IN-CHANNEL, BANK & FLOODPLAIN REMEDIATION: UPDATE ON PROGRESS ON THE TITTABAWASSEE RIVER

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Tenth International Conference on the Remediation and Management of Contaminated Sediments

Overview

Cleanup actions have been underway for several years to manage contaminants in the Tittabawassee River, Saginaw River & Bay site. These actions are being implemented by The Dow Chemical Company (Dow) with oversight by the U.S. Environmental Protection Agency (USEPA) and Michigan Department of Environmental Quality (MDEQ).

In 2010, the Agencies and Dow signed an administrative order on consent (AOC) and the Tittabawassee River was divided into seven segments ranging from 3 to 4 miles each. River work is being done segment-by-segment from upstream to downstream. Cleanup work targets specific sediment deposits and riverbank areas in each segment. Evaluations and cleanup of properties in the adjacent Tittabawassee floodplain started in 2015 and is an ongoing, multi-year project.

This poster provides information about the cleanup progress achieved. The central map shows the 24-mile lower Tittabawassee River and a small part of the upper Saginaw River, and highlights some typical projects that have been completed on the river.

Adaptive management process

A collaborative approach has allowed for flexibility in project management, planning and implementation.

- Day-to-day collaboration and open communication with Agencies and Trustees fosters trust, continuous technical feedback and improved (and faster) outcomes
- Frequent dialogue fosters real-time decisions (avoids review/comment/reply cycle)
- Creates an atmosphere for innovation
- Requires substantial commitment of resources by all participating members

Performance-based cleanups and post-construction risk assessments allow progress while postponing possible prolonged discussions around risk numbers and cleanup goals.

Learning by doing – pilot study and early action work along the Tittabawassee and Saginaw Rivers

Early actions were completed prior to signing of the 2010 AOC:

- Sediment removal
- Bank removal and stabilization
- Floodplain soil removal and replacement

Pilot studies:

- Bank stabilization technologies
- Capping via cellular containment system (CCS)

Pilot studies and early response actions prior to 2010 AOC resulted in significant lessons learned regarding:

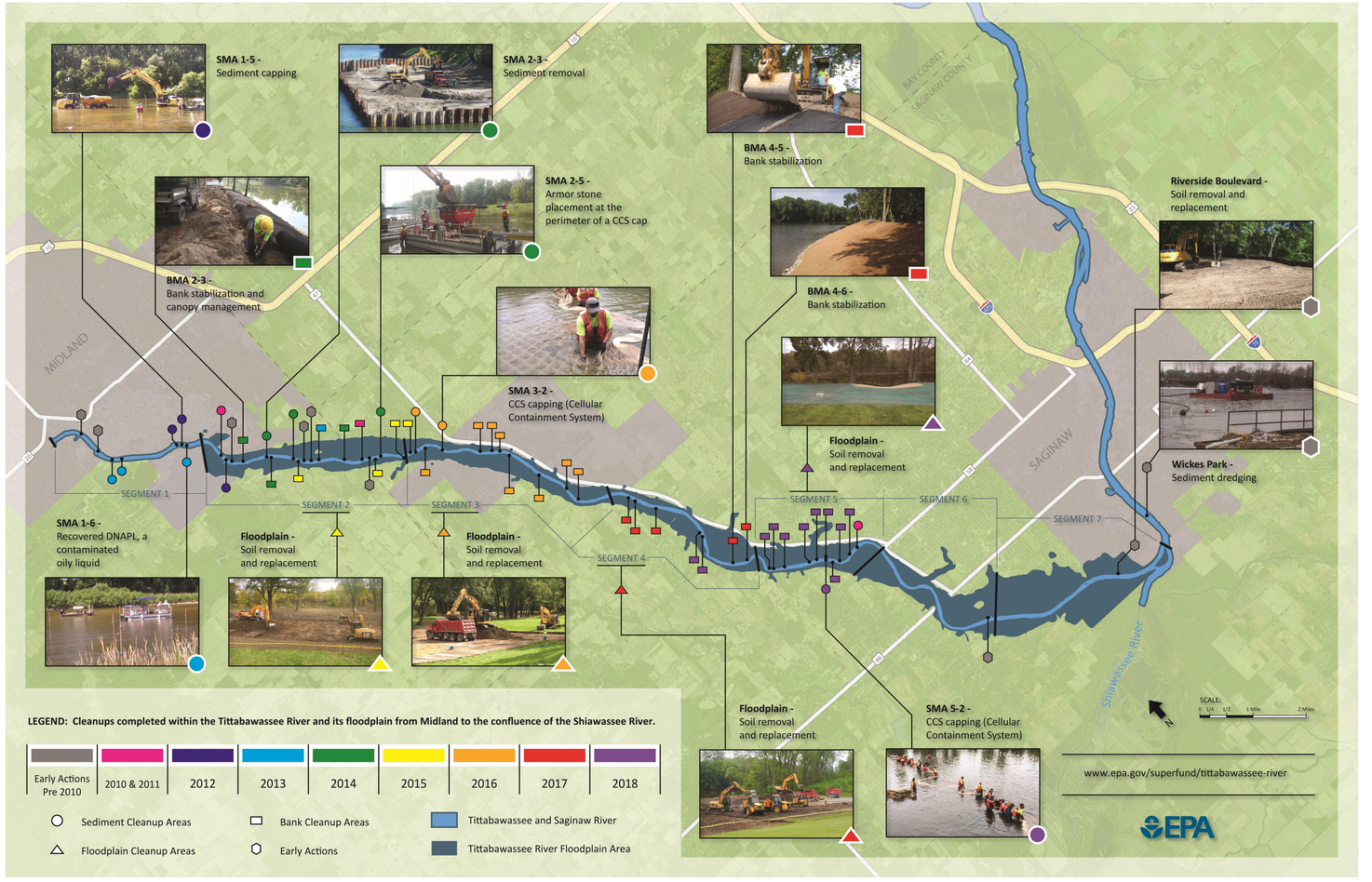
- Bank stabilization technologies
- Dredging and removal under wet or dry conditions
- Sediment capping and cap stability
- General access and working conditions in the River

Monitoring is conducted to document effectiveness of pilot studies and response actions; lessons learned are applied to continuously improve future actions.


Reach D sediment dredging


Reach M bank pilot study


Reach J sediment capping pilot



Floodplain soil removal and replacement in Segments 2 through 5

Floodplain cleanups focus on properties in frequently flooded areas within the 8-year floodplain. Contamination is not found evenly throughout the 8-year floodplain. USEPA and MDEQ developed cleanup numbers in order to determine where a cleanup is needed.

Properties with dioxin levels lower than the cleanup numbers require no further action under this program. If dioxin levels are higher than the cleanup numbers, Dow will contact the property owner to discuss cleanup options. Soil is removed and replaced, and the vegetation is replanted.

As of the end of 2018, floodplain cleanup has been completed at almost 80 residential and non-residential properties.


Floodplain cleanup in Segment 4

Sediment and riverbank cleanup in Segments 1 through 5

There are distinct areas in and along the Tittabawassee River that require cleanup called sediment management areas (SMAs) and bank management areas (BMAs). USEPA has two main cleanup goals for these areas: 1) limit the spread of dioxin-contaminated riverbank soil and sediment to reduce dioxin levels farther downstream, and 2) help keep dioxin from building up in Tittabawassee River fish.

SMA cleanups typically involve dredging/excavation and disposal of contaminated sediment or capping of the sediment to prevent erosion. BMA cleanups usually include technologies that stabilize the bank to stop erosion of contaminated riverbank soil. Bank stabilization includes planting deep-rooted, erosion-resistant native vegetation, which increase habitat diversity along the river. In some cases, the banks have been completely removed.

Dow has conducted cleanups of SMAs and BMAs in Segments 1 through 5 from 2010 to 2018. USEPA is finalizing a cleanup plan for Segments 6 and 7, and that work will start in 2019. Cleanups are expected to continue in and along the Tittabawassee River until 2021. Then the project will focus on the Saginaw River and Bay.

As of the end of 2018, more than 4 miles (22,000 feet) of banks and 18 SMAs have been cleaned up.


Bank stabilization in Reach M


Sediment capping at SMA 1-4


Sediment removal at Reach MM Island