

GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

<i>Project Name</i>	<u>CANNELTON INDUSTRIES</u>	<i>ProjectID:</i> 05-03
<i>Last Updated:</i>	02/13/00	
<i>City:</i>	Sault Sainte Marie	
<i>County:</i>	Chippewa	
<i>State:</i>	MI	
<i>Country:</i>	USA	
<i>Bodies of Water:</i>	Tannery Bay; St. Marys River	
<i>US EPA Region:</i>	V	
<i>Status (Active, Complete, or Monitoring Only):</i>	Complete	
<i>Date On NPL:</i>	1990	
<i>ROD/ESD Date:</i>	1992; 1996 (Amend.)	
<i>Operable Unit:</i>	N/A	
<i>Areas of Concern (length or acres):</i>	0.8 mile nearshore area of the St. Marys River.	
<i>Other Characteristics of Water Body:</i>	<p>Pertinent site features include a small bay located adjacent to the site to the northeast called Tannery Bay. The eastern side of Tannery Bay is formed by a dock, while the southern and western sides are bordered by the site. The peninsula adjacent to Tannery Bay that forms its western shoreline is referred to as Tannery Point and is mostly wetland. Four ponds exist on Tannery Point and are called Dump Pond, Middle Pond, Long Pond, and Beaver Pond.</p> <p>The St. Marys River connects Lake Superior and Lake Huron via the Soo Locks and is the boundary between the United States and Canada. The Cannelton site is about one mile upstream of the Soo Locks. The St. Marys River is the sole outlet for Lake Superior, the largest freshwater lake in the world, and forms a connecting channel to Lake Huron, the third largest fresh water lake in the world.</p> <p>Most of the shore areas at the Cannelton site are wetlands. The wetlands and Tannery Bay are currently used by wildlife as habitat. Only limited recreational use or fishing occurs. Tannery Bay is shallow making boating and swimming difficult, although wading is possible.</p>	
<i>Contaminants of Concern:</i>	metals (Cd, Pb, As, Cr, Hg)	
<i>Source of Contamination:</i>	<p>Liquid tannery wastes from a tannery which operated at the site. The tannery operated from 1900-1958. As described in Reference A-185: "The company processed raw animal hides to form finished leather. In 1958, the tannery closed down and the property was sold. Later that year, the tannery plant was destroyed by fire."</p> <p>"The tannery plant had no sewage system other than three drains consisting of pipes and open ditches. These drains ran north to the shore of the St. Marys River, where tannery wastes were discharged. In addition to animal hair, scrap hide, and tree bark, various chemicals used in the plant were discharged through these drains. Solid waste by-products of the tanning process were placed in a portion of the waste discharge area referred to as the "barren zone." General refuse and barrels from the tannery were disposed of along the western shoreline of the St. Marys River; these wastes were typically burned after disposal."</p>	
<i>Contaminated Area Physical Characteristics:</i>	Refer to "Other Characteristics of Water Body" above	
<i>Type of Regulatory Action:</i>	Superfund. Final.	

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Overall Status Summary:

A ROD amendment was issued in September 1996 emphasizing containment (natural or engineered) as opposed to dredging. A 1992 ROD had called for removal of 225,000 cy (including 86,000 cy of sediments) and disposal in an onsite landfill. The 1996 ROD Amendment proposed removal of only 40,500 cy of soil and tannery wastes (no sediment) and no onsite landfill. Higher cleanup standards adopted in Michigan, plus favorable results from sediment toxicity and bioaccumulation studies, led to the ROD amendment. The approach for sediments became containment and natural recovery, supported by future monitoring and migration studies. Design completion was in December 1998. The cleanup was completed in October 1999.

The cleanup, which started in June 1999, targeted five specific areas. The following was accomplished:

- excavation of 33,000 tons of tannery-waste materials and contaminated soils from the Barren Zone, Western Shoreline, and Southern Shoreline of the Tannery Bay, with disposal at two offsite solid waste facilities;
- regrading and landscaping of the western shoreline and backfilling and regrading in the Barren Zone;
- construction of surface drainage improvements and replacement of the shoreline berm to prevent erosion along the Barren Zone;
- construction of a stabilization berm along the southern shoreline of Tannery Bay;
- construction and operation of a water-treatment system to treat 3.2 million gallons of wastewater from the site excavation and dewatering activities, with discharge to the St. Marys River; and
- seeding and mulching to revegetate the Western Shoreline and Barren Zone.

EPA will carry-out long-term groundwater monitoring at the site.

Remedial Action Planned: ☒

Risk Assessment: ☒

Remedial Action Implemented: ☒

Status of Dredging ☐

PRPs: ☒

Contacts: ☒

References: ☒

Modeling: ☒

Fishing Advisory: ☒

Key Conditions: Great Lakes AOC, hydrodynamic modeling, natural recovery, post monitoring, wetlands

REMEDIAL ACTION PLANNED

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Target Sediment Cleanup Standards (TSCS):	None. A containment, monitoring, and natural recovery approach will be used.	
How TSCS Established:	N/A	
Target Bank and Floodplain Cleanup Levels (if applicable):	N/A	
Other Target:	Wetland area (Zone C), a mix of sediments, tannery wastes, and sawdust.	
Environmental Sample Data References:	<ul style="list-style-type: none">• Sediment:• Water:• Fish:	
Estimated Target Volume:	No sediments (only site soil and tannery wastes targeted, totaling 40,500 cy).	
Planned Disposal Method:	N/A	
Estimated Calendar Time to Implement Remedy:		
Estimated Time to Implement Remedy:	One year for all remediation.	
Estimated Cost to Implement Remedy:	\$5.5 million, present worth, all activities (no sediment removal).	
Stated Remedial Action Objectives (and Source):	<p>Proposed ROD Amendment May 1996: "The principle criteria for overall protection of human health and the environment were based on the new Michigan soil and groundwater cleanup standards. At the present time the quality of groundwater discharging from the site is protective of the St. Marys River and is expected to remain protective of surface water quality in the future. Localized groundwater quality will further improve after the removal of soils and waste from the barren zone. After implementation of the remedial actions described in this revised proposed plan, the soil quality at the site will be protective of human health and the environment under all reasonably anticipated future land uses."</p> <p>"Deed restrictions will be used to ensure that future uses of the site remain consistent with the remedial approach taken. The remedial actions described in this revised proposed plan preserve a large area of wetland habitat which would have been destroyed under the 1992 ROD. The existing shoreline stabilization system (installed as an Interim Measure) will be maintained over time in order to prevent erosion. If found to be necessary, sediments along the western side of Tannery Bay will be contained. A monitoring study to be completed will evaluate the long-term stability of soils in the wetland area and sediments. The proposed remedy provides the same level of overall protection as the 1992 ROD."</p>	
Measures of Success to be Used:	<p>Proposed ROD Amendment May 1996: "The wetland area (Zone C) is a mix of sediments, tannery wastes and sawdust that has built up during the last 100 years. Further evaluation of stability of soils in the wetland area will be conducted as part of the remedial action. A monitoring study will also address the potential for soils and sediments to release metals to the environment in the future. The results of the study will be used to better define the long-term monitoring requirements for the site and the circumstances under which additional future</p>	

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remedial action might be needed. Deed restrictions will ensure that the future use of the wetland area is restricted."

"A phased approach will be taken for the sediments in Tannery Bay (Zone D). As part of the remedial action, an evaluation of Tannery Bay will be undertaken in order to determine if this area is subject to net erosion or net deposition of sediments. Studies completed to date suggest that at least a portion of Tannery Bay is located in a depositional area. However, a concern exists with the long-term stability of Tannery Point and sediment removal causing off-site transport through scouring and major storm events. If it is found that there is no unacceptable risk regarding future migration of contaminated sediments to the St. Marys River, the area will remain undisturbed and continue natural development as a wetland. If studies indicate there is a significant risk, a containment system in the form of a sheet pile wall will be constructed. The sheet pile wall would be located around Tannery Point and along the western side of Tannery Bay to control the migration of the materials into the St. Marys River. Natural wetlands would be allowed to fully establish. Sediments and surface water will be monitored and site studies will be conducted to determine the mechanisms that might release site specific metals to the environment. In addition, visible tannery waste from the southern shoreline of Tannery Bay will be removed (estimated 3,000 cy)."

Planned Monitoring and Restoration:

Proposed ROD Amendment May 1996: "Surface water monitoring is to be performed as part of the long-term monitoring plan. The overall plan is expected to meet Michigan surface water guidelines. Since contamination such as chromium and mercury would be left in place in the wetlands and sediments of Tannery Bay, additional monitoring of the surface waters will be conducted to ensure protection of human health and the environment. To further ensure that surface water standards are maintained, the shoreline stabilization system along the main shoreline, regraded areas and surface drainage works will be maintained over time by Cannelton. Five year reviews will be performed to ensure the protectiveness of site conditions."

As described in Reference A-185: "A monitoring study is underway in the Wetland Area to evaluate the potential for future releases of metals to the environment. The results of the study will aid in the long-term monitoring and management requirements for the site. Deed restrictions will limit future use consistent with wetland protection regulations."

"Monitoring of sediment in the Tannery Bay area will be conducted to confirm that erosion of sediment will not become a concern in the future. Biological monitoring will also be conducted to ensure protectiveness of the ecological food chain. If erosion or uptake of metals by organisms becomes a concern, a sheet-pile containment system or another appropriate remedy will be constructed. In addition, an estimated 3,000 yd³ of visible waste that is not adequately covered or contained will be removed from the shoreline of Tannery Bay and disposed of in an off-site landfill."

Agency Position on Sediment Removal (and Source):

ROD, September 1992: "The environmental benefits which may result from removal of all contamination must be weighed against the destructive nature of the excavation activities which would be required... EPA's opinion is that large-scale destruction of a quality wetland habitat and dredging and possible resuspension of a large volume of sediments (from the St. Marys River and Tannery Bay) would degrade the environment more than leaving some elevated levels of chemicals in place and may not be cost-effective. Removing tannery waste material from the St. Marys River and Tannery Bay will remove areas with the highest levels of contaminants found in the sediments, and will greatly improve the habitat for benthic organisms. All concentrations left will be below acceptable human health-based levels, and monitoring of the residual contamination and its effect on the environment will be done to ensure that the remedy is protective."

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Proposed ROD Amendment, May 1996: "With respect to sediments, the revised proposed plan calls for a containment approach (natural and engineered) as opposed to dredging, dewatering, transport, and disposal of sediments. In the short term, this approach could reduce impacts to the St. Marys River associated with dredging activities, which would include releases of suspended solids, migration of impacted sediments, and destruction of existing wetlands."
(Original ROD, remove 87,000 cy of sediments and dispose in an on-site landfill; amended ROD, remove 3,000 cy of visible tannery waste, no sediment, no on-site landfill.)

RISK ASSESSMENT

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ProjectID: 05-03

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RA Type: Human Health and Ecological

RA Status: Complete

RA Objectives:

***Company
Performing RA:***

RA Reference Report:

***RA Summary and
Conclusions:*** Source: 1992 ROD.

"The carcinogenic risks associated with exposure to river water, river sediments, pond water, and pond sediments are less than 1×10^{-6} for all populations. The hazard indices associated with exposure to river water, river sediments, pond water, and pond sediments were less than 1.0 for all populations. Based on the exposure assumptions and available toxicity information, the risks to human health associated with surface water and sediments are not significant."

"Sediment and soil toxicity testing and benthic macroinvertebrate studies were performed in order to better assess impacts to the environment. Detected concentrations of chromium in the surface water of the St. Marys River exceed specific federal and state standards. The maximum detected concentration of chromium exceeds the acute and chronic freshwater quality criteria, the Great Lakes Water Quality Agreement of 1978, and the Michigan Act 245 (Rule 57) guidelines."

"Specifically, sediment toxicity studies, benthic macroinvertebrate community studies, and a soil toxicity study were performed. The results of these studies were compared to the results of sediment and soil chemical analyses. A wetlands quality assessment was also done."

"The results of these studies were in some cases difficult to interpret. When looking at test mortality, none of the results showed that there was a relationship between chemical concentrations or other measured parameters and the effects seen in the laboratory tests. Benthic communities in Tannery Bay did appear to be stressed relative to reference locations, but again these effects could not be associated with any chemical concentrations."

"There are several confounding factors which could have influenced the test results. Sediment type, presence of tannery waste material and saw dust in the sediment may have been factors in the sediment toxicity tests conducted in the laboratory. In the benthic community studies, communities could be affected by physical habitat of the bay with the presence of tannery waste material, saw dust, and scrap lumber; constantly changing water levels due to seiche effects and boat passage; and inherent differences between bay communities and river communities. While some effects were observed, no cause and effect relationship could be established between site contaminants and impacts to the environment based on the studies done to date."

"The wetlands quality assessment indicated that the wetlands contained diverse habitats ranging from open water to forested wetlands. These wetlands appear to be functioning as quality habitat, supporting diverse plant and animal life."

Ultimately, in 1992, the site soil risk-based cleanup level was applied to sediments without a clear connection between the two.

The 1996 ROD Amendment relaxed the cleanup standards, as described below:

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The recently passed Michigan Part 201 Amendments . . . "incorporates the most current U.S. EPA research regarding human health and safety standards and still includes very rigorous risk evaluations. The previous law required the use of very conservative risk assumptions in developing cleanup standards which did not take into account any site-specific information about how people would be exposed to contaminants at the site (i.e., skin contact, ingestion, inhalation). The new cleanup standards are based on the risks that would be involved under different land uses (i.e., residential, commercial, industrial, and recreational). The potential for exposure to contamination is very different at residential versus industrial sites. The new regulations allow for these differences to be incorporated into the cleanup criteria that apply to the Cannelton site."

"The Pre-Design Studies completed by Cannelton in 1994 included groundwater sampling and analysis; soil leaching studies; and sediment toxicity and bioaccumulation studies."

. . . "The sediment toxicity and bioaccumulation studies indicated that the sediments do not pose a significant threat to aquatic organisms."

REMEDIAL ACTION IMPLEMENTED

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Physical Target:	Little or no sediment removal. A containment, monitoring, and natural recovery approach is selected.	
Goals:		
Primary Contractor:	N/A for sediment	
Other Contractors:	N/A for sediment	
Generic Remediation Method:	Containment and Natural recovery	
Equipment:	N/A	
Material Handling:	Refer to "Outcome"	
Volume Removed:	No sediment removal	
Calendar Time:	N/A	
Time To Implement:	N/A	
Total Cost:	N/A	
Dredging Cost:	N/A	
Disposal of Sediment:	N/A	
Volume of Water:	N/A	
Method of Water Treatment:	N/A	
Water Discharge Limit:	N/A	
Air Monitoring During Remediation:	N/A	
Water Monitoring During Remediation:	N/A	
Outcome:	<p>Initial activities in Spring 1999 included removing the fence from along the western shoreline and the river in the Barren Zone area. Construction of the water treatment system also took place. Removing debris and other clearing activities took place in the Barren Zone to prepare the area for cleanup.</p> <p>The cleanup, which started in June 1999, targeted five specific areas. Little or no sediment remediation was involved. The following was accomplished, and was completed in October 1999:</p> <ul style="list-style-type: none">• excavation of 33,000 tons of tannery-waste materials and contaminated soils from the Barren Zone, Western Shoreline, and Southern Shoreline of the Tannery Bay with disposal offsite at two solid waste facilities;• regrading and landscaping of the western shoreline and backfilling and regrading in the Barren Zone;	

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- construction of surface drainage improvements and replacement of the shoreline berm to prevent erosion along the Barren Zone;
- construction of a stabilization berm along the southern shoreline of Tannery Bay;
- construction and operation of a water-treatment system to treat 3.2 million gallons of wastewater from the site excavation and dewatering activities, with discharge to the St. Marys River;
- seeding and mulching to revegetate the Western Shoreline and Barren Zone;
- removal of hazardous waste signs and removal of most fencing on the site except that needed to protect property boundaries against trespassing; and
- installation of air-monitoring equipment and dust-control measures to reduce effects on homes and business near the site.

Restoration and Post-Monitoring:

EPA will carry-out long-term ground water monitoring. Details not identified.

Site-Specific Difficulties: N/A

Monitoring Data

References:

- *Sediment*
- *Water:*
- *Fish:*

POTENTIALLY RESPONSIBLE PARTIES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

PRP Name: PRP INFORMATION NOT RELEASED

PRPID:

Street Address:

City:

State:

KEY CONTACTS

Project Name **CANNELTON INDUSTRIES**

ProjectID: 05-03

Last Name: KEY CONTACT INFORMATION NOT RELEASED

Contact ID:

First Name:

Title:

Company:

Address:

City:

State:

Postal Code:

Work Phone # :

Other Phone #:

Fax # :

Email Address:

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: A

ReferenceID: 67

Title: ***Revised Proposed Plan
Cannelton Industries, Inc. Site
ROD Amendment***

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V

**Preparer/Author
Address:** 77 West Jackson Blvd.
Chicago, IL 60604

Prepared For: General Public

Date Published: May 1996

**Key Words and
Phrases:**

Reference Type: A

ReferenceID: 68

Title: ***Superfund Record of Decision: Cannelton Industries, MI
First Remedial Action - Final***

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA HQ

**Preparer/Author
Address:** 401 M Street, S.W.
Washington, D.C. 20460

Prepared For: General Public

Date Published: September 30, 1992

**Key Words and
Phrases:**

Reference Type: A

ReferenceID: 185

Title: ***Fact Sheet: Cleanup Activities to begin in May/June 1999 at the
Cannelton Industries, Inc., Superfund Site***

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V

**Preparer/Author
Address:** Chicago, IL

Prepared For: General Public

Date Published: April 1999

**Key Words and
Phrases:**

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: A

ReferenceID: 195

Title: *Design Report (Preliminary) (Report CANN 95-4)*

Location: AEM

Category: Site Update

Prepared by/Author: Cannelton Industries, Inc.

Preparer/Author Address: Sault Sainte Marie, MI

Prepared For: US EPA Region V

Date Published: May 1995

Key Words and Phrases:

Reference Type: A

ReferenceID: 518

Title: *Fact Sheet: Cannelton Superfund Site Cleanup Completed*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V

Preparer/Author Address: Chicago, IL

Prepared For: General Public

Date Published: November 1999

Key Words and Phrases:

Reference Type: B

ReferenceID: 32

Title: *EPA Changes Cannelton Industries Cleanup Plan*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V (News Release)

Preparer/Author Address: Chicago, IL

Prepared For: General Public

Date Published: October 3, 1996

Key Words and Phrases:

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: B

ReferenceID: 123

Title: *EPA National Priorities List: Cannelton Industries*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA HQ

**Preparer/Author
Address:**

Prepared For: Cannelton Industries, Inc.

Date Published: February 1996

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 521

Title: *Cleanup To Begin In May At Cannelton Industries Site; Open House Apr. 21*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V

**Preparer/Author
Address:** 77 West Jackson Boulevard
Chicago, IL 60604

Prepared For: General Public

Date Published: April 15, 1999

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 790

Title: *Realizing Remediation I - Great Lakes Contaminated Sediments
St. Mary's River - Cannelton Industries
(see Reference A-905)*

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: US EPA Great Lakes National Program Office (GLNPO)

**Preparer/Author
Address:** 77 West Jackson Boulevard (G-17J)
Chicago, IL 60604

Prepared For: General Public

Date Published: August 1, 2002

**Key Words and
Phrases:**

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: B

ReferenceID: 821

Title: *Realizing Remediation II - Updated Summary:
St. Marys River - Cannelton Industries
(see Reference A-907)*

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: US EPA Great Lakes National Program Office (GLNPO)

**Preparer/Author
Address:** 77 West Jackson Boulevard (G-17J)
Chicago, IL 60604

Prepared For: General Public

Date Published: July 2000

**Key Words and
Phrases:**

Reference Type: C

ReferenceID: 42

Title: *Soil design assembled at Cannelton Industries*

Location: AEM

Category: Site Update

Prepared by/Author:

**Preparer/Author
Address:**

Prepared For: Superfund Week

Date Published: April 3, 1998

**Key Words and
Phrases:**

Reference Type: C

ReferenceID: 157

Title: *EPA pares Cannelton soil fix*

Location: AEM

Category: Site Update

Prepared by/Author:

**Preparer/Author
Address:**

Prepared For: Superfund Week

Date Published: October 18, 1996

**Key Words and
Phrases:**

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: C
Title: *Cannelton sediment dredge needed*
Location: AEM
Category: Site Update
Prepared by/Author:
Preparer/Author Address:
Prepared For: Superfund Week
Date Published: February 16, 1996
Key Words and Phrases:

ReferenceID: 158

Reference Type: C
Title: *Mich.: Reuse Options Considered*
Location: AEM
Category: Site Update
Prepared by/Author:
Preparer/Author Address:
Prepared For: Hazardous Waste/Superfund Week
Date Published: October 28, 2002
Key Words and Phrases:

ReferenceID: 1085

Reference Type: D
Title: *Note to Correspondents: Media Event/Photo-Op at Cannelton Industries Superfund Site, Tuesday, June 27, 2 P.M.*
Location: AEM
Category: Site Update
Prepared by/Author: US EPA Region V
Preparer/Author Address:
Prepared For: General Public
Date Published: June 23, 2000
Key Words and Phrases:

ReferenceID: 132

REFERENCES

Project Name CANNELTON INDUSTRIES

ProjectID: 05-03

Reference Type: L
Title: *Memo re: Status of Cannelton Industries*
Location: AEM
Category: Site Update
Prepared by/Author: AEM, Inc. (Maribeth Dobbins)
Preparer/Author Address: Malvern, PA 19355
Prepared For: Internal file
Date Published: August 13, 1997
Key Words and Phrases:

ReferenceID: 4

Reference Type: L
Title: *Contaminated Sediment Projects in the U.S. Using Monitored Natural Recovery*
Location: AEM
Category: Capping/Placement
Prepared by/Author: AEM, Inc.
Preparer/Author Address:
Prepared For: Distribution
Date Published: September 25, 2001
Key Words and Phrases:

ReferenceID: 122

Reference Type: L
Title: *Summary of Major Revisions to RODs and Proposed Plans - Sediment Sites*
Location: AEM
Category: ROD/Proposed Plan/Action Memo/Decision Document
Prepared by/Author: AEM, Inc.
Preparer/Author Address: Malvern, PA 19355
Prepared For: Internal Distribution
Date Published: April 13, 2001
Key Words and Phrases:

ReferenceID: 168

REFERENCES

Project Name **CANNELTON INDUSTRIES**

ProjectID: 05-03

Reference Type: L

ReferenceID: 178

Title: ***EPA's Evolving Position on Remedial Dredging***

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: AEM, Inc.

Preparer/Author Malvern, PA 19355

Address:

Prepared For: Internal Distribution

Date Published: Undated

Key Words and
Phrases:

MODELING

Project Name: CANNELTON INDUSTRIES

ProjectID: 05-03

Last Updated: 08/11/98

Modeling Performed: Sediment transport model (SEDZL model)

Modeling Objectives: Predict fate of fine-grained sediment that would be introduced into the water column of Tannery Bay during dredging operations.

Modeling Description:

Company Performing Modeling:

Modeling Status: Complete

Modeling Summary: Source: Reference A-195 (issued in 1995 before the ROD Amendment)

A sediment transport model (SEDZL) was used to predict the fate of fine-grained sediment that would be introduced into the water column of Tannery Bay during dredging operations. This model, which was developed for USEPA, has been used to evaluate the transport and fate of contaminated sediments at a number of sites, including the Saginaw and Detroit Rivers in Michigan. The model has been applied for preliminary evaluation purposes and did not involve the application of a fully-developed, calibrated sediment transport model.

A rectangular numerical grid with variable grid spacing was used to discretize Tannery Bay and the St. Marys River in the area under consideration. The current distribution in the bay and river was predicted for the average flow condition in the St. Marys River. Information obtained from the Corps indicated the mean flow rate is approximately 75,000 cfs.

The sediment transport model was used to evaluate the impact of dredging on the transport of contaminated sediments out of Tannery Bay and into the river for this steady-state flow condition. Dredging losses were estimated by assuming that one percent of the fine-grained sediment mass dredged in Tannery Bay was introduced into the water column. This assumption resulted in a total of 10,219 kg (22,529 lb) of fine-grained sediment being released into the water column from each element during the dredging of that element.

The dredging program was simulated by assuming that dredging started near the southern shore of the bay and proceeded toward the St. Marys River. The total volume of simulated dredged sediment was 84,100 cy from sixty-one of the 100' x 100' elements in Tannery Bay. It was assumed that 30 cy/hr would be dredged for eight hours per day. These assumptions resulted in the simulated dredging program lasting 368 days.

The sediment transport model was run for a total 368 days with 10,219 kg (22,529 lb) of fine-grained sediment released into the water column from each element during the days that dredging was occurring in that element. The model predicted the fate and transport of the released sediments in Tannery Bay and the St. Marys River during the entire dredging period. The predicted flux of suspended sediment from the bay to the river was also calculated. A total of 17,360 kg (38,272 lb) of sediment was transported into the St. Marys River during the simulated dredging operation. This mass represented 0.028 percent of the total mass of dredged fine-grained sediment in Tannery Bay. The sediment transported into the river originated from seven grid elements in the northern portion of the bay.

The mass of chromium associated with the sediments transported from the bay to the river was also estimated based upon the sediment transport model predictions. Chromium concentrations of bed

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samples collected in the northern portion of the bay were used to estimate representative contaminant levels for the dredged sediments in this area. The chromium concentrations ranged from 0 to 7190 ppm. The geometric and arithmetic means of these data were 82 and 1670 ppm respectively. A range of predicted values was determined using the geometric and arithmetic means of the relevant data. Hence, the total mass of chromium transported from Tannery Bay to the St. Marys River during the simulated dredging operation was estimated to range from 1.4 to 29 kg (3.1 to 64 lbs). The average water column concentration of chromium in the river resulting from this release during dredging of these seven grid elements was estimated to range from 0.9 to 18 ppt. The maximum predicted chromium concentrations in the St. Marys River varied from 8 to 170 ppt.

FISH ADVISORIES

Project Name **CANNELTON INDUSTRIES**

ProjectID: 05-03

Advisory: St. Mary's River

AdvisoryID: 515

Extent: Great Lake connecting waterbody

Pollutant: mercury

Species: walleye

Population: RGP

Population Definition: Restricted Consumption-General Population: Advises the general population to restrict the size of the organisms and/or the frequency of meals consumed.

Advisory Type: Great Lake

Advisory Number: 224

Status (Active or Rescinded): Active

Date Rescinded:

Contact Name: David R. Wade

Contact Number: 517-335-8834

Advisory: St. Mary's River

AdvisoryID: 516

Extent: Great Lake connecting waterbody

Pollutant: mercury

Species: walleye

Population: RSP

Population Definition: Restricted Consumption-Subpopulation(s): Advises subpopulations potentially at greater risk, e.g., pregnant or nursing women, and/or small children, to restrict the size of the organism and/or frequency of meals consumed.

Advisory Type: Great Lake

Advisory Number: 224

Status (Active or Rescinded): Active

Date Rescinded:

Contact Name: David R. Wade

Contact Number: 517-335-8834
