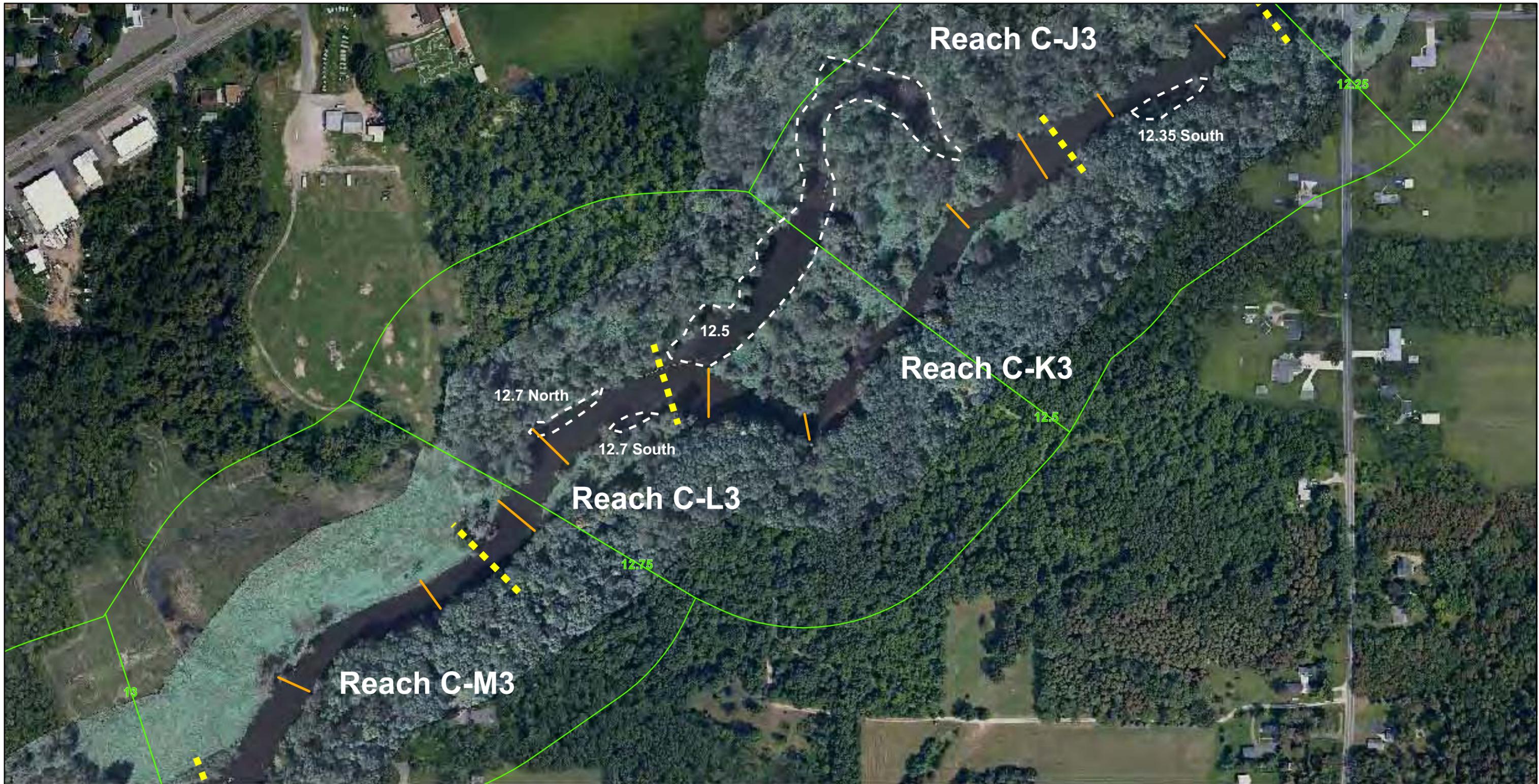
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP11.50-MP12.25
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



0 125 250 Feet
1 inch = 250 feet

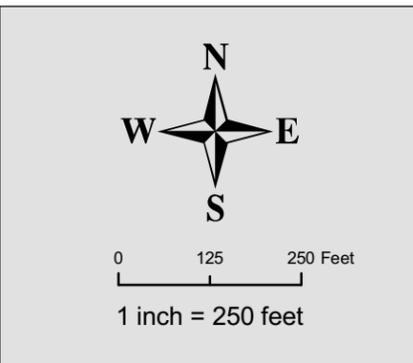
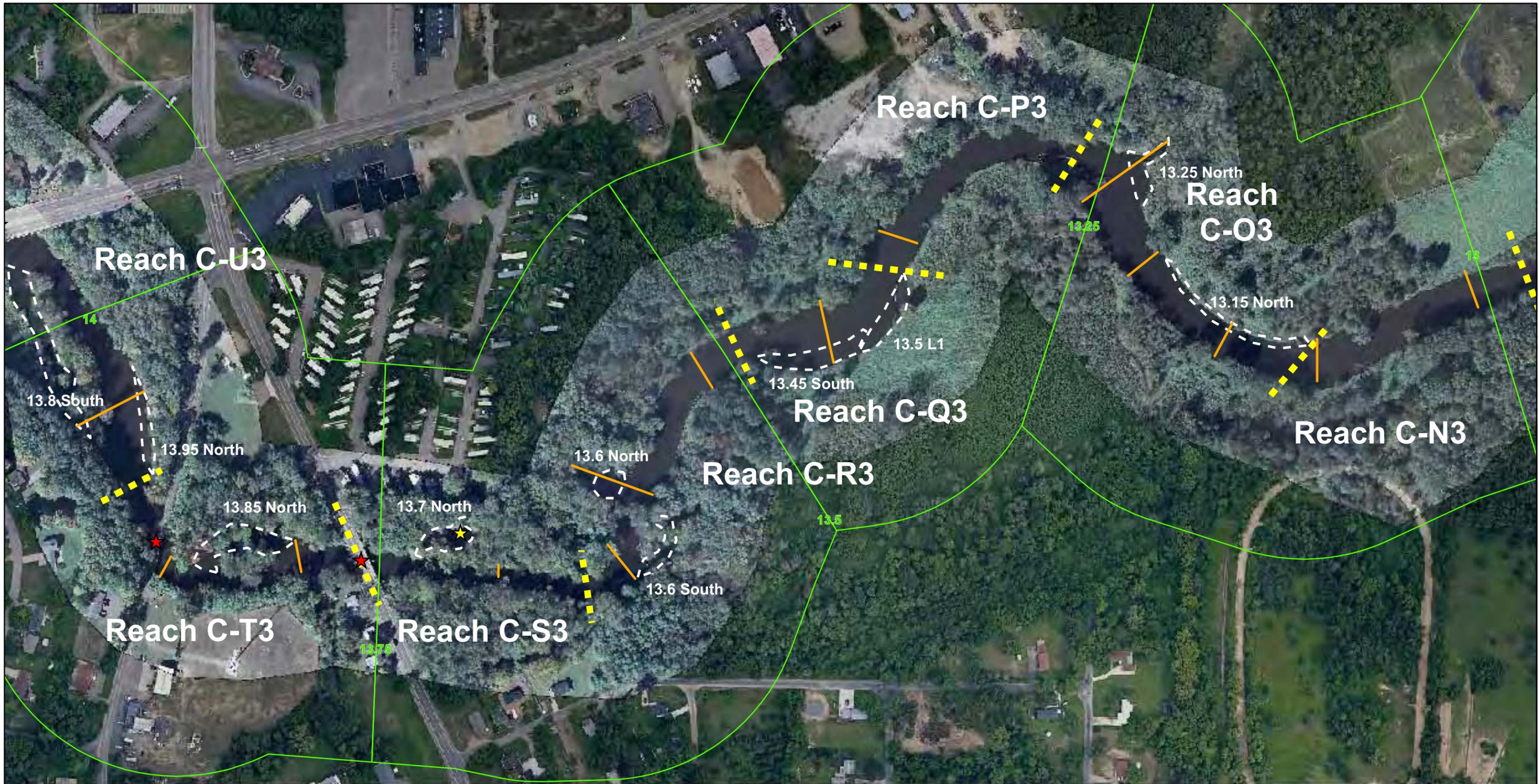
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
MP12.25-MP13.00
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011



Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

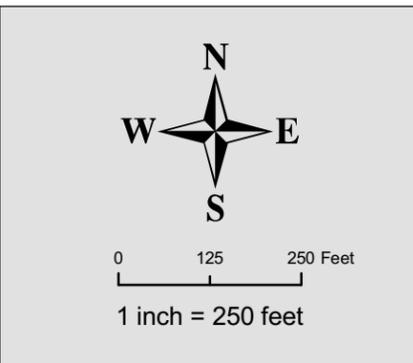
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Units: International Feet
Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
MP13.00-MP14.00

ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN

Apr 15, 2011


TETRA TECH EC, INC.



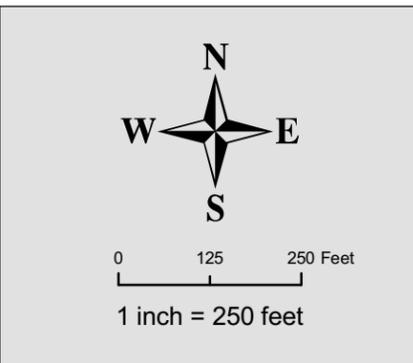
Legend

- Poling Focus Areas
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP14.00-MP14.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
MP14.75-MP15.50

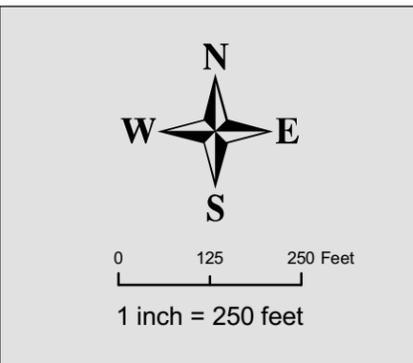
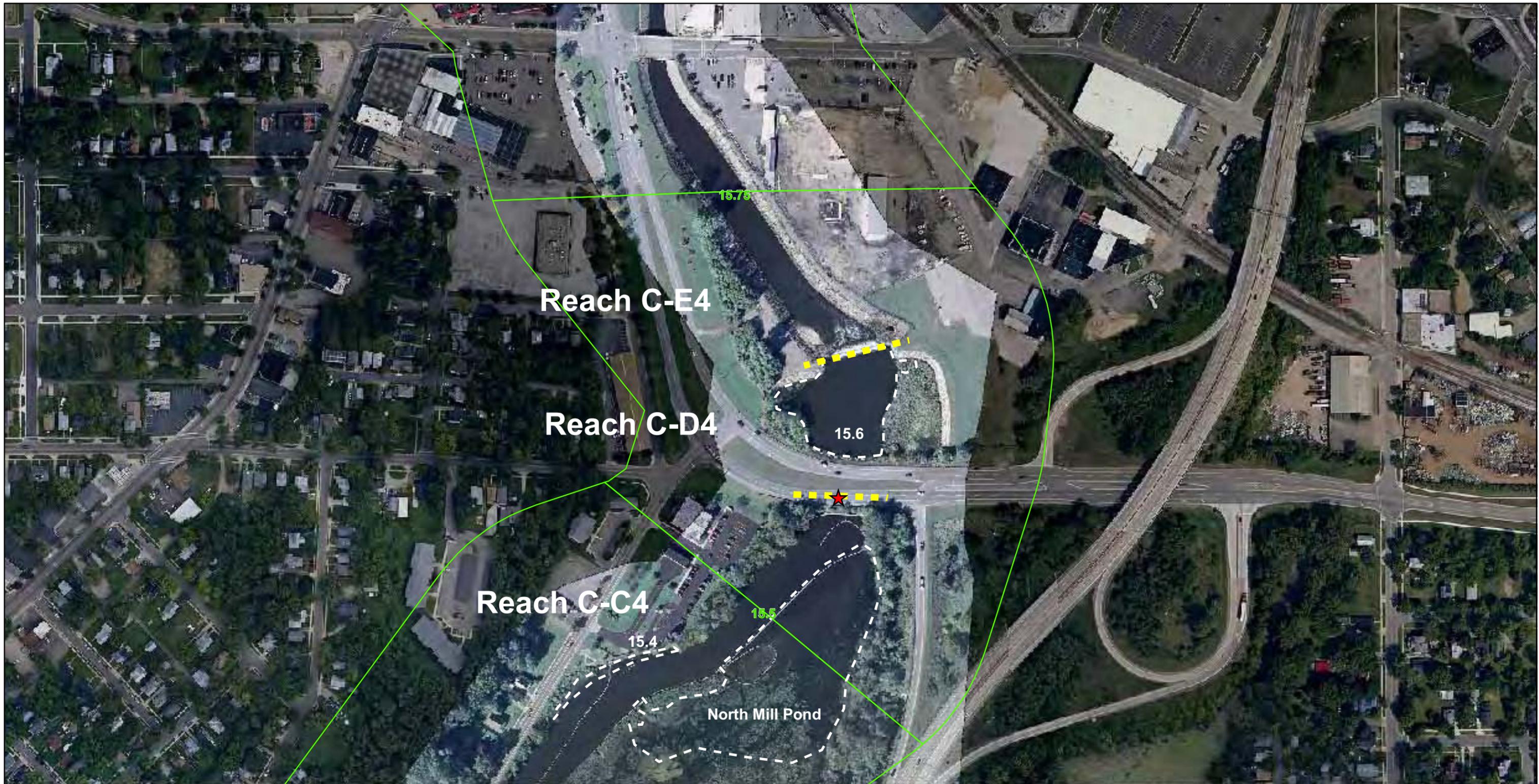
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN

Apr 15, 2011

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010



TETRA TECH EC, INC.



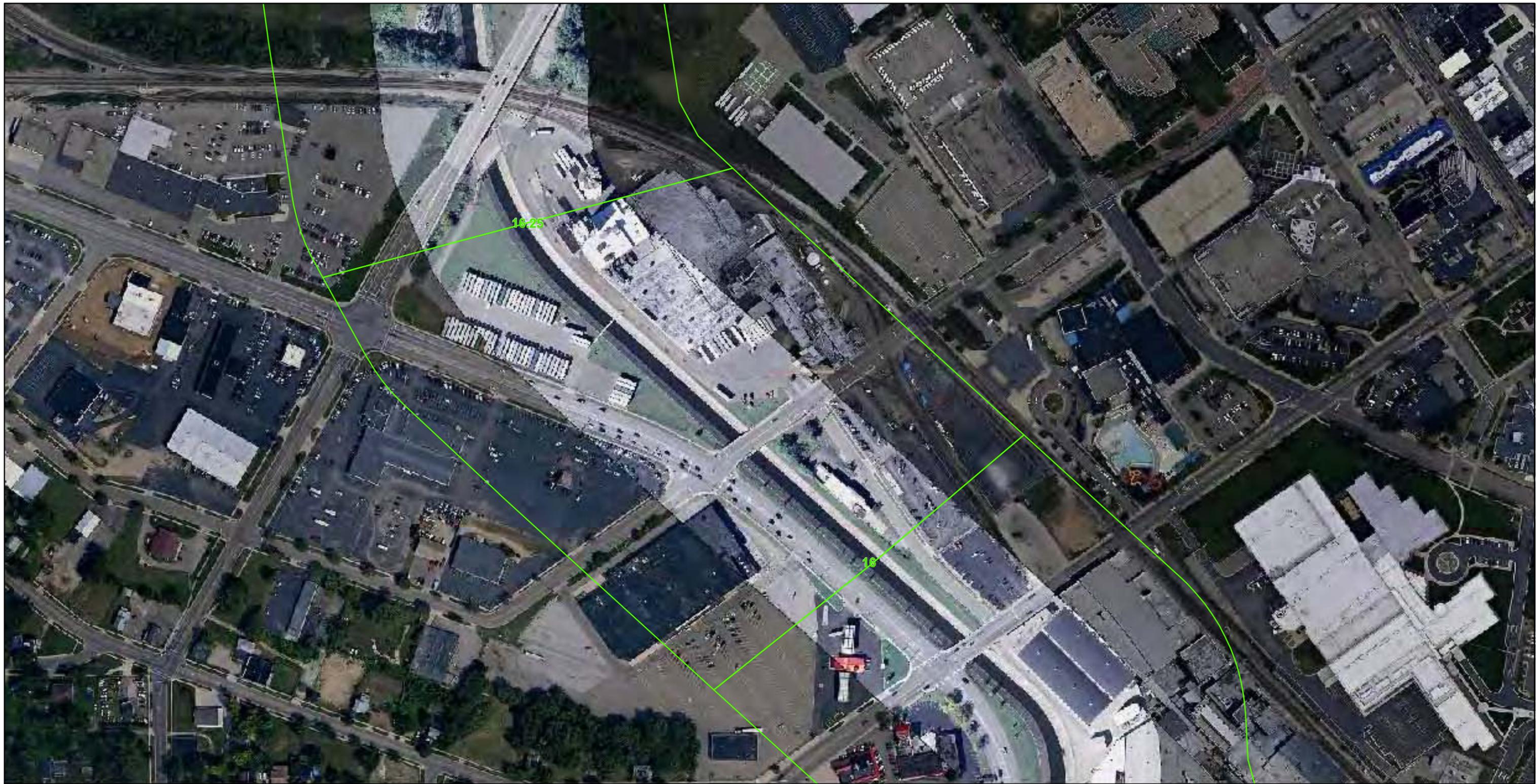
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP15.25-MP16.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



0 125 250 Feet
1 inch = 250 feet

Legend

-  Poling Focus Areas
-  Poling Transects
-  Park/Launch Access Poling Areas
-  Bridge Access Poling Areas
-  Geomorphic Reaches
-  Quarter Mile Section

Reassessment Poling Areas
MP16.00-MP16.50
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010





Reach C-G4

Reach C-F4

Reach C-E4

16.75

16.5

Legend

-  Poling Focus Areas
-  Poling Transects
-  Park/Launch Access Poling Areas
-  Bridge Access Poling Areas
-  Geomorphic Reaches
-  Quarter Mile Section

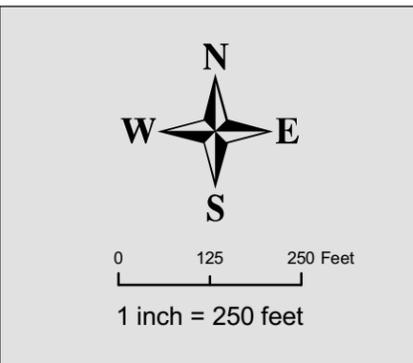
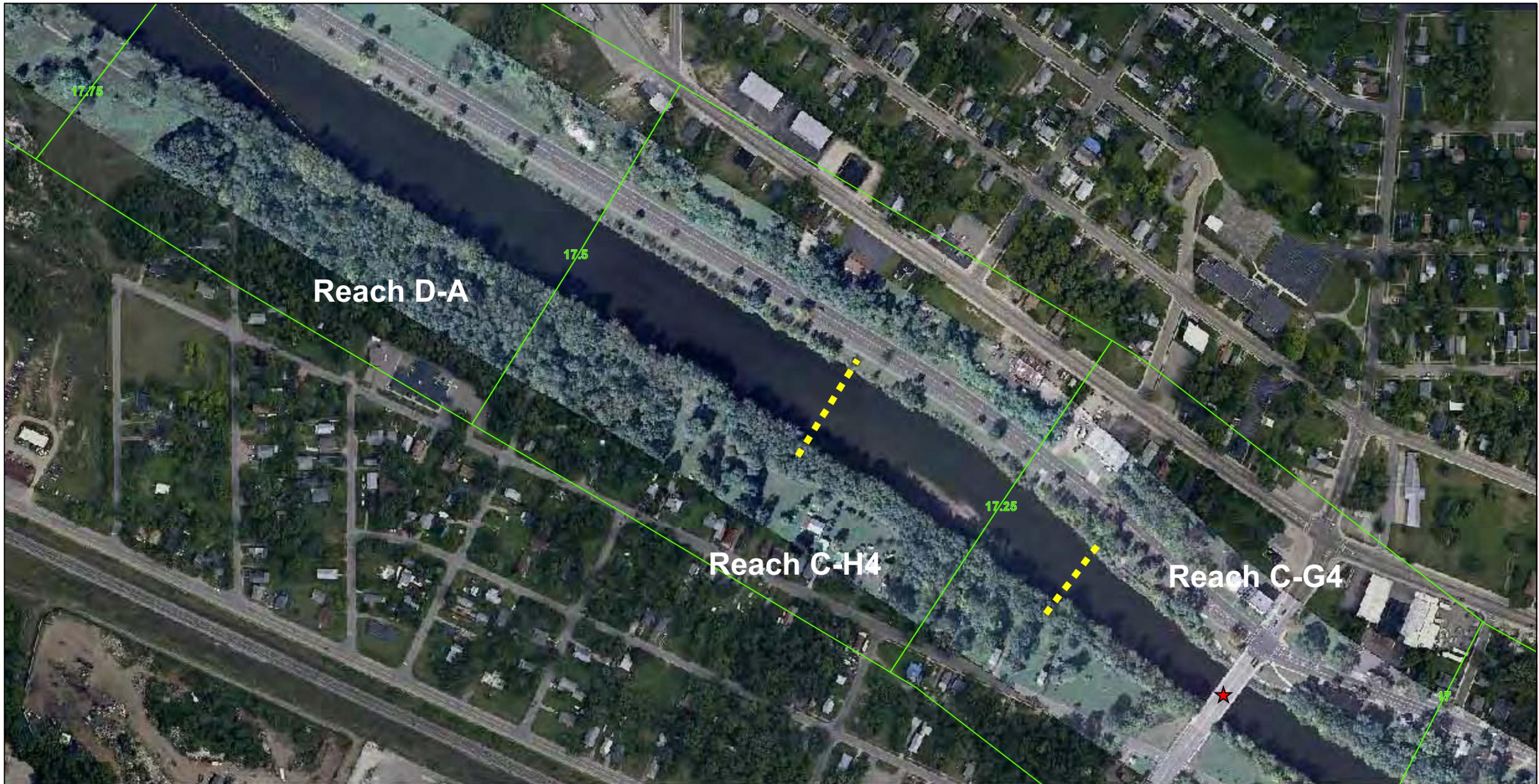


0 125 250 Feet
1 inch = 250 feet

Reassessment Poling Areas
MP16.50-MP17.00
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
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Enbridge Aerial Photography from August 26, 2010





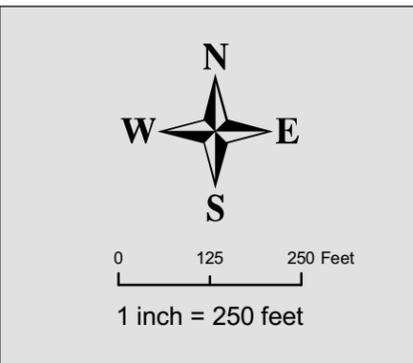
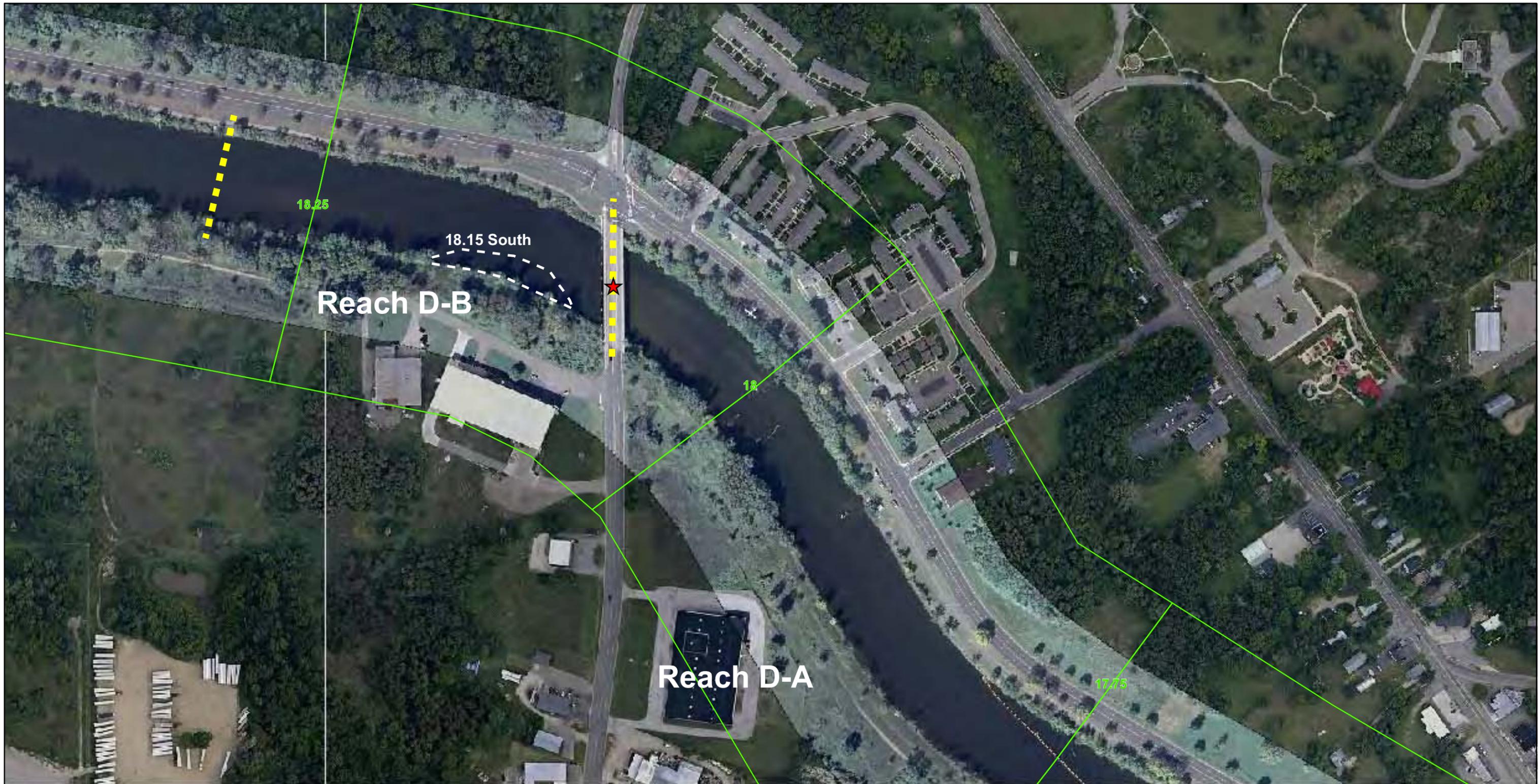
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP17.00-MP17.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



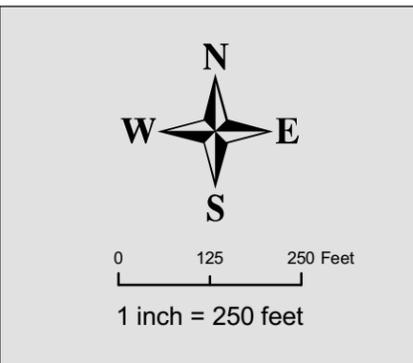
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP17.75-MP18.25
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP18.25-MP19.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



0 125 250 Feet
1 inch = 250 feet

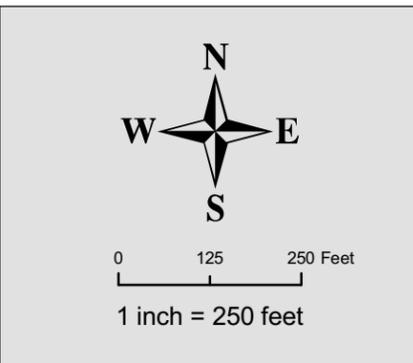
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
MP19.00-MP19.75
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010





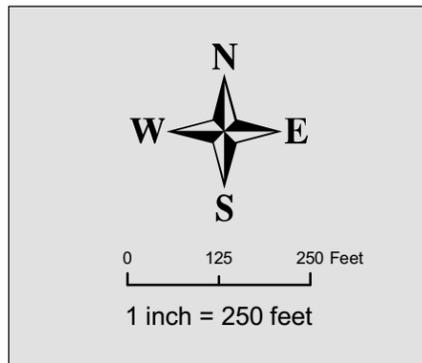
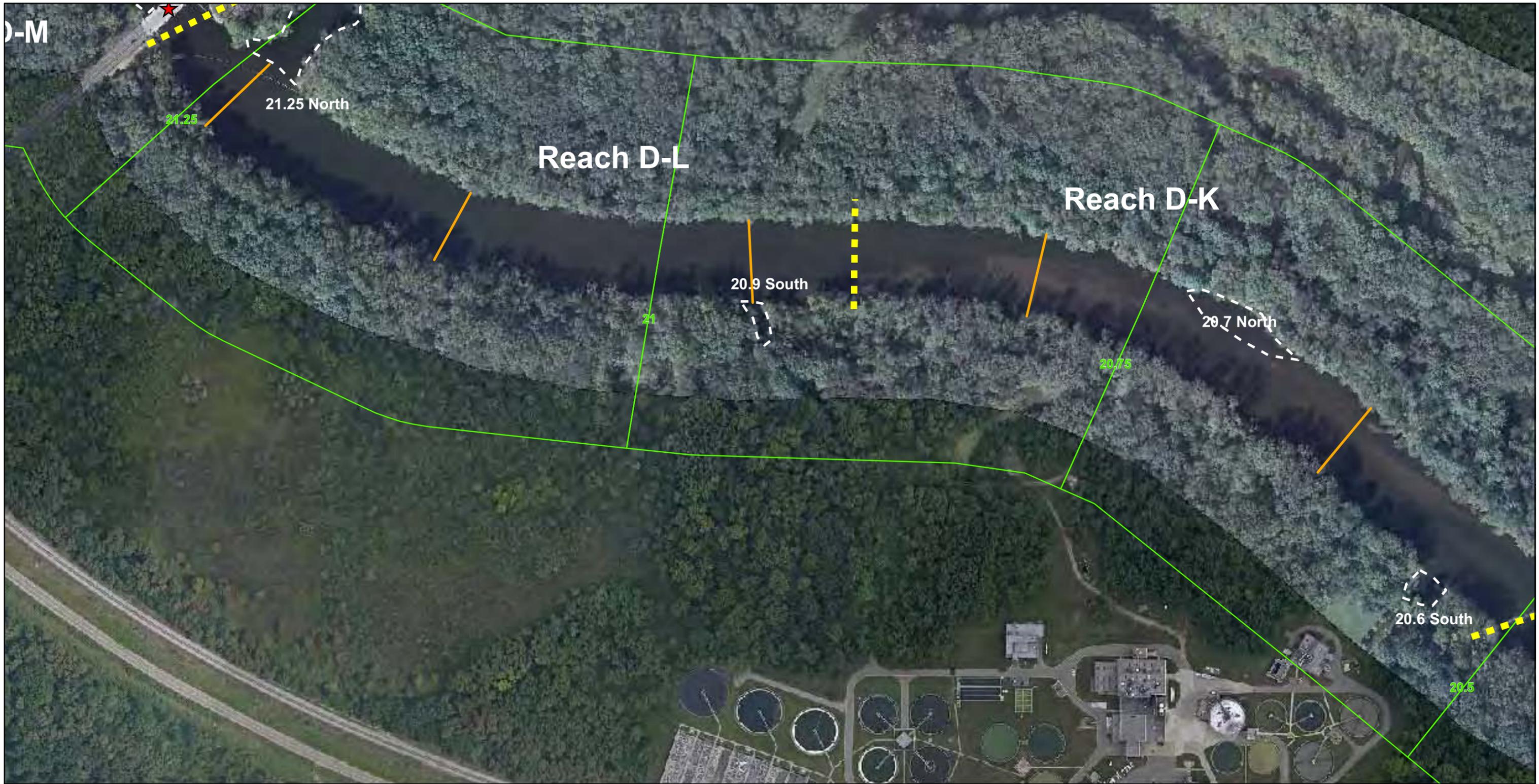
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP19.75-MP20.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
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TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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 Enbridge Aerial Photography from August 26, 2010



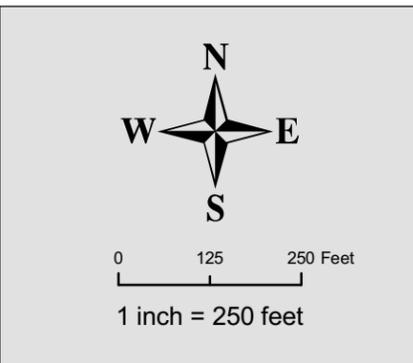
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
MP20.50-MP21.25
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

TETRA TECH EC, INC.



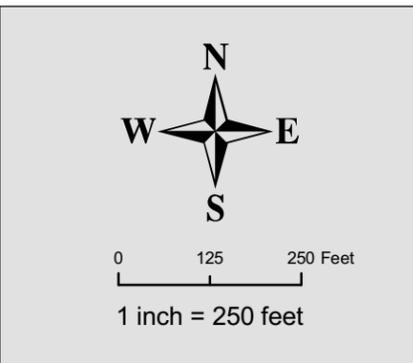
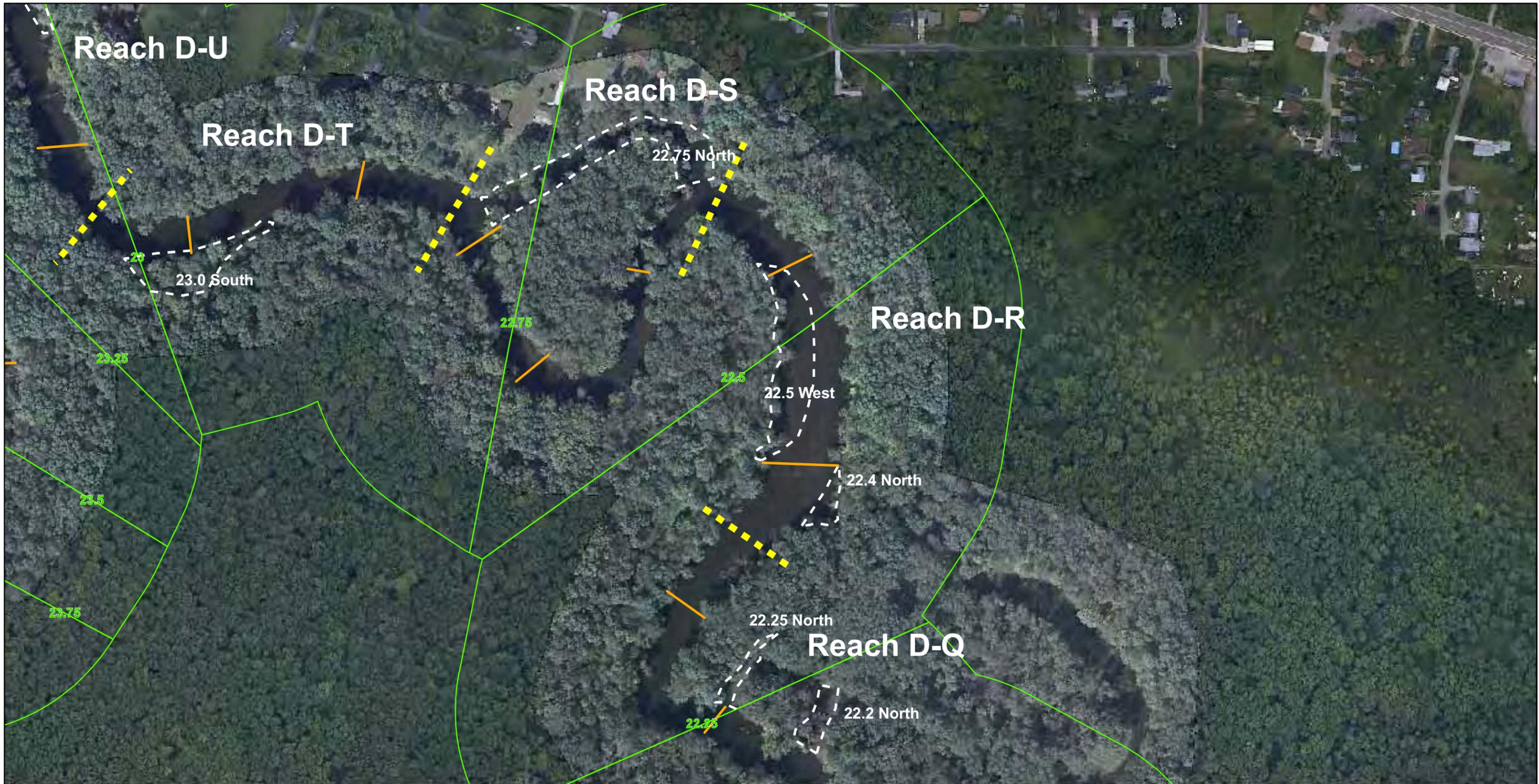
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP21.25-MP22.25
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
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TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

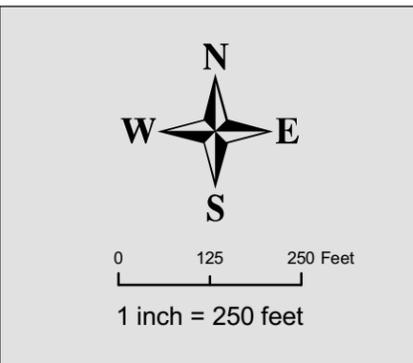
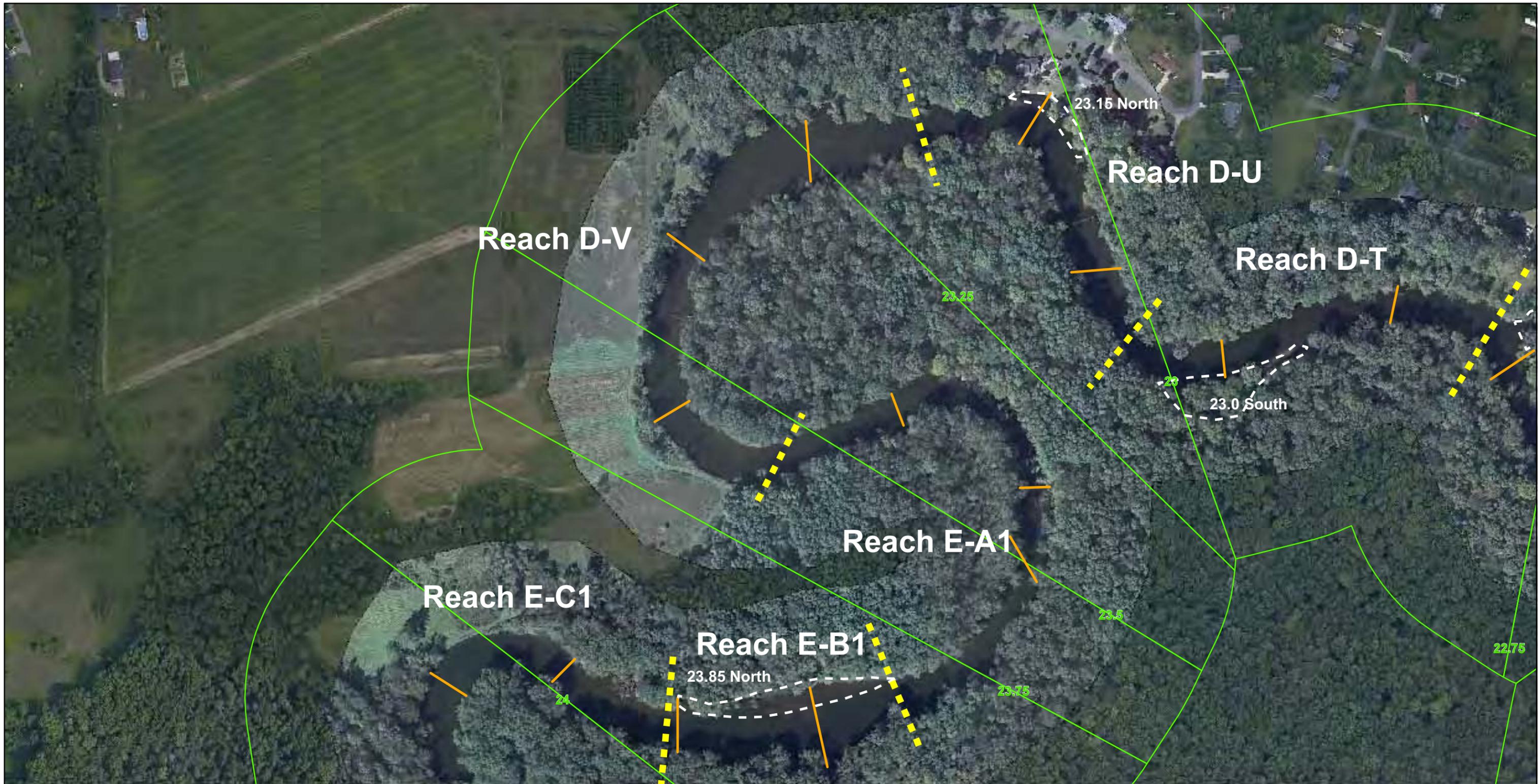
Reassessment Poling Areas
MP22.25-MP23.00

ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN

Apr 15, 2011

Coordinate System: Michigan State Plane South
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Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010

TETRA TECH EC, INC.



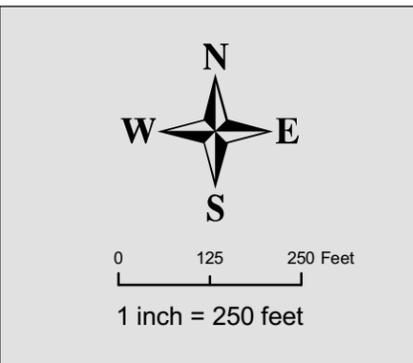
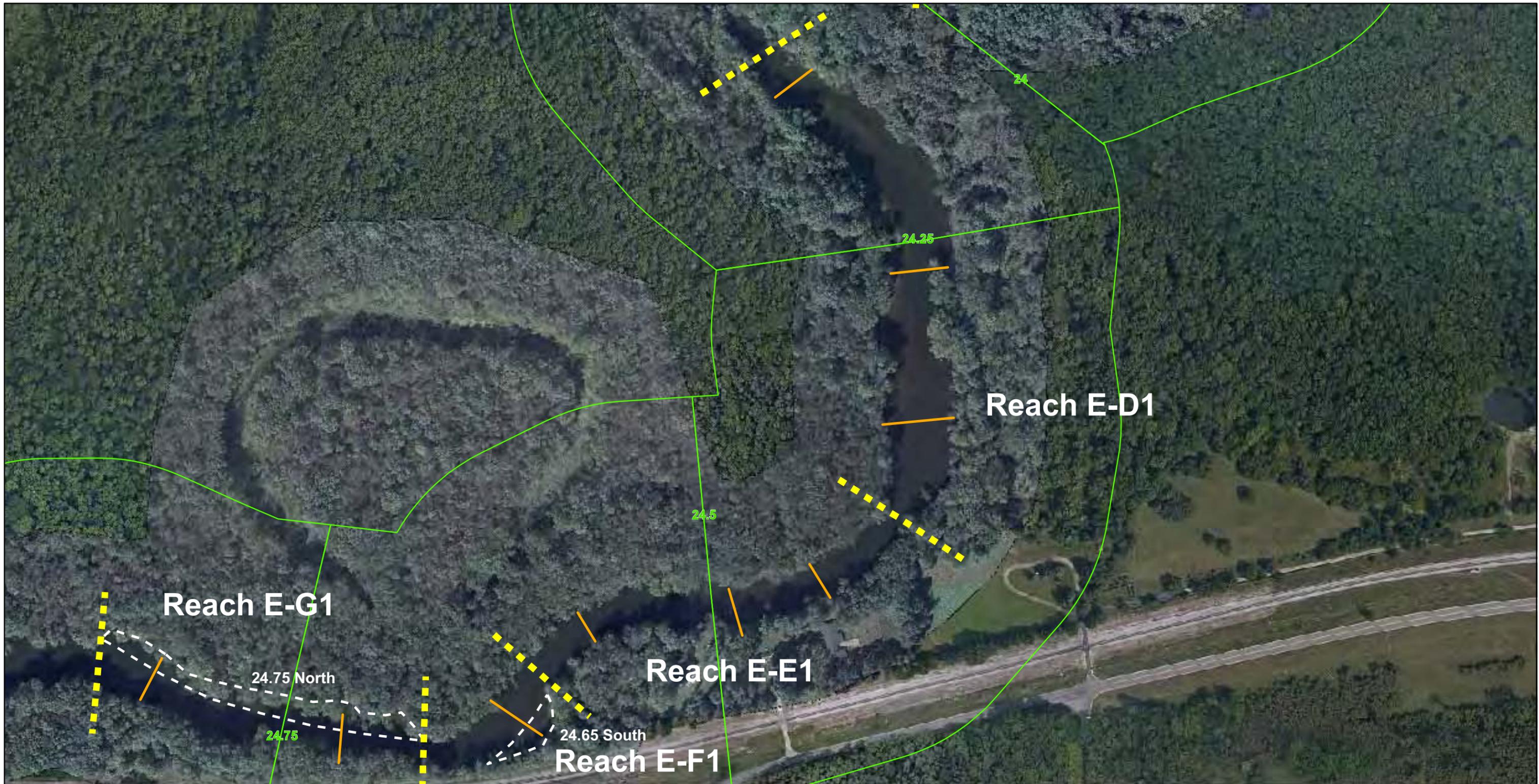
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP23.00-MP24.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
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 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010

TETRA TECH EC, INC.



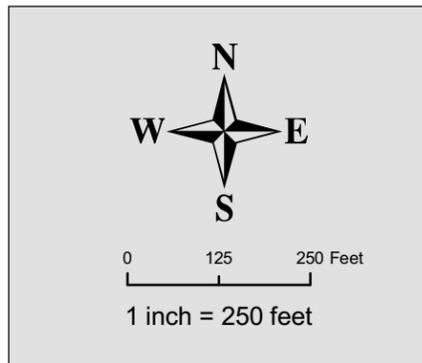
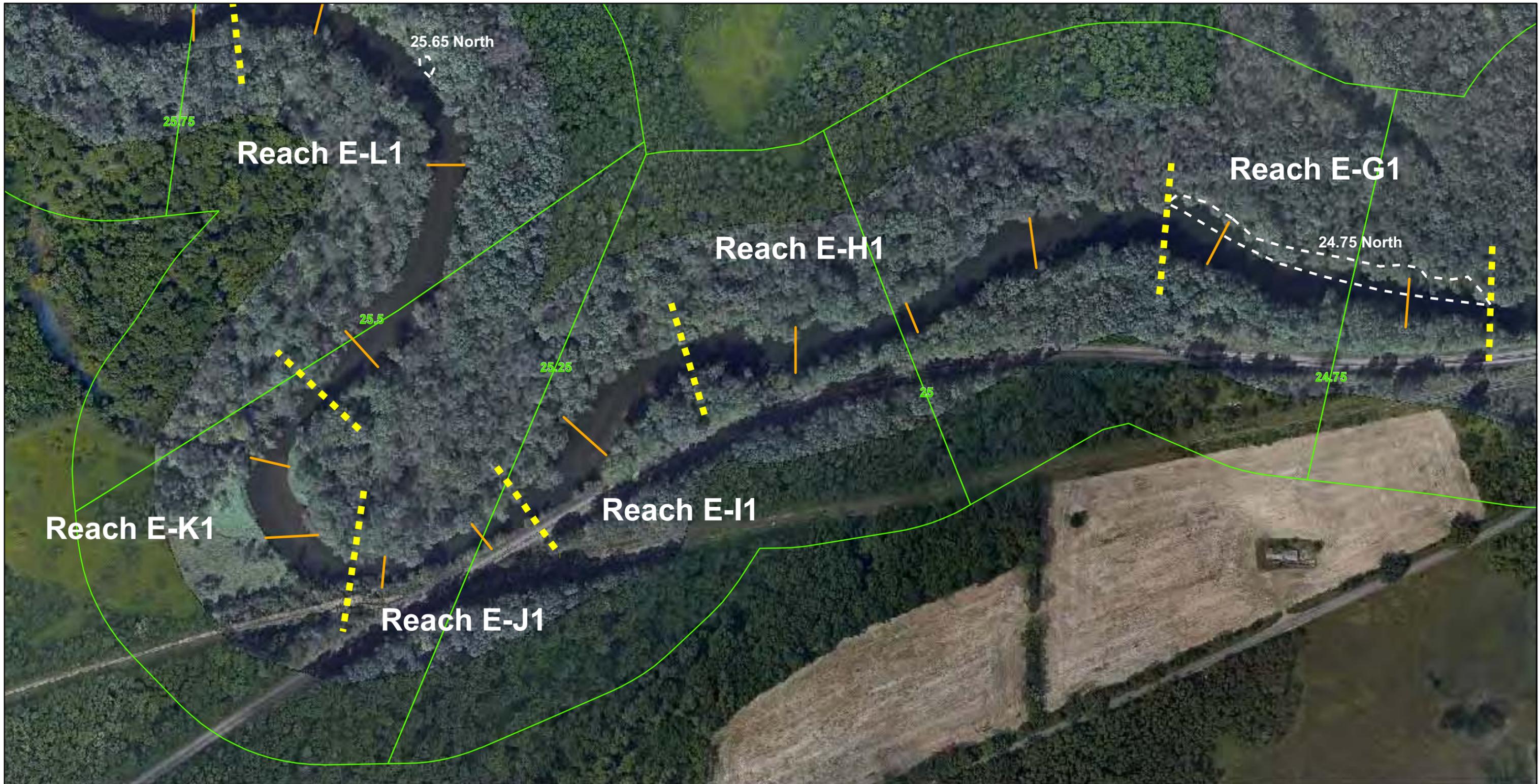
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP24.00-MP24.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
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TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



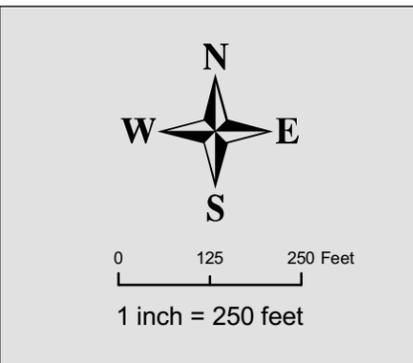
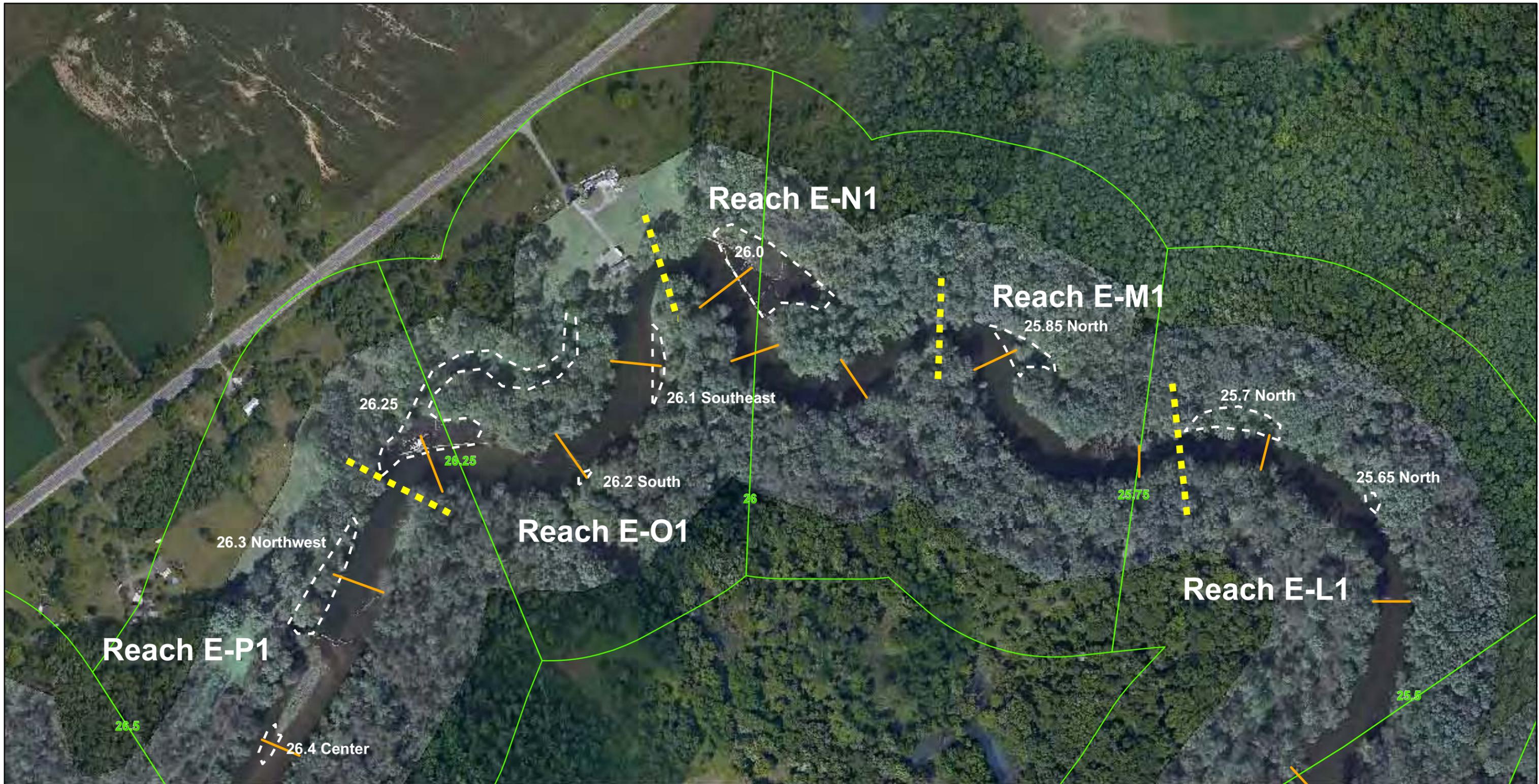
Legend

- Poling Focus Areas
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP24.75-MP25.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
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TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



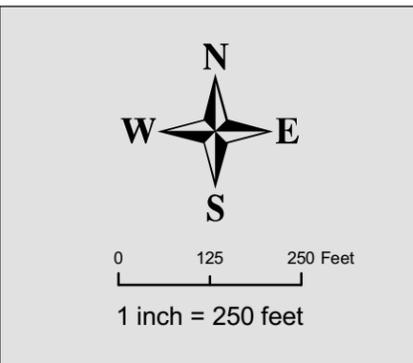
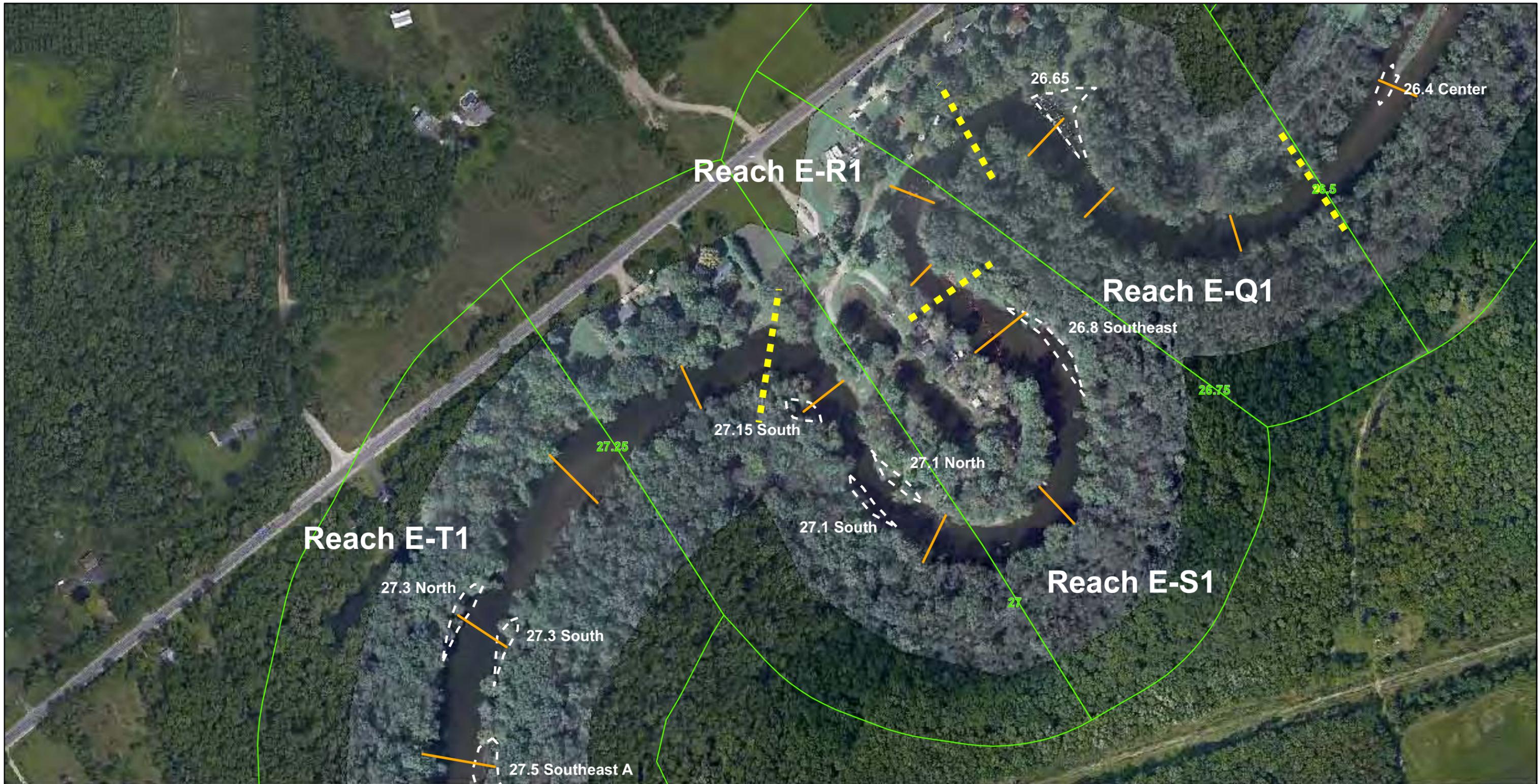
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP25.50-MP26.50
 ENBRIDGE LINE 6B RESPONSE
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TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

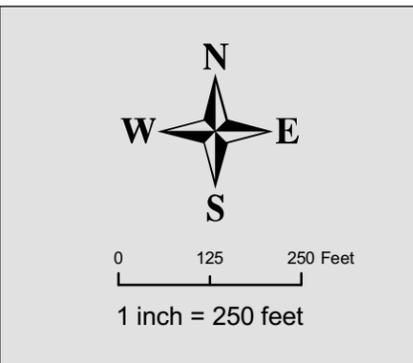
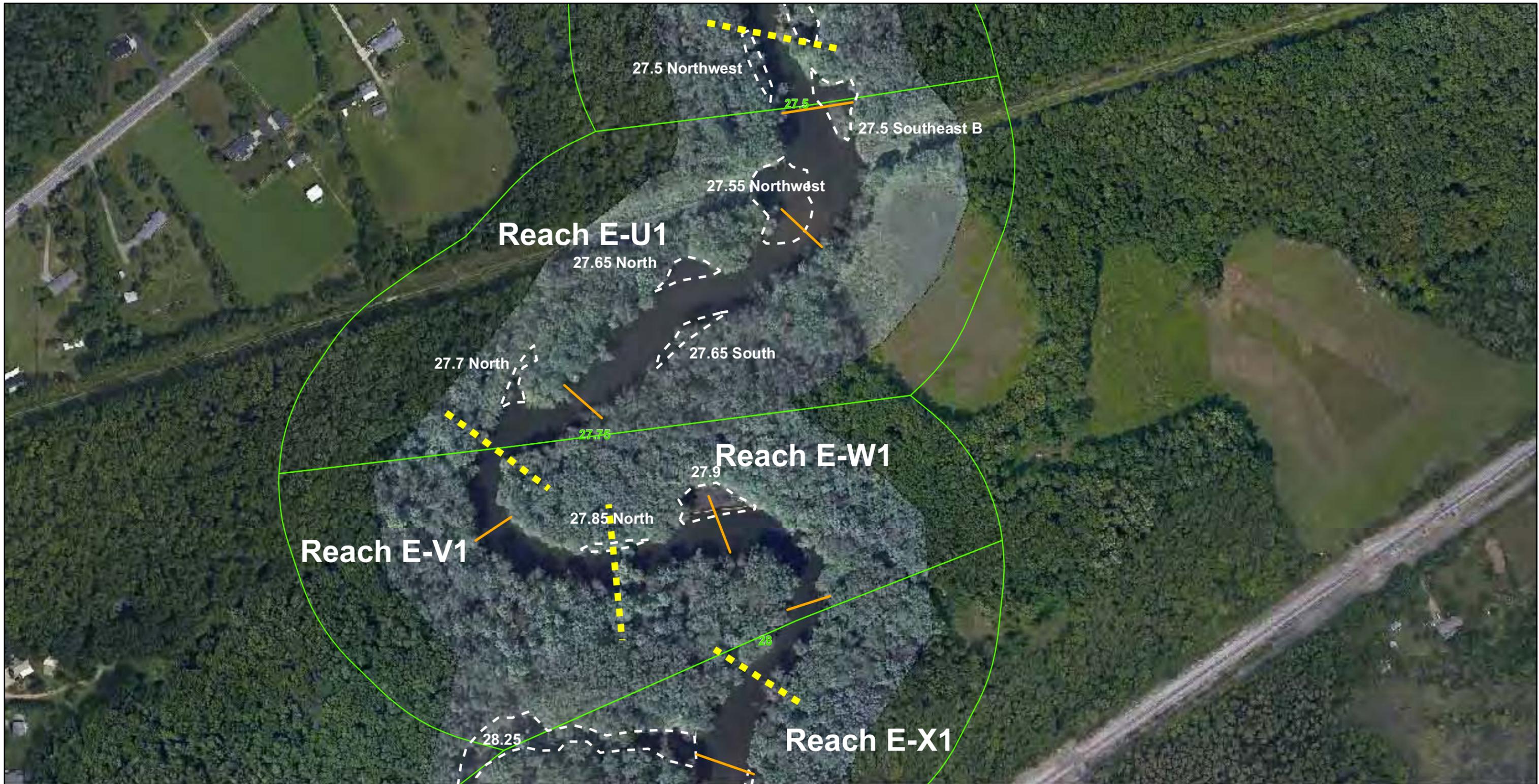
- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
 MP26.50-MP27.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011



TETRA TECH EC, INC.



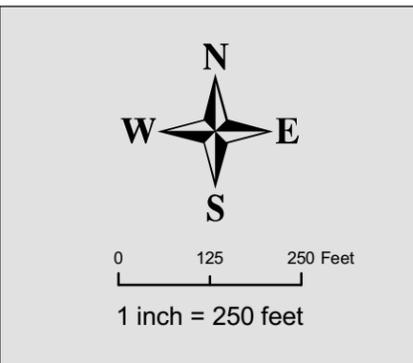
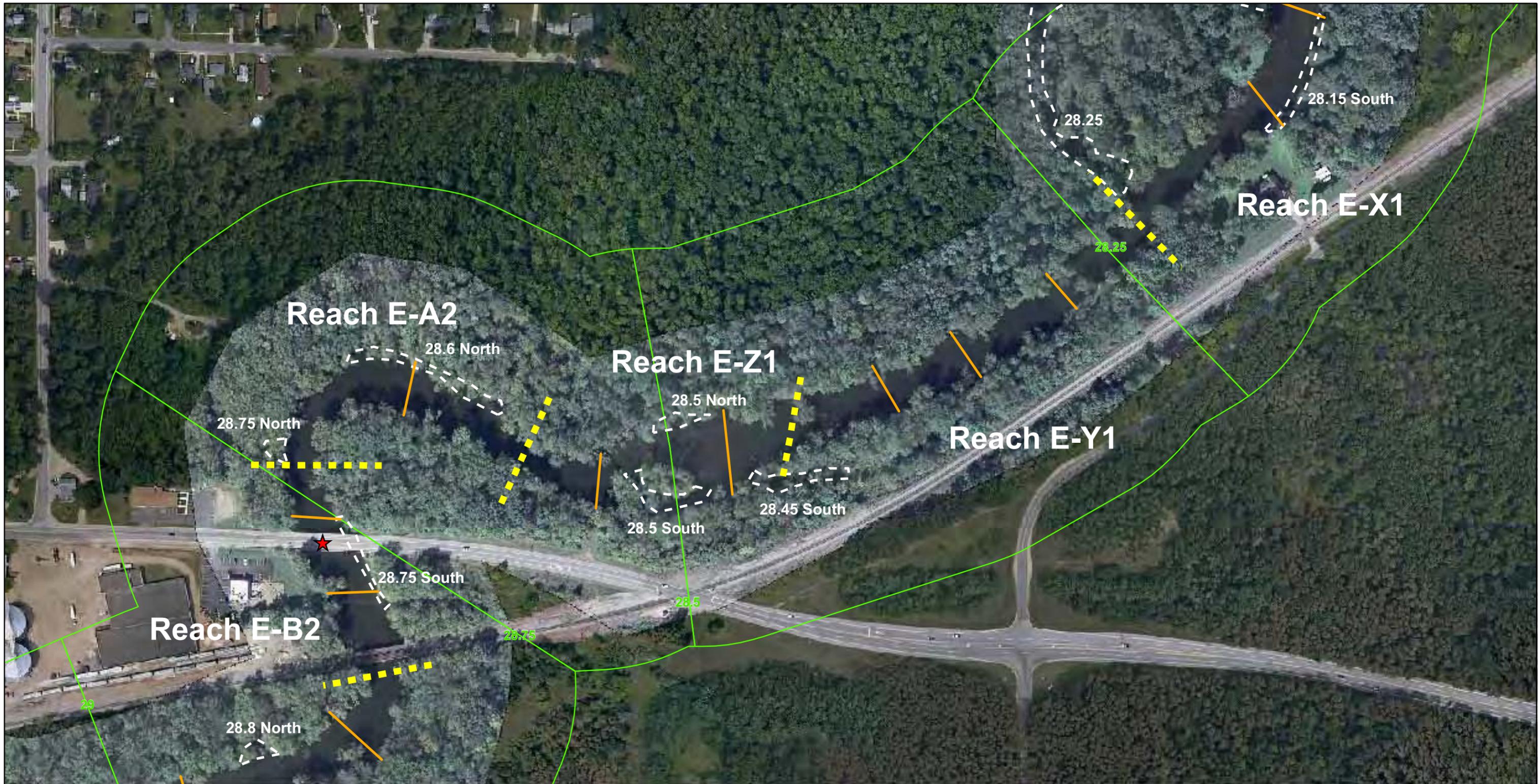
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP27.50-MP28.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP28.00-MP29.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Reach E-G2

Reach E-E2

Reach E-D2

Reach E-C2

Reach E-F2

29.5 North

29.5 South

29.1 North

29.15 North

29.05 South

28.9 South

29.25

29

29.5



0 125 250 Feet
1 inch = 250 feet

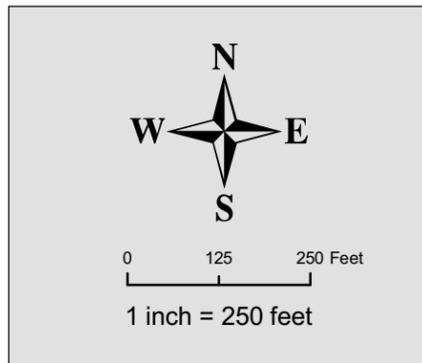
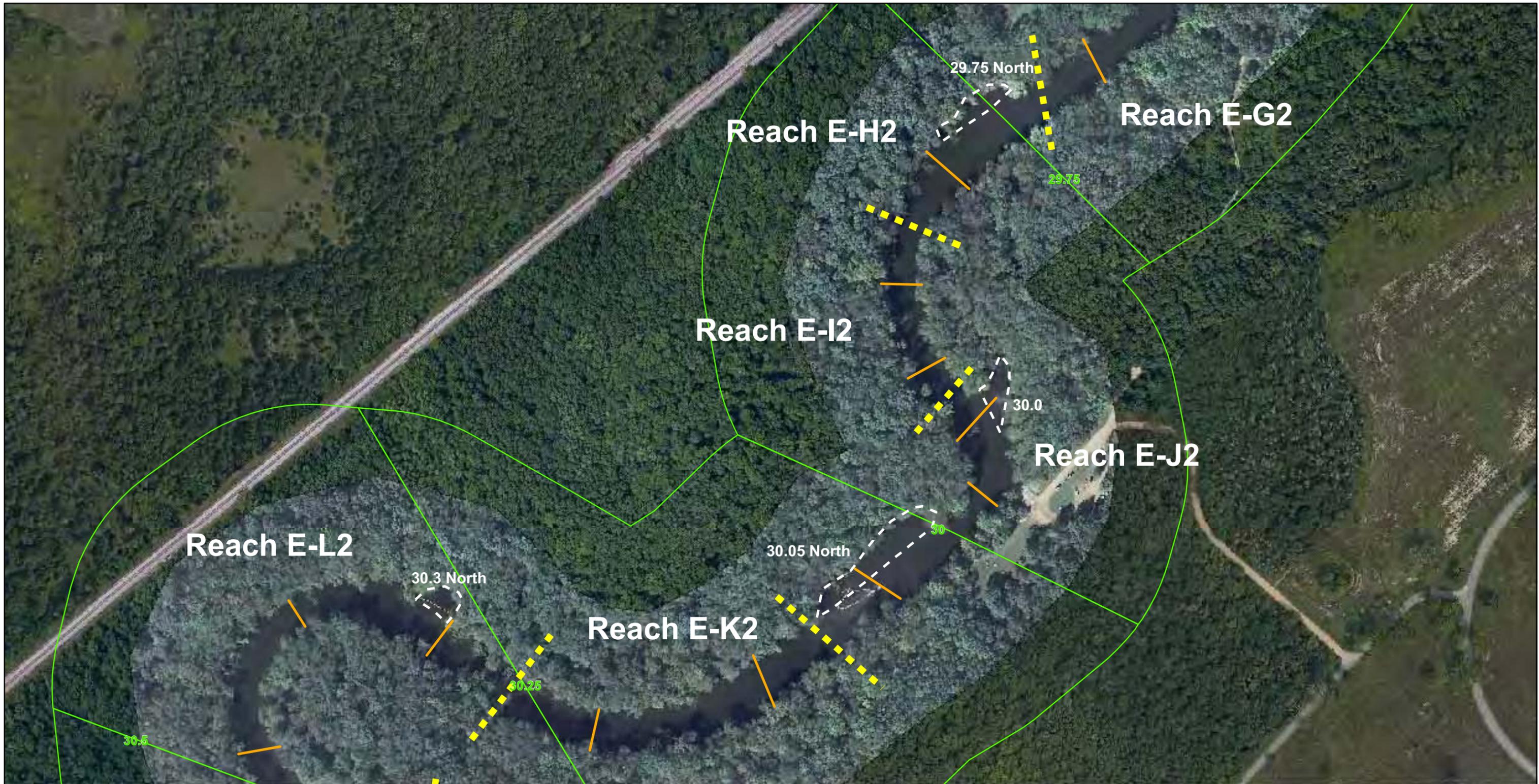
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
MP29.00-MP29.75
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011



Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Units: International Feet
Enbridge Aerial Photography from August 26, 2010



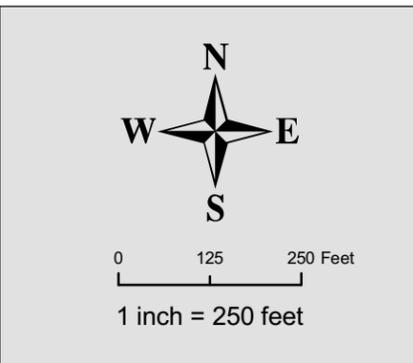
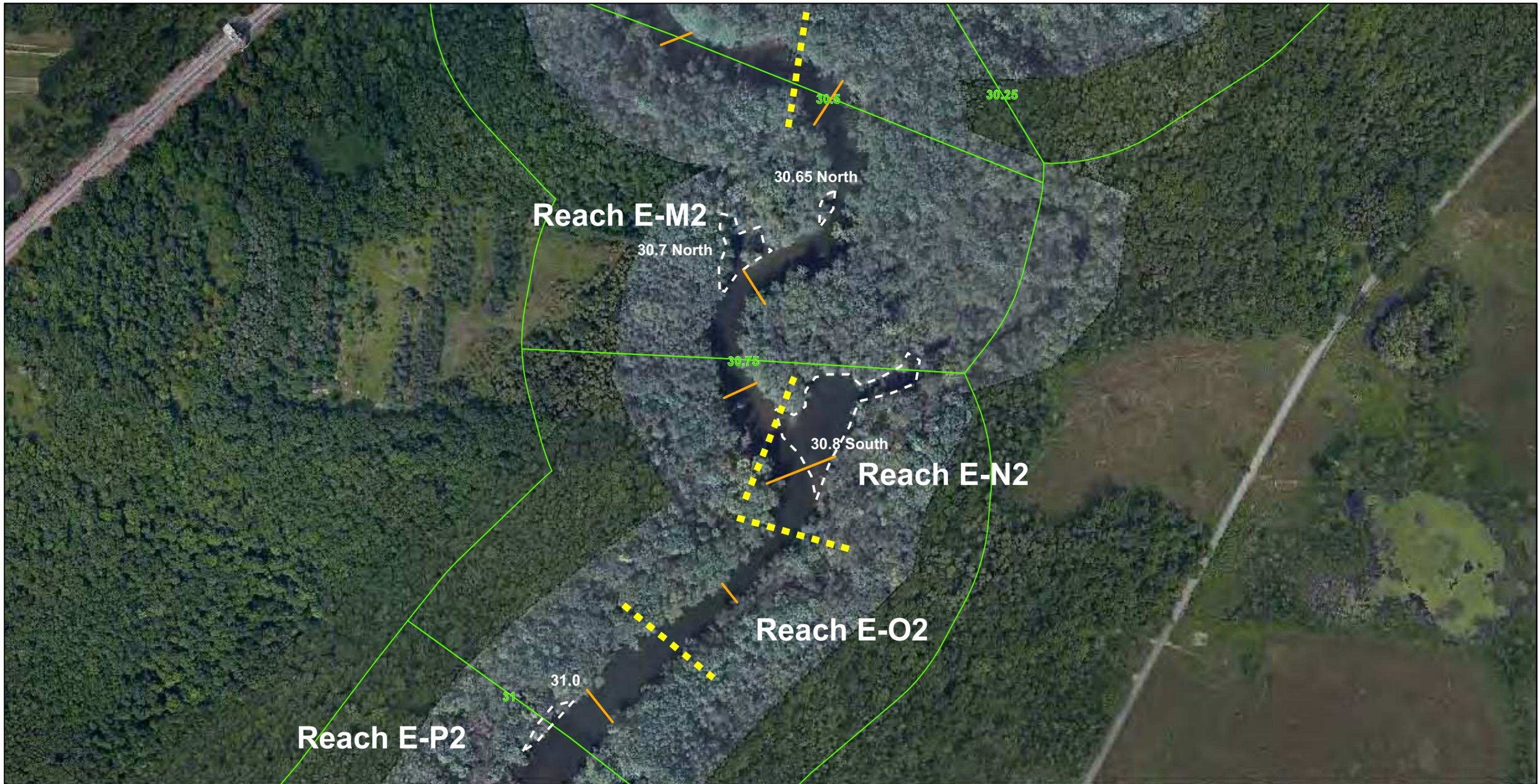
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP29.75-MP30.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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 Enbridge Aerial Photography from August 26, 2010



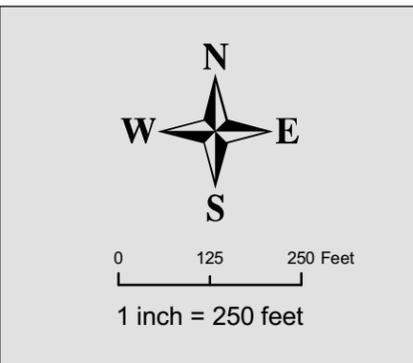
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP30.50-MP31.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

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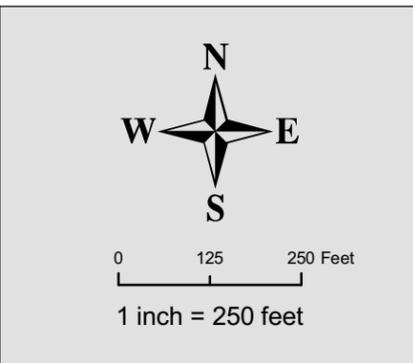
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP31.00-MP31.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

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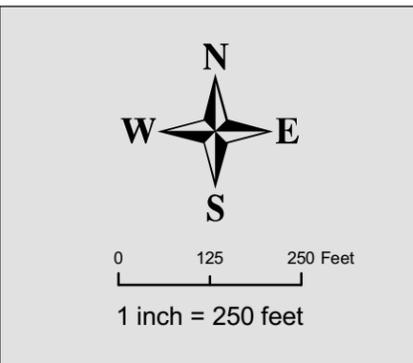
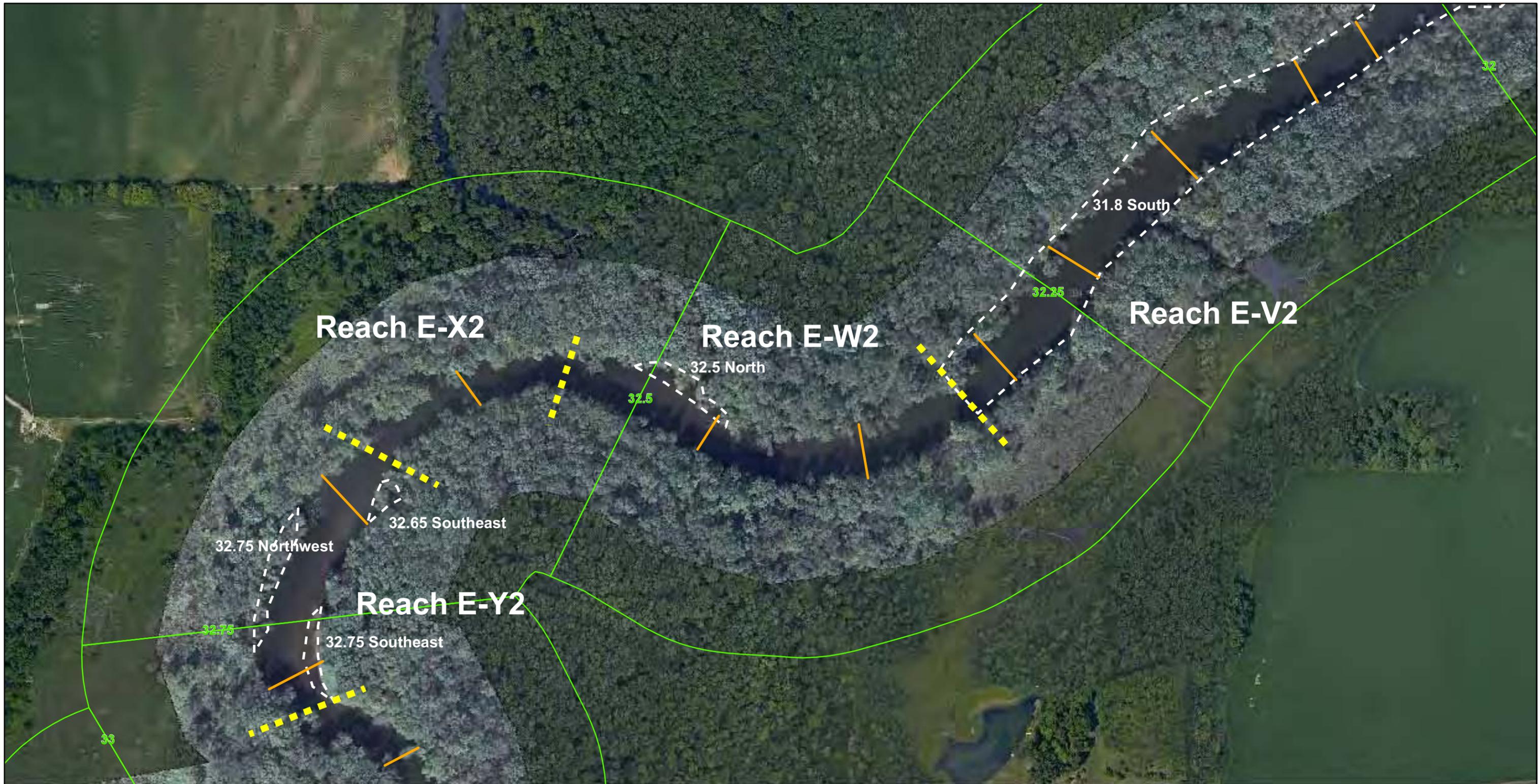
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP31.50-MP32.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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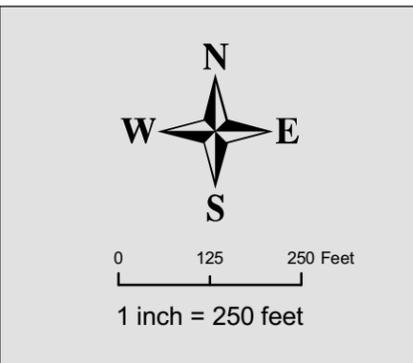
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP32.00-MP33.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
 Vertical Datum: NAVD88
 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Coordinate System: Michigan State Plane South
Horizontal Datum: NAD83
Vertical Datum: NAVD88
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Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
MP32.75-MP33.50
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

TETRA TECH EC, INC.



0 125 250 Feet
1 inch = 250 feet

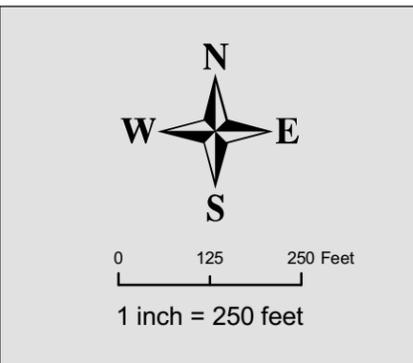
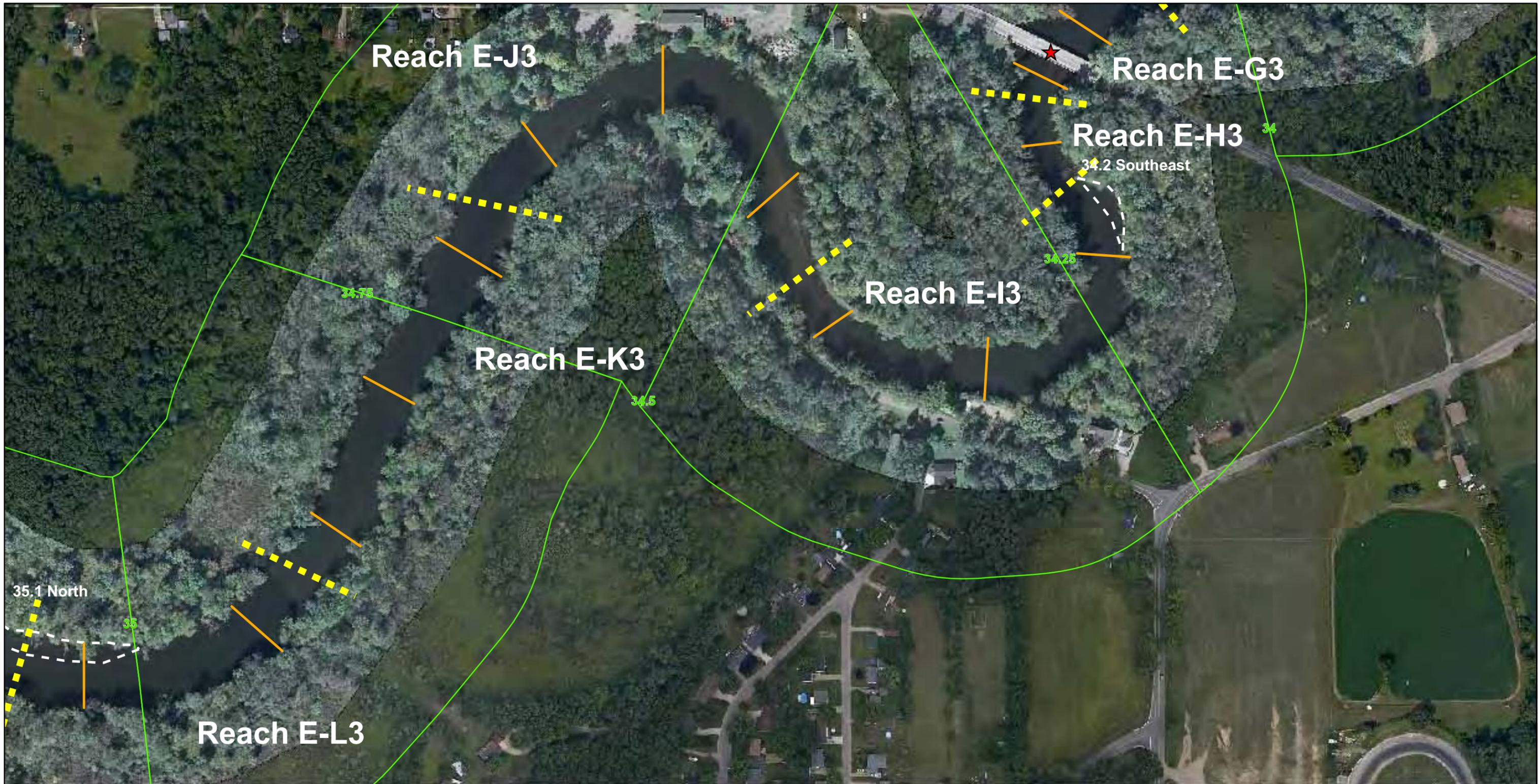
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
MP33.50-MP34.00
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
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Coordinate System: Michigan State Plane South
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Enbridge Aerial Photography from August 26, 2010



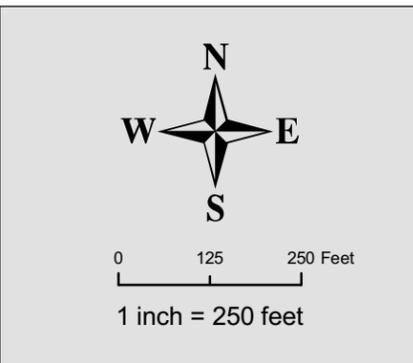
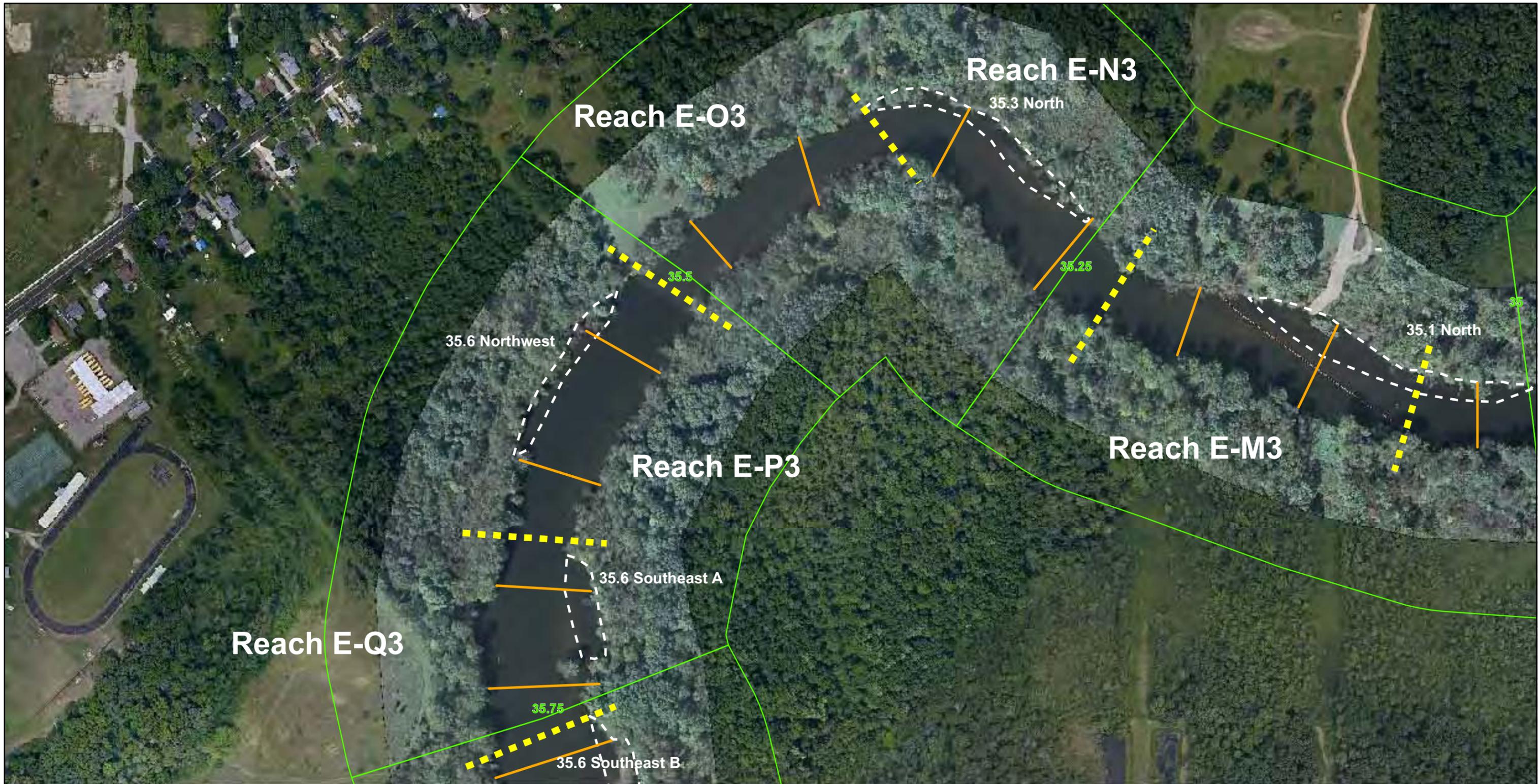
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP34.00-MP35.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

Coordinate System: Michigan State Plane South
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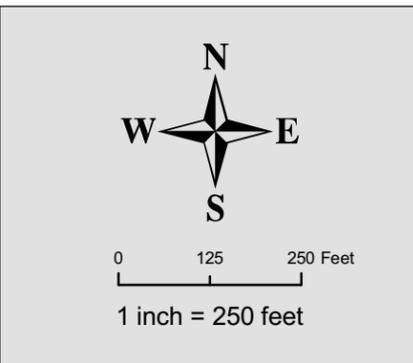
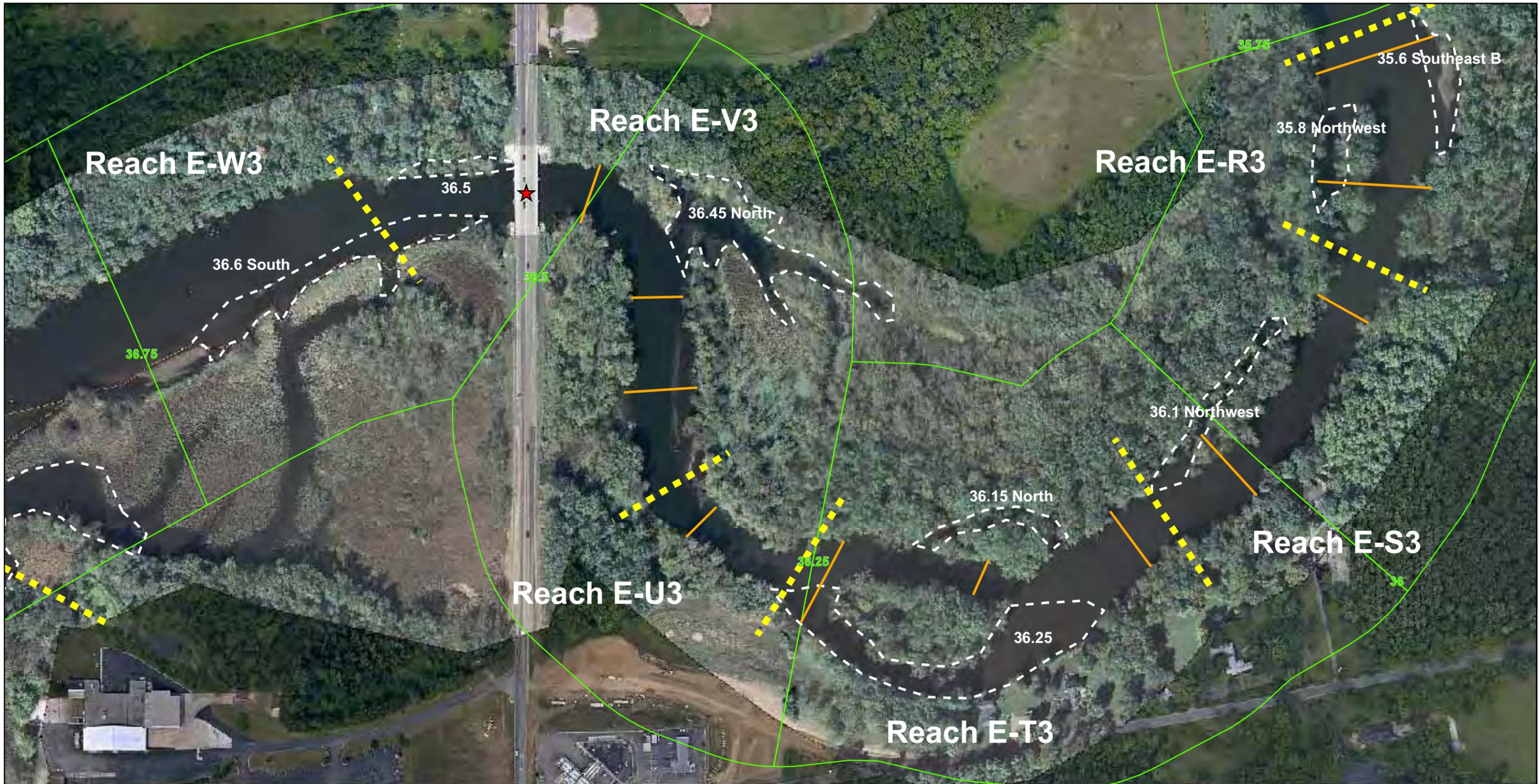
Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP35.00-MP35.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
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TETRA TECH EC, INC.

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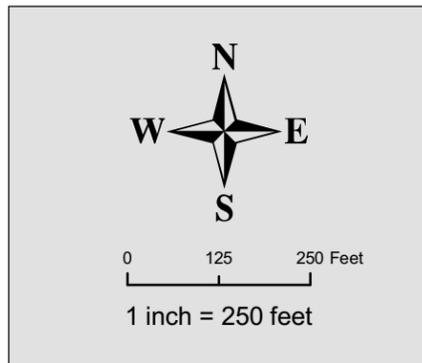
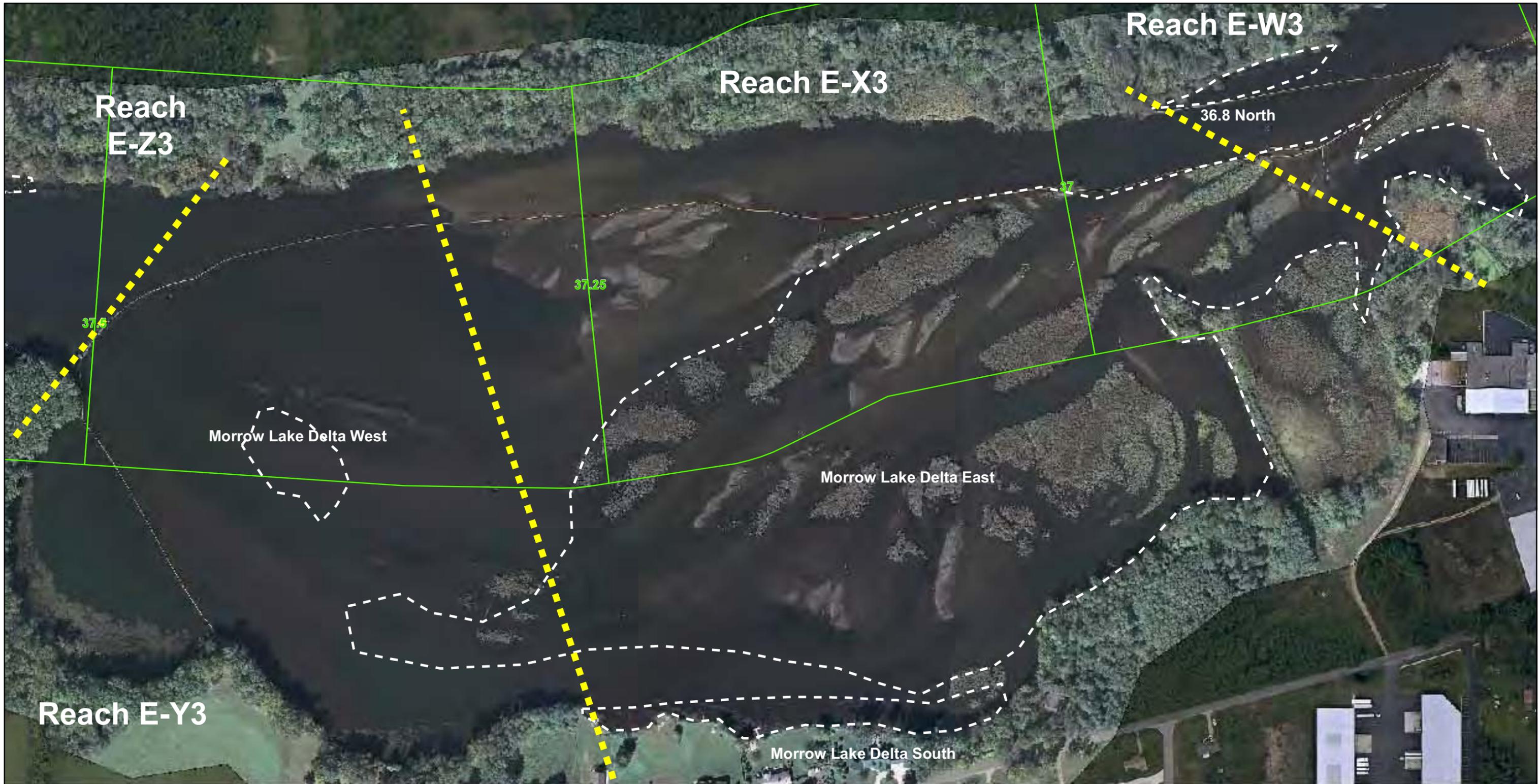
Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP35.75-MP36.75
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011


TETRA TECH EC, INC.

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 Enbridge Aerial Photography from August 26, 2010



Legend

- Poling Focus Areas
- Quarter Mile Section
- Poling Transects
- ★ Park/Launch Access Poling Areas
- ★ Bridge Access Poling Areas
- Geomorphic Reaches

Reassessment Poling Areas
 MP36.75-MP37.50
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
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TETRA TECH EC, INC.

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 Units: International Feet
 Enbridge Aerial Photography from August 26, 2010



Reach E-C4

Reach E-A4

Reach E-B4

Entrance to Morrow Lake

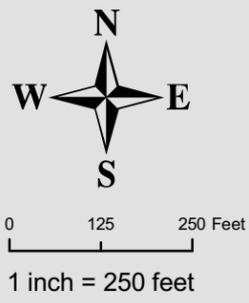
Reach E-Z3

38.25

36

37.75

37.75 North



Legend

-  Poling Focus Areas
-  Poling Transects
-  Park/Launch Access Poling Areas
-  Bridge Access Poling Areas
-  Geomorphic Reaches
-  Quarter Mile Section

Reassessment Poling Areas
 MP37.50-MP38.25C
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

Coordinate System: Michigan State Plane South
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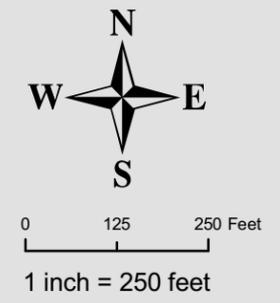
Reach E-B4

Reach E-C4

38.25

38

37.75



- Legend**
- Poling Focus Areas
 - Geomorphic Reaches
 - Park/Launch Access Poling Areas
 - Bridge Access Poling Areas
 - Quarter Mile Section
 - Poling Transects

Coordinate System: Michigan State Plane South
 Horizontal Datum: NAD83
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 Enbridge Aerial Photography from August 26, 2010

Reassessment Poling Areas
 MP37.50-MP38.25N
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011





Reach
E-C4

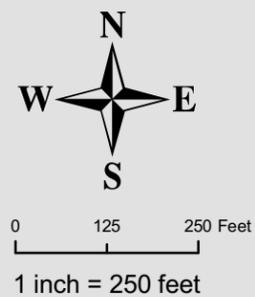
Reach
E-Z3

Reach E-B4

38.25

38

37.75



Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

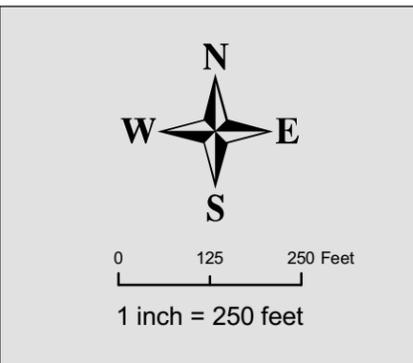
Reassessment Poling Areas
MP37.50-MP38.25S
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 15, 2011

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Enbridge Aerial Photography from August 26, 2010





Reach E-C4



Legend

- Poling Focus Areas
- Poling Transects
- Park/Launch Access Poling Areas
- Bridge Access Poling Areas
- Geomorphic Reaches
- Quarter Mile Section

Reassessment Poling Areas
 MP39.50-MP40.00
 ENBRIDGE LINE 6B RESPONSE
 KALAMAZOO AND CALHOUN COUNTIES
 MICHIGAN
 Apr 15, 2011

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 Enbridge Aerial Photography from August 26, 2010

TETRA TECH EC, INC.

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
Low-sinuosity: MP 2.0 to MP 4.5										
C-A1	2.03-2.20	871 ft	85-120 ft	2.5 ft	Low-sinuosity point bar (right bank), downstream of apex	Mostly sand and gravel, some areas of silt over sand	None	Minimal moderate and heavy, only at confluence	Confluence with Talmadge Creek at upstream end of reach	River setting
C-B1	2.20-2.25	264 ft	~100 ft	3.8 ft	Short, transitional straight reach between two point bars	Mostly sand and gravel, some areas of silt over sand	15 Mile Rd Bridge	None detected	Altered fluvial geomorphology due to bridge supports	Water depth, anthropogenic impact
C-C1	2.25-2.41	871 ft	110-225 ft	2.4 ft	Upstream side of large point bar (left bank), split by cutoff channel	Mostly sand and gravel, some soft sediment downstream of large island	None	Slight only	Two islands in reach	River setting
C-D1	2.41-2.57	818 ft	100-275 ft	1.7 ft	Transitional between two large point bars	Sand and gravel in main channel, soft sediment downstream of island	None	None, except heavy just downstream of island	Backwater area protected by island on north bank from MP 2.48 to MP 2.54	River setting, water depth
C-E1	2.57-2.68	581 ft	80-125 ft	2.7 ft	Apex of large right bank point bar	Sand and gravel in thalweg, soft sediment adjacent to point bar	None	Moderate to heavy immediately adjacent to point bar, none in central channel	None	River setting
C-F1	2.68-2.77	502 ft	125-250 ft	1.8 ft	Downstream side of large right bank point bar	Sand and gravel in thalweg, soft sediment adjacent to point bar	None	None in thalweg, slight to heavy immediately adjacent to point bar	Tributary enters on south bank at MP 2.71	Channel width, water depth
C-G1	2.77-2.87	528 ft	180-210 ft	2.3 ft	Low-sinuosity point bar (right bank), downstream of apex	Mostly sand and gravel, some soft sediment immediately adjacent to point bar	Possible bank armoring on left bank	Some moderate to heavy, only along south bank point bar	Upstream end of reach marked by notable decrease in water surface gradient as identified on longitudinal profile	Gradient, channel width, river setting
C-H1	2.87-3.22	1,822 ft	220-240 ft	2.0 ft	Straight reach with two large mid-channel islands	Mostly sand and gravel, except soft sediment immediately downstream of islands	Possible bank armoring on left bank	Moderate and heavy almost entirely restricted to immediately downstream of islands	Two large mid-channel islands in reach	River setting
C-I1	3.22-3.43	1,135 ft	100-225 ft	2.9 ft	Channel constriction (dual point bar)	Gravel in main channel, soft sediment near banks	Unknown	Some moderate and heavy along south bank	Narrow backwater channel on north bank only connected to river at higher water levels	Channel width, water depth, submerged oil
C-J1	3.43-4.08	3,432 ft	200-275 ft	2.0 ft	Very low-sinuosity meander	Generally sand, with some soft sediment around islands	None	Limited moderate to heavy, only around islands	Four small islands in reach	Channel width, water depth
C-K1	4.08-4.27	1,003 ft	290-310 ft	2.4 ft	Wide, straight reach with large mid-channel island	Sand north side of channel, soft sediment south side of channel	None	Moderate to heavy, especially south of island	Large mid-channel island	Channel width, bed type, river setting
C-L1	4.27-4.51	1,267 ft	120-300 ft	3.6 ft	Constriction due to tributary delta formation	Mostly soft sediment along south bank (delta), sand and sand/silt mix on north side of channel	Ceresco Dam	Moderate and heavy adjacent to tributary delta (south bank)	Upstream end of reach marked by notable decrease in water surface gradient (almost to zero) as identified on longitudinal profile	Gradient, channel width, water depth, river setting
Low-sinuosity: Ceresco Dam to MP 9.75										
C-T1	5.84-5.90	343 ft	80-200 ft	---	Straight reach, immediately downstream of Ceresco Dam	Sand and gravel in main channel, some soft sediment near powerhouse	Ceresco Dam, Main St Bridge	Heavy, unknown in thalweg but likely none	Very turbulent immediately downstream of dam	Anthropogenic impact, channel width
C-U1	5.90-6.03	686 ft	80-150 ft	2.6 ft	Upstream side of broad, right bank point bar	Sand and gravel in main channel, some soft sediment along banks	None	None to slight, except localized heavy along banks	Channel narrow at both ends of reach but wider in middle	Channel width
C-V1	6.03-6.22	1,003 ft	60-150 ft	2.4 ft	Downstream side of broad, right bank point bar	Mostly sand and gravel, some soft sediment along banks	None	Moderate to heavy localized along left bank, none in channel	Channel widens moving down reach, from upstream to downstream	River setting, channel width
C-W1	6.22-6.35	686 ft	200-240 ft	2.0 ft	Straight reach, with mid-channel islands	Sand and gravel, except along banks and downstream of islands	None	Localized moderate along left bank, heavy downstream of islands	Two mid-channel islands	River setting, channel width, water depth
C-X1	6.35-6.61	1,346 ft	110-150 ft	2.5 ft	Left bank point bar	Sand and gravel in main channel, soft sediment along north bank	Outfall/excavation on right bank at MP 6.59	Moderate to heavy along north bank in downstream half of reach	None	River setting, channel width, water depth
C-Y1	6.61-6.76	818 ft	175-280 ft	1.7 ft	Straight reach, with mid-channel island	Mostly sand and gravel in main channel with soft sediment downstream of island and localized along banks	None	Localized moderate to heavy along north bank, and downstream of island	Change in gradient at downstream end of reach	River setting, channel width, water depth, gradient
C-Z1	6.76-7.02	1,346 ft	90-140 ft (main channel), 35-70 ft (backwater channel)	2.1 ft	Straight reach, with backwater channel separated by two islands	Sand and gravel in main channel, silt, sand, and gravel in backwater channel	None	None in main channel, None to heavy in backwater channel	Change in gradient at upstream end of reach	River setting, gradient
C-A2	7.02-7.08	343 ft	110-125 ft	2.4 ft	Straight reach	Not known	None	Not known	None	Channel width
C-B2	7.08-7.18	502 ft	120-170 ft	1.1 ft	Upstream side of broad right bank point bar	Sand and gravel, with localized silt along south bank	11 Mile Rd Bridge is downstream end of reach	None	Possible man-made connection to pond on south bank at MP 7.14	Channel width, river setting, anthropogenic impact
C-C2	7.18-7.29	581 ft	125-140 ft	1.6 ft	Downstream side of right bank point bar	Sand and gravel	11 Mile Rd Bridge is at upstream end of reach	None	None	River setting, anthropogenic impact, channel width
C-D2	7.29-7.42	713 ft	140-170 ft	2.3 ft	Straight reach with mid-channel islands	Mostly sand and gravel, with limited areas of silt over sand	None	Mostly none, with some areas of silt	Two mid-channel islands	River setting, channel width
C-E2	7.42-7.58	845 ft	85-160 ft	2.0 ft	Left bank point bar	Sand and gravel, except sand over silt on downstream end of point bar	Bank remediation at point bar	Localized slight to heavy on downstream side of point bar	Small island and backwater channel along north bank	River setting

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
C-F2	7.58-7.73	792 ft	130-155 ft	1.8 ft	Straight reach with mid-channel islands	Sand and gravel	None	Localized slight along banks	Two small mid-channel islands, change in gradient at downstream end of reach	River setting, gradient
C-G2	7.73-7.89	845 ft	70-100 ft (main channel), 40-50 ft (backwater channel)	2.3 ft	Very low-sinuosity meander, with backwater channel on left bank	Mainly sand and gravel in main channel, with silt and silt over sand in backwater channel	None	None in main channel, heavy at upstream end of backwater channel	Gradient change at upstream end of reach	River setting, gradient, water depth
C-H2	7.89-8.00	581 ft	110-150 ft	2.6 ft	Upstream side of very broad left bank point bar	Sand and gravel, locally mixed with some silt along banks	None	None, except localized slight on north bank	None	River setting
C-I2	8.00-8.31	1,610 ft	120-260 ft	1.8 ft	Low-sinuosity meander, with many mid-channel islands	Sand and gravel	None	None	Numerous mid-channel islands	River setting, channel width
C-J2	8.31-8.48	924 ft	80-110 ft	2.6 ft	Generally straight reach with meander at downstream end	Sand and gravel, with localized silt along banks	None	None in main channel, slight to heavy in tributaries on south bank	Spring-fed tributaries enter main channel on south bank at MP 8.35 and MP 8.47	River setting, channel width, water depth
C-K2	8.48-8.70	1,162 ft	100-140 ft	2.3 ft	Straight reach	Sand and gravel	None	None	None	River setting
C-L2	8.70-8.87	898 ft	150-205 ft	2.3 ft	Straight reach with numerous mid-channel islands	Sand and gravel, with soft sediment downstream of islands	None	Generally none, slight downstream of islands	None	River setting, channel width
C-M2	8.87-9.07	1,030 ft	90-175 ft (main channel), 40-50 ft (backwater channel)	1.8 ft	Low-sinuosity meander with island and backwater channel	Sand and gravel, with soft sediment in upstream part of backwater channel and localized along banks	None	None in main channel, slight to moderate in upstream part of backwater channel	Large island forming backwater channel along south bank	River setting, water depth
C-N2	9.07-9.18	607 ft	95-160 ft	2.9 ft	Low-sinuosity meander	Sand and gravel, localized soft sediment along south bank	None	None	None	River setting, water depth
C-O2	9.18-9.30	634 ft	100-150 ft	2.5 ft	Straight reach upstream of I-94 bridge	Sand and gravel, with soft sediment along north bank	I-94 bridge	None	None	Anthropogenic impact, river setting
C-P2	9.30-9.48	950 ft	90-175 ft	3.1 ft	Very low-sinuosity meander between Wattles Rd Bridge and I-94 bridge	Sand and gravel, very localized soft sediment	I-94 bridge, Wattles Rd Bridge	None	Large mid-channel island, north bank tributary enters at MP 9.45	Anthropogenic impact, river setting, water depth
C-Q2	9.48-9.60	634 ft	100-120 ft	2.6 ft	South bank point bar	Sand and gravel, with soft sediment along banks	Wattles Rd Bridge at upstream end of reach	None	None	Anthropogenic impact, river setting, water depth
C-R2	9.60-9.83	1,214 ft	130-230 ft	2.0 ft	Straight reach with large mid-channel island and small right bank island	Sand and gravel, with soft sediment or silt over sand along banks	None	Slight between north-bank island and north bank	None	Channel width, river setting, water depth
High-sinuosity: MP 9.75 to MP 14.0										
C-S2	9.83-10.06	1,214 ft	95-160 ft	2.0 ft	High-sinuosity right bank point bar	Sand or sand and gravel, localized sand over silt	Possible impact from C3.2 launch area	None	Mid-channel island, beginning of high-sinuosity reaches	River setting, channel width
C-T2	10.06-10.25	977 ft	70-130 ft	2.8 ft	High-sinuosity left bank point bar	Sand and silt or sand over silt, with localized areas of soft sediment or sand and gravel	None	None	None	River setting, water depth
C-U2	10.25-10.32	370 ft	125-140 ft	2.2 ft	Upstream side of right bank point bar	Sand and gravel	Some bank armoring along left bank	None	Tributary enters on south bank at MP 10.30	Water depth, channel width
C-V2	10.32-10.41	502 ft	80-130 ft	3.2 ft	Downstream side of right bank point bar	Sand and gravel, with sand and silt along banks	Some bank armoring along left bank	None	None	Water depth, river setting
C-W2	10.41-10.55	739 ft	80-135 ft	3.3 ft	Right bank point bar	Sand and silt, with soft sediment along banks and in backwater areas	None	None in main channel, heavy in backwater area	Large backwater area on south bank at MP 10.43	River setting
C-X2	10.55-10.84	1,531 ft	90-150 ft (main channel), 35-50 ft (backwater channels)	2.0 ft	Straight reach with three large islands	Sand or sand and gravel in main channel, with silt over sand or soft sediment in backwater channels	None	None in main channel, slight to heavy in backwater channels	Three backwater channels, two on south bank, one on north	River setting, water depth
C-Y2	10.84-10.94	528 ft	120-150 ft	2.6 ft	Straight reach, no islands	Sand	None	None	None	River setting, water depth
C-Z2	10.94-11.08	739 ft	120-140 ft	2.4 ft	Straight reach, few small islands	Many: soft sediment, sand, sand and silt, sand and gravel	None	None	Few small islands	Bed type, river setting
C-A3	11.08-11.17	475 ft	110-160 ft	3.1 ft	Apex of left bank point bar	Sand and gravel in thalweg, soft sediment or silt over sand along banks	None	None	None	Water depth, river setting
C-B3	11.17-11.34	898 ft	50-135 ft	2.9 ft	High-sinuosity meander with many islands	Sand and gravel in main channel, silt and sand in backwater channels and along banks	Possible impact from C3.7 launch area	Slight, but only in channel between point bar and island	Gradient begins to steepen slightly at upstream end of reach	River setting, gradient
C-C3	11.34-11.42	422 ft	160-290 ft	1.8 ft	Straight reach with large island along left bank	Sand and gravel in main channel, silt and sand in backwater channels and along banks	None	None	None	Channel width, river setting, water depth
C-D3	11.42-11.55	686 ft	110-150 ft	2.6 ft	Left bank point bar	Mostly sand and gravel, localized silt and sand along banks	None	None	None	River setting, water depth
C-E3	11.55-11.64	475 ft	100-130 ft	2.5 ft	Meander with small point bar on right bank	Sand and gravel, with soft sediment in tributary backwater	None	None, except moderate to heavy in tributary backwater	None	River setting
C-F3	11.64-11.75	581 ft	55-80 ft	3.4 ft	Left bank point bar	Sand and gravel, with sand and silt along banks	None	None	None	Channel width, water depth
C-G3	11.75-11.91	845 ft	120-140 ft	3.7 ft	Right bank point bar	Sand and gravel, with localized silt over sand along banks	None	Moderate at apex of point bar	None	Channel width, water depth
C-H3	11.91-12.10	1,003 ft	75-100 ft	2.7 ft	Large left bank point bar	Sand and gravel, cobbles	Raymond Rd Bridge	None to slight	Channel constricted at bridge crossing	Anthropogenic impact, water depth

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
C-I3	12.10-12.26	845 ft	65-105 ft	2.6 ft	Very broad right bank point bar	Cobbles in thalweg, silt and sand along inside meander	Berm constructed along right bank, raised road bed restricts left bank	None	Old bridge crossing at south end of reach	Anthropogenic impact
C-J3	12.26-12.38	634 ft	90-130 ft	3.0 ft	Straight reach	Sand and gravel in thalweg, sand and silt along banks	Berm (likely old road bed) along right bank	None	None	River setting, anthropogenic impact
C-K3	12.38-12.65	1,426 ft	50-150 ft (main channel), 55-130 ft (backwater channel)	2.6 ft	Cutoff channel forming large oxbow lake along right bank	Sand and gravel in main channel, sand and soft sediment in oxbow area	None	None in main channel, slight to heavy in oxbow area	Channel gradient increases sharply between MP 12.55 and MP 12.65	River setting, gradient
C-L3	12.65-12.79	739 ft	90-130 ft	2.8 ft	Broad, left bank point bar	Sand and gravel, with localized silt along banks	None	Localized slight to heavy on downstream side of point bar	None	River setting, water depth
C-M3	12.79-12.98	1,003 ft	80-100 ft	2.5 ft	Fixed-width low-sinuosity meander	Sand and gravel	Possible channel straightening	None	Meander scar on north bank suggests channel may have been anthropogenically rerouted	River setting, anthropogenic impact
C-N3	12.98-13.10	634 ft	100-130 ft	2.0 ft	Straight reach, in area where channel widens	Sand and gravel in thalweg, silt and sand along north bank	None	Slight along north bank	None	Channel width, water depth
C-O3	13.10-13.27	898 ft	100-200 ft	2.7 ft	Right bank point bar	Sand and gravel in thalweg, silt and sand along north bank	None	Slight to moderate along north bank	Tributary enters on north bank at MP 13.24	Water depth, submerged oil
C-P3	13.27-13.40	686 ft	90-130 ft	2.8 ft	High-sinuosity left bank point bar	Sand and gravel, with some silt along banks	None	None to slight	None	Channel width
C-Q3	13.40-13.49	475 ft	110-200 ft	2.2 ft	Very shallow right bank point bar with large left bank cut bank	Sand and gravel in thalweg, but soft sediment along south bank	None	Heavy on upstream side of cutbank	None	River setting, channel width, water depth
C-R3	13.49-13.65	818 ft	125-250 ft	3.3 ft	Meander with numerous small backwater areas	Silt over sand in backwater areas	None	Localized slight to moderate in backwaters	None	River setting, water depth, channel width
C-S3	13.65-13.76	607 ft	55-70 ft	3.3 ft	Straight reach	Sand and gravel, with sand and silt along banks and in backwaters	Beadle Lake Rd Bridge and Main St Bridge	None	None	River setting, channel width, anthropogenic impact
C-T3	13.76-13.91	792 ft	55-70 ft	3.2 ft	Meandering with numerous backwater/island areas	Sand and gravel, with sand and silt along banks and in backwaters	Main St bridge	None to slight	None	River setting, anthropogenic impact
C-U3	13.91-14.13	1,162 ft	70-120 ft (main channel), 35-70 ft (backwater channel)	3.6 ft	Upstream side of broad, left bank point bar	Sand and gravel, with sand and silt in backwater channel	Columbia Avenue Bridge	Moderate in backwater channel	None	River setting, channel width, anthropogenic impact
Low-sinuosity: MP 14.0 to MP 14.5										
C-V3	14.13-14.25	634 ft	110-175 ft	3.1 ft	Downstream side of broad, left bank point bar	Sand and gravel in main channel, silt and sand in south bank backwater	None	None in channel, moderate in backwater	None	River setting, channel width
C-W3	14.25-14.42	898 ft	180-200 ft	3.1 ft	Upstream side of broad, right bank point bar	Sand and gravel in thalweg, sand and silt along banks	Kalamazoo River Dam	Slight to moderate along banks	Gradient drops to near zero at upstream end of reach, due to Kalamazoo River Dam	Gradient
C-X3	14.42-14.60	924 ft	160-200 ft	3.9 ft	Downstream side of broad, right bank point bar	Sand and silt in thalweg, silt over sand along banks	Kalamazoo River Dam	Localized slight to heavy	Gradient affected by Kalamazoo River Dam	Water depth, bed type
High-sinuosity: MP 19.5 to MP 37.0										
D-G	19.59-19.79	1,056 ft	200-290 ft	3.3 ft	Straightened reach	Mostly silt over sand	Straightened during Kalamazoo River Diversion Project, WWTP sill	Localized moderate in channel	Gradient decreases almost to zero at upstream end of reach, due to sill across channel at MP 20.49	Gradient
D-H	19.79-20.01	1,162 ft	215-250 ft	2.2 ft	Straightened reach	Sand in thalweg, silt over sand along banks	Straightened during Kalamazoo River Diversion Project, WWTP sill	Generally none, localized slight to moderate along banks	Gradient affected by wastewater treatment plant sill	Water depth
D-I	20.01-20.25	1,267 ft	260-325 ft	2.9 ft	Straightened reach, islands along left bank	Sand and silt over sand in main channel, soft sediment behind island	Straightened during Kalamazoo River Diversion Project, WWTP sill	Slight to heavy behind island	Gradient affected by wastewater treatment plant sill	Channel width, water depth, river setting
D-J	20.25-20.49	1,267 ft	250-260 ft	2.9 ft	Straightened reach, immediately upstream of WWTP sill	Generally sand, but soft sediment immediately upstream of sill	Straightened during Kalamazoo River Diversion Project, WWTP sill	Generally none, but localized moderate	Gradient affected by wastewater treatment plant sill	Anthropogenic impact, river setting
D-K	20.49-20.90	2,165 ft	250-260 ft	2.4 ft	Straightened reach, with gentle meander, immediately downstream of WWTP sill	Generally sand, but some areas of silt over sand along banks	Straightened during Kalamazoo River Diversion Project	None to slight, but localized moderate to heavy, especially in backwaters	Very shallow gradient due to river straightening	Anthropogenic impact, river setting, water depth
D-L	20.90-21.28	2,006 ft	250-260 ft	3.0 ft	Straightened reach, with gentle meander	Generally sand, but some areas of silt over sand along banks	Kalamazoo River Diversion Project	None to slight, but localized moderate to heavy, especially in backwaters	straightening, former Kalamazoo River channel enters on north bank	Water depth
D-M	21.28-21.48	1,056 ft	200-250 ft	3.0 ft	Straightened reach, with artificially cutoff oxbow	Soft sediment	Straightened during Kalamazoo River Diversion Project, Custer Dr Bridge	None in main channel, heavy in oxbow	Very shallow gradient due to river straightening	River setting, anthropogenic impact

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
D-N	21.48-21.71	1,214 ft	110-150 ft	4.4 ft	High-sinuosity meander with cutoff channel	Mostly sand and gravel, with limited areas of soft sediment	None	Generally none, but localized slight to heavy in cutoff channel	None	River setting, water depth, channel width
D-O	21.71-21.89	924 ft	100-155 ft	4.4 ft	Downstream side of right bank point bar	Sand and gravel	Cut bank movement restricted by road bed	None	None	River setting
D-P	21.89-22.07	977 ft	125-325 ft	4.7 ft	Straight reach with large mid-channel island	Sand	None	None to slight	None	River setting, bed type, channel width
D-Q	22.07-22.38	1,637 ft	90-175 ft	3.7 ft	Meandering with numerous backwater areas	Sand in main channel, soft sediment or silt over sand in backwater areas	None	None in main channel, slight to heavy in backwater areas	None	River setting, channel width, water depth
D-R	22.38-22.58	1,056 ft	135-250 ft	5.0 ft	Upstream side of left bank point bar	Sand and gravel with localized silt over sand along banks	None	None	Upstream end of reach marked by increase in gradient	Gradient, river setting, channel width, water depth
D-S	22.58-22.82	1,267 ft	70-140 ft (main channel), 70-100 ft (backwater channel)	3.6 ft	High-sinuosity meander with cutoff channel	Sand and gravel, with very localized silt over sand	None	None to slight	None	River setting, channel width, water depth
D-T	22.82-23.02	1,056 ft	125-150 ft	4.0 ft	Moderately sinuous meander	Sand and gravel in thalweg, silt and sand along banks	None	None to slight	None	River setting
D-U	23.02-23.20	924 ft	100-135 ft	4.9 ft	Sharp right-angle bend to west	Sand and gravel, some soft sediment along right bank	Possible bank armoring on outside of meander	None in thalweg, slight to moderate along right bank	None	River setting, water depth
D-V	23.20-23.48	1,505 ft	110-240 ft	3.7 ft	Large, high-sinuosity left bank point bar	Sand and gravel in thalweg, sand and silt along banks	None	None	None	Channel width, river setting, water depth
E-A1	23.48-23.79	1,637 ft	80-120 ft	4.6 ft	High-sinuosity right bank point bar	Sand and gravel in thalweg, silt over sand along banks	None	Generally none, very localized slight	None	Channel width, river setting, water depth
E-B1	23.79-23.91	634 ft	100-220 ft	2.5 ft	Straight reach	Cobbles in thalweg, silt and sand along banks	None	None	None	Channel width, water depth, river setting
E-C1	23.91-24.12	1,109 ft	100-130 ft	5.6 ft	High-sinuosity meander	Gravel in thalweg, silt over sand along banks	None	Generally none, very localized slight	None	Water depth, river setting, channel width
E-D1	24.12-24.40	1,452 ft	130-205 ft	3.9 ft	Broad, right bank point bar	Generally sand and gravel or larger, some localized areas of silt over sand along banks	None	Generally none, very localized slight	None	River setting
E-E1	24.40-24.60	1,082 ft	120-140 ft	4.4 ft	Gentle meander	Generally sand and gravel, with some silt along banks	None	None	None	Channel width, river setting
E-F1	24.60-24.68	422 ft	100-180 ft	4.3 ft	Right bank point bar with wide cut bank	Soft sediment, with some sand and gravel	Cut bank movement restricted by railroad bed	None in thalweg, slight at outside of cutbank	None	River setting, channel width
E-G1	24.68-24.85	898 ft	125-160 ft	4.0 ft	Gentle meander	Sand and gravel, with some silt over sand along banks	None	None to slight	None	Bed type, channel width, river setting
E-H1	24.85-25.11	1,373 ft	125-150 ft	4.4 ft	Gentle meander	Sand and gravel in main channel, silt over sand along banks	None	None to slight	None	Water depth, submerged oil
E-I1	25.11-25.23	634 ft	90-130 ft	5.0 ft	Downstream side of left bank point bar	Mostly sand and gravel	Channel adjacent to railroad bed at downstream end of reach	None	None	River setting, water depth
E-J1	25.23-25.32	475 ft	50-70 ft	5.2 ft	Upstream side of high-sinuosity right bank point bar	Not known	Railroad bed adjacent to channel on left bank of entire reach	Not known	None	Channel width
E-K1	25.32-25.44	634 ft	90-125 ft	5.6 ft	Apex of large, right bank point bar	Sand and gravel, except some soft sediment immediately adjacent to point bar	None	None	Tributary enters on left bank at MP 25.42	Channel width
E-L1	25.44-25.73	1,531 ft	90-165 ft	4.0 ft	Large, left bank point bar	Sand and gravel, silt over sand along banks	None	Generally none, very localized slight	None	River setting, water depth
E-M1	25.73-25.89	845 ft	90-150 ft	5.6 ft	Small, right bank point bar	Sand and gravel, silt over sand in backwater	None	Generally none, very localized slight	None	Water depth, river setting
E-N1	25.89-26.08	1,003 ft	100-150 ft	5.5 ft	Small, right bank point bar	Sand and gravel in thalweg, soft sediment in backwater	None	None in main channel, heavy in backwater area	None	Submerged oil
E-O1	26.08-26.29	1,109 ft	90-175 ft	5.5 ft	Small, right bank point bar	Sand in thalweg, mixed with silt along banks and in backwaters	None	None in main channel, moderate to heavy in backwater and downstream side of point bar	None	River setting
E-P1	26.29-26.50	1,109 ft	110-165 ft	3.3 ft	Straight reach with mid-channel island	Sand and gravel in thalweg, sand and silt along banks and downstream of island	None	None to slight, except moderate to heavy just downstream of island	None	River setting, water depth
E-Q1	26.50-26.72	1,162 ft	110-150 ft	4.5 ft	Broad, right bank point bar	Sand and gravel in thalweg, sand and silt along banks	None	None to slight, except moderate to heavy in backwater	None	River setting, water depth
E-R1	26.72-26.82	528 ft	80-100 ft	7.1 ft	Apex of high-sinuosity left bank point bar	Many: gravel, sand, soft sediment	None	None	None	River setting, water depth, submerged oil
E-S1	26.82-27.16	1,795 ft	120-160 ft	4.2 ft	High-sinuosity meander, right bank point bar	Many: gravel, sand, sand and silt, soft sediment	None	None to slight in thalweg, localized moderate to heavy along banks	None	Water depth, river setting
E-T1	27.16-27.46	1,584 ft	140-180 ft	3.9 ft	Broad, low-sinuosity left bank point bar	Sand, gravel, cobbles in thalweg, soft sediment along banks	None	None to slight in thalweg, localized moderate to heavy along banks	None	River setting, channel width

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
E-U1	27.46-27.76	1,558 ft	130-295 ft	3.8 ft	Broad, low-sinuosity right bank point bar	Sand and gravel in thalweg, soft sediment along banks	Former railroad crossing, now powerline crossing	None in thalweg, slight to heavy in backwater areas	None	Channel width, anthropogenic impact, river setting
E-V1	27.76-27.87	581 ft	100-120 ft	5.5 ft	Apex of high-sinuosity meander	Cobbles in thalweg, sand along banks	None	Generally none, localized slight to moderate along banks	None	Channel width, river setting, water depth
E-W1	27.87-28.04	898 ft	110-150 ft	4.9 ft	High-sinuosity right bank point bar	Cobbles in thalweg, soft sediment in backwater	None	None in thalweg, heavy in backwater area	None	River setting, channel width, water depth
E-X1	28.04-28.23	1,030 ft	100-160 ft	4.6 ft	Gentle meander, with righ bank oxbow	Sand, gravel, cobbles in thalweg, soft sediment or silt over sand in oxbow	None	Minimal in main channel, heavy in oxbow	None	River setting
E-Y1	28.23-28.44	1,082 ft	110-150 ft	4.8 ft	Straight reach	Cobbles in thalweg, soft sediment along banks	None	None in thalweg, slight along banks	None	Bed type, river setting
E-Z1	28.44-28.58	766 ft	130-250 ft	5.4 ft	Straight reach with mid-channel island	Sand and gravel in thalweg, soft sediment along banks and behind island	None	None in thalweg, slight to heavy along banks and in backwater areas	Gradient in this reach increases above 2 ft/mile	Gradient, bed type, channel width, water depth
E-A2	28.58-28.73	792 ft	90-150 ft	4.9 ft	Upstream side of high-sinuosity left bank point bar	Sand in thalweg, mixed with silt along banks and in backwaters	None	None in thalweg, slight to moderate along banks	None	Bed type, river setting, channel width, water depth
E-B2	28.73-28.85	607 ft	135-160 ft	5.9 ft	Straight reach with two bridge crossings	Cobbles in thalweg, soft sediment along banks	Michigan Ave Bridge and railroad bridge	None in thalweg, slight to moderate along left bank	None	Anthropogenic impact, bed type, water depth
E-C2	28.85-29.08	1,241 ft	140-210 ft	3.9 ft	Downstream side of right-bank point bar	Cobbles in thalweg, soft sediment along banks	None	None in thalweg, slight to heavy along banks	Gradient in this reach increases above 2 ft/mile	Gradient, water depth
E-D2	29.08-29.21	686 ft	130-150 ft	2.8 ft	Straight reach with oxbow channel	Mostly sand and gravel in main channel, soft sediment in backwater	None	None in main channel thalweg, moderate to heavy along main channel right bank and in oxbow	Gradient in this reach is steepest section of river downstream of straightened channel	Gradient, water depth, channel width, river setting
E-E2	29.21-29.40	1,003 ft	110-140 ft	4.5 ft	Very gentle left meander	Sand and gravel in thalweg, soft sediment along banks	None	Generally none, very localized slight	None	River setting, water depth
E-F2	29.40-29.60	1,056 ft	130-170 ft	3.7 ft	Straight reach	Cobbles in thalweg, soft sediment along banks	None	None in thalweg, slight to moderate along banks	None	Channel width, water depth, river setting
E-G2	29.60-29.73	686 ft	110-125 ft	5.7 ft	Straight reach	Sand and gravel or larger on left bank, silt over sand on right bank	None	None in thalweg, slight along banks	None	Channel width, bed type, water depth
E-H2	29.73-29.82	475 ft	130-160 ft	4.6 ft	Upstream side of left-bank point bar	Sand and gravel, soft sediment along right bank	None	None in thalweg, slight to moderate along banks	None	Water depth, channel width
E-I2	29.82-29.92	502 ft	80-125 ft	5.8 ft	Downstream side of left-bank point bar	Sand and gravel	None	None	None	Water depth, channel width
E-J2	29.92-30.09	898 ft	90-175 ft	3.3 ft	Right bank point bar with backwater areas	Sand and gravel in main channel, soft sediment in backwater	Fort Custer Recreation Area boat launch	None in thalweg, slight to moderate in backwater areas	None	River setting, water depth, anthropogenic impact
E-K2	30.09-30.26	924 ft	120-140 ft	4.2 ft	Right bank point bar	Sand and gravel, localized silt over sand	None	None in thalweg, none to slight along banks	None	Channel width, river setting, water depth
E-L2	30.26-30.57	1,637 ft	110-135 ft	5.2 ft	High-sinuosity meander	Sand and gravel, locally mixed with silt	None	Generally none, localized slight to heavy	None	River setting, water depth
E-M2	30.57-30.80	1,214 ft	100-125 ft	5.6 ft	Meandering channel	Sand and gravel or larger, with some silt along banks	None	None, except moderate to heavy on downstream side of point bar	None	River setting, channel width
E-N2	30.80-30.85	264 ft	130-150 ft	3.8 ft	Large left bank backwater	Soft sediment in backwater with some sand	None	None in main channel, slight to heavy in backwater	None	River setting, water depth
E-O2	30.85-30.93	422 ft	80-100 ft	5.4 ft	Straight reach	Sand and gravel or larger	None	None	None	Channel width, river setting, water depth
E-P2	30.93-31.20	1,426 ft	135-180 ft	3.5 ft	Straight reach	Sand and gravel	None	Very localized slight to moderate along banks	None	Bed type, channel width, water depth
E-Q2	31.20-31.32	634 ft	110-160 ft	4.3 ft	Upstream side of left bank point bar	Mostly soft sediment	None	Moderate to heavy along banks	None	River setting, channel width, water depth
E-R2	31.32-31.40	422 ft	90-100 ft	5.3 ft	Downstream side of left bank point bar	Sand and gravel	None	Generally none, very localized slight	None	Bed type, river setting, water depth
E-S2	31.40-31.51	581 ft	90-125 ft	4.5 ft	Right bank point bar	Sand and silt	None	Generally none, very localized slight	None	River setting, water depth
E-T2	31.51-31.61	528 ft	125-175 ft	2.9 ft	Straight reach	Soft sediment along banks, localized sand and gravel	None	Heavy along right bank, none to slight along left bank	None	Channel width, water depth
E-U2	31.61-31.83	1,162 ft	135-235 ft	3.6 ft	Very gentle meander with backwater areas	Sand and gravel, with soft sediment around island	None	None, except slight to heavy around left bank island	None	River setting, water depth
E-V2	31.83-32.32	2,587 ft	150-200 ft	3.6 ft	Gentle meander	Mostly soft sediment along banks	None	Moderate to heavy along both banks	None	Bed type
E-W2	32.32-32.54	1,162 ft	120-150 ft	4.8 ft	Broad right bank point bar	Soft sediment along point bar, sand along cut bank	None	None to slight, but heavy on downstream side of point bar	None	River setting, channel width, water depth
E-X2	32.54-32.65	581 ft	100-135 ft	5.1 ft	Apex of left bank point bar	Soft sediment and silt over sand along banks	None	Generally none, very localized slight	Decrease in gradient at upstream end of reach. Gradient near zero until MP 33.41	Gradient, channel width

Kalamazoo River Geomorphic Reaches

Reach	Milepost	Reach Length	Approximate Channel Width	Mean Thalweg Depth	River Setting	Typical Bed Type	Anthropogenic Impact	Pre-Recovery Submerged Oil	Other Notable Characteristics	Primary Differentiators from Adjacent Reaches
E-Y2	32.65-32.80	792 ft	150-180 ft	4.3 ft	Downstream side of broad, left bank point bar	Soft sediment on cut bank, sand and gravel on point bar	None	Moderate to heavy along right bank, localized moderate on left bank	None	Channel width, river setting, water depth
E-Z2	32.80-32.96	845 ft	100-140 ft	6.2 ft	High-sinuosity right bank point bar	Sand and gravel	None	Generally none, very localized slight	None	River setting, channel width, water depth
E-A3	32.96-33.06	502 ft	120-170 ft	5.1 ft	Wide meander	Sand and silt in backwater	None	None in main channel, slight to heavy in backwater	None	Channel width, river setting
E-B3	33.06-33.17	607 ft	100-170 ft	6.2 ft	Straight reach with backwater	Sand and silt in backwater	None	None in main channel, slight to heavy in backwater	None	River setting
E-C3	33.17-33.41	1,267 ft	120-140 ft	4.7 ft	Straight reach	Soft sediment along banks, sand and silt in backwater	None	Moderate to heavy along both banks and in backwater areas	None	Water depth
E-D3	33.41-33.70	1,531 ft	150-260 ft	3.4 ft	Straight reach	Soft sediment	None	Moderate to heavy along both banks	Gradient begins to steepen slightly at upstream end of reach	Gradient, water depth, channel width
E-E3	33.70-33.85	792 ft	145-190 ft	4.7 ft	Straight reach	Soft sediment, sand and silt	None	Slight to heavy along right bank	None	Channel width, water depth
E-F3	33.85-34.05	1,030 ft	200-300 ft	3.6 ft	Straight reach	Soft sediment	None	Slight to heavy both banks	None	Channel width, water depth
E-G3	34.05-34.13	449 ft	120-200 ft	5.4 ft	Apex of left bank point bar	Sand and gravel, localized soft sediment	Michigan Ave Bridge	Generally none, very localized slight	None	River setting, anthropogenic impact, water depth
E-H3	34.13-34.18	238 ft	100-110 ft	5.7 ft	Downstream side of left bank point bar	Sand and gravel	None	None	None	Channel width
E-I3	34.18-34.43	1,346 ft	120-160 ft	4.7 ft	High-sinuosity right bank point bar	Sand and gravel	None	Generally none, very localized slight to moderate	None	River setting, water depth, channel width
E-J3	34.43-34.69	1,346 ft	140-170 ft	2.7 ft	High-sinuosity left bank point bar	Sand and gravel	None	Generally none, very localized slight	Increase in gradient above 2 ft/mile for this reach	Gradient, water depth, channel width
E-K3	34.69-34.90	1,135 ft	150-200 ft	3.0 ft	Straight reach	Sand and gravel in thalweg, silt and sand along banks	None	None in thalweg, slight along banks	None	River setting
E-L3	34.90-35.06	845 ft	160-180 ft	5.2 ft	Right bank point bar	Sand and gravel in thalweg, silt and sand along banks	None	None in thalweg, slight along banks	None	Water depth, river setting
E-M3	35.06-35.23	871 ft	170-250 ft	4.1 ft	Straight reach	Mostly sand and gravel, some silt over sand	Boat launch	None in thalweg, slight along banks	None	Channel width, river setting
E-N3	35.23-35.38	792 ft	140-250 ft	3.2 ft	Upstream side of left bank point bar	Sand and gravel in thalweg, silt over sand along banks	None	None in thalweg, slight along banks	None	River setting, water depth
E-O3	35.38-35.51	713 ft	130-180 ft	3.4 ft	Downstream side of left bank point bar	Many: gravel, sand, sand and silt, soft sediment	None	None in thalweg, slight along banks	None	River setting
E-P3	35.51-35.66	792 ft	200-250 ft	2.1 ft	Low-sinuosity meander	Sand and gravel with localized soft sediment	None	Generally none, very localized slight	None	Water depth, channel width
E-Q3	35.66-35.76	528 ft	250-330 ft	2.3 ft	Low-sinuosity meander	Sand and gravel in thalweg, soft sediment along banks	None	Localized moderate to heavy along left bank	None	Channel width
E-R3	35.76-35.89	660 ft	275-365 ft	3.2 ft	Low-sinuosity meander, with island	Sand and gravel in main channel, soft sediment in backwater channel	Morrow Lake Dam	Moderate to heavy behind island	Gradient drops to near zero at upstream end of reach, due to Morrow Lake Dam	Gradient, water depth
E-S3	35.89-36.06	924 ft	175-225 ft	4.1 ft	Low-sinuosity meander	Sand and gravel in main channel, soft sediment in backwater channel	Morrow Lake Dam	Moderate to heavy behind island	Gradient affected by Morrow Lake Dam	Channel width, water depth
E-T3	36.06-36.26	1,030 ft	175-375 ft	4.0 ft	Apex of very broad right bank point bar, with large island and backwater channel	Sand and gravel in main channel, soft sediment in backwater channel	Morrow Lake Dam	None to slight in thalweg, moderate to heavy in backwater channels	Gradient affected by Morrow Lake Dam	River setting, channel width
E-U3	36.26-36.34	449 ft	110-140 ft	7.5 ft	Narrow, straight reach	Sand and gravel	Morrow Lake Dam	None to slight	Gradient affected by Morrow Lake Dam	Channel width, water depth, river setting
E-V3	36.34-36.62	1,452 ft	160-200 ft	6.7 ft	Left bank point bar with bridge crossing	Sand and gravel in main channel, soft sediment along banks and in backwaters	Morrow Lake Dam	None in channel, slight to heavy in backwater and along banks	Gradient affected by Morrow Lake Dam	River setting, channel width, anthropogenic impact
E-W3	36.62-36.93	1,637 ft	250-275 ft (main channel)	4.8 ft	Straight reach, upstream portion of delta area	Soft sediment, silt over sand, and mixed sand and silt	35th St Bridge, Morrow Lake Dam	Localized slight to heavy along banks	Morrow Lake Delta, gradient affected by Morrow Lake Dam	River setting, water depth, channel width

2011 Poling Assessment



Poling Area	Approximate Area (acres)	Minimum Number of Poling Locations to Assess Area ¹	Approximate Number of Additional Poling Locations if Delineation Required ²	Justification ³
Talmadge Creek - Source to I-69	1.12 miles ⁴	66	NA ⁵	PA, OM, MH, PD
Talmadge Creek - I-69 to 15.5 Mile Rd	0.10 miles ⁴	9	NA ⁵	PA, OM, MH, PD
Talmadge Creek - 15.5 Mile Rd to Confluence	0.74 miles ⁴	54	NA ⁵	PA, OM, MH, PD
Talmadge Creek - Kalamazoo River Confluence	0.1	6	3	PA, OM, MH, PD
2.3 North	0.5	6	5	PD
2.35 South	0.5	6	4	PD
2.50 North	0.3	4	4	PD
2.55 North	0.2	4	4	OM, MH, PD
2.60 North	0.3	6	5	OM, MH, PD
2.75	0.2	6	4	OM, MH, PD
2.80 South	0.4	6	5	OM, MH, PD
2.90 South A	0.1	4	4	OM, MH, PD
2.90 South B	0.1	4	4	MH, PD
3.15 South	0.2	4	4	OM, MH, PD
3.3 South A	0.1	4	4	OM, MH, PD
3.25 R1	0.7	8	3	OM, MH, PD
3.3 South B	0.2	4	4	OM, MH, PD
3.45 North	0.3	6	3	PD
3.5 South	0.3	4	5	PD
3.6 South	0.2	4	5	OM, MH, PD
3.75 South	0.6	6	6	OM, MH, PD
4.15 South	2.1	8	8	OM, MH, PD
4.15 North	0.1	3	3	MH, PD
4.3 South	1.9	8	11	OM, MH, PD
4.6 Center	0.3	4	5	PD
4.9 North	0.1	3	3	OM, MH, PD
4.9 South	0.3	4	4	OM, MH, PD
5.25 North	1.2	6	9	OM, MH, PD
5.25 South	1.0	6	5	MH, PD
5.35 North	0.3	4	4	MH, PD
5.63 South	1.3	12	8	PA, OM, MH, PD
5.75 South	3.1	15	10	PA, OM, MH, PD
5.75 North/5.55 North	3.7	24	20	PA, OM, MH, PD
5.8 South	0.1	6	4	PA, OM, MH, PD
5.8 North	0.2	6	4	PA, OM, MH, PD
5.9 South A	<0.1	3	3	MH, PD
5.9 South B	<0.1	3	3	MH, PD
5.9 North	0.1	3	3	OM, MH, PD
6.1 North	0.3	6	5	PD
6.2 South	0.1	3	3	OM, MH, PD
6.25 South	0.1	3	3	MH, PD
6.25 North	1.0	8	5	MH, PD
6.45 North A	0.2	4	4	OM, MH, PD
6.45 North B	0.1	3	4	MH, PD
6.7 North	0.1	3	3	MH, PD
6.75 South	0.2	4	4	OM, MH, PD
7.0 R1	0.1	3	3	OM, MH, PD
7.0 South	1.9	10	8	PA, OM, MH, PD
7.35 Center	0.2	4	5	PD
7.45 North	0.2	4	4	PD
7.55 South	0.1	4	4	MH, PD
7.65 North	0.3	6	4	PD
7.75	0.8	10	7	PA, OM, MH, PD
8.05 Center	0.1	3	5	PD
8.25 Islands	4.0	12	12	PD
8.5 L1/L2	0.2	4	6	OM, MH, PD
8.6 North	0.1	4	4	PD
8.75 North	1.0	8	6	PD
8.95 South	0.6	6	6	OM, MH, PD
9.15 South	0.2	5	7	PD
9.35 Center	0.5	5	7	PD
9.5 North	<0.1	3	3	PD
9.65 North	0.2	4	4	PD
9.75 South	1.1	10	6	PD
10.0 Center	0.2	4	5	PD
10.2 South	0.2	5	5	PD

2011 Poling Assessment



Poling Area	Approximate Area (acres)	Minimum Number of Poling Locations to Assess Area ¹	Approximate Number of Additional Poling Locations if Delineation Required ²	Justification ³
10.25 North	0.2	4	4	PD
10.4 North	0.1	3	3	PD
10.5 North	0.5	6	5	PD
10.5 L2	0.3	6	5	OM, MH, PD
10.65 North	0.4	6	4	MH, PD
10.75 L2	0.4	6	5	OM, MH, PD
10.8 South	0.5	6	6	PD
10.8 North	<0.1	3	3	PD
10.95 North	0.1	3	4	PD
11.0 North	0.3	4	5	PD
11.2 South	0.3	4	6	PD
11.4 South	0.8	8	7	PD
11.75 South	0.1	3	3	PD
11.75 R1	0.1	3	3	OM, MH, PD
11.8 North	0.2	4	4	MH, PD
12.35 South	0.2	4	5	PD
12.5	3.0	15	6	PA, OM, MH, PD
12.7 South	0.1	3	3	MH, PD
12.7 North	0.2	4	4	PD
13.15 North	0.2	4	6	MH, PD
13.25 North	0.2	4	4	MH, PD
13.45 South	0.3	5	5	PD
13.5 L1	0.2	4	4	OM, MH, PD
13.6 North	0.1	3	4	MH, PD
13.6 South	0.1	4	4	PD
13.7 North	0.2	4	4	PD
13.8 South	0.5	6	8	OM, MH, PD
13.85 North	0.4	5	5	PD
13.95 North	0.1	4	4	MH, PD
14.2 South	0.3	4	4	MH, PD
14.35 North	0.4	4	6	MH, PD
14.6 South	0.1	3	5	MH, PD
14.75	1.4	8	5	PA, OM, MH, PD
14.8 South	<0.1	3	3	MH, PD
14.9 South	1.2	10	8	OM, MH, PD
15.05 South	0.5	6	7	MH, PD
South Mill Pond	9.0	24	8	PA, OM, MH, PD
North Mill Pond	4.3	24	8	PA, OM, MH, PD
15.25	0.2	4	5	OM, MH, PD
15.4	0.2	4	4	PD
15.6	1.5	6	6	PD
18.15 South	0.5	6	6	OM, MH, PD
18.5 South	1.0	6	7	OM, MH, PD
18.65 South	0.7	4	7	MH, PD
18.65 North	<0.1	3	3	MH, PD
18.8 Center	1.8	8	10	OM, MH, PD
18.85 North	<0.1	3	3	MH, PD
18.95 North	0.1	3	3	MH, PD
19.0 Center	0.1	3	5	MH, PD
19.15 South	0.1	3	5	MH, PD
19.25 South	0.2	4	4	PD
19.25 L1	1.1	8	5	OM, MH, PD
19.45 North	0.2	3	4	OM, MH, PD
19.5 North	<0.1	3	3	MH, PD
19.6 South	1.9	8	11	OM, MH, PD
19.85 South	0.1	3	4	MH, PD
20.1 South	2.3	10	11	OM, MH, PD
20.3 South	0.1	3	4	OM, MH, PD
20.6 South	0.2	3	3	OM, MH, PD
20.7 North	0.4	4	6	OM, MH, PD
20.9 South	0.1	3	3	OM, MH, PD
21.25 North	0.9	6	5	OM, PD
21.4	4.2	12	6	PD
21.5 R1	3.9	16	6	PA, OM, MH, PD
21.55 South	0.8	8	5	MH, PD
22.0 South	1.0	8	5	PD

2011 Poling Assessment



Poling Area	Approximate Area (acres)	Minimum Number of Poling Locations to Assess Area ¹	Approximate Number of Additional Poling Locations if Delineation Required ²	Justification ³
22.15 South	0.3	4	5	OM, MH, PD
22.2 North	0.2	4	3	OM, MH, PD
22.25 North	0.2	3	3	PD
22.4 North	0.2	3	4	PD
22.5 West	1.1	8	8	PD
22.75 North	1.2	8	4	OM, PD
23.0 South	0.7	6	6	PD
23.15 North	0.2	4	4	OM, MH, PD
23.85 North	0.7	6	5	PD
24.65 South	0.2	4	4	PD
24.75 North	1.1	6	8	OM, PD
25.65 North	<0.1	3	3	PD
25.7 North	0.3	4	4	PD
25.85 North	0.2	4	5	PD
26.0	0.9	8	5	PA, OM, MH, PD
26.1 Southeast	0.1	4	4	OM, MH, PD
26.2 South	<0.1	3	3	MH, PD
26.25	1.2	8	6	PA, OM, MH, PD
26.3 Northwest	0.4	5	6	OM, PD
26.4 Center	0.1	3	5	OM, MH, PD
26.65	0.3	6	5	PA, OM, MH, PD
26.8 Southeast	0.2	4	6	OM, MH, PD
27.1 North	0.1	3	3	OM, MH, PD
27.1 South	0.1	3	3	OM, MH, PD
27.15 South	0.1	3	3	OM, MH, PD
27.3 North	0.1	3	4	OM, MH, PD
27.3 South	0.1	3	3	OM, MH, PD
27.5 Southeast A	0.3	4	4	MH, PD
27.5 Southeast B	0.3	4	4	OM, MH, PD
27.5 Northwest	0.1	3	4	MH, PD
27.55 Northwest	0.6	6	6	PD
27.65 North	0.2	3	4	OM, MH, PD
27.65 South	0.1	4	5	OM, MH, PD
27.7 North	0.1	4	3	PD
27.85 North	0.1	3	3	MH, PD
27.9	0.3	4	4	PA, OM, MH, PD
28.15 South	0.2	4	5	OM, MH, PD
28.25	1.6	16	5	PA, OM, MH, PD
28.45 South	0.2	4	3	OM, MH, PD
28.5 North	0.1	3	3	OM, MH, PD
28.5 South	0.2	4	3	OM, MH, PD
28.6 North	0.3	4	5	OM, MH, PD
28.75 North	0.1	3	3	OM, MH, PD
28.75 South	0.1	4	5	OM, MH, PD
28.8 North	0.1	3	3	OM, MH, PD
28.9 South	<0.1	3	3	OM, MH, PD
29.05 South	0.1	3	3	MH, PD
29.1 North	0.8	8	4	MH, PD
29.15 North	0.2	4	5	OM, MH, PD
29.5 North	0.2	4	5	OM, MH, PD
29.5 South	0.1	3	3	OM, MH, PD
29.75 North	0.2	3	4	MH, PD
30.0	0.2	4	3	OM, MH, PD
30.05 North	0.6	6	5	MH, PD
30.3 North	0.2	3	3	OM, MH, PD
30.65 North	0.1	3	3	MH, PD
30.7 North	0.3	6	5	MH, PD
30.8 South	1.1	8	6	OM, MH, PD
31.0	0.1	3	3	OM, MH, PD
31.25 North	0.6	4	6	OM, MH, PD
31.3 Southeast	0.1	3	3	OM, MH, PD
31.6 North	0.3	4	5	OM, MH, PD
31.6 Southeast	0.8	6	6	MH, PD
31.8 South	8.8	24	12	OM, MH, PD
32.5 North	0.3	4	5	MH, PD
32.65 Southeast	0.1	3	3	MH, PD

2011 Poling Assessment



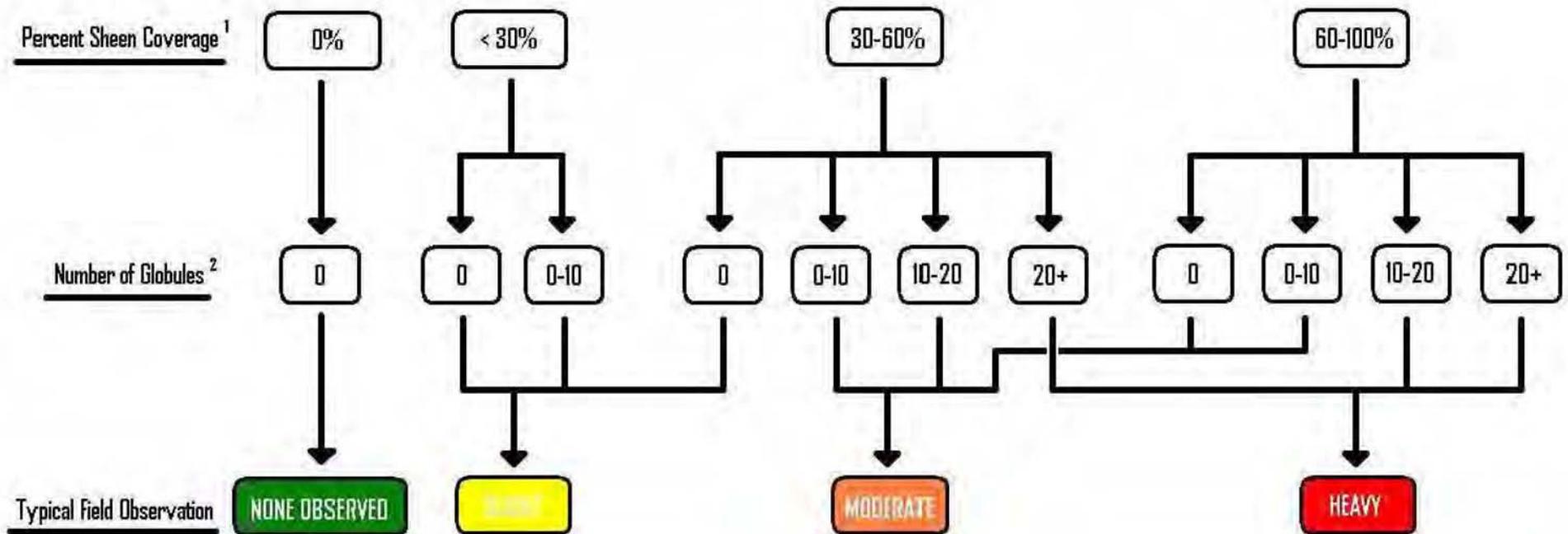
Poling Area	Approximate Area (acres)	Minimum Number of Poling Locations to Assess Area ¹	Approximate Number of Additional Poling Locations if Delineation Required ²	Justification ³
32.75 Northwest	0.3	4	6	OM, MH, PD
32.75 Southeast	0.2	4	5	MH, PD
32.9 Northwest	0.2	4	5	PD
33.0 A	0.5	6	6	PA, OM, MH, PD
33.0 B	0.4	8	6	PA, OM, MH, PD
33.2 South	0.2	4	6	MH, PD
33.25	1.6	8	10	PA, OM, MH, PD
33.5 North	0.3	4	7	OM, MH, PD
33.5 South	0.5	4	8	OM, MH, PD
33.65 North	0.3	3	4	MH, PD
33.75 North	0.2	3	5	OM, MH, PD
34.0	1.3	8	9	OM, MH, PD
33.95 South	0.2	4	4	MH, PD
34.2 Southeast	0.2	3	4	MH, PD
35.1 North	1.1	7	10	PD
35.3 North	0.7	6	9	PD
35.6 Northwest	0.5	5	7	PD
35.6 Southeast A	0.5	4	6	OM, MH, PD
35.6 Southeast B	0.5	6	6	MH, PD
35.8 Northwest	0.5	6	4	OM, MH, PD
36.1 Northwest	0.6	6	4	OM, MH, PD
36.15 North	0.4	4	4	MH, PD
36.25	2.3	10	8	PA, OM, MH, PD
36.45 North	1.8	10	5	MH, PD
36.5	0.3	4	5	OM, MH, PD
36.6 South	1.4	10	9	OM, MH, PD
36.8 North	0.6	4	6	OM, MH, PD
Morrow Lake Delta East	47.2	120	80	PA, OM, MH, PD
Morrow Lake Delta South	1.8	12	12	PA, OM, MH, PD
Morrow Lake Delta West	1.1	9	12	PA, OM, MH, PD
37.75 North	0.6	6	7	PA, OM, MH, PD
Entrance to Morrow Lake	29.5	16	20	MH, PD
Totals:	213 ⁶	1490	1249 ^{7,8}	---

Notes:

1. Increase in the number of poling locations subject to field conditions.
2. Delineation required if moderate or heavy sheen is observed. Number of poling locations subject to field conditions.
3. PA = 2010 Priority Area
 OM = Operations & Maintenance Site
 MH = Moderate or Heavy Submerged Oil in 2010
 PD = Potential Deposition Area
4. Approximate acreage not determined due to scale. Value listed is river length.
5. NA = Not Applicable
 Area may consist of a large subset of delineations.
6. Total acreage does not include Talmadge Creek Source to Confluence. The river length of this segment is 1.96 miles.
7. Value does not include approximate additional delineation poling loctions from Talmadge Creek Source to Confluence.

Figure 1

Submerged Oil Field Observation Flowchart



Notes:

- 1. Percent coverage of 1 square yard
- 2. Number of globules per square yard

ATTACHMENT B

Anticipated Implementation Schedule

ID	Task Name	Duration	Start	Finish	Mar 6, '11	Mar 13, '11	Mar 20, '11	Mar 27, '11	Apr 3, '11	Apr 10, '11	Apr 17, '11	Apr 24, '11	May 1, '11	May 8, '11	May 15, '11	May 22, '11
1	 Aerial Imagery	30 days	Mon 4/11/11	Fri 5/20/11												
2	Draft plan submission	1 day	Mon 3/14/11	Mon 3/14/11												
3	Plan review by agencies	12 days	Mon 3/14/11	Tue 3/29/11												
4	 Revised plan submission	2 days	Wed 3/30/11	Thu 3/31/11												
5	 Plan review by agencies	3 days	Fri 4/1/11	Tue 4/5/11												
6	 Approved plan submission	1 day	Wed 4/6/11	Wed 4/6/11												
7	 Submerged Oil & Sediment Reassessment	20 days	Mon 4/18/11	Fri 5/13/11												
8	 Overbank and Shoreline Reassessment	25 days	Mon 4/11/11	Fri 5/13/11												
9	 Data Compilation QA/QC	30 days	Mon 4/11/11	Fri 5/20/11												
10	 Overbank and Poling Reassessment Final Report	30 days	Mon 4/11/11	Fri 5/20/11												

Project: Tentative Overbank and Poling Reassessment Schedule
Date: March 31, 2011

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			