Black Lagoon Site
Trenton, MI
First Great Lakes Legacy Act
Sediment Clean-up Project
Black Lagoon Site

Approximately 2-acre exposed cove on Trenton Channel of Detroit River
• Part of Detroit River Area of Concern & Detroit River International Wildlife
  Sanctuary
• Located immediately downstream of former McLouth Steel plant (closed in 1995)
• Acted as settling basin for past 50 years
Multiple joint sampling efforts:

- One of six major contaminated areas of Trenton Channel
- Over 400,000 cubic yards of contaminated sediments in Trenton Channel
Black Lagoon Site Contamination

- Site contributed approximately 115,000 cy of contaminated sediments.
- Average contaminant thickness was 8-15 feet.
- Average contaminant concentrations:
  - Total PCBs: 1.12 mg/kg
  - Mercury: 1.40 mg/kg
  - Lead: 146 mg/kg
Great Lakes Legacy Act of 2002…

…a new “tool” in the Great Lakes sediment remediation
Great Lakes Legacy Act

- The Legacy Act authorizes $50M per year from FY2004 through FY2008 for contaminated sediment projects in the Great Lakes
- Funds can be used for clean-ups, research, and public outreach in AOCs
- $10 Million appropriated in FY2004
- $22 Million appropriated in FY 2005
- Black Lagoon Site submitted by MDEQ
Multi-Agency Cooperative Effort

- U.S. EPA Region V
  - Great Lakes Superfund Division (Emergency Response)
- Michigan Department of Environmental Quality
  - Surface Water Quality Section
- US Army Corps of Engineers
  - Detroit District & Detroit Area Office
  - Grand Haven Area Office
  - Pointe Mouillee Confined Disposal Facility
Multi-Agency Cooperative Effort

- Greater Detroit American Heritage River Initiative
- City of Trenton
- Private land-owners
Primary Objectives

- Reduce risks to human health, wildlife, and aquatic life in Detroit River AOC
- Restore the aquatic habitat in Black Lagoon
- Prepare for recreational and economic redevelopment of Black Lagoon
Black Lagoon Clean-up Plans

Lagoon Isolation/Silt Curtain Installation

Environmental Controls

• Mechanical Dredging

Barge Transport to Pointe Mouillee CDF

Sediment Solidification at CDF

Truck Transport to CDF

Final Sediment Placement
Lagoon Isolation/Silt Curtain

- Approximately 2,000 ft long and 24 ft deep
- Fifty foot sections of laminated vinyl-polyester fabric with heat-treated seams
- 8” x 8” x 48” EPS foam block floats
- Initially connected to pipe piles at 50 ft intervals
- Final connection at 10-15 ft intervals with steel beam support
Lagoon Isolation/Silt Curtain
Lagoon Isolation/Silt Curtain
Environmental Controls

- Oil Spill Protection Equipment at Lagoon
  - Harbor Boom
  - Sorbent Boom
  - Shoreline
- Work Barges
Environmental Controls

- Turbidity Monitoring
  - 1 Station Upstream
  - 2 Stations Downstream
  - Collect data 2 hours after start of shift
  - Repeat throughout shift
  - Continuous feed units
  - Handheld readings
Environmental Controls

- Air Monitoring & Sampling
  - Several locations at both Lagoon & CDF
  - Real-time VOCs and particulates
  - Biweekly Sampling for PCBs, Lead and Mercury
Mechanical Dredging

- Two work barges with steel hoppers
- CAT 235DL excavator with environmental clamshell for top sediment
- Long-reach 320L excavator for finer sediments
- Material transferred to transport barges
- Weekly soundings conducted for volume measurements (GPS/total station)
Mechanical Dredging
Barge Transport to Pointe Mouillee Confined Disposal Facility (CDF)

- Sediments loaded over silt curtain into transport barges
- Barges hold approximately 1800 cy
- Spill prevention steel plate used for transfer
- Transport barges travel down Detroit River Channel to CDF in Lake Erie
Barge Transport to Pointe Mouillee CDF
Pointe Mouillee CDF

- Designed to contain 18 million cubic yards of contaminated dredged sediments from the Detroit and Rouge Rivers
- 700-acre crescent-shape dike in Lake Erie
- Structure is 3.5 miles long and 1,400 ft wide
- Constructed in sections from 1976 – 1981
- USACE authorized to manage under River and Harbor Act of 1970
Sediment Solidification at CDF

- Sediments solidified with Calciment
- Transport barge at CDF
- Solidified sediments off-loaded into off-road dump trucks
- Silt curtain in place around barges
- Sediments off-loaded into either temporary storage pit or directly into CDF cell
Sediment Solidification at CDF
Sediment Solidification at CDF
Truck Transport to CDF

- Project delays due to increased volume and inclement weather conditions
- Transport by barge no longer possible
- Initiated solidification at Lagoon with transport by truck to CDF
- Continued truck transportation for remainder of project
Truck Transport to CDF
Other Weather Considerations

• Turbidity monitoring in River

• Silt curtain inspection and repairs
  – Diver assisted inspections
  – Longer sections of impermeable silt curtain
  – Second layer of permeable silt curtain added

• Ice management in excavation area
Winter at the Black Lagoon
Two Layers of Silt Curtain
Final Sediment Placement at CDF

Cross dike constructed to isolate Black Lagoon sediments:
- Outer CDF walls lined with geotextile
- Overflow weir installed to manage oil/water
- Solidified sediments placed in 12 inch lifts
- Two foot cover material placed on top
- Sediments compacted
Final Placement at CDF
Final Sediment Placement at CDF
Cooperative Multi-Agency Effort

Dredging occurred over 13 months

- Approximately 115,000 cy of contaminated sediments removed
- Excavated area covered with 6 inches of sand and 3 inches of stone
- Sand bar area created with stone riprap
- City of Trenton received $113,000 grant for shoreline restoration
Black Lagoon Contamination

- 115,000 cy of contaminated sediment removed

<table>
<thead>
<tr>
<th>CONTAMINANT</th>
<th>AMOUNT (in lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCBs</td>
<td>160</td>
</tr>
<tr>
<td>Mercury</td>
<td>360</td>
</tr>
<tr>
<td>Oil and Grease</td>
<td>300,000</td>
</tr>
<tr>
<td>Lead</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
</tr>
</tbody>
</table>
Black Lagoon Project Costs

- Total cost approximately $9.3 million
- $6 million Legacy Act funds
- $3.3 Clean Michigan Initiative funds

(The Clean Michigan Initiative is a $675 million bond used to clean up, protect and enhance Michigan’s environmental quality and natural resources).
Black Lagoon Site Contacts

- J.S. EPA Region V GLNPO
  - Marc Tuchman (312) 353-1369
- MDEQ
  - Mike Alexander (517) 335-4189
- U.S. EPA Region V Superfund Division
  - Michelle Jaster (734) 692-7683
  - jaster.michelle@epa.gov
Human Error or Equipment Failure?
The Resulting Multifaceted Response