Tittabawassee River, Saginaw River & Saginaw Bay Site

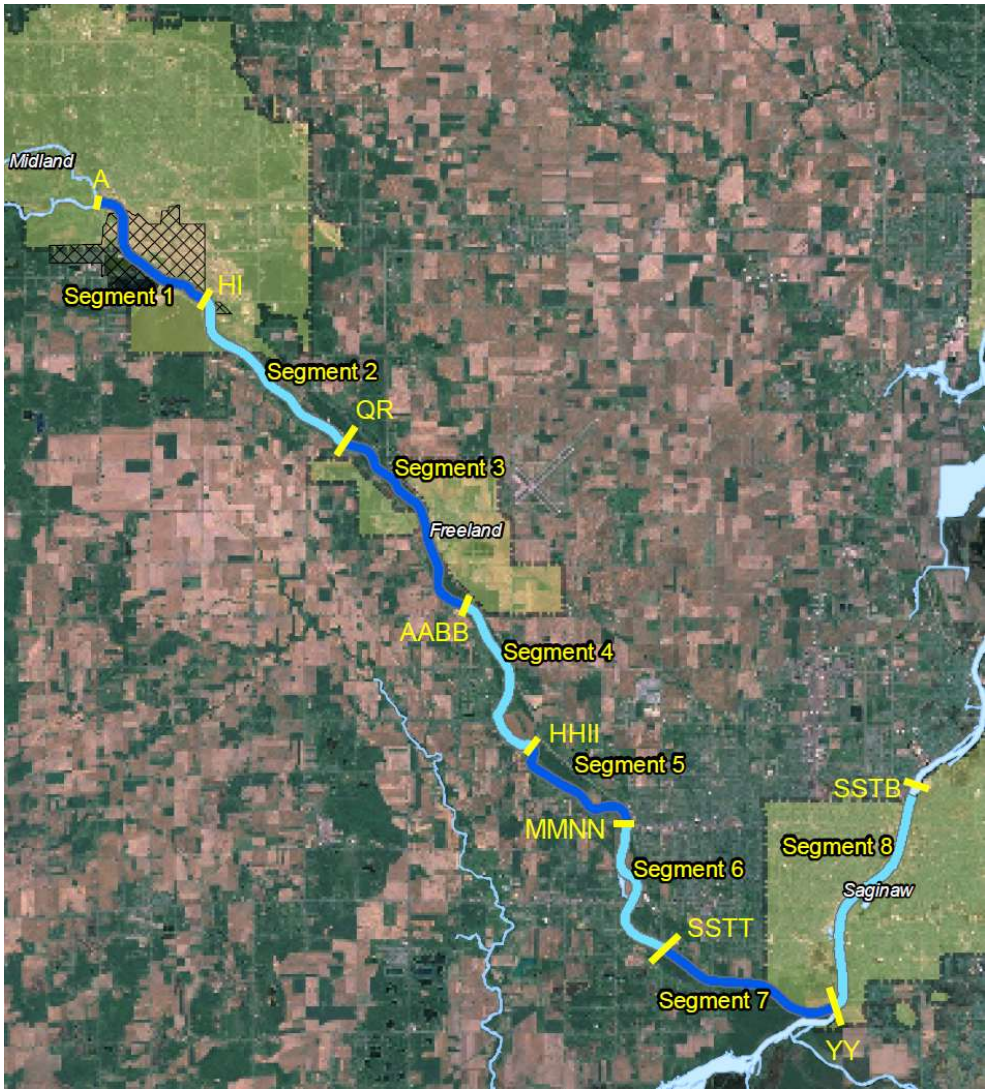
Tittabawassee River and Saginaw River Updates and Monitoring Results

Colleen Moynihan– U.S. EPA

CAG Meeting October 21, 2026

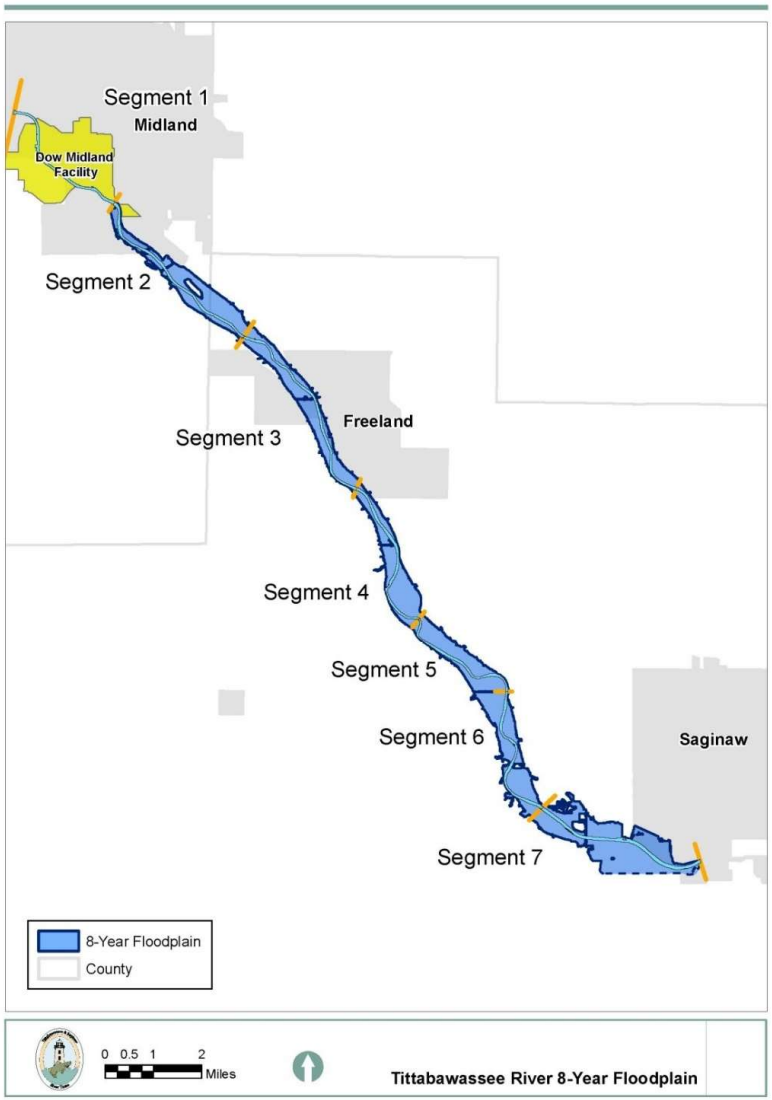
Tittabawassee River Response Actions Segment-by-Segment

- Tittabawassee River includes 7 Segments
- Work completed from upstream to downstream.
  - Each Segment is 3 to 5 miles
- Response Actions:
  - In-channel sediment: Sediment Management Areas (SMAs)
  - Banks: Bank Management Areas (BMAs)

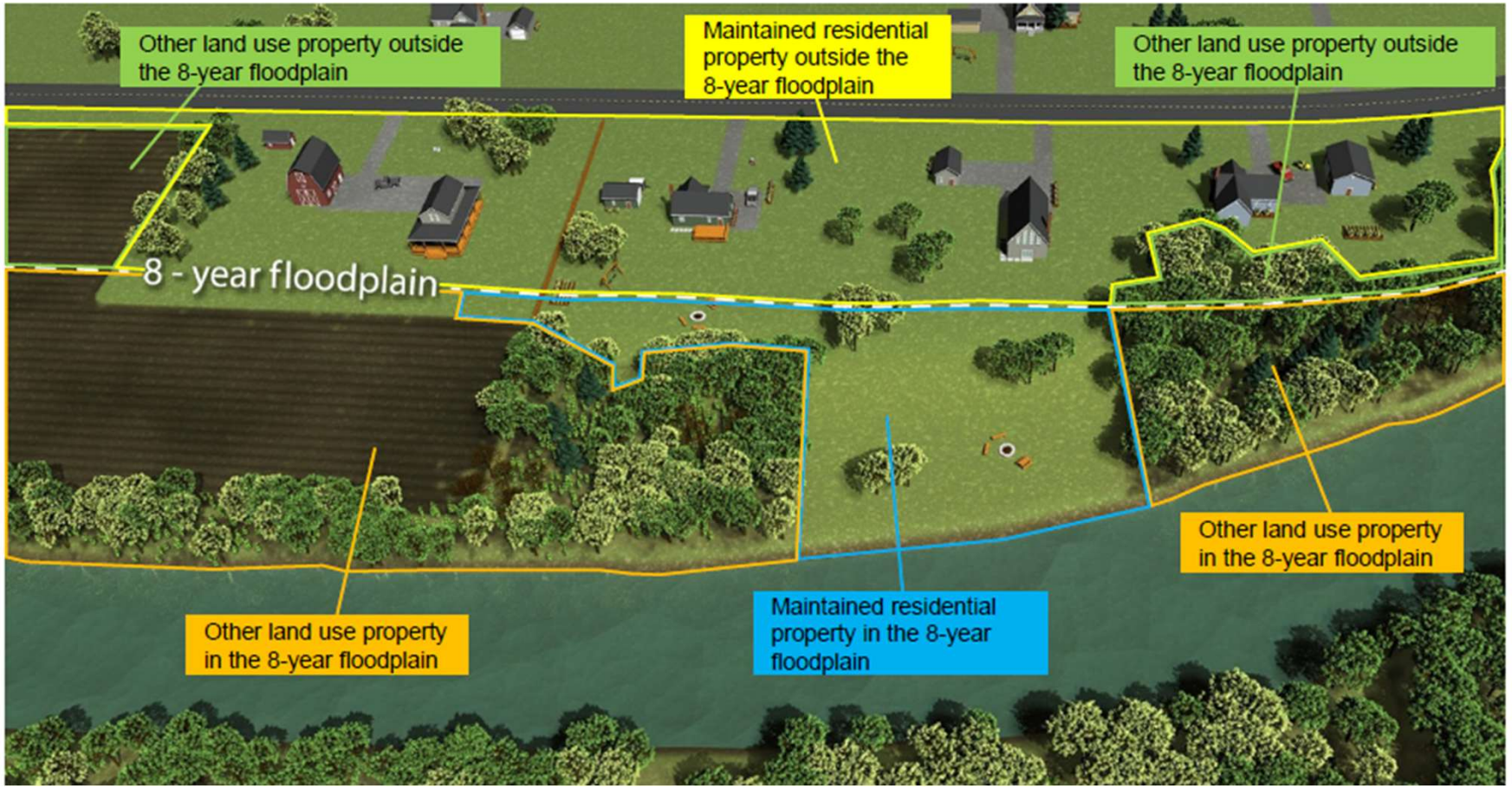


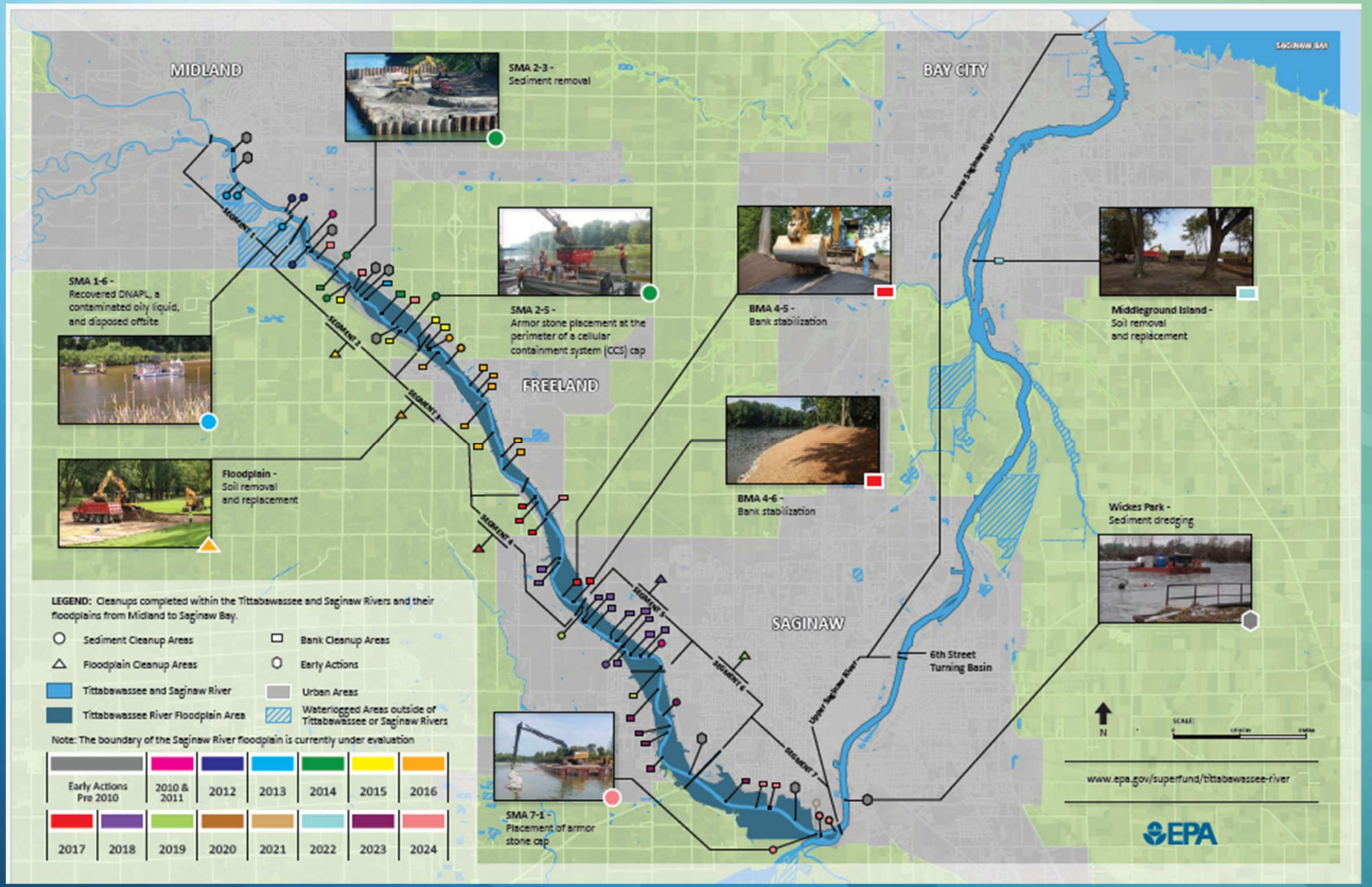
Tittabawassee River Floodplain Cleanup

- 2015 cleanup selected and started.
- Site-specific cleanup numbers developed.
  - 250 ppt maintained residential
  - 2000 ppt other land use
- If cleanup number is exceeded soil is dug out and replaced.
- About 4,500 acres in the 8-year floodplain.



8-Year Floodplain




MIDLAND
BAY CITY
FREELAND
SAGINAW
SAGINAW BAY
Lower Saginaw River
SMA 2-3 -
Sediment removal
SMA 1-6 -
Recovered DNAPL, a contaminated oily liquid, and disposed offsite
SMA 2-5 -
Armor stone placement at the perimeter of a cellular containment system (CCS) cap
BMA 4-5 -
Bank stabilization
Middleground Island -
Soil removal and replacement
Floodplain -
Soil removal and replacement
BMA 4-6 -
Bank stabilization
Wickes Park -
Sediment dredging
SMA 7-1 -
Placement of armor stone cap
6th Street Turning Basin
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4
SEGMENT 5
SEGMENT 6
SEGMENT 7
LEGEND: Cleanups completed within the Tittabawassee and Saginaw Rivers and their floodplains from Midland to Saginaw Bay.
Sediment Cleanup Areas
Floodplain Cleanup Areas
Tittabawassee and Saginaw River
Tittabawassee River Floodplain Area
Bank Cleanup Areas
Early Actions
Urban Areas
Waterlogged Areas outside of Tittabawassee or Saginaw Rivers
Note: The boundary of the Saginaw River floodplain is currently under evaluation
Early Actions Pre 2010
2010 & 2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
N
SCALE:
www.epa.gov/superfund/tittabawassee-river
EPA

Tittabawassee River Update

Site Progress Brochure: https://semspub.epa.gov/src/document/05/999626

- EPA and EGLE working with Dow to close out the 3 open ASAOCs (Administrative Settlement Agreement and Order on Consent).
  - TR Floodplain, Segments 4/5 and Segments 6/7.
- Next steps in Tittabawassee River: Record of Decision for the Tittabawassee River (Segment 1 through 7).
- Dow to continue ongoing monitoring (SMA, BMA and Tittabawassee Floodplain)

Record of Decision (ROD) for the Tittabawassee River Segment 1 through 7
2027/2028

- Close out the remaining open ASAOCs.
- The ROD would summarize the “response action” selected under the previous ASAOCs.
- The ROD would also outline the Annual Monitoring and Maintenance Activities.
- The ROD and Monitoring Requirements would be in a Consent Decree (CD).



Floodplain Cleanup, Segment 4 (DU01-DU06)
work completed 2024

What is Being Monitored?

Tittabawassee River Post-Response Monitoring:

- **SMAs**: 23 Sediment deposits addressed, 7.7 acres of sediment capped.
- **BMAs:** 41 banks areas addressed, 5.4 miles of riverbank stabilized or removed.
- **Floodplain Properties**: ~ 656 floodplain properties evaluated (470 properties with residence) and 115 TR floodplain properties remediated, while hundreds more properties were assessed and do not need cleanup.

Site-Wide Monitoring (Tittabawassee and Saginaw River):

- Contaminant Uptake Into Biota (Fish Monitoring)
- Sediment and Contaminant Monitoring (In-channel Composite Sampling)

Bank Management Area

Stabilization and Removal









Sediment Management Area

MNR, Capping and Removal

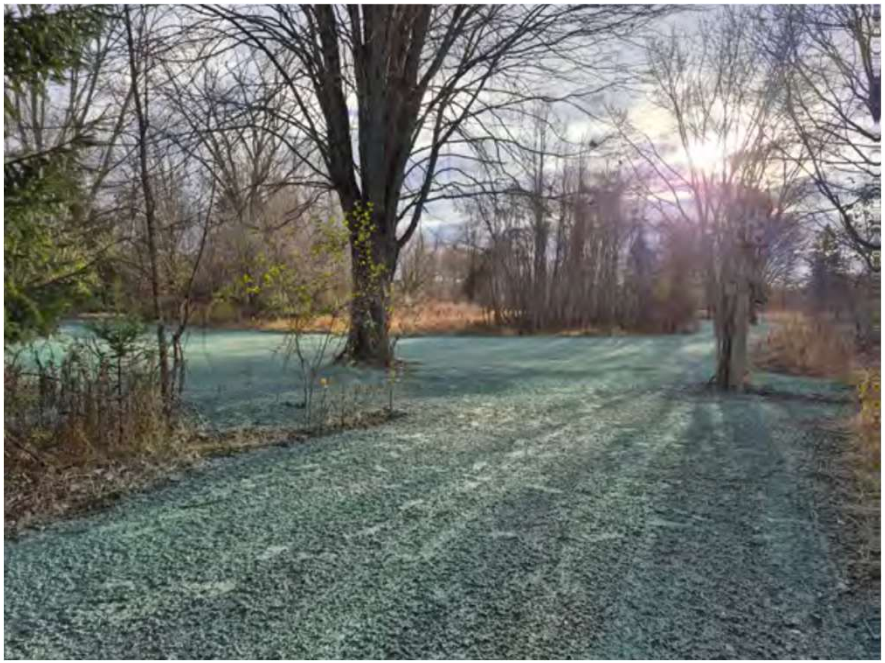






Floodplain Property Monitoring

FP Community Guide on FP Monitoring:
http://semspub.epa.gov/work/05/708605.pdf



Segment 3 Floodplain Property (2025)

- **Ownership Change and Refusals:**
  - October 2026, Dow mailed 62 letters to new homeowners in the 8-year floodplain.
- **Land Use Change:**
  - End of April, Dow flew a drone (aerial photography) in a portion of Segment 6 and all of Segment 7.
  - Next step is to review aerial photos and if land use change is observed, Dow will conduct field verification.
  - In addition, 10 % of 8-year floodplain property owners are randomly selected for field verification.

- **Post-Flood Floodplain:**
  - If a flood occurs and "if all or part of its area has been flooded" selected properties that were cleaned up will be re-sampled by Dow.
  - Two flood events in the Spring, post-flood floodplain sampling completed in August 2026.

2025 Monitoring Results

2025 Annual Monitoring Report, Dow submitted in April 2026

- Fish Monitoring Report
- In-channel Cap Monitoring Report
- Reach MM Island Monitoring Report
- Bank Monitoring Report
- Segment 3 Areas of Interest Sediment – Monitoring Report
- Flood Response Activities at Residential and Public Properties
- In-channel Composite Sampling
- Floodplain Post Removal Site Control Monitoring Report

2026 Monitoring Status

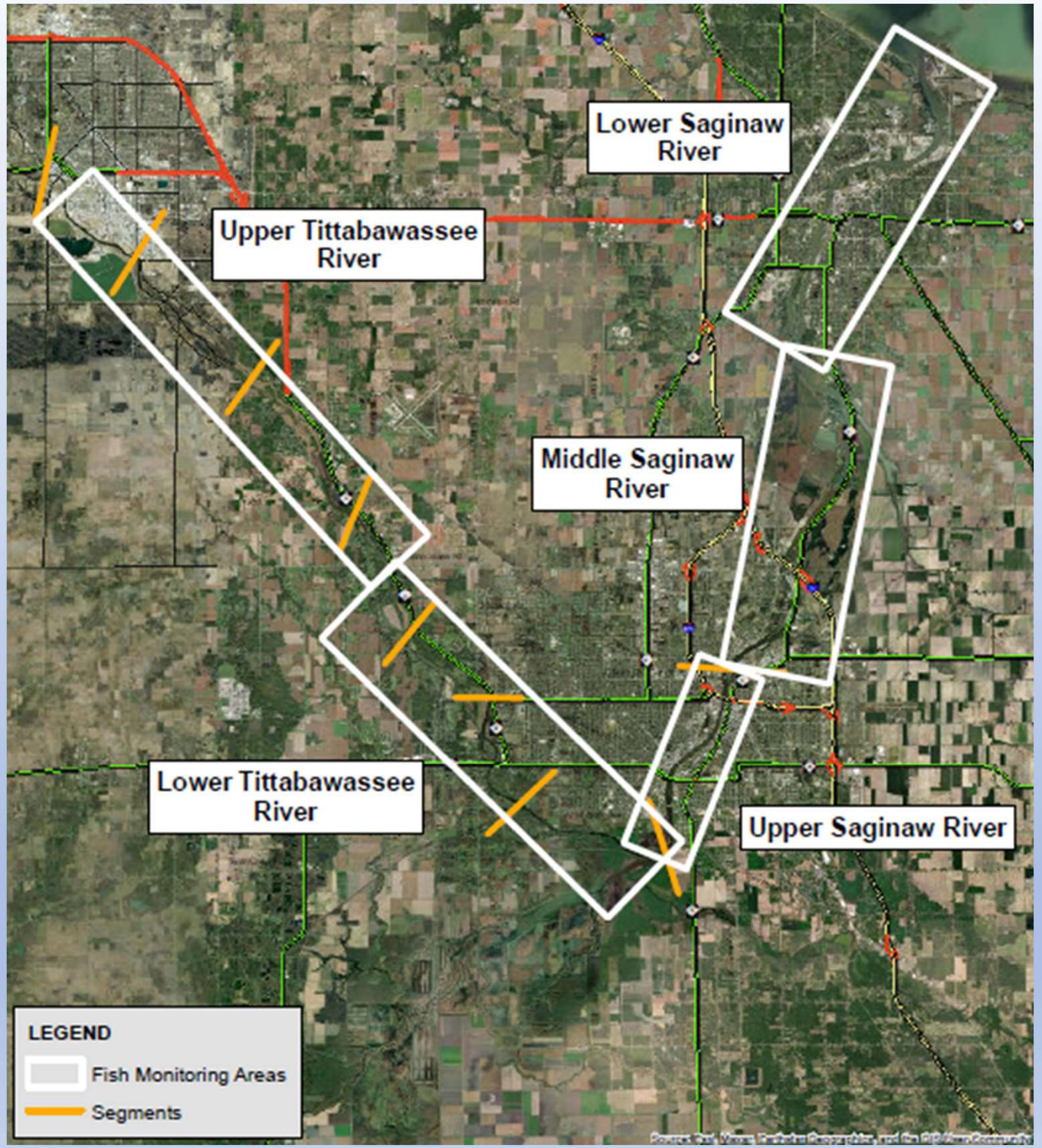
All 2026 monitoring field work completed, waiting sample results.

- **BMAs**: No major maintenance or repairs required.
- **High Stability/High TEQ (Bank Monitoring):** No reduction in stability, therefore no action needed.
- **Sediment Caps:** No major maintenance or repairs required.
- **In-channel Composite Sampling (ICCS)**: Completed Fall and Spring sediment sampling events.
- **Fish Sampling** - Completed, see next slides for more information.

Fish Monitoring

Contaminant Uptake Into Biota

- Fish Species Monitored:
  - Three species: channel catfish, smallmouth bass, walleye.
- Fish Monitoring Plan (FMP) objectives
  - Measure chemical residues (dioxins) in fish, representing different trophic groups, with consideration of species that anglers preferentially consume; and
  - Monitor fish concentrations over time.


Lower Saginaw River
Upper Tittabawassee River
Middle Saginaw River
Lower Tittabawassee River
Upper Saginaw River
LEGEND
Fish Monitoring Areas
Segments

Fish Monitoring Plan	Location	Species	2024	2025	2026	2027	2028
OU1	Upper TR (Dow Dam to Tittabawassee Road)	Walleye			x		
		Channel catfish	x		x		x
		Smallmouth Bass			x		
	Middle TR (Tittabawassee Road to Confluence of Shiawassee River)	Channel catfish	x		x		x
		Smallmouth Bass			x		
	USR	Channel catfish	x		x		x
		Smallmouth Bass			x		
OU2	MSR (SSTB to James Clements Airport)	Channel catfish		x		x	
		Smallmouth Bass		x			
	LSR (James Clements Airport to Saginaw Bay)	Channel catfish		x		x	
		Smallmouth Bass		x			

2012, Dow started fish tissue data collection under a monitoring plan.

Fish Monitoring Plan

- Catfish caught every 2 years.
- Walley and Smallmouth Bass collected every 4 years.
- Walleye only caught by the Dow Dam.
- Target size for each fish species, adult fish only.

Fish Tissue Trend Results

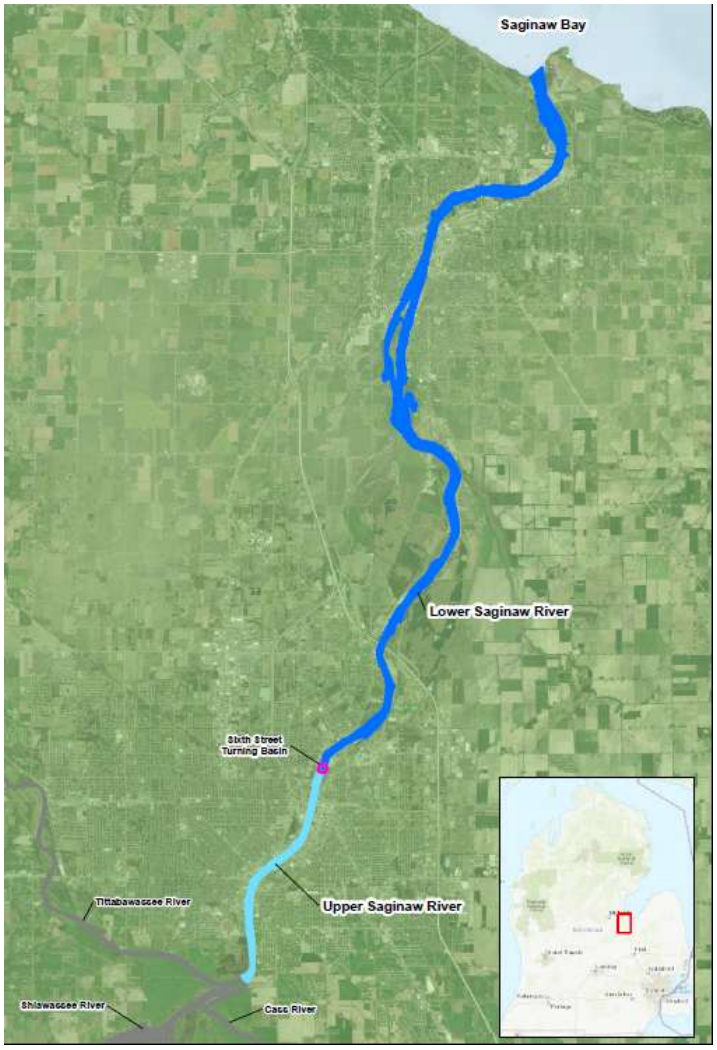
- Based on multiple sampling events, Dow in coordination with EPA conducted a statistical evaluation of the fish tissue data set and there appears to be downward trends in the fish data.

- Additional fish tissue data collection events are needed to confirm this trend.

Saginaw River Segments

Investigation/Sampling

- **Floodplain** – Includes floodplain for the entire length of the Saginaw River.
- **Upper Saginaw River** – From confluence of TR to the upstream end of the Sixth Street Turning Basin (SSTB), ~ 4.8 river miles.
- **Lower Saginaw River** – From the SSTB to river mouth at Saginaw Bay, ~ 17 river miles.
- **Saginaw Bay** – Includes area of bay near Saginaw River mouth and any other area where elevated TEQ levels may be present due to releases from the Dow Midland facility.

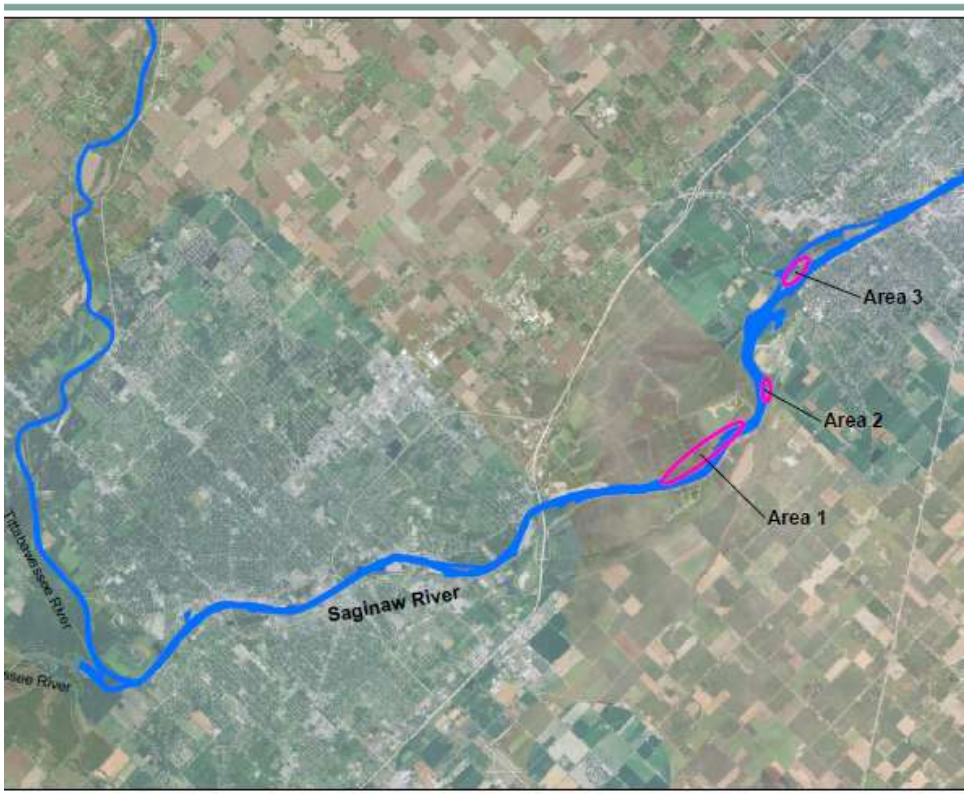


Saginaw River Floodplain

Investigation/Sampling

Dow took screening samples starting in late 2018.

- Incremental composite soils samples were taken across multiple properties – locations chosen based on:
  - Location of residential areas
  - Frequency of flooding/extent of floodplain
  - Available data
- Dow has obtained access and sampled properties along the Saginaw Floodplain.
- Investigative field work is ongoing.

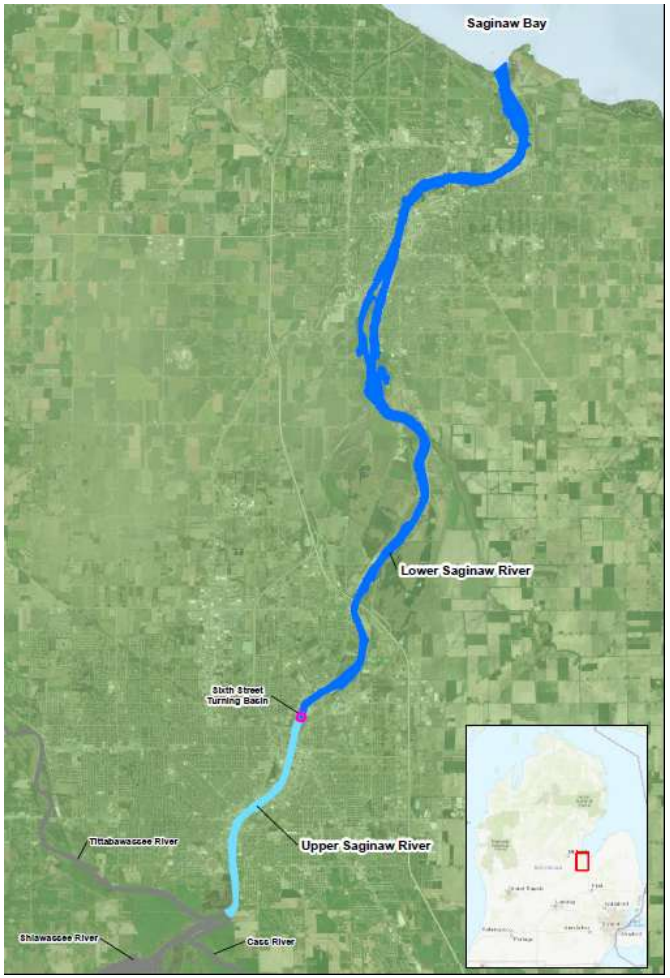


Lower Saginaw River

~ 17 river miles

Investigation/Sampling

- In 2025 and 2026, Dow collected incremental composite sediment samples in the Lower Saginaw River.
- Investigative field work is ongoing.







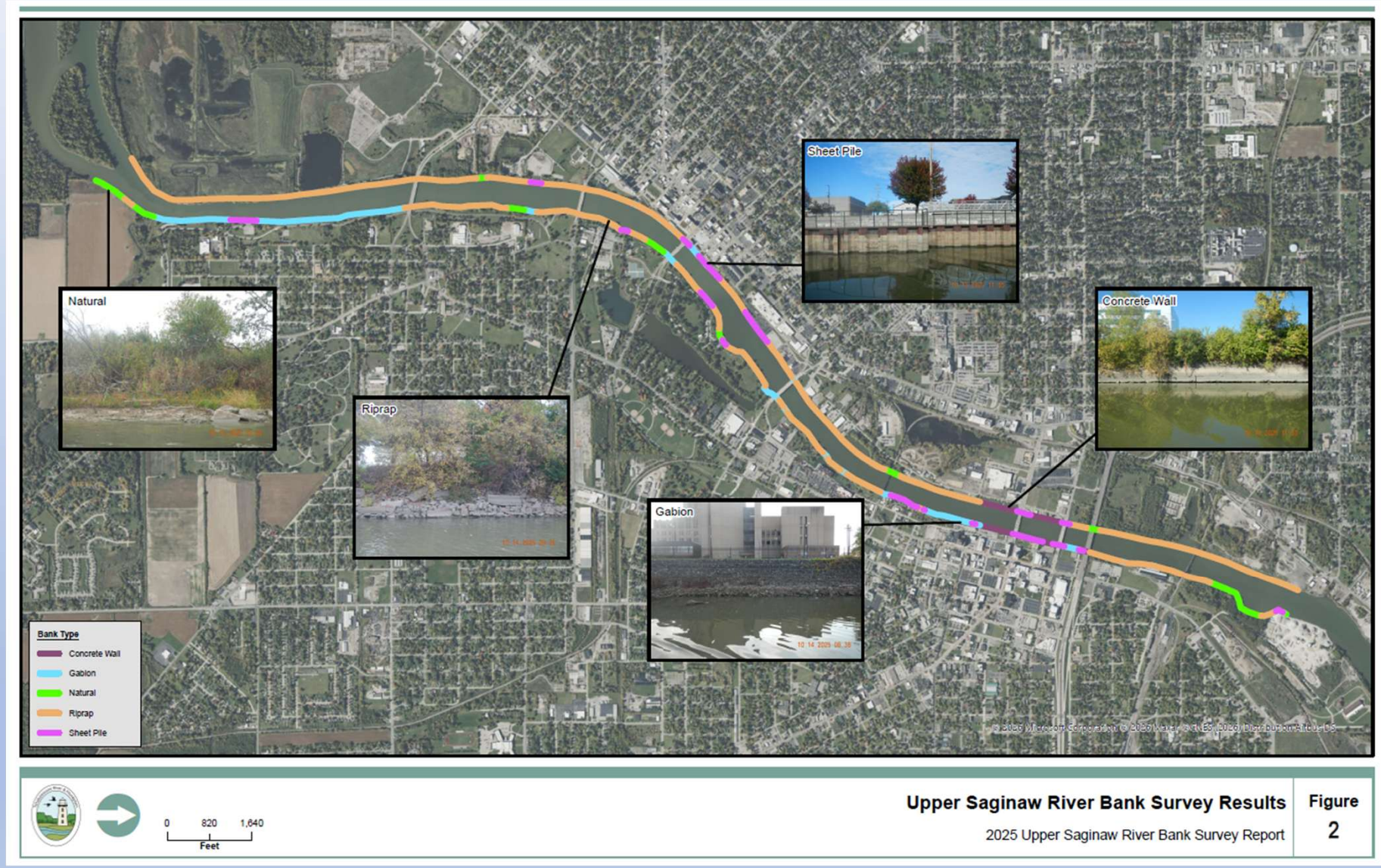


Upper Saginaw River (USR)
~ 4.8 river miles.
(excludes Six Street Turning Basin)

- USR Bank Survey Results.
- USR Site Management.
- USR Data Gap Results.

Upper Saginaw Bank Survey

Natural, Riprap, Gabion, Sheet Pile, Concrete Wall



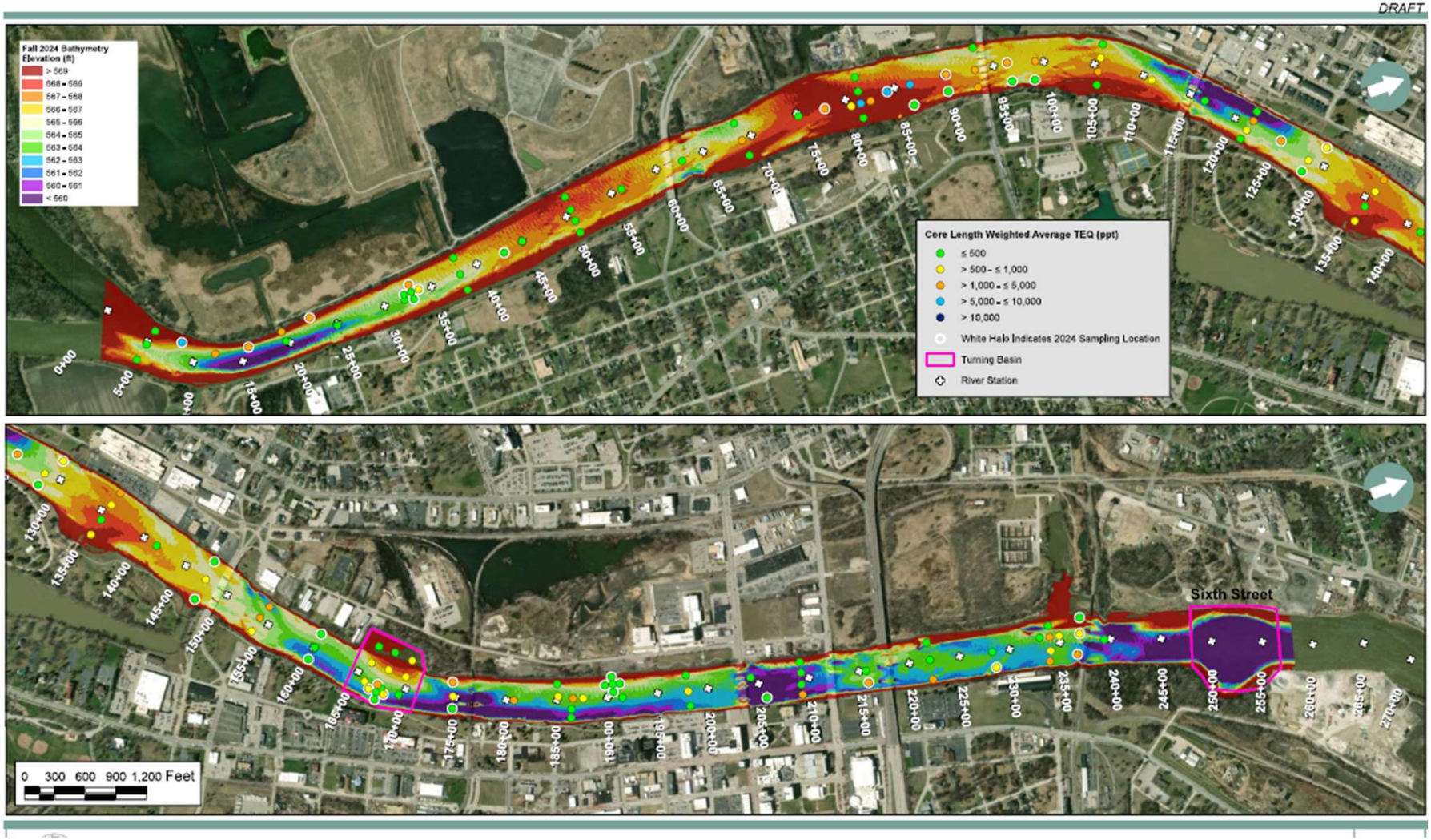
EPA and EGLE have ruled-out USR Banks as potential sources of Dioxin contamination to the Saginaw River.

Steps for Site Management: USR

1. ✓ Evaluations and actions to address early exposure concerns – entire SR/B
2. ✓ Current Conditions Report – entire SR/B
3. ➡ **Development of data gap / pilot study work plan; including data collection – by segment**
4. Response Proposal, including a basis for action that might be removal criteria or a risk screening – by segment
5. Remedy Design – by segment
6. Construction – by segment
7. Residual Risk Assessment – by segment or entire Saginaw River and Bay, but ultimately entire Site will be assessed
8. Monitoring – by segment but ultimately Saginaw River and Bay Site-wide

Upper Saginaw River (USR) Data Collection

- In 2024 and 2025, Dow collected surface and core sediment data in the Upper Saginaw following the USR Data Gap Work Plan.
- Bathymetry data collected to map the underwater topography.
- Dow collected multiple rounds of bathymetry data to understand sediment transport and sediment elevation/water depth.
- Sediment samples results and bathymetry data assist to identify sediment areas of concern.
- Field work is ongoing.



- The USR displayed in the figure above is split for display purposes only.
- Circles represent sediment core sample locations (target 7ft deep).
- Cooler colors represent lower sediment elevation (purple). The lower the sediment elevation, the deeper the water.
- Warmer colors represent higher sediment elevation (red/yellow).

Summary of Upper Saginaw River (USR) Data Gap Results

Identifying Sediment Areas of Concern:

- Cluster of sediment core samples that could serve as a **current source** and/or a **potential future source** of contamination to the river.
- **Current source:** cores with relatively higher TEQ levels (orange and blue) immediately below the active bedload layer/surface sediment.
- **Potential future source:** cores with relatively higher TEQ levels in subsurface sediment that could potentially be exposed during a future scour event that could erode the surface sediment.
- **Unlikely a source**: cores with relatively low TEQ levels (green and yellow)

Steps for Site Management (Upper Saginaw River Segment)

1. ✓ Evaluations and actions to address early exposure concerns – entire SR/B
2. ✓ Current Conditions Report – entire SR/B
3. ✓ Development of data gap / pilot study work plan; including data collection – by segment
4. ➡ **Response Proposal, including a basis for action that might be removal criteria or a risk screening – by segment**
5. Remedy Design – by segment
6. Construction – by segment
7. Residual Risk Assessment – by segment or entire SR/B, but ultimately entire SR/B Site will be assessed
8. Monitoring – by segment but ultimately SR/B Site-wide

Superfund Removal Process and Community Involvement



Upper Saginaw River Proposed Timeline

- 2026, Dow to collect additional cores to refine the areas of concern locations.
- Spring 2027, Dow to submit Response Proposal to Agencies for review.
- Winter 2027/Spring 2028, EPA to present Proposed Plan summarizing the Response Proposal.

Community Involvement Update

- We've successfully renewed the cooperative agreement with MDHHS for another 5 years – continuing the educational work on consumption advisories with local partners including the Bay County Health Dept, Bay City State Park and First Ward Community Center.

- Our latest newsletter is out and can be found here: https://semspub.epa.gov/work/05/711876.pdf

Want to Know More?

Scan the QR codes below with your phone to learn more.

MDHHS Michigan Department of Health & Human Services

Dioxin Health Information

EGLE Michigan Department of Environment, Great Lakes, and Energy

State Dioxin Information

EPA United States Environmental Protection Agency

Federal Cleanup Actions

Saginaw - Tittabawassee Rivers Contamination Community Advisory Group

Community Participation and Information Videos