GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	***WHITE LAKE - PROJECT 1 (Tannery Bay)***	***ProjectID:*** 05-38
Last Updated:	01/13/04	

City:	Whitehall
County:	Muskegon
State:	MI
Country:	USA
Bodies of Water:	Tannery Bay; White Lake
US EPA Region:	V
Status (Active, Complete, or Monitoring Only):	Complete
Date On NPL:	N/A
ROD/ESD Date:	N/A
Operable Unit:	N/A
Areas of Concern (length or acres):	About 6.7 acres of 10-acre Tannery Bay.
Other Characteristics of Water Body:	White Lake is a 2,570-acre drowned river mouth located along the eastern shore of Lake Michigan. The lake is a Great Lakes AOC that includes the lake proper and a 0.25 mile zone around the lake. Ten-acre Tannery Bay is located along the southern shore in the eastern-most portion of White Lake and is 10 to 15 feet deep in areas where contaminated sediment exists.
Contaminants of Concern:	arsenic, chromium, mercury, lead, nickel, and zinc
Source of Contamination:	Direct discharge of tannery wastes into the bay from the site when operations began in 1866 until about 1940. The now defunct Whitehall Leather Company took over operations in 1944 and began disposing of bails of cow hide into the bay for erosion control and discharging liquid tannery wastes containing heavy metals into a series of six lagoons, then to the lake. Direct discharges of tannery wastes to the bay ceased in 1976.
Contaminated Area Physical Characteristics:	Chromium is the most elevated contaminant found in Tannery Bay with concentrations in the upper 6 to 8 inches of sediment typically ranging from 2,000 to 4,000 ppm and in sediment greater than 12 inches deep typically greater than 5,000 ppm (with maximum levels in excess of 20,000 ppm). In addition to elevated heavy metals concentrations, Tannery Bay sediment reportedly also contains significant quantities of leather scraps, dyes, and cow hair. The depth (top of sediment to design cut elevation) of non-native sediment targeted for removal varied from about five to eight feet, with removal in the area of Hide Island extending another eight feet in depth. The bay also contains an artificial island (referred to as "Hide Island") created from bales of hide scraps and wood cribbing that were deposited over time into the bay.
Type of Regulatory Action:	Consent Judgment. State-Lead. Final.
Overall Status Summary:	Tannery Bay has been identified as having the most highly contaminated sediment in White Lake. The Bay's sediment reportedly contains chromium levels as high as 5,000 ppm and 20,000 ppm in the top 6 to 8 inches and in deeper sediments, respectively. Additionally, the sediment contains significant quantities of leather scraps, dyes, and cow hair. The source of contamination to the Bay was direct discharge of liquid and solid wastes from the now defunct Whitehall Tannery located adjacent to the bay that operated from about 1866 to 1976. Genesco, Inc. ("Genesco") purchased the tannery in 2000 and tannery operations ceased shortly thereafter. Cleanup of the upland areas around the tannery are ongoing. About 6.7 acres of the 10-acre bay is affected. A US Army Corps of Engineers study in 2000 estimated the cost for removing 83,000 cy of

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contaminated sediment from Tannery Bay at between $5 and $8.5 million. At that time, a judge ruled that the proposed sediment cleanup could proceed and that the state could bill Genesco for costs of the cleanup. In 2001, MDEQ and Genesco reached a compromise agreement to remove and dispose of 73,000 cy of contaminated sediment from about 4.7 acres of the bay at an estimated cost of $6.7 million. Genesco reportedly would pay $3.35 million to remove 62,000 cy of sediment and MDEQ would pay a similar amount to remove the remaining 11,000 cy of sediment. The removal volume and estimated total cost were since increased to 78,000 cy and $8 million, respectively. MDEQ began advertising for bids on February 16, 2002 and subsequently awarded the dredging contract to Williams Environmental Services, Inc. Sediment was removed from the bay in 2002 from August to mid-November and in 2003 from mid-April to the end of July. Final removal volume was 85,000 cy. Sediment removal was by both barge-mounted excavator and hydraulic cutterhead dredging and disposal was to a local commercial Type II landfill.

Remedial Action Planned:	☑
Risk Assessment:	☐
Remedial Action Implemented:	☑
Status of Dredging	☐
PRPs:	☑
Contacts:	☑
References:	☑
Modeling:	☐
Fishing Advisory:	☑

Key Conditions: commercial landfill, dredging, Great Lakes AOC, solidification/stabilization, water handling limitations

REMEDIAL ACTION PLANNED

Project Name	***WHITE LAKE - PROJECT 1 (Tannery Bay)***	***ProjectID:*** 05-38
Last Updated:	08/19/02	

Target Sediment Cleanup Standards (TSCS):

Two criteria will be used (Source: Reference A-581):

- Cr concentration is < 1,000 ppm; and
- As concentration is < 20 ppm

How TSCS Established: MDEQ designated criteria

Target Bank and Floodplain Cleanup Levels (if applicable): N/A

Other Target: Sediment that is discolored (purple/burgundy) and/or contains hides and/or hair.

Environmental Sample Data References:

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

Estimated Target Volume: 78,000 cy (includes a maximum of one foot overdredging)

Planned Disposal Method: Onsite dewatering and solidification, then to an offsite Type II landfill for disposal.

Estimated Calendar Time to Implement Remedy: Late May to end of September 2002.

Estimated Time to Implement Remedy: 4 months

Estimated Cost to Implement Remedy: $8 million

Stated Remedial Action Objectives (and Source):

(Source: Reference A-737)

"The objective of this Concept Design Documentation Report is to evaluate the feasibility of sediment remediation to restore the aquatic environment of Tannery Bay in White Lake."

Measures of Success to be Used: Confirmation samples will be collected to verify that TSCS have been met.

Planned Monitoring and Restoration: Turbidity monitoring will be performed at three locations outside the perimeter silt curtains during dredging operations. Turbidity measurements will be recorded at 50 ft. upstream of the dredge area to serve as background, then at midpoint and 50 ft. downstream of the dredge area. Corrective action is required if either downstream measurement exceeds the upstream measurement by 50% or greater. Some dredged areas will be backfilled following dredging.

Agency Position on Sediment Removal (and Source):

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Physical Target: 6.7 acres of the 10-acre Tannery Bay and, of this, about 5 acres were dredged.

Goals: (Source: Reference A-737)
"…to restore the aquatic environment of Tannery Bay in White Lake."

Primary Contractor: Williams Environmental Services, Inc.

Other Contractors:
- DLZ Michigan, Inc. (Design Engineer)
- Eagle Dredging Co. (hydraulic dredging)
- White Lake Excavating (mechanical dredging and sand placement)

Generic Remediation Method: Hydraulic and mechanical dredging

Equipment: One 10- or 12-inch hydraulic cutterhead dredge; one barge-mounted excavator; silt curtains (double layer); belt filter press; settling basin

Material Handling: Dredging was performed during a single work shift each day, six days per week. Shifts began at 6:30am and ended at typically between 8:00 and 9:00pm. Maximum onsite staffing was 20 to 25 persons.

The dredge area was enclosed with a double silt curtain to control turbidity migration from the work area. During dredging, another silt curtain was installed following dredging completion of the southern half of the work area to minimize the opportunity for recontamination of this area while dredging the remaining area.

The hydraulic dredge was used to remove the majority of soft bottom material. The excavator was used for debris removal and for removal of materials consisting primarily of animal hides and hair (specifically Hide Island) which the hydraulic dredge could not effectively remove.

Dredging using the hydraulic dredge began in the southwest corner of the dredge area and continued east until the southern half of the dredge area was complete. Following completion, a silt curtain was installed to separate the completed area from the remaining area. Turbidity monitoring was implemented inside the completed area silt curtain as a means of monitoring for contaminant infiltration into the area during continued dredging of the remaining areas. A discharge pipe conveyed the slurried sediment from the hydraulic cutterhead to the land-based facility, a maximum distance of about 500 feet. The sediment slurry was dewatered using a belt filter press and dewatered sediment was loaded onto trucks for disposal.

Mechanical dredging was performed for much of the project duration simultaneously with hydraulic dredging. During mechanical dredging, sediment and other materials were loaded onto small barges for transport to a shore-based bulkhead, located on the peninsula adjacent to the dredge area, for offloading. Before offloading, the sediment and sediment-like materials were treated by the addition and mixing of a polymer using a land-based long-reach excavator to promote solidification. Many of the hide bales removed as part of excavation and dredging of Hide Island contained little water, eliminating the need for polymer treatment prior to offloading. The treated (as necessary) materials were then offloaded directly into trucks by excavator for transport to the disposal facility.

Volume Removed: 85,000 cy (50,000 tons)

Calendar Time: August to mid-November 2002 and mid-April through July 2003

Time To Implement: 7 months

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Total Cost:	$8 million ($94/cy)
Dredging Cost:	
Disposal of Sediment:	Type II landfill located in Coopersville, MI.
Volume of Water:	Averaged 275,000 gallons per day (an estimated 46.2 million gallons for the entire project).
Method of Water Treatment:	Carriage water from the belt filter press was passed through a settling basin before being discharged to the local POTW. The permitted maximum discharge volume was 300,000 gallons per day although a provision was included that if a single rain event exceeded one inch, the discharge volume was to be limited to 300 gallons per minute. Treated water samples were sent to an offsite laboratory for analysis.
Water Discharge Limit:	The primary COCs with permit limits were arsenic (level not identified), chromium (level not identified), and mercury (200 µg/L). Additionally, suspended solids were limited to 250 mg/L.
Air Monitoring During Remediation:	
Water Monitoring During Remediation:	Williams Environmental Services performed turbidity monitoring outside the double silt curtain at one upstream and two to three downstream locations. Water samples were collected at two-thirds the water column depth and analyzed onsite in the tannery building. The turbidity limit was 1.5 times background. Typical background was around 10 NTU, but considerable variability in background was observed throughout the duration of the project.
Outcome:	The dredge area was divided into north and south removal areas to assist controlling dredging and verification sample collection. A single silt curtain was used to divide the areas. An overdredge allowance of one foot was used. Removal depths were verified by staff gauging and located using GPS. Once design removal elevations were reached, ponar samples were collected and visually inspected for the presence of hide, hair, or material discoloring. The number and location of verification samples in each area were determined using the Michigan DEQ Guidance Document, Verification of Soil Remediation, April 1994, Revision 1. Although all sediment samples were sent to an offsite laboratory for arsenic (limit: 20 ppm) and chromium (limit: 1,000 ppm) analysis, the need to redredge areas was based solely on visual criteria. Elevated arsenic or chromium levels were used only to identify areas for additional sample collection for visual inspection. Where visual inspection following dredging indicated the continued presence of hides, hair, or material discoloring, a single redredge pass was performed and no verification samples were collected following its completion. Average daily production rate was 545 cy per day (based on the removal of 85,000 cy over a total of 156 thirteen-hour days).
Restoration and Post-Monitoring:	Removal area restoration included sand placement in the Hide Island removal area to create 4:1 slopes, the addition of rip-rap along disturbed shoreline areas of the existing peninsula and the southern shoreline of Tannery Bay, and a small area of wetland habitat restoration on the existing peninsula.
Site-Specific Difficulties:	• Initial full-scale dredging was delayed in 2002 due primarily to a series of debris-related and mechanical difficulties with the dredge and last-minute changes by the local POTW to the project's water discharge permit. • The mercury limit in the treated water effluent was exceeded on numerous occasions and became the most difficult discharge limit to meet over the duration of the project.

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Monitoring Data References:

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

POTENTIALLY RESPONSIBLE PARTIES

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

PRP Name: **PRP INFORMATION NOT RELEASED** ***PRPID:***

Street Address:

City:

State:

KEY CONTACTS

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

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:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: A ***ReferenceID:*** 581

Title: ***Sediment Assessment and Remediation Report - Preliminary Investigation of the Extent and Effects of Sediment Contamination in White Lake, MI***

Location: AEM

Category: Contaminated Sediments: Characteristics/Bioavailability

Prepared by/Author: US EPA

Preparer/Author Address: Great Lakes National Programs Office
Chicago, IL

Prepared For: General Public

Date Published: April 12, 1999

Key Words and Phrases:

Reference Type: A ***ReferenceID:*** 737

Title: ***Draft Concept Design Documentation Report for Sediment Remediation***

Location: AEM

Category: Remedial Design

Prepared by/Author: Snell Environmental Group, Inc. (A Subsidiary of DLZ Michigan, Inc.)

Preparer/Author Address: 1425 Keystone Avenue
Lansing, MI 48911

Prepared For: USACE, Detroit District, Box 1027, Detroit, MI 48321-1027

Date Published: July 2000

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: A ***ReferenceID:*** 853

Title: ***Specifications and Project Manual – Environmental Dredging, Treatment, and Disposal of Dredged Sediments***

Location: AEM

Category: Bid Package

Prepared by/Author: DLZ Michigan, Inc.

Preparer/Author Address: 1425 Keystone Ave.
Lansing, MI 48911

Prepared For: Michigan DEQ
Surface Water Quality Division
Constitutional Hall
525 W. Allegan, 2nd Floor South
Lansing, MI 48913

Date Published: February 2002

Key Words and Phrases:

Reference Type: A ***ReferenceID:*** 1057

Title: ***Proposed Interim Response Remedy for Sediments Limited Removal and Sub-Aqueous Capping***

Location: AEM

Category: Remedial Action Plan/Work Plan

Prepared by/Author: Horizon Environmental

Preparer/Author Address:

Prepared For: Genesco, Inc.

Date Published: December 1, 2000

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

ReferenceID: 455

Reference Type: B

Title: ***AOC Updates - White Lake***

Location: AEM

Category: Site Update

Prepared by/Author: Tanya Cabala

Preparer/Author Address:

Prepared For: General Public

Date Published: 1996 Fall

Key Words and Phrases:

ReferenceID: 456

Reference Type: B

Title: ***White Lake Area of Concern***

Location: AEM

Category: Site Update

Prepared by/Author: Michigan Department of Natural Resources
(now the Michigan Department of Environmental Quality)

Preparer/Author Address:

Prepared For: General Public

Date Published: 1994-95 circa

Key Words and Phrases:

ReferenceID: 457

Reference Type: B

Title: ***Remedial Action Plan - White Lake***

Location: AEM

Category: Site Update

Prepared by/Author: Michigan Department of Natural Resources
(now the Michigan Department of Environmental Quality)

Preparer/Author Address:

Prepared For: General Public

Date Published: 1996 circa

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: B ***ReferenceID:*** 458

Title: ***White Lake***

Location: AEM

Category: Site Update

Prepared by/Author: Tanya Cabala

Preparer/Author Address:

Prepared For: Michigan Areas of Concern News

Date Published: 1997 Spring

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 535

Title: ***White Lake Area of Concern***

Location: AEM

Category: Site Update

Prepared by/Author: US EPA

Preparer/Author Address: Great Lakes National Program Office
Chicago, IL

Prepared For: General Public

Date Published: August 23, 1999

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 623

Title: ***White Lake Contaminated Sediment Outreach Project***

Location: AEM

Category: Miscellaneous

Prepared by/Author: US EPA

Preparer/Author Address: Great Lakes National Program Office
77 W. Jackson Blvd.
Chicago, IL

Prepared For: Distribution

Date Published: October 10, 2001

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: B ***ReferenceID:*** 624

Title: ***Realizing Remediation II - An Updated Summary of Contaminated Sediment Remediation Activities at Great Lakes Areas of Concern: White Lake - Tannery Bay***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: US EPA

Preparer/Author Address: Great Lakes National Program Office
Chicago, IL

Prepared For: Distribution

Date Published: July 2000

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 625

Title: ***Clinton River, Muskegon Lake, and White Lake Sediment Assessments***

Location: AEM

Category: Contaminated Sediments: Investigation/Delineation

Prepared by/Author: US EPA

Preparer/Author Address: Great Lakes National Program Office
Chicago, IL

Prepared For: Distribution

Date Published: September 9, 1996

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 684

Title: ***State of the Great Lakes - Annual Report 2001 (Partial)***

Location: AEM

Category: Site Update

Prepared by/Author: Russell Harding

Preparer/Author Address: Michigan DEQ

Prepared For: Distribution

Date Published: 2002

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: B ***ReferenceID:*** 937

Title: ***DEQ Hosts Media Event at White Lake Tannery Bay Cleanup Site***

Location: AEM

Category: Site Update

Prepared by/Author: Michigan DEQ

Preparer/Author Address:

Prepared For: General Public

Date Published: November 7, 2002

Key Words and Phrases:

Reference Type: D ***ReferenceID:*** 156

Title: ***State may clean lake, sue tannery***

Location: AEM

Category: Site Update

Prepared by/Author: Jeff Alexander

Preparer/Author Address:

Prepared For: Gazette News Service

Date Published: 1997 post

Key Words and Phrases:

Reference Type: D ***ReferenceID:*** 157

Title: ***Tannery waste cleanup put at $5 million-plus***

Location: AEM

Category: Site Update

Prepared by/Author: The Associated Press

Preparer/Author Address:

Prepared For: The Kalamazoo (MI) Gazette

Date Published: May 14, 2000

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

ReferenceID: 341

Reference Type: D

Title: ***State to help pay for Tannery Bay cleanup***

Location: AEM

Category: Site Update

Prepared by/Author: Dave LeMieux

Preparer/Author Address:

Prepared For: The Muskegon (MI) Chronicle

Date Published: September 21, 2001

Key Words and Phrases:

ReferenceID: 493

Reference Type: D

Title: ***Muskegon Lake is cleansed of tannery's effects***

Location: AEM

Category: Site Update

Prepared by/Author: The Associated Press

Preparer/Author Address:

Prepared For: The Detroit (MI) News

Date Published: August 17, 2003

Key Words and Phrases:

ReferenceID: 494

Reference Type: D

Title: ***Cleaned Tannery Bay to be tested***

Location: AEM

Category: Site Update

Prepared by/Author: Susan K. Trentler

Preparer/Author Address:

Prepared For: The Muskegon (MI) Chronicle

Date Published: August 27, 2003

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Reference Type: G ***ReferenceID:*** 31

Title: ***Removal of Impacted Sediment***

Location: AEM

Category: Remedial Design

Prepared by/Author: DLZ Michigan, Inc.

Preparer/Author Address:

Prepared For: Michigan DEQ

Date Published: November 2001 circa

Key Words and Phrases:

Reference Type: I ***ReferenceID:*** 114

Title: ***Memo to Bidders re: White Hall Lake, Tannery Bay - Environmental Dredging***

Location: AEM

Category: Dredging: Equipment

Prepared by/Author: Cable Arm, Inc.

Preparer/Author Address:

Prepared For: Distribution

Date Published: March 2002

Key Words and Phrases:

Reference Type: L ***ReferenceID:*** 111

Title: ***Memo re: Torch Lake, Deer Lake, White Lake***

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Distribution

Date Published: June 22, 2001

Key Words and Phrases:

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

ReferenceID: 220

Reference Type:	L
Title:	***Memo re: Reconnaissance of White Lake, MI Dredging Projects on August 7 and 8, 2003***
Location:	AEM
Category:	Site Update
Prepared by/Author:	AEM, Inc.
Preparer/Author Address:	
Prepared For:	AEM, Inc.
Date Published:	September 25, 2003
Key Words and Phrases:	

FISH ADVISORIES

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Advisory:	White Lake	***AdvisoryID:***	838
Extent:	Muskegon County		
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:	Lake	***Advisory Number:***	247
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	White Lake	***AdvisoryID:***	839
Extent:	Muskegon County		
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:	Lake	***Advisory Number:***	247
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	White Lake	***AdvisoryID:***	840
Extent:	Muskegon County		
Pollutant:	mercury		
Species:	bass-smallmouth		
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:	Lake	***Advisory Number:***	247
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Project Name ***WHITE LAKE - PROJECT 1 (Tannery Bay)*** ***ProjectID:*** 05-38

Advisory:	White Lake	***AdvisoryID:***	841
Extent:	Muskegon County		
Pollutant:	mercury		
Species:	bass-smallmouth		
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:	Lake	***Advisory Number:***	247
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834