



EPA Proposes Cleanup Action for Small Island

Tittabawassee River, Saginaw River and Bay Site

Midland, Saginaw and Bay City, Michigan

April 2011

Share your opinion

EPA invites comments on its proposed cleanup plan for an island located in the Tittabawassee River. The Agency encourages people to attend the public meeting at 6:30 p.m., Thursday, April 28, 2011, at Saginaw Valley State University, Curtiss Hall, Banquet Rooms B & C, 7400 Bay Road, Saginaw. EPA and MDEQ representatives will also be available to talk to residents at an informal session on April 28, 2 - 4 p.m., at the Thomas Township Library, 8207 Shields Drive, Saginaw.

There are several ways to offer comments on the proposed plan:

1) orally or in writing at the public meeting; 2) fill out and mail the enclosed comment form or submit it at the meeting; 3) electronically by Internet at epa.gov/region5/publiccomment/dowchemical-pubcomment.htm; and 4) fax to EPA's Patricia Krause at 312-697-2568.

Contact EPA

If you need special accommodations at either the availability session or the public meeting or have questions contact:

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9:30 a.m. – 5:30 p.m., weekdays

The U.S. Environmental Protection Agency, working with the state of Michigan, is proposing a cleanup action on a small island in the Tittabawassee River to limit contaminated sediment (mud) from moving downstream. The island is located in a stretch of river known as Reach MM in a section of the site designated by EPA as Segment 5 (*see Figure 1 on Page 2*). The island contains high levels of dioxins (primarily furans) and is eroding over time. EPA's recommended plan to control dioxin movement from the island is to remove the contaminated sediment located above the water surface, combined with in-place containment of the remaining island sediment under a cap designed to let the island restore itself naturally. Nearby underwater sediment would also be capped as needed. This work would remove highly contaminated sediment and isolate less polluted sediment and stop it from moving downstream. The project would also promote natural restoration of the area to an island habitat.

The measures described in this fact sheet are called "early actions." EPA is proposing to perform these steps later this year, long before an extended, comprehensive cleanup can be accomplished for floodplain soil and river sediment in designated segments of the Tittabawassee and Saginaw rivers.

Public comment needed

The purpose of this proposed plan fact sheet is to give you background information, describe the proposed options to control contaminant movement from the Reach MM island, and explain EPA's recommendation¹. You are encouraged to comment on this proposed plan. More details can be found in a document called the *Reach MM In-Channel Island Engineering Evaluation/Cost Analysis (EE/CA)*. EPA is also seeking comments on this technical report, which can be found on our website and at the local document repositories listed on Page 7.

EPA will be accepting comments from April 22 – May 22, 2011, and holding a public meeting on April 28. See the left-hand box for ways you can participate in the decision-making process.

Background

The Dow Chemical Co. has been operating its Midland plant since the 1890s. Dioxins including furans and other contaminants are found in and along the Tittabawassee and Saginaw rivers and in Saginaw Bay from past waste disposal practices at Dow's Midland plant. A January 2010 legal agreement sets out requirements for Dow to perform investigations and develop and design cleanup options selected by EPA, in consultation with the Michigan Department of Environmental Quality, leading to protective cleanup of the Tittabawassee River, Saginaw River and Bay site. For cleanup purposes, EPA divided the Tittabawassee and upper Saginaw rivers into eight segments

¹ Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, known as the Superfund law) requires EPA to provide an opportunity for public input with a comment period. It also requires a newspaper ad announcing the proposed plan with a brief description. This fact sheet summarizes a document called the "engineering evaluation/cost analysis" and other site-related reports. All official site documents can be found in the repositories listed on P. 7 and at the EPA Chicago Office.

ranging from three to five miles long. Work will be conducted in stages from upstream to downstream, segment-by-segment, ensuring that each section is cleaned up before moving on to the next. However, the legal agreement also recognizes that movement of highly contaminated sediment and riverbank soil to other areas of the site is a concern that would be handled, as needed, on an accelerated schedule.

A procedure was established to determine if these early actions might be needed for certain sediment and riverbank deposits. The evaluation considers the size of the deposit, the level of dioxins and the likelihood the contaminants could move. The evaluation also considers how far down the river the deposit is located, because areas farther downstream may need to be treated through early actions before the final, long-term cleanup work reaches that particular area. Federal and state environmental regulators determined the island in Reach MM is one of these locations needing early action.

It is likely the Reach MM island formed in the early 1900s because of changes in Tittabawassee River currents after construction of a nearby bridge. At the same time,

very large amounts of sediment were washing into the river because of logging and agricultural practices. The sediment mixed with contaminants and built up in certain areas like the Reach MM island. Over time, less contaminated sediment layers built up on the island over the more polluted deposits. Sampling from Reach MM island showed high levels of dioxins in the island sediment and along the bank faces.

Why is this early action important?

Dioxins are the main contaminants found at the site. The term “dioxins” refers to a large family of similar chemicals including the closely related furans. EPA has concluded that some dioxins may cause cancer or other health effects such as skin problems, liver damage and reproductive issues.

Dioxins are not created intentionally but can be formed by human activity or naturally, for example, by fires. At the site, dioxins were formed as byproducts of Dow’s early manufacturing processes at its plant in Midland. In the past, the chemicals were released to the Tittabawassee River where they deposited in some sediment, like at the Reach MM island. It is believed that current waste

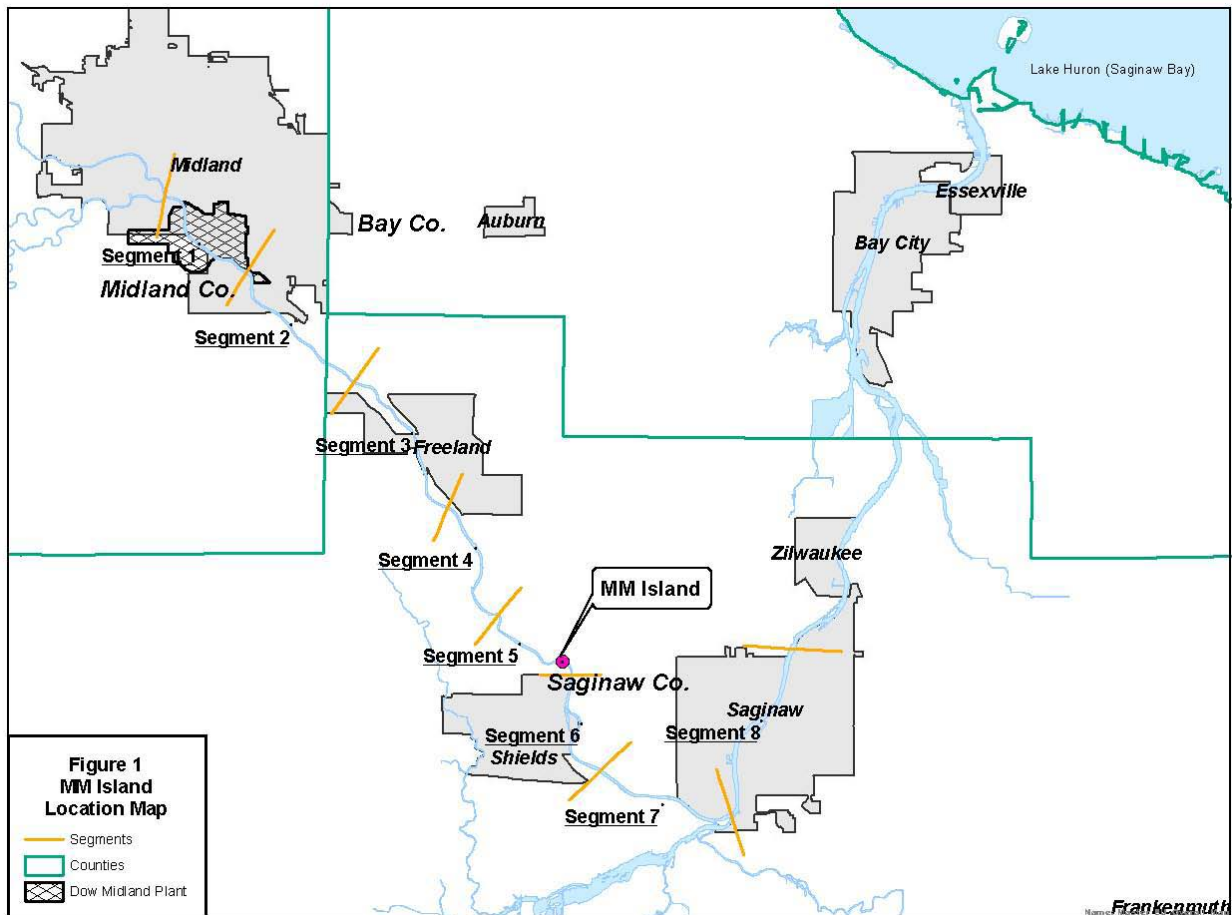


Figure 1 – The Reach MM island is located in Segment 5 of the site near the intersection of M-47 and Weiss Street about 17 miles downstream from the confluence of the Chippewa and Tittabawassee rivers and about seven miles upstream from the Shiawassee River.

management practices now control contaminant releases from Dow's facility.

The Reach MM island is subject to erosion that may be spreading dioxins to downstream locations within the floodplain and river channel where people or wildlife could come into contact with the pollution. Once they erode from the island, contaminants may build up in the food chain or be distributed in sensitive ecosystems. Historical aerial photographs show the Reach MM island has dwindled in size over time (*see Figures 2 and 3 on Page 7*).

Addressing the Reach MM island through an early action is important. It will be several years before the long-term, comprehensive cleanup can be executed for Segment 5. By taking these cleanup steps now, the potential for contamination from the Reach MM island to move downstream will be diminished.

Summary of proposed alternatives

EPA considered three alternatives to control contaminant movement from the Reach MM island:

Alternative 1 – Stabilization: This alternative would protect the Reach MM island from further erosion by placing material such as large woody debris or armor stone over existing sediment on the island surface and banks. The materials would be designed and placed on the island to prevent sediment movement. Monitoring would be conducted to make sure stabilization is effective. **Estimated Cost: \$250,000**

Alternative 2 – Above-Water Sediment Removal and In-Place Containment (*this is EPA's recommended alternative*): This alternative would include removal of sediment located above the water line, combined with in-place containment of the remaining sediment under a cap designed to promote natural restoration of island habitat. Excavation of the visible island would be done under dry conditions. Removed sediment would be transported for disposal at a licensed landfill. A containment cap made of clean material would be placed over the exposed areas created by the removal. Nearby underwater areas might be capped as well depending on what conditions additional investigations find. The cap would stabilize the remaining sediment making it less mobile and reduce the potential for human or wildlife exposure on the island. After the work is completed, the area would remain an island during typical water flow conditions and over time the island should redevelop naturally. The cap would be monitored for continued effectiveness. **Estimated Cost: \$500,000**

Alternative 3 – Removal of All Targeted Sediment: This alternative would include the removal of all targeted sediment from above the water surface at the island and underwater in this area as well. The exact zone to be removed would be determined based on additional

investigations. Best management practices would be used to minimize sediment movement during construction. Water would need to be removed from the sediment by "dewatering" – either near the removal area or the sediment would be loaded onto trucks and taken to a staging facility. After dewatering, dredged sediment would be transported off-site and disposed of in a licensed landfill. **Estimated Cost: \$1.1 million – \$2 million**

Common elements to all alternatives

Some features are common to all of the cleanup options. Additional sampling will be needed to understand existing conditions and identify the final size of the work area. Each alternative would require an assessment of water flow to make sure the sediment is stable and other nearby deposits do not erode. Access to the island is likely to be on temporary roads from an adjacent shoreline. Each alternative would require clean material to be shipped into the work area. Alternatives 2 and 3 would also require contaminated sediment be removed from the location and transported to a landfill for disposal. Because of the increased truck volume, traffic controls will be put in place as a safety measure. Work is expected to be completed this year in one construction season. A health and safety plan will be required for the project to protect workers and residents.

Evaluation of alternatives

EPA is required by law to evaluate these options against the criteria of effectiveness, implementability and cost (*see box on Page 4 for an explanation of the criteria*). Table 1 compares each alternative against these criteria.

Effectiveness: All three options are expected to protect human health and the environment and will limit downstream contaminant movement. Alternative 1 protects the Reach MM island from further erosion and immediately reduces downstream movement of contaminants by stabilizing the existing island sediment. However, nearby underwater areas would not be handled. Alternative 2 offers long-term protection by removing the contaminated sediment most likely to erode – the sediment at and above the water line – and isolates and safely contains the remaining deposit with a clean cap. Alternative 3 would be effective in the long-term because it removes contaminated sediment from the river system, preventing downstream movement.

All three alternatives will have short-term effects that will temporarily disrupt areas in and along the river during construction. The construction period for Alternative 1 is the shortest and Alternative 3 is the longest. Alternative 2 could have limited short-term effects of water cloudiness because of sediment removal, although this work will be done under dry conditions so the effects will be minimal. Alternative 3 could have short-term effects because

underwater sediment removal may result in the release of contaminants to surface water, cause cloudiness, and move contaminants downstream during construction. In addition, after removal under Alternative 3, contamination may remain on the sediment surface and could later move downstream.

Alternative 1 will cause the least changes to existing river conditions, and Alternative 3 will cause the most. Under Alternative 1 the island habitat will remain, although the materials needed to prevent erosion may change the look of the bank faces and surfaces. The flows will remain similar, minimizing concerns about erosion in other areas. Under Alternative 2 the cap will create a low island that is expected to redevelop naturally over time. The flows will remain similar, also minimizing concerns about erosion in other areas. Under Alternative 3, no island habitat will remain. The flows will change in this part of the river and potential erosion of other areas must be considered.

Implementability: Actions similar to Alternatives 1, 2, and 3 have been done successfully at other areas along the Tittabawassee River. Stabilization under Alternative 1 may require a more refined approach compared to previous projects because of specific conditions at the Reach MM island. The river flow and the shape and steepness of the island are conditions that may be challenging. Targeted removal similar to Alternative 3 has been done, but past experience shows that underwater sediment removal in the Tittabawassee River is likely to have potential difficulties. Managing river flow conditions to perform underwater work, maintaining water quality during a removal, and managing water from the dewatering process are all challenges with Alternative 3. In addition, buried logs and other debris pose obstacles to the sediment cleanup process in Alternative 3. Partial removal and capping similar to Alternative 2 has been successful at other locations without major implementation issues. For Alternatives 2 and 3 a local licensed landfill would be the location for permanent disposal of removed sediments. Necessary personnel and equipment are available for all options.

Cost: The costs for stabilization and a monitoring program under Alternative 1, at \$250,000, are comparatively low. The costs for above-water sediment removal, in-place containment and a monitoring program under Alternative 2, at \$500,000, are moderate. The costs for targeted sediment removal under Alternative 3 would be high, with an estimated price tag between \$1.1 million and \$2 million, which includes anticipated construction monitoring but no long-term monitoring. The range of costs for Alternative 3 is large because of uncertainties around the final volume of sediment that needs to be removed.

EPA’s recommendation

EPA, in consultation with MDEQ, recommends Alternative 2 – Above-Water Sediment Removal and In-Place Containment. The environmental agencies believe this option provides the best balance of effectiveness, implementability, and cost. Alternative 2 protects human health and the environment long-term. It also provides permanence by removing the most highly contaminated sediment that is the most vulnerable to erosion, while stabilizing and isolating remaining sediment. Alternative 2 will cause minimal short-term disruptions. Alternative 2 also is doable since the technology, materials and services are available.

Explanation of evaluation criteria

For this type of action, EPA uses three criteria to evaluate and compare cleanup options.

Effectiveness evaluates the ability of an option to meet cleanup objectives. It also considers whether the option protects human health and the environment, and whether the option will be reliable.

Implementability evaluates how difficult the option will be to construct and whether materials and services are available in the area.

Cost includes not only equipment, materials and labor but also the long-term expenses of maintaining the option.

Table 1 – Compares how each alternative meets the evaluation criteria, relative to other alternatives.

Evaluation Criteria	Alternative 1 Stabilization	Alternative 2 Above-water sediment removal and in-place containment	Alternative 3 Removal of all targeted sediment
Effectiveness	Moderate	High	Moderate to High
Implementability	High	High	Moderate
Estimated Cost	\$250,000	\$500,000	\$1.1 million - \$2 million

Tittabawassee River, Saginaw River and Bay Site - Comment Sheet

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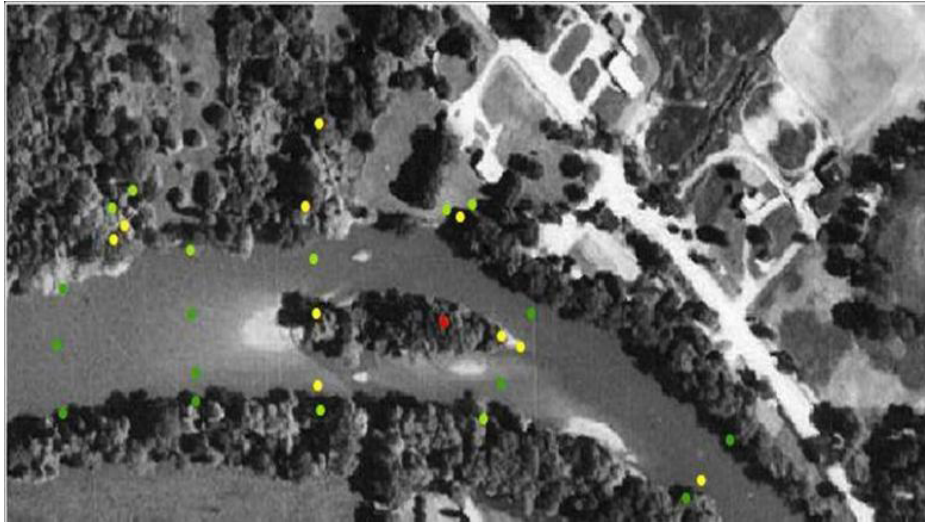


Figure 2 – Historical aerial photograph of the Reach MM island, 1963-65 time period.



Figure 3 – Aerial photograph of the Reach MM island, 2007.

Next Steps

Before it makes a final decision, EPA will review comments received during the public comment period and at the public meeting. Based on the comments, EPA, in consultation with MDEQ, may modify its recommended plan, so your opinion is important.

More details are available in the official documents on file at the information repositories and on EPA's website listed in the right-hand box. EPA will respond to the comments in a document called a "responsiveness summary." The Agency will announce the final plan in local newspapers and will place a copy in the information repositories and on the website.

Once the plan is finalized, EPA expects Dow to implement the work at the Reach MM island. Dow's work will be done with oversight by EPA and MDEQ. To try to avoid bad weather and potential high-water levels, the work is expected to be completed during late summer and early fall 2011.

For more information

EPA Field Office

EPA has opened an information office in the Saginaw County Courthouse, 111 S. Michigan Ave., Saginaw. Telephone: 989-790-5215.

View Site Documents

You can view documents related to the Tittabawassee River, Saginaw River and Bay site on the Web or at information repositories:

- At www.epa.gov/region5/sites/dowchemical.
- Grace A. Dow Memorial Library, 1710 W. Saint Andrews St., Midland.
- Hoyt Main Library, 505 Janes Ave., Saginaw.
- Alice and Jack Wirt Public Library, 500 Center Ave., Bay City.

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Public Comment Period: April 22 – May 22, 2011

Public Meeting: April 28, 2011

Availability Session: April 28, 2011

(details inside)

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