

Historic Outfall Investigation in Vicinity of Dow Plant Site (H-12 Investigation)

- **Part of License Compliance Schedule**
 - H = High priority in Operating License
- **Proposed for transition to the CERCLA process with U.S. EPA as lead agency and MDEQ in support role**
- **Phase II Work Plan submitted to MDEQ and approved - investigation is underway**
- **Iterative Process**
- **Source area work – other high concentration deposits (e.g., Reach H) to be identified and remediated**
 - Not only dioxins and furans; other contaminants significant and present at elevated concentrations
 - Dioxins and furans not necessarily co-located with other contaminants of concern
- **Areas for further evaluation to see if IRAs are appropriate prior to final remedy (e.g. toxicity testing, bed measurements, etc.) and to fill data gaps for final remedy**
- **Phase II Work Plan – more cores in Reaches E, F, G, and H (below the Dow Dam)**
- **Good progress being made**
 - Phase II field work to be completed over the next several weeks



Historic Outfall Investigation (H-12)





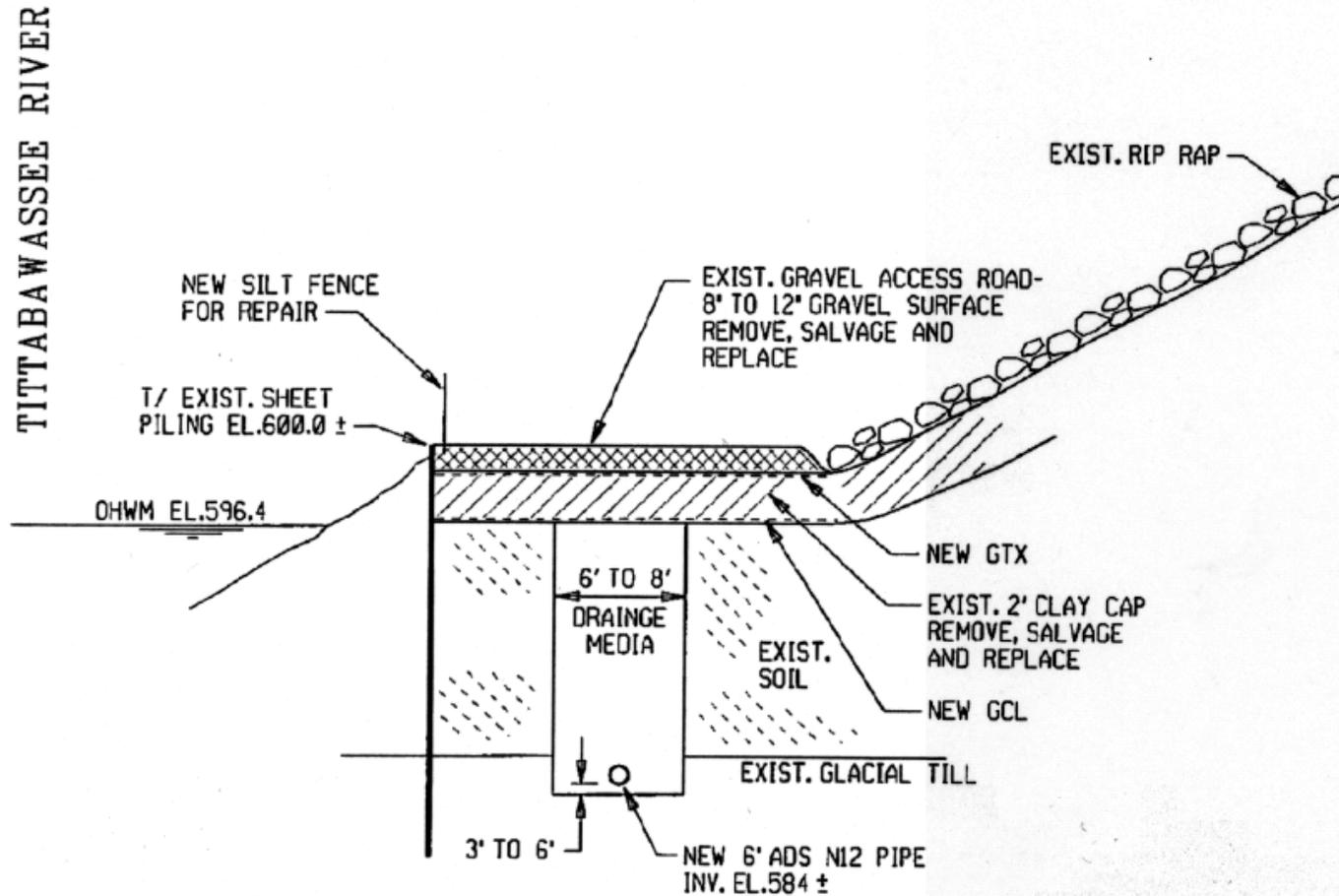
Legend

- ✦ Reach H Samples
- ▲ Proposed Core Locations

RGIS Repair near LS-5

- Small section of blocked tile was repaired
- Proactive repair – identified during routine maintenance
- Located near Lift Station 5 downstream of Dow Dam
- Major repairs previously conducted in 1997
- Root cause analysis to be conducted
- RGIS is critical component of corrective action as it prevents release of contaminated groundwater into the Tittabawassee River

RGIS 09 Repair Cross Section





RAELink
Remote

ON

Y/+ MODE N/-



RAE Read Manual Carefully
Before Using This Monitor

Bank Stabilization – Eroding Banks



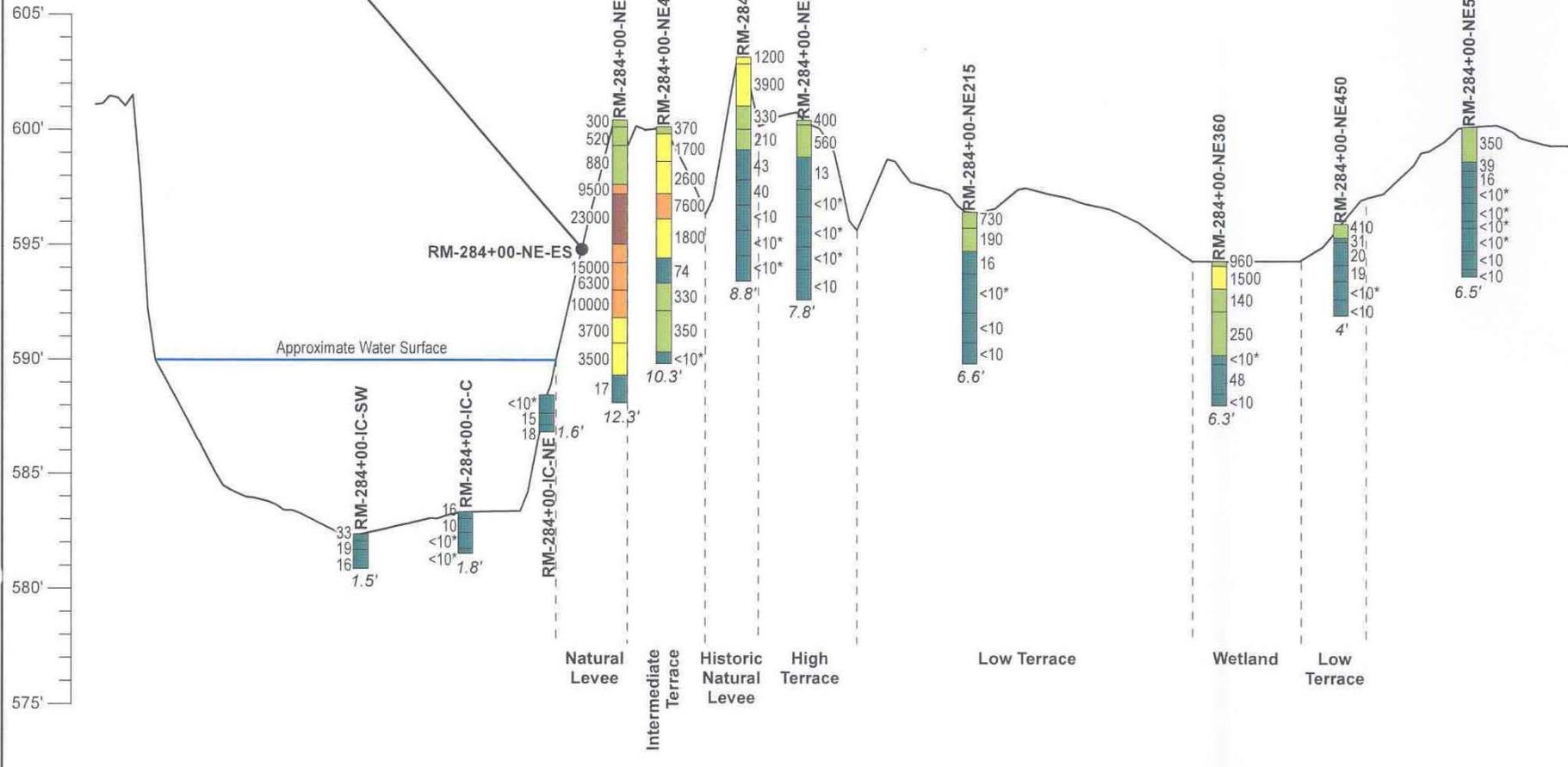
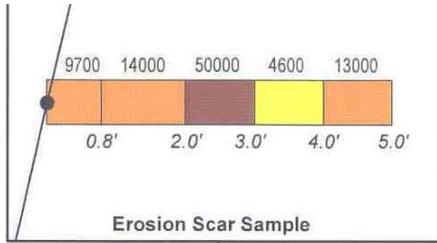
Eroding Bank Stabilization - Tittabawassee River

- **High levels of dioxin/furan in bank “levee” deposits**
- **Active source of contamination into the river as these banks erode**
- **Bank erosion is significant and widespread**
- **Consistent with U.S. EPA/MDEQ guidance to control sources first**
- **Pilot different technologies - “softer footprint” where possible**
 - 4 pilot stabilization areas
 - 3 additional areas – monitoring only
- **MDEQ approval of Pilot Work Plan on July 10, 2008**

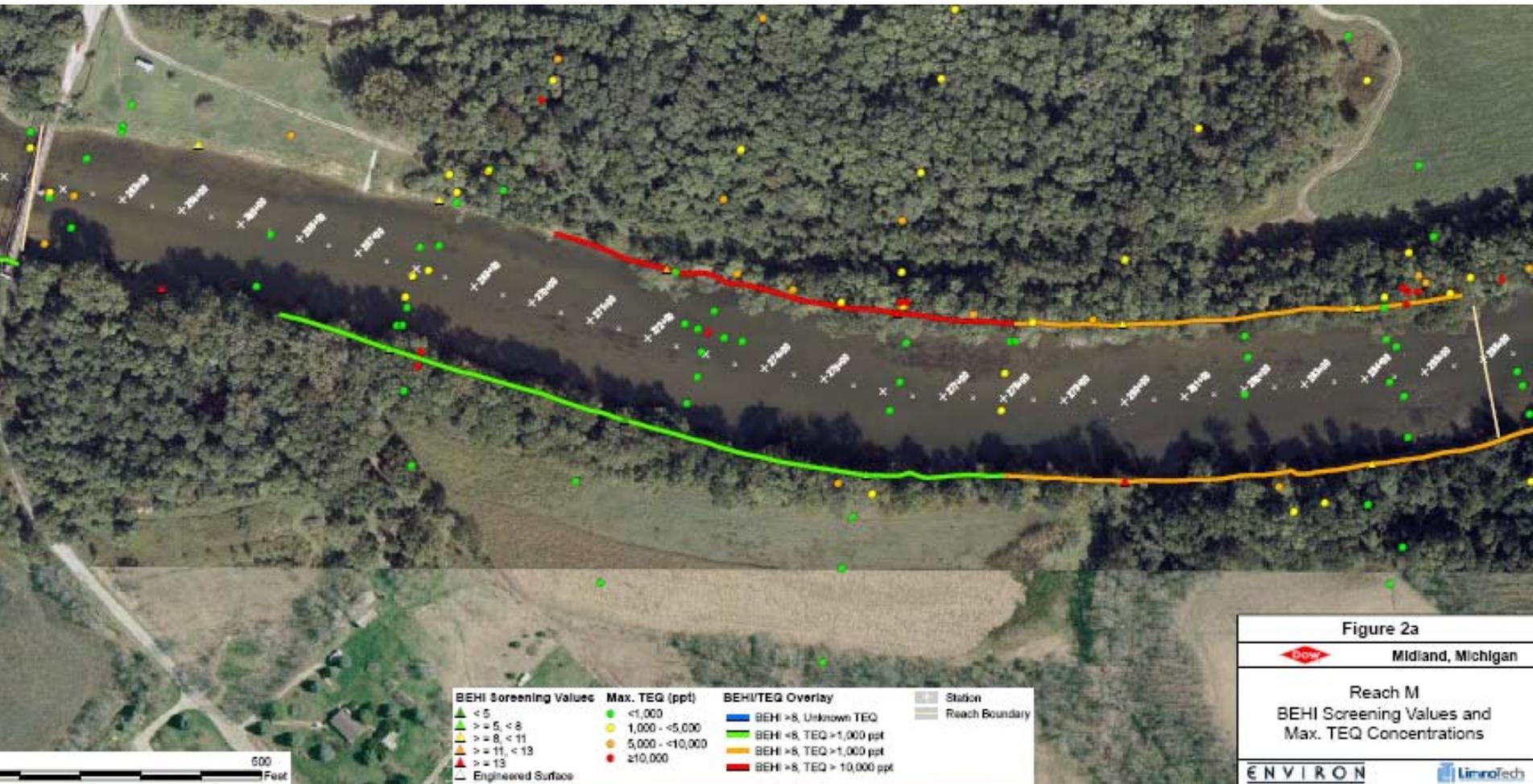
Eroding Bank Stabilization - Tittabawassee River

- **Canopy management (tree trimming) over winter and early spring**
- **Other downstream areas for stabilization in Reach M in 2009**
 - **Water levels need to go down**
- **Monitoring Plan under review in coordination with NRDA Trustees**

Southwest



Eroding Bank Stabilization - Example Pilot Area



Summer 2008



Summer 2008



Summer 2008



Fall 2008





February 2009 – Ice and flood flows along bank at Freeland



February 2009 – Ice and flood damage at Reach J/K remediation area

Spring 2009



Spring 2009





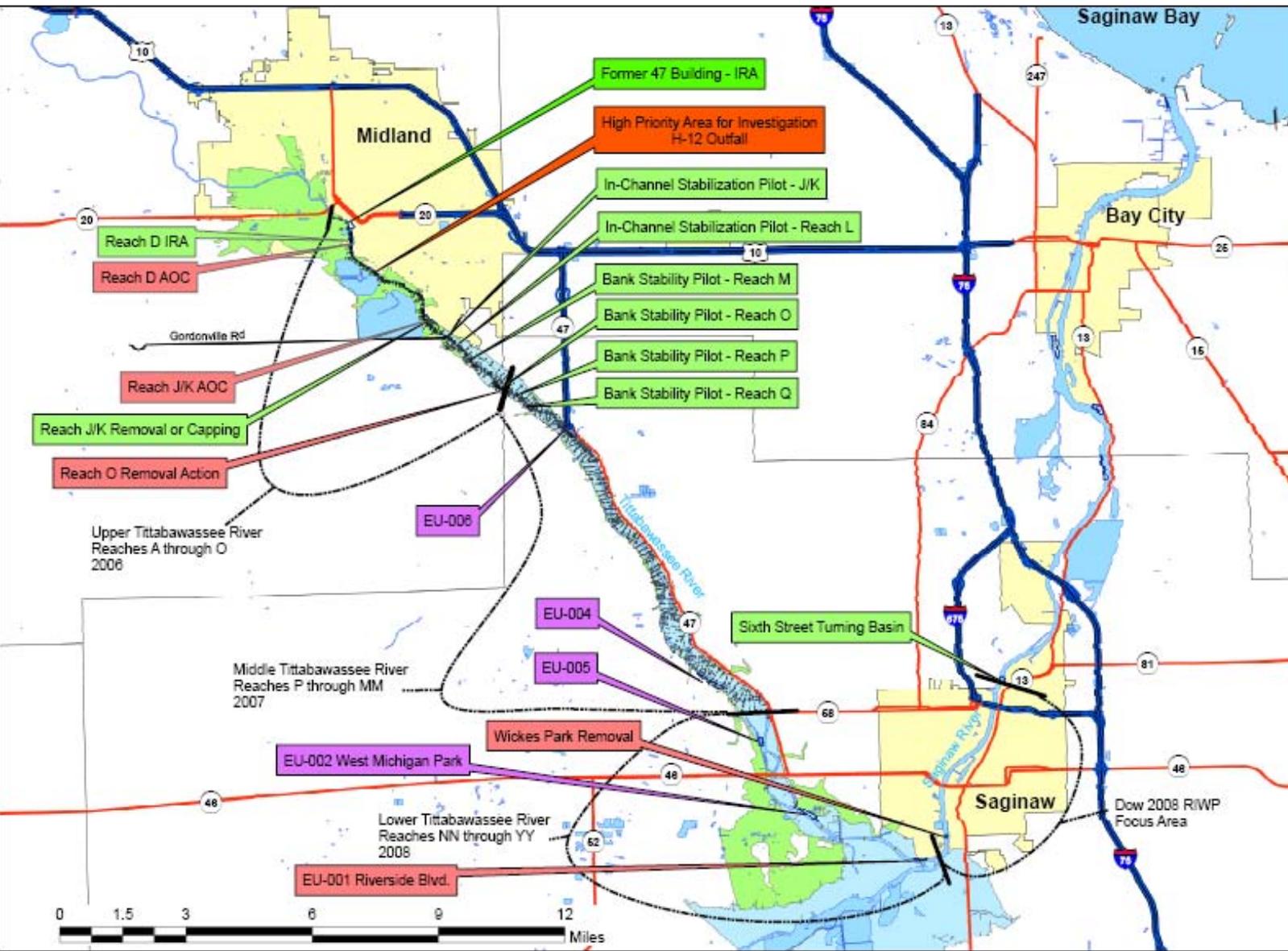




A photograph of a riverbank. The foreground is dominated by dense, green and brownish vegetation, including tall grasses and shrubs. A small, young tree with yellowing leaves stands prominently in the middle ground. The river is calm, reflecting the surrounding trees and sky. The background is a dense line of trees with varying shades of green and yellow, suggesting an autumn setting. The overall scene is a natural, somewhat overgrown riverbank.

**Monitoring banks in
different conditions to
determine where efforts
are best applied**

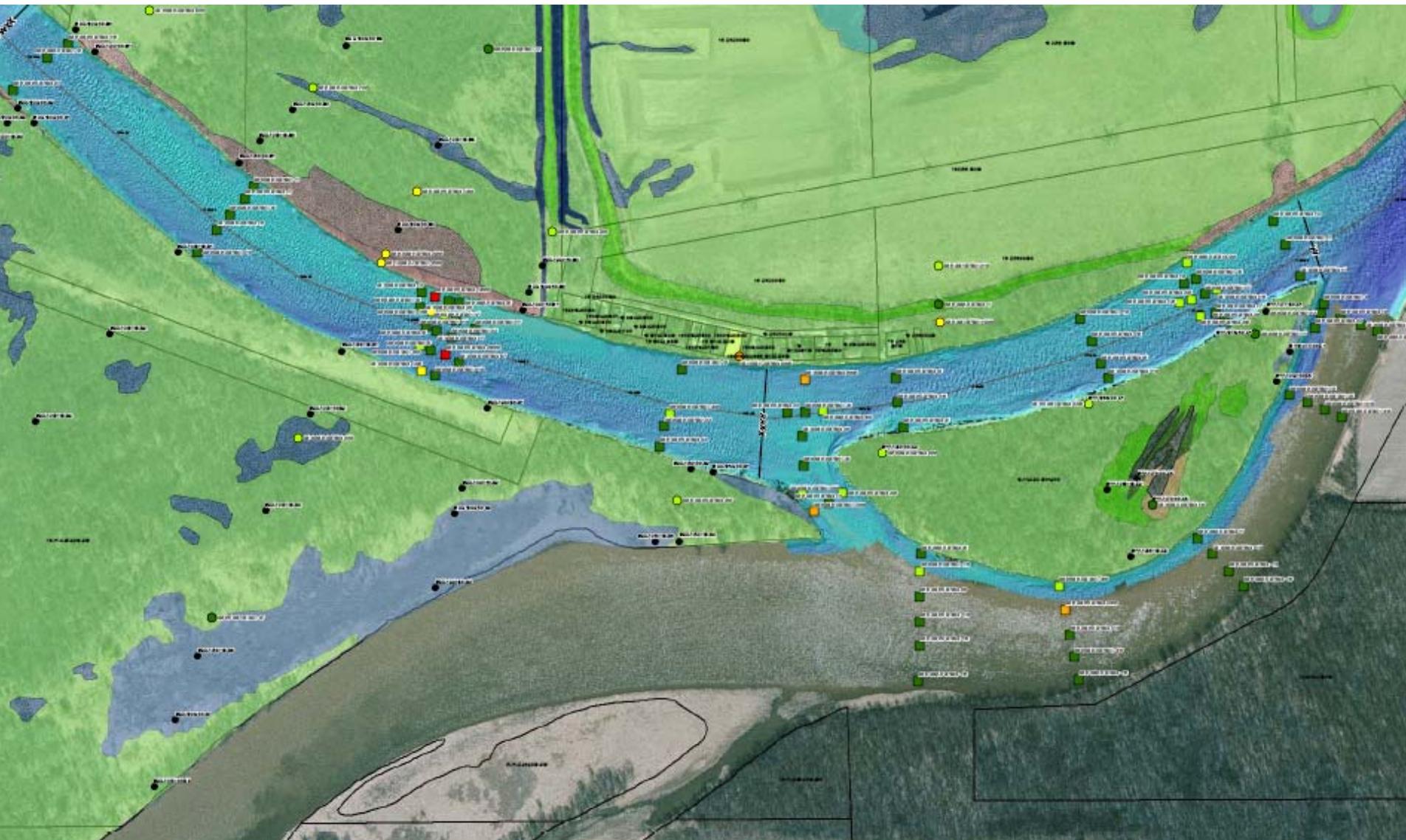
August 2008 Status of Dow Off-Site Corrective Action Activities



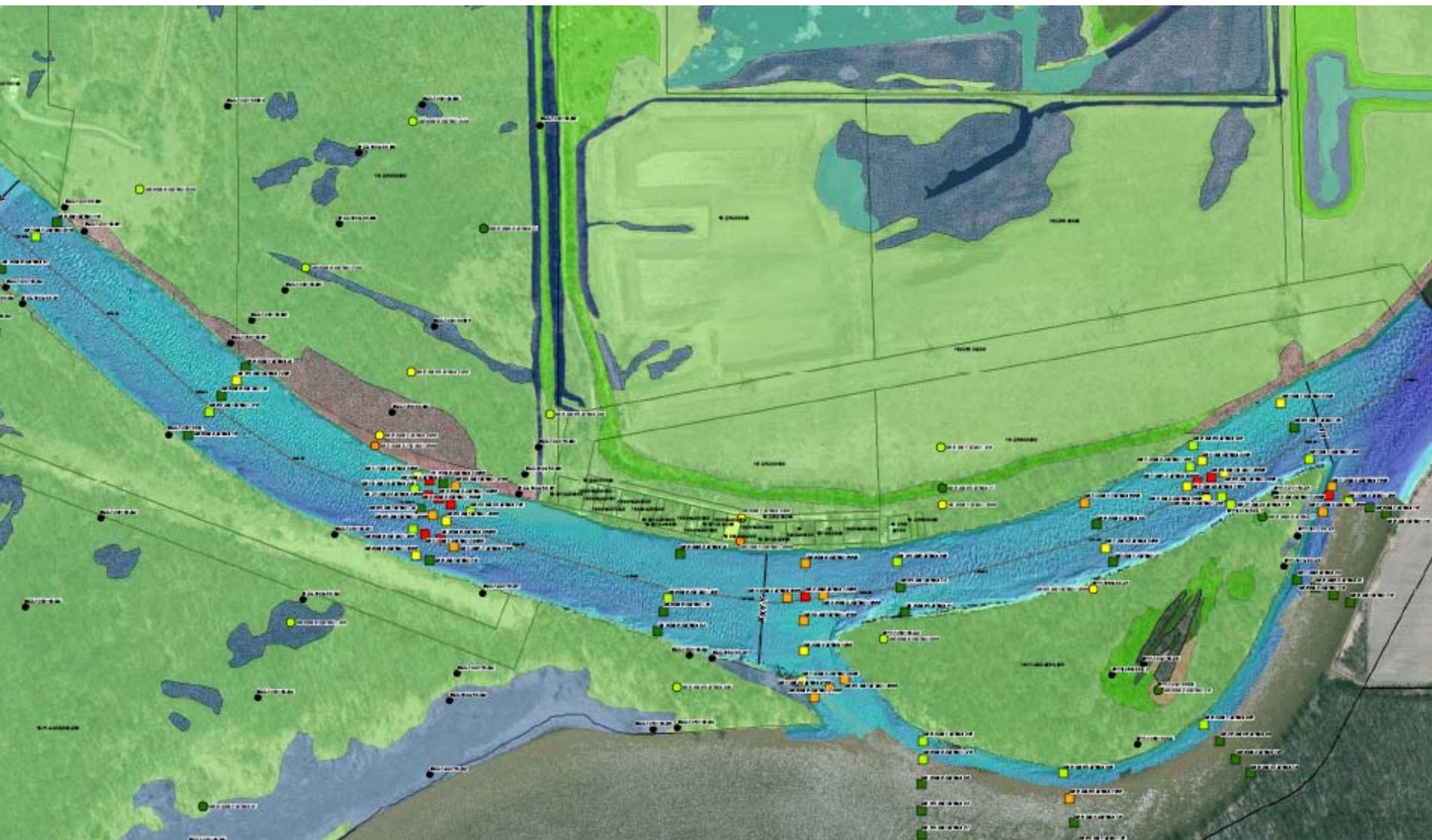
- Investigation Focus Area
- AOC - CERCLA
- Exposure Units
- IRA - Includes Tittabawassee River 100 Year Floodplain for Miss Dig



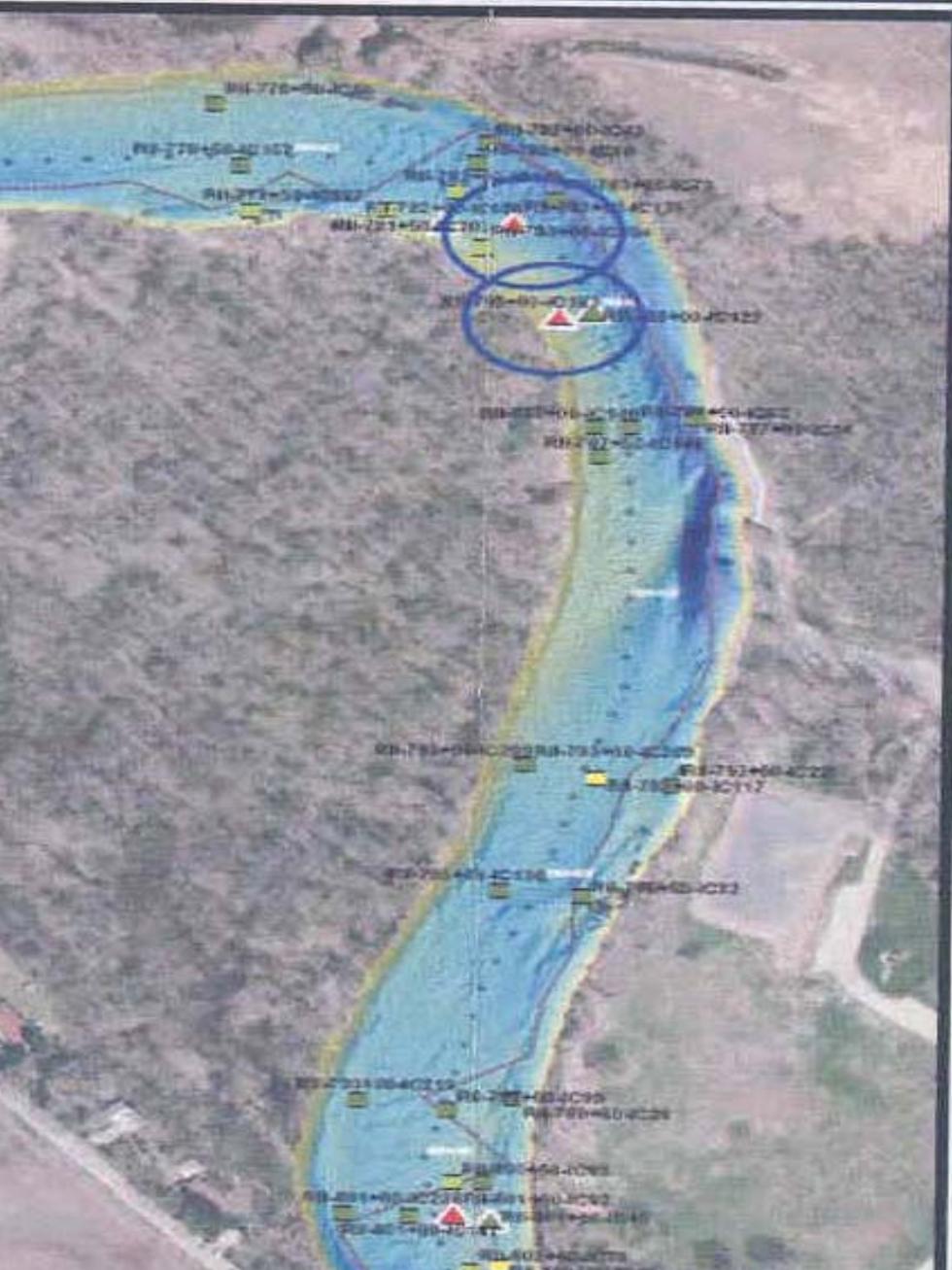
Confluence Area – Surface TEQ Concentrations - 10/2009



Confluence Area – Maximum TEQ Concentrations - 10/2009



Inchannel ETEQ Surface Sample Results



Inchannel ETEQ Max Sample Results



Midland Area Soils

Presumptive Approach

- Soil contamination located primarily north and east of Dow plant site
- Dioxins and furans are typically less than 1000 ppt TEQ but greater than 200 ppt over large residential areas
- Very limited soil data
- Dow proposal was to use air modeling to identify “presumptive remedy” areas and to use limited soil data for model validation
- This is an alternative approach to the development of a “site specific” soil criteria with independent peer review

Midland Area Soils Presumptive Approach

- Initial discussions with Dow and the city of Midland were held in 2008 on a “presumptive remedy approach”
- Since then, MDEQ has been working with Dow to further develop a strategy
- Presumptive Remedy Model and Pilot CA Work Plan submitted by Dow on August 10, 2009
- MDEQ (with technical support from U.S. EPA) reviewed plans and provided comments on October 15, 2009
- Dow responses due in mid- December

Midland Area Soils Presumptive Approach

- Air dispersion modeling component results in too much uncertainty for remedial decision making (based on agency review)
- More focus on use of existing soil data and development of new data as necessary to refine the presumptive remedy boundary and to decrease uncertainty
- Pilot work plan needs to be expanded to address key remedial investigation/feasibility study data gaps:
 - Non-dioxin contaminants (e.g., toluene)
 - Depth of contamination that would be addressed by the presumptive remedy
 - Other pilot work beyond activated carbon
- MDEQ has been working with Dow to further develop a strategy
- Continued coordination with the city of Midland
 - Clean up criteria
 - Facility issue
 - Additional sampling

Signs Updated to be Consistent with Revised Fish Advisory



- Michigan Department of Community Health
- Advisories have become more stringent
- Signs being updated – approximately 70% complete

Updated Sign

Eating River Fish



Saginaw & Tittabawassee River fish, from Midland to Saginaw Bay, have dioxins & PCBs that may harm your health.

Everyone Do Not Eat
No Coma Pescado



carp



catfish



white bass

Women & Children Do Not Eat
Mujeres y Niños
No Coma Pescado



smallmouth bass



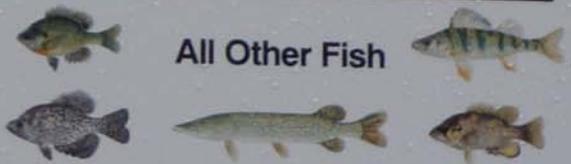
Walleye

longer than 18 inches
de más de 18 pulgadas

women & children → do not eat
mujeres y niños → no coma pescado
everyone else → one meal a week
resto de la población → una vez por semana

shorter than 18 inches
de menos de 18 pulgadas

women & children → one meal a month
mujeres y niños → una vez al mes
everyone else → unlimited meals
resto de la población → ilimitado vez



All Other Fish

women & children → one meal a month
mujeres y niños → una vez al mes
everyone else → one meal a week
resto de la población → una vez por semana

For more information contact the Michigan Department of Community Health:
1-800-648-6942

<http://www.michigan.gov/fishandgameadvisory>

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