GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	***FORD OUTFALL***	***ProjectID:*** 05-05
Last Updated:	01/25/02	

City:	Monroe
County:	Monroe
State:	MI
Country:	USA
Bodies of Water:	River Raisin; Monroe Harbor
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):	The AOC is the lower 2.6 mile portion of the River Raisin downstream from a low head dam (Dam #6) and extending one-half mile into Lake Erie. The targeted hot spot was a 2.6 acre nearshore area (roughly 750 feet long by 150 feet wide) in the river opposite the PRP site.
Other Characteristics of Water Body:	Water depths ranged from 4 - 6 feet nearshore then increased due to a rapid, steep slope to 15 - 18 feet, then to 30 feet in the navigational channel.
Contaminants of Concern:	PCBs (1242)
Source of Contamination:	Reportedly industrial outfalls from the Ford Monroe Plant, in particular closed 36" and 48" diameter outfalls.
Contaminated Area Physical Characteristics:	Embayment in River Raisin; the surface area weighted average concentration was calculated to be 3,020 ppm in the hot spot using results from 18 samples collected by Ford in May 1993.
Type of Regulatory Action:	Non-Time Critical Removal Action (NTCRA) under the Superfund Accelerated Cleanup Model (SACM). AOCs between the PRP and US EPA in 1993 and 1997.
Overall Status Summary:	In 1993, US EPA re-classified the site as a Non-Time Critical Removal Action (NTCRA) under the Superfund Accelerated Cleanup Model (SACM). The PRP prepared an Engineering Evaluation/Cost Analysis (EE/CA) and US EPA selected the removal and disposal option, also in 1993. Several years of delays ensued pending review and approval of the features of and location for a proposed dedicated disposal facility (Sediment Containment Unit). In-plant sewer cleaning and related work were implemented with a combination of hydraulic, mechanical and pneumatic methods during July 1996. The sediment removal phase conducted under a Non-Time Critical Removal Action began in late June 1997 and was completed in late September 1997, except water treatment activities continued into July 1998. Approximately 28,500 cy of sediment were removed from a 2.6 acre area in the River Raisin using a Cable Arm clamshell bucket, supplemented by a conventional clamshell bucket. Materials were stabilized/solidified with cement and then disposed in a 3-acre onsite dedicated TSCA cell. The dedicated 3-acre cell is within a 32-acre onsite landfill. Final sediment verification samples exhibited concentrations ranging from 0.5 to 20 ppm PCBs in about 60% of the dredged area; insufficient sediment remained for sample collection in about 40% of the dredged area. A year after the removal, in Fall 1998, MDEQ collected 16 sediment core and 30 fish tissue samples, and conducted 3 caged fish studies as part of their ongoing investigation of the River Raisin. Core samples exhibited average PCB concentrations of ~10 ppm in river sediments outside the former hot spot area. Two samples collected within the former hot spot area

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exhibited PCB concentrations of 64 ppm (0-6") and 110 ppm (0-18"). MDEQ has documented these results, as well as results from 1995 and 1997, in an August 1999 report. MDEQ collected additional sediment cores from River Raisin in Summer 2001. The results are being used to develop remedial alternatives for the river. A Remedial Alternatives Report is targeted for completion by MDEQ in Summer 2002.

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

Key Conditions: dedicated landfill or CDF, specialty dredge, extended (>1 mile) river, Great Lakes AOC, post monitoring, solidification / stabilization

REMEDIAL ACTION PLANNED

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Target Sediment Cleanup Standards (TSCS): 10 ppm PCBs

How TSCS Established: The AOC defined a 50 ppm PCB target level. The project was bid and awarded, and commenced with this as the goal. Shortly thereafter, the EPA directed that the cleanup level be 10 ppm PCBs, derived as described below.

An EPA Region V risk analysis with a primary and secondary element (Reference A-279). The primary element was to estimate levels of PCBs in River Raisin sediments which, if significantly exceeded, would potentially result in pregnant or childbearing age women to have adverse reproductive effects as a result of consuming PCB-contaminated fish in the area. The second element used existing River Raisin sediment data to estimate surface area weighted average concentrations of PCBs within a delineated zone representing a reasonable area around the hot spot where fish may be exposed. The surface area weighted average for the removal zone of 3020 ppm PCBs and for the overall fish exposure zone of 312 ppm, provided a baseline assessment of existing PCB levels for comparison to post-removal options. Options were evaluated to determine if concentrations left behind would exceed the risk based cleanup level.

For the reproductive endpoint, the risk analysis resulted in sediment levels of 1 to 10 ppm PCBs being deemed protective. This estimate was made using a range of exposure assumptions and potential differences in sediment to fish interaction.

The PRPs plan to remove sediments down to the clay layer would, in EPA's opinion, produce residual surface concentrations in the hot spot layers of 10-30 ppm PCBs and in the overall fish exposure zone of 11 - 13 ppm. Since the 11 - 13 ppm estimate came close to the desired 1 - 10 ppm range, since expeditious removal was desired, and since further sampling with the potential for additional remediation would follow, EPA settled on removal down to clay and verification sampling to 10 ppm.

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

Other Target: N/A

Environmental Sample Data References:

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

Estimated Target Volume: 44,000 cy

Planned Disposal Method: Dedicated onsite landfill.

Estimated Calendar Time to Implement Remedy:

Estimated Time to Implement Remedy: 3-4 months

Estimated Cost to Implement Remedy: $6-8 million

REMEDIAL ACTION PLANNED

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Stated Remedial Action Objectives (and Source):

Remove contaminated sediments from 800' sector of river. Remove all sediment to hardpan in the center of the river, and remove all shoreline sediment greater than 10 ppm PCBs.

Measures of Success to be Used:

Post-remediation sediment verification sampling.

Planned Monitoring and Restoration:

Collect post-remediation verification samples to ensure RAOs are met. Backfill materials along shoreline to prevent future erosion at the bank.

Agency Position on Sediment Removal (and Source):

During preliminary negotiations with US EPA, the agency position was to consider dredging only and no other remedial alternatives. Reasons for this position by the agency were because of high levels of PCBs in some hot spot areas and the river being a tributary to the Great Lakes. The agency originally planned to have a larger area dredged, but this was negotiated down. The negotiations were supported by sediment sampling performed by the PRP showing elevated levels of PCBs upstream of the plant. Additionally, the width of the targeted area was reduced based on a sediment sampling program conducted by the PRP in April/May 1997. At that time, a 3.6 acre area was targeted which extended into the navigational channel and a turning basin. The sample results allowed the width to be reduced by 50-60 feet, reducing the target area to 2.6 acres.

Work to be performed under the February 20, 1997 Administrative Order on Consent (AOC) for Non-Time Critical Removal Action included:

- Dredging of PCB-contaminated sediments, with concentrations of up to 29,000 ppm, within the River Raisin Sediment Removal Area (specifically, "The Respondent shall dredge and dewater all sediment ... that contains PCBs above 50 ppm");

- Preventing sediment resuspension using best management practices and a silt curtain during dredging;

- Conducting in-stream confirmatory sampling of residual river sediment after dredging to determine PCB concentrations, and additional dredging as necessary, to ensure that the PCB target levels in the US EPA approved EE/CA are met;

- Disposing of dredged sediment and excavated soil at a US EPA/MDEQ approved dedicated TSCA facility either on-site or off-site;

- Conducting air monitoring for PCBs prior to and during removal activities in accordance with State and Federal regulations.

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RA Type: Human Health

RA Status: Complete

RA Objectives:

Company Performing RA: EPA Region V

RA Reference Report: A-279

RA Summary and Conclusions:

Source: Reference A-279: As part of the Superfund Emergency Removal Action at Ford Motor Company-Monroe, Michigan, EPA Region V performed a risk based sediment cleanup analysis for the site. The methodology utilized for this project was developed and applied by the EPA Water Division's Sediments Group.

The analysis consisted of a primary and secondary element. The primary effort involved a risk analysis to estimate levels of PCBs in River Raisin sediments which, if significantly exceeded, would potentially result in pregnant or childbearing age women to have adverse reproductive effects as a result of consuming PCB-contaminated fish in the area. The secondary element used existing River Raisin sediment data to estimate surface area weighted average concentrations of PCBs within a delineated zone representing a reasonable area around the hot spot where fish may be exposed. The surface area weighted average provided a baseline assessment of existing PCB levels for comparison to post-removal options. Options were evaluated to determine if concentrations left behind would exceed the risk based cleanup level.

A range of possible exposure assumptions were used, including amount of fish consumed and potential differences in sediment to fish interaction. Looking at the reproductive endpoint, the risk analysis estimated that levels in the range of 1 to 10 ppm PCBs in the sediment would be protective. Data to describe contaminant movement from sediment to fish and to perform the risk analysis were: MI DNR's caged fish study (1990), ambient fish data from 1983-88, and sediment data from the second part of the analysis. Allowable sediment levels were calculated using a hazard index of 10, or when the exposure is 10 times greater than the Reference Dose as given in USEPA's database IRIS.

A surface area weighted average was determined for both Ford's proposed removal zone and the larger inclusive fish exposure zone. Concentrations in the proposed removal zone were estimated by using data from 18 sampling locations taken by Ford in May 1993. The surface area weighted average for the removal zone was estimated to be 3,020 ppm PCBs. The remaining portions were estimated using available data points from USEPA Superfund sediment sampling from 1992 and 1993. The overall average for the entire fish exposure zone, including the proposed removal zone, was calculated to be 312 ppm.

Ford's proposal was to remove sediments down to the clay layer, an action EPA considered likely to eventually produce surface concentrations in the surface layer of 10 to 30 ppm following redeposition from nearby areas and natural deposition. If remaining sediment concentrations in the removal zone are on average 10 to 30 ppm, the overall fish exposure zone would have post-removal concentrations of 11 to 13 ppm, respectively.

The 11 to 13 ppm estimate came close to the desired range of 1 to 10 ppm. As the remedial program would follow the project with further sampling and necessary remediation and as the Superfund OSC recommended an immediate decision in order to assure expeditious removal, EPA recommended acceptance of the proposal.

REMEDIAL ACTION IMPLEMENTED

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Physical Target: 2.6 acre hot spot in river encompassing the area directly in front of the PRP's plant out toward the center of river; target area of about 750 feet long by 150 feet wide between the shore and navigational channel.

Goals: 10 ppm PCBs or sediment removal down to native clay.

Primary Contractor: Sevenson Environmental Services

Other Contractors: Metcalf & Eddy of Michigan, Inc. (design, and construction QA); Midwest Environmental Consultants (construction oversight); Luedtke Engineering of Luddington, MI (dredging subcontractor)

Generic Remediation Method: Mechanical dredging

Equipment: A 3900 crane on barge with first a 4 cy and subsequently a 6 cy Cable Arm clamshell bucket; deepest sediment cuts were 4 to 6 feet deep; supplemented by conventional clamshell bucket for rocks and debris along shoreline and for some "hard till" removal target areas; 3,000 linear feet of silt curtain was deployed including a lengthy outer curtain, and an inner curtain around the dredging area; dredged sediments were loaded into an 800 cy three-compartment scow.

Material Handling: A clamshell bucket dumped into a three-compartment scow during first shift. The scow was 40' (W) by 110' (L) by 14' (D). On second shift, wet sediments were unloaded from the barge by a 3900 crane using a 3.5 cy slim-profile Cable Arm bucket and were placed into gasketed dump trucks. Water from the barge was pumped via transfer hose to a 20,000 gallon holding tank on shore. The dump trucks hauled the sediments to a temporary staging area where they were stockpiled on a pad. A loader then transported the stockpiled sediments to a staging area adjacent to the pugmill power screen. An excavator placed the sediments into the power screen, which discharged directly into the pugmill hopper. Reagent was added from one of three 30-ton silos. The pugmill homogenized the sediments with reagent. The treated sediments were stockpiled in a staging area on a pad for curing. Typically one to two days later, a loader moved the treated sediments from the curing pad into trucks. The trucks transported the solidified sediments to the Sediment Containment Unit (3-acre dedicated landfill cell).

As described in Reference A-407:

"(The Contractor) immediately initiated re-dredging in dredge-cells not meeting the cleanup goal. The date of October 1st was identified as the deadline for completing re-dredging and moving of the silt curtain, since the river closure posted under the Local Notice to Mariners would expire and a commercial shipment was planned. The environmental clamshell bucket was used in dredge-cell areas with remaining sediment of greater depth. The environmental clamshell bucket, being gasketed, was also used in dredge-cell areas with deposits of sediment from resuspension. In such areas, the dredging cycle-time was increased in order to minimize resuspension. A conventional clamshell bucket was used along the base of the sloped drop-off since it was a narrower bucket. The conventional bucket was efficient in picking up narrow pockets of sediment that were missed during prior dredging from along the break in slope."

Volume Removed: 28,500 cy

Calendar Time: Mobilization: Start 4/17/97, Complete 6/25/97; Sediment Containment Unit (Landfill) Construction: Start 5/1/97, Complete 7/7/97; Silt Curtain: Start 6/19/97, Complete 6/25/97; Dredging: Start 6/25/97, Complete 9/14/97; Redredging: Start 9/16/97, Complete 9/26/97; Reef and Reinstall Silt Curtain: Start 7/25/97, Complete 8/9/97; Solidification: Start 6/27/97, Complete 9/27/97; Placement within

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	Sediment Containment Unit: Start 7/7/97, Complete 10/10/97; Waste Water Treatment Plant-Phase 1: Start 6/30/97, Complete 10/17/97; Waste Water Treatment Plant-Phase 2: Start 10/18/97, Complete 4/16/98; Waste Water Treatment Plant-Phase 2 extension: Start 4/17/98, Complete 6/30/98; Sediment Containment Closure: Start 10/6/97, Complete 10/23/97; Work Area and Haul Road Removal: Start 10/6/97, Complete 7/23/98; Demobilization: Start 10/1/97, Complete 9/15/98.
Time To Implement:	About 3 months for dredging (8 hours per day, 5 days per week); second shift each day was used for material handling on-land. The actual number of dredging/redredging days was 51 dredging days within 88 calendar days.
Total Cost:	$5.65 million (includes dredging, solidification, water treatment, construction of and placement of solidified material in an onsite TSCA containment cell, and engineering support); $198 per cy.
Dredging Cost:	$62 per cy (water-side costs)
Disposal of Sediment:	Off-loaded wet sediments into sealed tandems, then 12-13% cement added in a pug mill to achieve a 25 psi strength prior to disposal. Resultant material staged for 24-48 hours, then solidified sediments disposed in a dedicated landfill cell at the plant site (built as part of this project).
Volume of Water:	725,000 gallons discharged as of Oct. 10, 1997; 1,041,000 gallons treated (water sometimes treated more then once to meet discharge limit) as of Oct. 10, 1997.
Method of Water Treatment:	Water from the scow was decanted and then pumped into a 20,000 gallon holding tank, where oil/water separation occurred. Then water was pumped through a dedicated wastewater treatment facility, including, in series, 1) an inclined plate clarifier, 2) 50,000 gallon Modutanks which serve as secondary clarifiers, 3) bag filters, 4) activated carbon filters, and 5) sand filters.
Water Discharge Limit:	
Air Monitoring During Remediation:	Performed. No details obtained.
Water Monitoring During Remediation:	For turbidity and total PCBs; originally, water column sampling and analysis for PCBs was only to be performed when the turbidity action level was exceeded (action level unknown). Water column monitoring for PCBs was performed during the first week of dredging, concurrent with the existing turbidity monitoring program as a precautionary measure and to determine baseline PCB concentrations during dredging. Further water column monitoring for PCBs was discontinued following the first week of dredging when the turbidity action levels to trigger additional monitoring was not exceeded.
Outcome:	Post-dredging verification samples were obtained using field kits every 20 ft and 10% of samples were sent to a lab for more vigorous confirmatory sampling; samples were obtained from 14 discrete quadrants and analyzed for PCBs; additional dredging was performed in eight of the quadrants in response to elevated verification sample results; not clear how (or if) long-term benefit is defined or being measured. Specifically, as described in Reference A-407: "As of September 10, results of samples collected from the dredge-cell floors and sideslopes in accordance with the amended Field Sampling Plan (FSP) indicated: • 5 of 14 dredge-cells had PCB concentrations less than the 50 ppm FSP cleanup goal; • 4 of 14 dredge-cells had PCB concentrations greater than the 50 ppm FSP cleanup goal; • 5 of 14 dredge-cells had laboratory analytical results pending; 4 of these 5 had field screening results greater than 50 ppm PCBs.

- The average of PCB concentrations from confirmatory sideslope samples exceeded the 10 ppm cleanup goal presented in the approval letter from US EPA. . ."

"Confirmatory sample collection activities in many dredge-cells were revealing that sediment remained, even though prior dredging to refusal had occurred. A review of information from dredging, sampling and the dive inspection for the silt curtain identified the following suspected sources of remaining sediment:

- A 0-3 foot layer of sediment deposited due to the passage of the unauthorized lake freighter;
- A 0-0.5 foot layer of sediment deposited following resuspension during dredging;
- 0-2 foot thick pockets of sediment along the base of the slope comprising the drop-off in the Sediment Removal Area (SRA) from the near-shore shelf to the dredged channel;
- Sloughing of sediment outside of the SRA into the SRA along the base of the silt curtain."

"As soon as re-dredging in a dredge-cell was completed, re-sampling of the cell floor and/or sideslope was performed for confirmation. In a few dredge-cells, re-dredging and re-sampling were performed several times. Confirmatory sample results from all 14 dredge-cells indicated that the FSP cleanup goal of 50 ppm was met. The AOC target cleanup goal was also 50 ppm PCBs. Confirmatory sideslope sample results also indicated that the US EPA target cleanup goal of 10 ppm was met."

It was further reported that the redredging effort went essentially to bedrock. Often, the remaining sediment being dredged consisted of a 2-6 inch layer of highly liquid sediment. The redredging effort was assisted by diver inspections.

At the completion of redredging (Sep. 26, 1997), a verification sediment sample for lab analysis was to be collected from near the center of each of 14 sub-areas which constituted the 2.6 acre target area. In 7 of the sub-areas, insufficient sediment remained for sample collection. In 4 of the sub-areas, the final sample exhibited less than 10 ppm PCBs (0.5 to 7 ppm range). In 3 of the sub-areas, the final sample exhibited greater than 10 ppm PCBs (12 to 20 ppm range).

Restoration and Post-Monitoring:

Added backfill as necessary along shoreline where remediation activities were performed, to prevent future erosion of bank materials.

Post-monitoring activities are ongoing by MDEQ and include the collection of sediment core and fish tissue samples and conducting caged fish studies in and around the dredged hot spot area during Fall 1998. Sixteen sediment core samples were collected from the turning basin outlet area downstream to the river mouth, including one from the mouth of Plum Creek. Two of the sediment samples were collected from the hotspot area and exhibited PCB concentrations of 64 ppm (0-6") and 110 ppm (0-18"), both significantly above the dredging target level of 10 ppm PCBs. Concentrations in the other 14 sediment samples averaged ~10 ppm PCBs. Reference A-436 is the MDEQ report summarizing the results of this sampling effort along with sediment samples collected in 1995 and 1997. The report does not define further actions.

MDEQ also collected 30 fish samples (edible portion) and conducted 3 caged fish studies (one above and two below the hot spot area) in Fall 1998. MDEQ is presently awaiting analytical results for these samples.

Site-Specific Difficulties:

Refer to resuspension and redeposition difficulties described in "Outcome."
As described in Reference A-407:

"During solidification of dredged sediment in early and mid-July 1997, the contractor experienced

problems with the pugmill, powerscreen and Portland cement feed systems. These problems were evidenced by the following:

- Frequent pugmill shutdown.
- Clogging of additive feed lines.
- Additive measuring/weighing device malfunction or non-operation.
- Solidified sediment not meeting required Unconfined Compressive Strength (UCS) testing criteria and having to be reprocessed.
- Solidification Work Pad capacity for dredged sediment and solidified sediment storage and capacity of an additional work area for solidified sediment storage were completely filled.
- Dredging performance slowed or stopped due to lack of space for more dredged sediments.
- Proposal was made and field-testing initiated to mix reagents to facilitate dewatering of dredged sediment prior to screening."

"These problems were quickly resolved due to the contractor's implementation of the following:

- Raised the silos containing the Portland cement additive, improving material flow.
- Removed the pugmill and screen and replaced with a larger pugmill and screen.
- Final determination and use of an increased percentage of Portland cement additive over the percentages of additive previously used.
- Processing the stockpile of stored dredge sediment and low-UCS solidified sediment during the scheduled dredging shutdown period for lake freighter access to the Port of Monroe.
- Extended operating hours for the pugmill."

"Following re-startup of dredging in early August 1997, no problems associated with the rate or performance of the new pugmill were experienced which impacted the dredging schedule."

"On August 30, 1997 the lake freighter Sam Laud proceeded up the River Raisin and passed the fully deployed silt curtains and work vessels which comprise the River Work Area. The freighter turned around in the turning basin adjacent to the Port of Monroe facility and proceeded down the river, again passing the River Work Area. At that time, the River Raisin adjacent to the River Work Area and access to the turning basin was closed to commercial vessel traffic as identified in the U.S. Coast Guard's "Local Notice to Mariners". No site personnel were injured as a result of this action. However, the following impacts to the project resulted from this action:

- Damage to the outer silt curtain.
- Additional cost of dredging operation shutdown.
- Additional cost of dive team inspection of silt curtains.
- Additional cost of silt curtain repair and anchoring adjustments.
- Additional cost of associated documentation, meetings and monitoring of these activities.
- Additional cost of re-dredging due to deposition of up to 3 feet of sediment in previously completed dredge cells.
- Delay to dredging schedule due to silt curtain inspection, curtain repair, anchor adjustment and re-dredging."

"The contractor and the dredging subcontractor sought restitution for the additional cost from the shipping company with the aid of the U.S. Coast Guard. The project delay was mitigated by installation of a temporary silt curtain patch, which allowed dredging to resume until the appropriate patching materials and equipment arrived. The delay to the project was approximately 1-2 dredging days."

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Last Updated: 04/13/01

Monitoring Data References:

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

POTENTIALLY RESPONSIBLE PARTIES

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

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

Street Address:

City:

State:

KEY CONTACTS

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

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 ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: A ***ReferenceID:*** 279

Title: ***Sediment Cleanup Level Analysis for Ford Monroe Superfund Emergency Removal Action***

Location: AEM

Category: Risk Assessment

Prepared by/Author: Howard Zar

Preparer/Author Address: US EPA Region V
77 West Jackson Blvd.
Chicago, IL 60604-3590

Prepared For: Ford Monroe Work Group, and other addressees

Date Published: July 12, 1995

Key Words and Phrases:

Reference Type: A ***ReferenceID:*** 407

Title: ***Completion of Removal Action/Completion of Work Report for River Raisin Sediment and Soil Removal (including Appendices E (partial), G, and H)***

Location: AEM

Category: Site Update

Prepared by/Author: Metcalf & Eddy of Michigan, Inc.

Preparer/Author Address: Metcalf & Eddy, Inc.
One Detroit Center, Suite 1510
500 Woodward
Detroit, MI 48226

Prepared For: US EPA Region V

Date Published: September 23, 1998

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: A ***ReferenceID:*** 436

Title: ***MDEQ Staff Report: PCB Sediment Investigation, River Raisin Area of Concern, Monroe, Michigan, 1995, 1997, and 1998***

Location: AEM

Category: Monitoring, Remediation (Pre- and during)

Prepared by/Author: Michigan Department of Environmental Quality, Surface Water Division

Preparer/Author Address:

Prepared For: MI DEQ and US EPA

Date Published: August 1999

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 258

Title: ***Final Effluent Limitations, Outfall 001 (one page)***

Location: AEM

Category: Monitoring, Remediation (Pre- and during)

Prepared by/Author: Sally Averill (provided by)

Preparer/Author Address: US EPA Region V

Prepared For:

Date Published: not determined

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 763

Title: ***Realizing Remediation I - Great Lakes Contaminated Sediments River Raisin - Ford Outfall Site (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:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: B ***ReferenceID:*** 819

Title: ***Realizing Remediation II - Updated Summary: River Raisin - Ford Monroe Outfall Site (Ford Outfall) (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: B ***ReferenceID:*** 980

Title: ***e-mail re: Ford Outfall (River Raisin) (re: Post Monitoring)***

Location: AEM

Category: Monitoring, Post

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Distribution

Date Published: March 26, 1999

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 1078

Title: ***Significant Activities Report: Sediment Results Reported***

Location: AEM

Category: Site Update

Prepared by/Author: US EPA GLNPO

Preparer/Author Address:

Prepared For: General Public

Date Published: June - July 2003

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: C ***ReferenceID:*** 178

Title: ***PCBs sediment cleanup prepared***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: May 13, 1994

Key Words and Phrases:

Reference Type: C ***ReferenceID:*** 181

Title: ***Ford site disposal plan changed***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: October 18, 1996

Key Words and Phrases:

Reference Type: C ***ReferenceID:*** 199

Title: ***Ford Outfall sediment fix eyed***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: January 6, 1995

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: C ***ReferenceID:*** 580

Title: ***Sediment Remediation Can Improve Great Lakes Water Quality***

Location: AEM

Category: Miscellaneous

Prepared by/Author: (1) John H. Hartig, (2) Lisa Maynard, (3) Michael A. Zarull, (4) Gail Krantzberg

Preparer/Author Address: (1) Greater Detroit American Heritage River Institute
Detroit, MI
(2) International Joint Commission
Windsor, Ontario, Canada
(3) National Water Research Institute
Burlington, Ontario, Canada
(4) Ontario Ministry of Environment

Prepared For: Water Environment & Technology (WE&T)

Date Published: October 1999

Key Words and Phrases:

Reference Type: D ***ReferenceID:*** 58

Title: ***EPA: PCB River Cleanup to Begin Next Week at Ford Outfall Site***

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region V

Preparer/Author Address: Chicago, IL

Prepared For: General Public

Date Published: June 19, 1997

Key Words and Phrases:

Reference Type: D ***ReferenceID:*** 80

Title: ***As River Raisin becomes cleaner, volunteers dwindle***

Location: AEM

Category: Site Update

Prepared by/Author: Associated Press

Preparer/Author Address:

Prepared For: The Detroit (MI) News

Date Published: March 24, 1999

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: E ***ReferenceID:*** 246

Title: ***Remediation of Sediments by Dredging: Methods and Case Histories***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: Bradford S. Cushing

Preparer/Author Address: AEM, Inc.

Prepared For: WODCON XV Conference, Las Vegas, NV

Date Published: June 28 - July 2, 1998

Key Words and Phrases:

Reference Type: E ***ReferenceID:*** 249

Title: ***The Cable Arm Clamshell: Development and Track Record for Environmental Dredging***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: (1) R.E. Bergeron, (2) B.S. Cushing, (3) M.K. Hammaker

Preparer/Author Address: (1) Cable Arm, Inc.
Trenton, MI 48183
(2), (3) Applied Environmental Management
Malvern, PA 19355

Prepared For: WEDA XX Conference, Warwick, RI

Date Published: June 25-28, 2000

Key Words and Phrases:

Reference Type: G ***ReferenceID:*** 11

Title: ***Dredging Successes***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: Jim Hahnenberg

Preparer/Author Address: US EPA Region V
Chicago, IL

Prepared For: Fox River PRPs

Date Published: November 13, 1997

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

ReferenceID: 2

Reference Type:	H
Title:	***Map of Ford Outfall Area***
Location:	AEM
Category:	Site Update
Prepared by/Author:	DeLorme Street Atlas USA
Preparer/Author Address:	
Prepared For:	
Date Published:	1996
Key Words and Phrases:	

ReferenceID: 7

Reference Type:	H
Title:	***Map of River Raisin Area of Concern***
Location:	AEM
Category:	Miscellaneous
Prepared by/Author:	
Preparer/Author Address:	
Prepared For:	
Date Published:	
Key Words and Phrases:	

ReferenceID: 2

Reference Type:	K
Title:	***Cable Arm Clamshell (video)***
Location:	AEM
Category:	Site Update
Prepared by/Author:	Cable Arm, Inc.
Preparer/Author Address:	3452 West Jefferson Ave. Trenton, MI 48183
Prepared For:	General Public
Date Published:	1998
Key Words and Phrases:	

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

ReferenceID: 23

Reference Type:	K
Title:	***Cable Arm Clamshell***
Location:	AEM
Category:	Dredging: Remedial (Contaminated Sediments)
Prepared by/Author:	Cable Arm, Inc.
Preparer/Author Address:	3452 West Jefferson Ave. Trenton, MI 48183-2939
Prepared For:	Distribution
Date Published:	Undated
Key Words and Phrases:	

ReferenceID: 251

Reference Type:	M
Title:	***Environmental Dredging: An Evaluation of Its Effectiveness in Controlling Risks***
Location:	AEM
Category:	Contaminated Sediments: Overview of Issues
Prepared by/Author:	Blasland, Bouck & Lee, Inc.
Preparer/Author Address:	6723 Towpath Road P.O. Box 66 Syracuse, NY 13214
Prepared For:	General Electric Company
Date Published:	August 2000
Key Words and Phrases:	

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Reference Type: M ***ReferenceID:*** 416

Title: ***Results of Contaminated Sediment Cleanups Relevant to the Hudson River: River Raisin, Michigan (Ford Outfall)***

Location: AEM

Category: Contaminated Sediments: Overview of Issues

Prepared by/Author: Joshua Cleland

Preparer/Author Address:

Prepared For: Scenic Hudson
9 Vassar Street
Poughkeepsie, NY 12601

Date Published: October 2000

Key Words and Phrases:

Reference Type: P ***ReferenceID:*** 4

Title: ***Fish Contaminant Monitoring Report, MDEQ (Fish Collected 9/98)***

Location: AEM

Category: Fish/Biota

Prepared by/Author: Michigan Department of Environmental Quality

Preparer/Author Address:

Prepared For: Distribution

Date Published: 1999 Summer

Key Words and Phrases:

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

ReferenceID: 8

Reference Type:	R
Title:	***Letter to PRP re: Case Histories: Contaminated Sediment Sites (with response from Ford Motor Company)***
Location:	AEM
Category:	Site Update
Prepared by/Author:	AEM, Inc. with response from Ford Motor Company
Preparer/Author Address:	Malvern, PA 19355
Prepared For:	Ford Monroe Company, submitted to
Date Published:	August 14, 1998
Key Words and Phrases:	

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Advisory:	River Raisin	***AdvisoryID:***	1008
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1009
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1010
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	bass-white		
Population:	NCSP		
Population Definition:	No Consumption-Subpopulation(s): Advises against consumption for populations that are potentially at greater risk, e.g., pregnant or nursing women, and small children.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Advisory:	River Raisin	***AdvisoryID:***	1011
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	bass-white		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1012
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	carp-common		
Population:	NCSP		
Population Definition:	No Consumption-Subpopulation(s): Advises against consumption for populations that are potentially at greater risk, e.g., pregnant or nursing women, and small children.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1013
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	buffalo-black		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Advisory:	River Raisin	***AdvisoryID:***	1014
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	catfish-channel		
Population:	NCGP		
Population Definition:	No Consumption-General Population: Advise against consumption by the general population.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1015
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	buffalo-black		
Population:	NCGP		
Population Definition:	No Consumption-General Population: Advise against consumption by the general population.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1016
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	drum-freshwater		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Advisory:	River Raisin	***AdvisoryID:***	1017
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	bass-white		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	1018
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	carp-common		
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:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Advisory:	River Raisin	***AdvisoryID:***	156
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	bass-white		
Population:	NCGP		
Population Definition:	No Consumption-General Population: Advise against consumption by the general population.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834

Project Name ***FORD OUTFALL*** ***ProjectID:*** 05-05

Advisory:	River Raisin	***AdvisoryID:***	157
Extent:	Below Monroe Dam		
Pollutant:	PCBs (total)		
Species:	carp-common		
Population:	NCGP		
Population Definition:	No Consumption-General Population: Advise against consumption by the general population.		
Advisory Type:	River	***Advisory Number:***	279
Status (Active or Rescinded):	Active	***Date Rescinded:***	
Contact Name:	David R. Wade	***Contact Number:***	517-335-8834