

SEDIMENT MANAGEMENT WORK GROUP

WWW.SMWG.ORG

C/O STEVEN C. NADEAU, COORDINATING DIRECTOR

2290 FIRST NATIONAL BUILDING

660 WOODWARD AVENUE

DETROIT, MICHIGAN 48226

E-MAIL SNADEAU@HONIGMAN.COM

TELEPHONE: (313) 465-7492

FACSIMILE: (313) 465-7493

Via E-Mail

January 16, 2007

Ms. Amy Thomas
Battelle
505 King Avenue
Columbus, OH 43201

Re: Comments on the Draft Great Lakes Binational Toxics Strategy Report - Sediments

Dear Ms. Thomas,

I have enclosed the Sediment Management Work Group's (SMWG) comments on the draft Great Lakes Binational Toxics Strategy Report - Sediments (Report). The SMWG has two overall comments on the draft Report.

First, the SMWG notes that the draft report discusses a new Canadian framework for contaminated sediments but does not discuss the U.S. EPA's new *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*, December 2005 (Guidance). It is clear from conference calls on the Great Lakes Water Quality Agreement Review that not many stakeholders in either the U.S. or Canada are aware of the Guidance. It is important to inform the public, government, industry, and other stakeholders that this Guidance exists because it embodies the U.S. EPA's national contaminated sediment policy, provides a decision-making framework for contaminated sediment sites, and is being applied to contaminated sediment sites in the Great Lakes, including the Fox River. The SMWG drafted an insert on the Guidance for inclusion into the Report and proposes heading changes to both the U.S. and Canadian updates for consistency.

Second, the draft Report focuses almost exclusively on dredging. While there are not yet many sites in Great Lakes Areas of Concern that employ alternatives to dredging, such as monitored natural recovery (MNR) or in-situ capping, these sediment management options are increasingly being evaluated during remedy selection because of the growing recognition of the limitations of dredging. It is important to emphasize that, because mass removal does not necessarily equate to risk reduction, and, therefore, to achievement of remedial goals, dredging is not the only tool for addressing contaminated sediments. MNR and in-situ capping are tools that

should also be evaluated and used, either alone or in combination with other sediment management options. The SMWG proposes several additions to the draft Report to reflect the increasing use of MNR and in-situ capping.

Enclosed is a redline version of the draft Report with the SMWG's proposed inserts and a clean version of the draft Report, which incorporates the SMWG's proposed inserts.

The SMWG would be pleased to answer any questions about its comments and proposed inserts. Please contact me for further information.

Sincerely,



Steven C. Nadeau, Coordinating Director
Sediment Management Work Group

Enclosures

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6.0 SEDIMENTS CHALLENGE

Under the Great Lakes Binational Toxics Strategy, EC and US EPA committed to:

“Complete or be well-advanced in remediation of priority sites with contaminated bottom sediments in the Great Lakes Basin by 2006.”

Highlights of sediment assessment and remediation activities undertaken in the U.S. and Canada are described below.

2006 Sediment Assessments with US EPA’s *Research Vessel Mudpuppy*

Contaminated sediments are a significant concern in the Great Lakes Basin. Although toxic discharges have been reduced over the past 30 years, high concentrations of contaminants still remain in the sediments of many rivers and harbors. These sediments are of potential risk to the health of aquatic organisms, wildlife, and humans.

To assist in determining the nature and extent of sediment contamination at these polluted sites, US EPA’s GLNPO provides the *Research Vessel (R/V) Mudpuppy*. The *R/V Mudpuppy* is a 32-foot-long, flat-bottom boat that is specifically designed for sampling sediment deposits in shallow rivers and harbors. The boat is able to sample at water depths between 2 feet and 50 feet. Using a vibrocoring unit, the *R/V Mudpuppy* can take sediment core samples of up to 15 feet in depth.

To adequately characterize a site, GLNPO uses an integrated sediment assessment approach. This involves collecting data for sediment chemistry, toxicity, and the benthic community at a specific site, and then using the results to determine the extent of contamination that could be impacting the aquatic ecosystem.

Since 1993, the *R/V Mudpuppy* has conducted surveys at 39 locations, including 27 of the 31 Great Lakes Areas of Concern (AOCs). In 2006, the following surveys have been conducted with the assistance of the *R/V Mudpuppy*:

- **Ashtabula River, Ashtabula, OH** – Collected baseline data for GLNPO to generate a pre-dredging characterization of Ashtabula River sediments by evaluating sediment chemistry, toxicity, and bioaccumulation potential.
- **Trenton Channel, Trenton, MI** – Assisted US EPA with sampling to investigate the nature and extent of contamination at two US Steel sites on the Detroit River.
- **Saginaw River, Saginaw, MI** – Assisted the Michigan Department of Environmental Quality (MDEQ) with sampling to characterize the visual distribution of strata in sediments of the Saginaw River.

- **Muskegon Lake, Muskegon, MI** – Assisted MDEQ with sampling to determine the extent and magnitude of sediment contamination near the Division Street Outfall.
- **St. Louis River, Superior, WI** – Conducted a sediment thickness survey in support of a Great Lakes Legacy Act project to determine sediment depositional areas for future sampling.
- **Indiana Harbor, East Chicago, IN** – Collected samples to support university-sponsored research to evaluate the existing PCB partitioning between air, water, and sediment matrices and assisted U.S. Army Corps of Engineers with sampling to investigate sediment contamination.
- **Grassy Island, Detroit River, MI** – Assisted the US Fish and Wildlife Service and USGS with sampling to determine the magnitude of the sediment contamination adjacent to Grassy Island.
- **Lake Macatawa, Holland, MI** – Assisted MDEQ with sampling to determine the extent and magnitude of sediment contamination in Lake Macatawa.
- **Milwaukee Harbor, Milwaukee, WI** – Assisted University of Wisconsin-Milwaukee and University of Washington researchers with sampling to field-test innovative sampling equipment, which utilizes x-ray spectroscopy to assess and quantify metals concentrations.

Great Lakes Sediment Remediation Projects - 2005¹

In 2005, over 400,000 cubic yards of contaminated sediment were remediated from nine U.S. sites in the Great Lakes Basin. Three of these sites were Great Lakes Legacy Act sediment remediation projects. Of the three, two of these sites initiated work for the first time in 2005 (Newton Creek/Hog Island Inlet and Ruddiman Creek), and two of these sites completed their remedial actions in 2005 (Black Lagoon and Newton Creek/Hog Island Inlet). Three US EPA Superfund sites made significant progress towards completing their remedial actions. The Alcoa Grasse River Superfund site completed a Remedial Options Pilot Study. [This pilot evaluated various dredging methods and in-situ capping and ice scour protective measures. In 2006, an innovative in-situ treatment method utilizing granulated activated carbon \(GAC\) will be evaluated. In addition, over 3,700 acres of the Presque Isle Bay AOC continued its recovery utilizing Monitored Natural Recovery.](#)

While no remedial actions were conducted in Canada in 2005, significant progress was made on further sediment investigations and evaluations.

¹ Sediment remediation data for 2005 are presented because data lag a year behind in reporting (i.e., 2006 data will become available in 2007).

U.S. Report

A. Sediment Remediation Policy Issued

Risk Management Decision Making Framework for Contaminated Sediments – In December 2005, US EPA issued the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*. This Guidance provides a comprehensive risk management decision-making framework for contaminated sediment sites that applies from discovery of the site through long-term monitoring following remediation. At the discovery of a site, the Guidance provides information on site characterization, development of a conceptual site model, risk assessment, source control, cleanup goals, watershed considerations, sediment and contaminant fate and transport, modeling, and adaptive management. During the feasibility study phase, the Guidance recommends that many remedial alternatives, including monitored natural recovery (MNR), capping, *in-situ* treatment, dredging, some combinations of MNR, capping, and/or dredging be evaluated in terms of their risk reduction, overall effectiveness and implementability, and cost.

While dredging has historically been the chosen remedial alternative, because of the serious limitations of dredging, capping and monitored natural recovery are being given more consideration than in the past. The primary limitation is the recognition, based on numerous completed projects, that contaminants typically remain on the surface sediments above action levels after dredging. Related to and contributing to residuals are resuspension and release of contaminants. Other factors include disruption of benthic habitats and aquatic vegetation. Based on this growing body of experience, the Guidance encourages a thorough and open-minded evaluation of the benefits and limitations of each remedial alternative when selecting a remedy, which it calls “comparative net risk.” Finally, during and after implementation of the selected remedy, the Guidance recommends monitoring approaches to evaluate both the short-term and long-term effectiveness of the remedy.

The Guidance recommends that when the effectiveness/success of each potential remedy is evaluated, it should be remembered that contaminant mass removal should not be the goal; rather, the goal is to reduce the risk posed by the contaminants in sediments. Different remedial alternatives, including MNR, capping, dredging, or a combination thereof, may be appropriate at different sites due to site-specific characteristics. The Guidance provides a framework for addressing these issues and this framework is currently being applied in the Great Lakes on the United States side of the border.

B. Remediation Update

The following is a list of details relating to remediation sites in the U.S. ~~and Canada.~~

U.S. Sites

Newton Creek/Hog Island Inlet – This remedial action resulted from a Great Lakes Legacy Act project jointly funded by US EPA GLNPO and the Wisconsin Department of Natural Resources (WDNR). PAHs and lead drove the cleanup at this site, and the cleanup goal set for PAHs was 2.6 ppm total PAHs. Approximately 46,288 cubic yards were removed by dry excavation and disposed of in a local landfill. Sediments with concentrations above 50 ppm lead were disposed of in the landfill, and sediments with lead levels below 50 ppm were used as cover at the landfill.

Lower Fox River and Green Bay, Operable Unit (OU) 1 – The joint Superfund and Natural Resource Damage Assessment (NRDA) OU-1 (Little Lake Butte des Morts) project is in its second year of cleanup of the Lower Fox River and Green Bay site. Approximately 88,000 cubic yards of PCB-contaminated sediment were removed and disposed of in a state-licensed landfill. A spud barge with swinging ladder dredge was used to remove the sediments. Sediments were successfully dewatered using geotubes. The OU-1 project has a 1 ppm action level for PCBs and a surface weighted average concentration (SWAC) standard of 0.25 ppm. If these risk standards are not met, the contractor has the option of dredging more sediment or placing a sand cover over the area.

Hayton Area Remediation Project – The Hayton Area Remediation Project (HARP) is a PCB-contaminated site on Hayton Mill Pond and its tributaries near Chilton, Wisconsin. Since 2001, Tecumseh Products Company, with WDNR oversight and a small financial contribution from the state and US EPA, has removed approximately 16,300 cubic yards and 1,180 kg of PCBs in OU-1 and upper OU-2. In 2005, approximately 1,100 cubic yards of contaminated sediment were removed from the downstream end of upper OU-2. Contaminated sediments were removed by dry excavation to achieve a cleanup target of 1 ppm PCBs. Sediments with concentrations at 50 ppm PCBs or greater were transported to a Toxic Substances Control Act (TSCA) landfill in Oklahoma, and sediment with concentrations less than 50 ppm PCBs were transported to a local landfill. Approximately 60,000 cubic yards remain in lower OU-2, OU-3, and OU-4.

Moss-American – Moss-American is a US EPA Superfund National Priorities List (NPL) site in Milwaukee, Wisconsin. The primary sediment contaminants of concern are PAHs from former creosote activity. Remediation was conducted to execute the provisions of a 1990 Record of Decision, which called for several phases of work at the Moss-American site; one of which was sediment management work. A site-specific cleanup goal is 15 mg/kg carcinogenic PAH. Approximately 5 miles of the Little Menomonee River downstream of the former creosote facility were believed to have been contaminated. Stream segment 1 underwent remediation in 2002 and 2003; during 2004, stream segments 2 and 3 were remediated. From November to December 2005, approximately 3,400 cubic yards of sediment were dredged from Segment 4 and

transported from the Moss-American site to the Peoria Disposal facility in Peoria, Illinois.

Ruddiman Creek – Ruddiman Creek is located within the boundaries of the Muskegon Lake AOC. This Great Lakes Legacy Act project, jointly funded by GLNPO and MDEQ, will remediate Ruddiman Creek sediments contaminated with cadmium, chromium, lead, PCBs, and benzo(a)pyrene at concentrations that exceed site-specific sediment quality criteria for protection of human health and the environment. Approximately 35,900 cubic yards of contaminated sediment were mechanically dredged from the main branch of Ruddiman Creek and Pond. This material was solidified on-site and transported to a Type II landfill in the area. Confirmation samples collected within selected locations of the dredge area will verify that the goals of the project are met. Once the project is completed, MDEQ will work with GLNPO to develop a long-term monitoring program to gauge the overall success of the project.

Velsicol Chemical/Pine River – The Velsicol Chemical/Pine River site is an NPL site. US EPA signed a removal action memorandum in 1998 and a Record of Decision in 1999 for the DDT-contaminated Pine River sediments (OU-2 of the site). Sediment removal from the river using dry excavation methods has been ongoing since 1999, first as a Superfund removal action, then as a Superfund remedial action. The removal action addressed a “hot spot” cell in the river and removed sediments with concentrations greater than 3,000 ppm total DDT. The remedial action is addressing sediments contaminated with total DDT at levels greater than 5 ppm. In 2005, approximately 143,000 cubic yards of contaminated sediment and 4,536 kg of DDT were removed and disposed offsite in landfills. It is anticipated that the remedial action will be completed in 2006 with the remediation of an additional 28,000 cubic yards of contaminated sediment.

Shiawassee River – US EPA Superfund removed 63 cubic yards of PCB-contaminated sediment from the Shiawassee River in Howell, Michigan, to meet the site cleanup target for PCBs of 5 ppm for river sediments. This action resulted in a surface-weighted average concentration of 1 ppm immediately after remediation. Longer term recovery will result in lower concentrations. Over the next two years, MDEQ expects to remediate an additional 5,000 cubic yards of contaminated sediment to a site-specific cleanup target of 0.33 ppm total PCBs and dispose of the sediment in a landfill.

Detroit River, Trenton Channel, Black Lagoon – The Black Lagoon is located within the Trenton Channel of the Detroit River, part of the Detroit River AOC. This cleanup was the result of a two-year Great Lakes Legacy Act project jointly funded by GLNPO and MDEQ. PCBs, oil and grease, and heavy metals, including mercury, were the contaminants of concern. In 2005, approximately 60,000 cubic yards of the contaminated sediment were dredged from the Black Lagoon, a layer of sand and gravel was placed over the affected area, and sediments were disposed of in the Pointe Mouille Confined Disposal Facility. A post-remediation study is planned to verify that all site-specific criteria have been met and to measure the success of the remediation.

Alcoa Grasse River, Remedial Options Pilot Study – Alcoa Inc., with oversight from US EPA, conducted a Remedial Options Pilot Study (ROPS) during 2005 for a stretch of the lower Grasse River near its Massena West Plant in Massena, New York. The primary objectives of the ROPS were to evaluate remedial options; develop site-specific information to address outstanding issues regarding remedy effectiveness and remedy implementation to support future decision making related to the final remedy for the site; and consequently make progress towards the overall remediation of PCBs. Approximately 24,400 cubic yards of sediment were dredged out of the main channel area using a hydraulic horizontal auger, and 1,600 cubic yards of sediment were mechanically excavated from the northern near-shore area. All material removed from the river was disposed in Cell 3 of Alcoa’s Secure Landfill. The ROPS also included placement of a thin-layer cap in the southern near-shore area and implementation of a one acre armored cap designed to withstand the forces of an ice jam-related scour event.

Figure 6-1 presents the cumulative volume of sediment remediated in the U.S. since 1997. Information in the bar graph includes quantitative estimates as reported by project managers. Data collection and reporting efforts are described in the *Great Lakes Sediment Remediation Project Summary Support, Quality Assurance Project Plan*.² Detailed project information is available upon request from project managers. In addition, the Monitored Natural Recovery remedy at the Presque Isle Bay site in Pennsylvania continues to be successful. Capping will be utilized in part at another Great Lakes AOC, the St. Louis River/Interlake/Duluth Tar Site (SLRIDT), in a 2007 construction start.

[We strongly recommend including an area volumetric bar for MNR acreage and capping acreage, once implemented in the future or, include a second figure depicting those two remedies.]

Information included in Figure 6-1 is quantitative as reported by project managers. No attempt has been made to evaluate chemical data quality or verify calculations of mass removed.

² US EPA Great Lakes National Program Office. 2006. Quality Assurance Project Plan for “Great Lakes Sediment Remediation Project Summary Support.” Unpublished. Available from Mary Beth G. Ross (ross.marybeth@epa.gov).

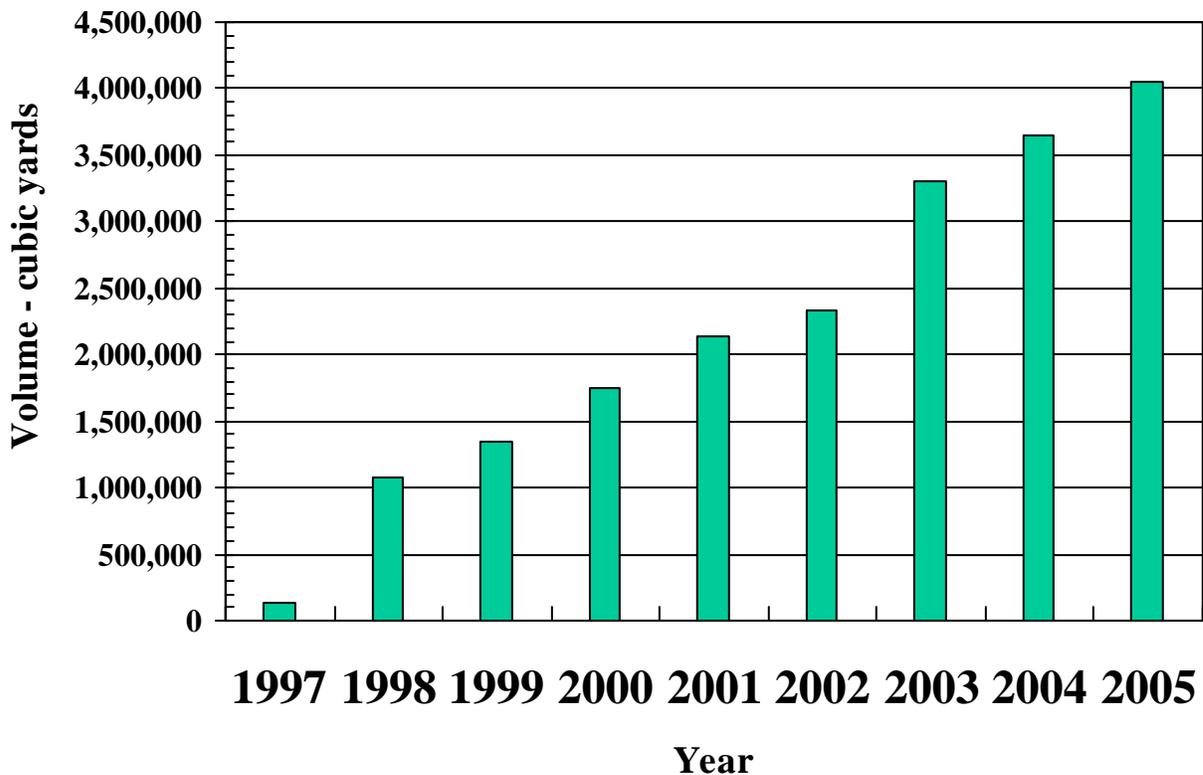


Figure 6-1. Cumulative Volume of Sediment Remediated in the U.S. Since 1997. Source: US EPA – Great Lakes National Program Office³

Canadian [Sites Report](#)

A. [Sediment Remediation Policy](#)

Decision-Making Framework for Contaminated Sediments – A risk-based decision-making framework for contaminated sediments has been completed under the *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA)*. Agency reviews have been completed, and the final document is awaiting approval for release in late 2006. Using the COA framework to evaluate the need for management actions, sediment assessments were completed in the Niagara River, Peninsula Harbour, and Thunder Bay AOCs. The Bay of Quinte, Wheatley Harbour, Detroit River, St. Clair River, and St. Marys River AOCs are still under evaluation and will have assessments completed by 2007.

B. [Remediation Update](#)

[The following is a list of details relating to remediation sites in Canada.](#)

³ US EPA Great Lakes National Program Office. 2006. Quality Assurance Project Plan for “Great Lakes Sediment Remediation Project Summary Support.” Unpublished. Available from Mary Beth G. Ross (ross.marybeth@epa.gov).

St. Lawrence River (Cornwall) – Investigations on mercury contaminant levels and distribution, benthic community impairment, sediment toxicity, and bioaccumulation/biomagnification potential were employed in a Canada-Ontario risk-based decision-making framework for contaminated sediments. It was concluded that the mercury contaminated sediments posed no risk to the aquatic environment; they will be left in place for natural recovery. A seven-party administrative controls protocol has been developed with stakeholder involvement to ensure that the deeper sediments remain undisturbed by human activities.

Hamilton Harbour (Randle Reef) – Work on project feasibility and engineering is continuing for PAH contaminated sediments at the Randle Reef, with completion scheduled for 2007. A dry cap engineered containment facility about 9.5 hectares in size has been proposed to cover 130,000 cubic metres of sediments in-situ and contain 500,000 cubic metres of contaminated sediment dredged from the impacted area surrounding the facility. [A cap that was placed in 1995 covering 2.5 acres continues to be successful in isolating the chemicals of concern.](#)

Thunder Bay (North Harbour) – Assessments of mercury bioaccumulation and organic enrichment continued at this site in 2005. The technical assessments are being used as the basis for consultations with local stakeholders to determine the need to assess sediment management options.

Peninsula Harbour – Assessments of mercury bioaccumulation at this site continued in 2005, and an ecological risk assessment is planned for the fall of 2006 to determine the need for sediment management intervention.

St. Marys River (Bellevue Marine Park and Algoma Boat Slip) – Algoma Steel Inc. completed an assessment of PAH contaminated sediment in its boat slip during 2005. The dredging and disposal on-site of 4,000 to 4,400 cubic metres of sediment are planned for the 2006 to 2007 timeframe. Further assessments of sediment contamination at the Bellevue Marine Park location are planned for 2006 to determine the cause of site-specific toxicity and the need for sediment management.

Bay of Quinte (Trent River) – Elevated levels of dioxins and furans were found in sediments at the mouth of the Trent River in 2004-2005. Human health and ecological risk assessments are planned for 2006 to assess the significance of the findings and the need for sediment management interventions. Source trackdown is ongoing at this site.

Supporting Table and Graphics

Table 6-1 reports progress on sediment remediation projects at both AOCs and non-AOCs in the U.S. and Canada, from 1997 through 2005. The maps on the following pages illustrate the progress and achievements made in sediment remediation activities in the Great Lakes from 1997 through 2005. Information included in the tables and maps are quantitative estimates as reported by project managers. Data collection and reporting

efforts are described in the *Great Lakes Sediment Remediation Project Summary Support Quality Assurance Project Plan*. Detailed project information is available upon request from project managers. On occasion, project managers may submit to GLNPO updated sediment remediation estimates on projects previously reported on. Always refer to the most current version of the GLBTS Progress Report for the most up-to-date sediment remediation estimates.