

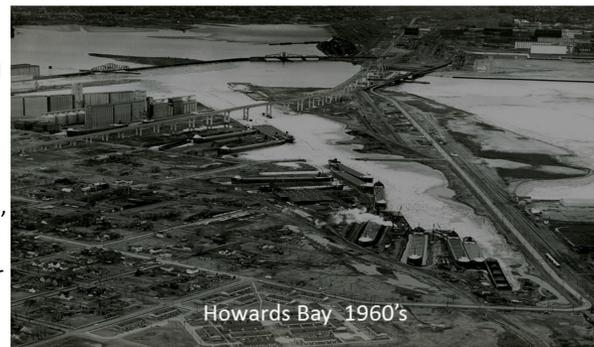
Cleaning Up Legacy Contamination in Howards Bay through Public-Private Partnership

Joe Graham¹, Darienne McNamara², Sean Smith³, and Bill Murray⁴

¹ Wisconsin Department of Natural Resources, ² City of Superior, ³ Fraser Shipyards, ⁴ U.S. EPA Great Lakes National Program

Overview

Howards Bay is an industrial embayment that is important for Lake Superior commerce. The bay has been the home to shipyards, grain terminals, commercial fishing operations and other industries for well over 100 years. This history of industrial use has polluted sediments in the bay. Dredging is needed to remove contamination and to provide a deep enough channel for vessels entering the shipyard. To reduce costs, the City of Superior, Wisconsin DNR, EPA, and Fraser Shipyards, Inc. are collaborating in order to address environmental problems and meet maritime needs with a single project. The US Army Corps of Engineers is also participating in project design and implementation. Once cleaned up, the bay can continue to serve commerce while providing important habitat for fish like musky and northern pike as well as migratory waterfowl.



Howards Bay Project

- Located within the St. Louis River Area of Concern
- Priority area for cleanup due to contaminated sediment
- Elevated Polynuclear Aromatic Hydrocarbons (PAHs), Lead, Mercury and Tributyltin
- Cleanup action needed to address contamination and related restrictions on dredging
- Dredging of the shipping channel for navigation
- Supports local business and workers
- Economic and environmental benefits achieved thru public-private partnership

Collaborative Effort

- Great Lakes Restoration Initiative
- US Army Corps conducting strategic navigation dredging
- Great Lakes Legacy Act Project for cleanup action
- Project Partners include US EPA, Fraser Shipyards, City of Superior and DNR
- US Army Corps of Engineers also serves as EPA's contractor on the cleanup project



What's in Howards Bay Sediments?

Lead

- Paint (sand blasting ship hulls)
- Leaded Gasoline

PAHs

- Combustion
- Road Runoff
- Spills
- Treated Wood

Mercury

- Many Industrial Uses
- Coal Combustion

Tributyltin

- Antifouling Agent in Marine Paint



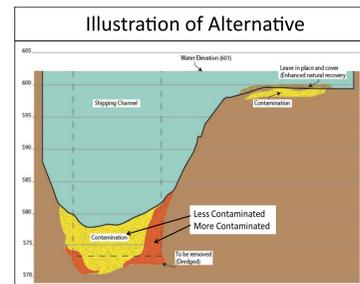
Feasibility Study

- Evaluated **data** and **potential sources**
- Established **cleanup goals** and identified **areas needing cleanup**
- Identified and **screened** possible **cleanup technologies**
- Developed **cleanup options** and **evaluation criteria**
 - Sediment **Removal** (i.e. dredging) (4 Options)
 - Sediment **Removal and Capping** (3 Options)
 - Dredged **Sediment Management** (9 Options)
- Selected a **cleanup option** that best meets the **cleanup goals** and **evaluation criteria**
- Combination of **dredging** and **enhanced natural recovery** (leave in place and cap) is the best option based on long-term effectiveness, costs, and ability to implement.



Project Design & Implementation

Selected Cleanup Alternative ~\$14,000,000		
Action	Clean-up Area (Acres)	Approximate Volume (Cubic Yards)
Navigation Dredging	6.7	40,000
Clean-Up Dredging	17.0	83,000
Enhanced Natural Recovery	1.5	N/A



Dredged Material Management

Strategic Navigation Dredging

Erie Pier Processing and Reuse Facility

Cleanup Dredged Material

Use to Improve cap/cover at Wisconsin Point Landfill

Wisconsin Point Landfill

Existing Cap Issues

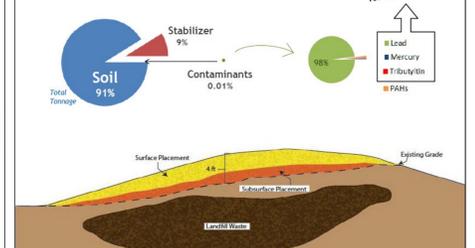
Used for stockpiling recently

- Benefits of placing dredge material:**
- greater thickness over waste
 - improved drainage
 - reduce leaching
 - maintain vegetation
 - minimize future maintenance

Recreational Improvements



What about contamination?



Site-Specific Protective Standards for Recreation

- **Developed based on recreational use identified in Wisconsin Point Management Plan**
- **Protective of human health and the environment**
- **Limited recreational uses**
 - e.g. hiking trails, off leash dog exercise area
- **Realistic Exposure Assumptions**
 - Frequency and exposure times reduced in comparison to non-industrial/residential exposure
- **Placement Criteria for the Chemical Present**
 - ◊ Lead, Mercury and Tributyltin—Same as non-industrial site (e.g. residential)
 - ◊ PAHs—Less stringent for some compounds, but comparable to urban background
- **Recreational Uses Allowed at Similar Sites**
 - ◊ Recreation trails on former railroad corridors with similar contaminants
 - ◊ Dog parks and other uses on closed landfills
- **Standards for Recreation Higher than Sediment Cleanup Targets**
 - Aquatic organisms tend to be more sensitive to contamination than people or organisms that live on land, standards to protect aquatic life are often much lower than protective levels for receptors on land.



Recreational Improvements

Plans and design determined by community

Improvements funded by EPA, DNR and Fraser

Achieve objectives in Wisconsin Point Management Plan (2012) which calls for:

- "unpaved trails or foot paths"
- "signage"
- "improved access" and linkage between Lot 1
- "pet-friendly activities such as fenced off-lead play area"

Limitations based on landfill constraints and placement criteria* for dredge material

* This will be revisited based on community feedback, ongoing



What about leaching and runoff?



Project Benefits

- Addresses contamination in Howards Bay
- Restores navigation depths in Howards Bay
- Beneficial use of dredged material
- Improve landfill cap, help protect environment around landfill
- New recreation area in Superior
- Supports local business and workers
- Takes advantage of available funding
 - ◊ Cash from shipyard and Wisconsin's sediment bonding authority
 - ◊ Placement site provides City's portion of cost share (no cash needed from City)

