

**Revised Reconnaissance Study
Section 905(b) (WRDA 86) Analysis**

Environmental Dredging

Detroit River, Michigan

18 December 2001

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1. Study Authority

- a. This Section 905(b) (WRDA 86) Analysis for Detroit River, Michigan was prepared in response to a Congressional Add to the Senate Appropriations Committee Appropriations Act. Using allocated funds, the United States Army Corps of Engineers (USACE) has appropriated funds to initiate a Reconnaissance Study of environmental dredging in the Detroit River, Michigan.
- b. Funds in the amount of \$120,000 were appropriated in Fiscal Year 2000 to conduct the reconnaissance phase of the study.

2. Study Purpose

In response to the Congressional Add, this 905(b) analysis was initiated in March 2000. This analysis evaluates the potential for Federal interest in a project to remove and/or remediate contaminated sediments from the Detroit River, Michigan, for the purpose of environmental enhancement and water quality improvement. The Corps of Engineers is authorized to provide this type of project per the programmatic authority of Section 312 of the Water Resources Development Act (WRDA) of 1990, as amended. This study also includes a preliminary evaluation of the level of interest and support of a non-Federal sponsor(s) and potential solutions to accomplish environmental enhancement and water quality improvements. If a Federal interest is determined, the feasibility report would be forwarded to the Secretary of the Army with a recommendation for approval. This reconnaissance phase of the study has resulted in the finding that there is a Federal interest in continuing the study into the feasibility phase. The purpose of this Section 905(b) (WRDA) Analysis is to document the basis for this finding and to establish the scope of the feasibility phase.

3. Location of Study, Non-Federal Sponsor and Congressional Districts

- a. The study area encompasses the United States' portions of the Detroit River and the Lower Rouge River, Michigan. The Detroit River is part of the international boundary between the United States (southeast Michigan) and Canada (Province of Ontario). The Detroit River is a 32-mile long channel linking Lake St. Clair, and the upper Great Lakes, to Lake Erie (Figure 1). The Detroit River is used extensively for diverse activities and needs, including commercial navigation, industrial and municipal drinking water supply, recreational activities, and as a receiving water for treated industrial and municipal wastewater. The portion of the Detroit River within the study area is defined as the segment beginning at the upstream end of Belle Isle on the north to Brownstown Township on the

south. The portion of the Lower Rouge within the study area is defined as the segment beginning at the turning basin upstream of the Dix Avenue Bridge to the River's confluence with the Detroit River.

- b. The Michigan Department of Environmental Quality (MDEQ) has stated its intent to be the non-Federal sponsor of the feasibility phase in a Letter of Intent dated March 1, 2001 (Attachment 1). The Letter of Intent expressed support for the project and local sponsor's intent and willingness to proceed with negotiations of the Feasibility Cost Sharing Agreement for the feasibility study phase. The MDEQ will most likely use the Clean Michigan Initiative (CMI) to financially support the environmental dredging program.
- c. The study area is located in the 15th and 16th U.S. Congressional Districts of Michigan represented by John D. Dingle, D-Trenton, and Barbara Rose Collins, D-Detroit and within the jurisdiction of U.S. Senator Carl Levin, D-Michigan (Detroit) and U.S. Senator Spencer Abraham, R-Michigan (Auburn Hills).

4. Prior Reports and Existing Projects

a. Prior Reports and Studies

There are no prior reports or studies on the Detroit River that were authorized by Congress or a programmatic authority for the USACE.

b. Existing Projects

- 1) **Navigational Dredging and Operation of Pointe Mouillee CDF.** The USACE conducts sediment sampling every five years for heavy metal, organics, PCBs, and other pollutants in conjunction with maintenance dredging in the Main Branch of the Rouge River and the Detroit River. The USACE dredges the Lower Rouge (up to the Turning Basin) and the Detroit River every other year, removing approximately 60,000 CY and 100,000 CY, respectively.

The Pointe Mouillee Confined Disposal Facility is a 700-acre, crescent-shaped dike (3½ miles long by ¼ mile wide) on the western shore of Lake Erie in Monroe County. It was authorized and constructed under Section 123 of the River and Harbor Act of 1970 (P.L. 91-1611). The CDF was constructed to contain contaminated dredged sediments from the Detroit and Rouge River federal navigation projects and permitted non-federal users. The latter pay an appropriate disposal fee. The Detroit District manages the facility. After its use for disposal is complete, the State of Michigan will maintain the facility. The design capacity of the facility was 18,600,000 CY and the estimated available capacity is 8,974,000 CY. Approximately 70 percent of the available capacity is reserved for channel maintenance disposal.

c. Other Reports, Research, Projects and Ongoing State and Federal Activities

The following reports are being reviewed as a part of this study:

- 1) **1988 Upper Great Lakes Connecting Channel Study (UGLCCS).** The most intensive studies ever conducted on the Detroit River were between 1984 and 1988 for the UGLCCS. The UGLCCS was a cooperative effort among federal, state, provincial, and municipal governments, with the purpose of assessing environmental quality, pollution sources, and protective actions for the Upper Connecting Channels in the Great Lakes (St. Marys River, St. Clair River, Lake St. Clair, and Detroit River). Based on the extensive collection of water, sediment, and biota data, the study concluded that the Detroit River has the most severe environmental quality problems of the Upper Connecting Channels. Development of the Stage 1 Detroit River Remedial Action Plan (RAP) partially coincided with the UGLCCS. Data and interim reports from the UGLCCS were included in the Stage 1 and the Stage 1 Update that was included as a chapter in the 1996 RAP report.
- 2) **1996 Detroit River Remedial Action Plan Report.** The Detroit River is a binational Area of Concern (AOC). The RAP was developed in three stages: stage one was problem identification, stage two was selection of remedial and regulatory measures, and stage three is monitoring to identify beneficial uses that have been restored. The stage one RAP process began in 1987 and was submitted to the International Joint Commission in 1991. The 1996 Detroit River RAP Report covers stage two and was a primary source of information for this 905(b) analysis. The RAP identified nine impaired uses and described hotspots throughout the Detroit River in need of contaminated sediment remediation and habitat restoration.
- 3) **1997 Trenton Channel Project.** The Trenton Channel is a 9-mile reach between the Michigan mainland and a series of islands that include Grosse Ile. The Trenton channel extends from the upstream end of Fighting Island downstream to Celeron Island (see Figure 3). The top half of the Trenton Channel has a navigational channel that is dredged for commercial shipping by the USACE. The Trenton Channel Project is a set of several sediment activities in the Trenton Channel conducted by the MDEQ and USEPA. The Trenton Channel was identified in the UGLCCS and the Stage 1 RAP as the most polluted segment of the AOC in terms of degraded sediment. Results of the Project sediment sampling in 1993-1996 led to the conclusion that six major depositional areas are extremely contaminated in the Trenton Channel. The Project delineated the volume of currently known hotspots and contamination levels of previously unsampled areas. In addition, the Project addressed low-level contaminant loadings, sediment toxicity, and sediment disposal technologies. Sediment contamination was primarily in depositional areas along the Michigan mainland shore.

- 4) **1998 Rouge River Remedial Action Plan Progress Report.** The initial Rouge River Remedial Action Plan (RAP) was completed in 1989 and was updated in 1994 to include new information and address new issues. The list of use impairments is very similar to that for the Detroit River. A major emphasis of the 1989 RAP was the combined sewer overflows (CSOs), which contributed an estimated 7.8 billion gallons of combined sewage (sanitary and storm water) to the Rouge River annually. CSO controls have since been constructed, thereby curtailing a major source of contaminants to the Detroit River. Sediments in the Lower Rouge River remain contaminated with a wide range of pollutants, such as lead, cyanide, barium, chromium, copper, zinc, and numerous organic chemicals, such as polychlorinated biphenyls (PCBs).
- 5) **1999 Detroit River Update Report.** The Detroit River Canadian Cleanup Committee (DRCCC) prepared the most recent update to the Detroit River RAP process. This report has two purposes: (1) summarize progress made since the 1996 Detroit River RAP Report and (2) help the DRCCC identify problems causing environmental degradation of the Detroit River and prioritize the actions required to restore its ecological integrity. In addition to providing a revised summary of the environmental state of the Detroit River, the report includes the results of scientific studies completed since 1996 that further identify the extent of sediment and biotic contamination. This report concluded that sediments are a major source of contamination to the Detroit River water and contaminant levels in sediments seem to be determining contaminant levels in biota throughout the Detroit River ecosystem. Furthermore, the report concluded that sediment remediation is needed to eliminate fish consumption advisories.

The following sediment contamination removal activities have been completed or are ongoing:

- 1) **Black Lagoon Remediation and Treatment Demonstration.** The Detroit River RAP and the Trenton Channel Project identified the Black Lagoon—a 3.5-acre contaminated site in the mid-section of the Trenton Channel—as a priority site for implementation of sediment and habitat remedial measures. Contaminants at high levels at this site include mercury, PCBs, PAHs, cadmium, chromium, copper, lead, zinc, and oil and grease. A Detroit steel mill immediately upstream of the lagoon was long considered to be the source of contamination. The steel mill closed due to bankruptcy in 1995, leaving the Black Lagoon as an orphan site. The cleanup of the site has become a joint effort between the MDEQ and the USACE–Detroit District. USACE is authorized under Section 401(a), WRDA 1990, to participate in the cleanup of the Black Lagoon sediments. MDEQ and USACE are moving forward with the planning for mass removal of contaminants from Black Lagoon. The goal is to remove approximately 30,000 CY of contaminated sediment down to clean clay, which was found at approximately 8 feet in the sediments. Based on the authority of Section 217, WRDA 92, the USACE has recommended the one-time request for the disposal of 30,000 to 52,900 CY of sediments from Black Lagoon to the

Pointe Mouillee CDF, contingent on MDEQ's acquisition of a Section 10 permit, an executed Memorandum of Agreement between MDEQ and USACE, and completion of the NEPA process.

- 2) **Rouge River Contaminated Sediment Removal.** The entire Rouge River Basin is designated an AOC. Many sediment removal projects have been completed on the Rouge River. The following activities were described in the 1998 Rouge RAP Progress Report and on a USEPA web site (<http://www.epa.gov/grtlakes/sediment/realizing/realpast.html>):
 - Double Eagle Steel Zinc Remediation, Lower Rouge River (1987)—34,500 CY of contaminated sediments were removed from the Rouge River (Turning Basin to Fort Street) as part of an environmental cleanup. The sediments were disposed at Point Mouillee CDF.
 - Evans Products Ditch, Middle Rouge River (1997)—MEDQ-SWQD removed 7,000 CY of PCB-contaminated sediment from ditch, upstream of Newburgh Lake. Approximately 1,800 tons of TSCA-level material were sent to Model City, NY for disposal, the remaining 7,700 tons were taken to a Type II landfill in Michigan
 - Newburgh Lake, Middle Rouge River (1996-1998)—Wayne County coordinated cleanup of the 100-acre lake; removed 558,000 CY of sediment and approximately 350,000 CY contained PCB-contaminated sediment, which were sent to a Type II landfill.
- 3) **Monguagon Creek.** Monguagon Creek is tributary to Detroit River Trenton Channel. It was identified as a site of environmental contamination pursuant to Michigan Act 307 because of contaminated sediments. The source of contamination was determined to be urban runoff and industrial wastewater discharges. It was "highly polluted" with heavy metal (mercury, chromium, zinc, and lead) and organic contaminants (PCBs, phenols, heptachlor, hexachlorobenzene, and extractable oil and grease). The remediation project was completed in 1997, under a voluntary agreement between MDEQ and three chemical companies. Approximately 25,000 CY of contaminated sediment were removed.
- 4) **Conner Creek.** Conner Creek is at the upstream boundary of the Detroit River study area. It is a slack water channel that is also used to discharge CSO to the Detroit River during storm events; otherwise, there is no flow in the Creek. A 3,700-foot by 150-foot area of Conner Creek has approximately 146,000 CY of contaminated sediments. The City of Detroit Water and Sewerage Department is coordinating removal of the contaminated sediments, along with the USACE-Detroit District and the MDEQ. The public notice for the Section 10 (River and Harbor Act 1899) permit indicates the sediment will be dewatered near the channel and hauled to the Pine Tree Acres Type II landfill.

Other Federal, State, and International initiatives for the study area have been and/or are underway to provide ecosystem restoration benefits. These other initiatives include the Great Lakes Water Quality

Agreement, Detroit River Remedial Action Plan, American Heritage River Initiative, Lake Erie Lakewide Management Plan, and the Clean Michigan Initiative. A brief summary is given of each of these non-USACE programs that share the goal of restoring the Detroit River ecosystem.

The Great Lakes Water Quality Agreement (GLWQA) of 1978, as amended in 1987, is an international treaty between the governments of the United States and Canada. The purpose of the GLWQA is to “restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem.” The GLWQA designated 43 Areas of Concern (AOC) around the Great Lakes where beneficial uses of the lakes and tributaries are impaired. In the GLWQA, the U.S. and Canada committed to cooperating with State and Provincial governments in the development and implementation of Remedial Action Plans (RAP) to restore the beneficial uses in the AOC. The Detroit River and the Rouge River are AOC and RAPs have been completed for both of them.

In the 1987 amendment to the GLWQA, the governments of Canada and the United States made a commitment to develop a Lakewide Management Plan for the Great Lakes. The Lakewide Management Plan (LaMP) for Lake Erie has been drafted to restore and protect the Lake Erie ecosystem. Based on ecosystem objectives, the LaMP “provides a binational structure for establishing joint commitments for reducing, eliminating, or preventing sources of beneficial-use impairments.” The removal of contaminated sediments and subsequent ecological restoration in the Detroit River will certainly support the goal of the Lake Erie LaMP, because it will reduce or eliminate beneficial-use impairments.

Another federal program influencing the restoration of the Detroit River is the American Heritage River Initiative. President Clinton formalized the American Heritage River Initiative in a 1997 executive order. The purpose of the initiative is to support community-based efforts to restore and protect the environmental, economic, cultural and historic values of our rivers. The Detroit River was designated an American Heritage River in 1998. The Greater Detroit American Heritage River Initiative supports the restoration of Grosse Ile’s Hennepin Marsh and Trenton Channel’s Black Lagoon.

The State of Michigan uses the Clean Michigan Initiative (CMI) as a source of funding for a wide range of environmental projects, including contaminated sediment cleanup. The CMI has included funding for contaminated sediment cleanup in the Black Lagoon.

5. Plan Formulation

a. National Objectives

The national objective of water and related land resources planning is to contribute to national economic development (NED) consistent with protecting the nation’s environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

Additionally, the national objective concerning the protection, restoration, conservation and management of ecological resources is provided through numerous Federal laws, executive orders and treaties promulgated in recent decades. These provisions include compliance requirements and emphasize protecting environmental quality. They also endorse Federal efforts to advance environmental goals, and a number of these general statements declare it national policy that full consideration be given to the opportunities which projects afford to ecological resources. Contributions of ecosystem restoration to the nation's ecosystems are to be measured by changes in the amounts and values of habitat. Recent water resources authorizations have enhanced opportunities for Corps involvement in studies and projects to specifically address objectives related to the restoration of ecological resources. Specific authorities for new individual studies and projects to restore ecological resources have also been provided in legislation. Examples of legislation that broadly support Federal involvement in the restoration and protection of ecological resources are as follows:

- Fish and Wildlife Coordination Act of 1958, as amended
- Federal Water Project Recreation Act of 1965, as amended
- National Environmental Policy Act of 1969, as amended
- Coastal Zone Management Act of 1972, as amended
- Water Pollution Control Act of 1972, as amended
- Endangered Species Act of 1973, as amended
- Water Resource Development Acts of 1986, 1988, 1990, 1992, 1996

b. Public Concerns

A number of public concerns have been identified during the course of the reconnaissance study. Public comment was solicited during a public workshop held on March 22, 2000 in Trenton, MI, near the project study area. The meeting was co-hosted by the Detroit District U.S. Army Corps of Engineers and the non-federal sponsor, the MDEQ. The public concerns expressed that are related to the establishment of planning objectives and planning constraints are:

- 1) Will there be an effort to identify responsible parties?
- 2) Do existing CDFs in the region leak?
- 3) Suggested sediment disposal alternatives included capping material at the Allen Creek Park Mine, a new CDF at Celeron Island, cement lock technology, expansion of the Pointe Mouille CDF, a new CDF off of Woodtick Peninsula, and cover material for the Riverview (and other regional) Landfill.

- 4) Suggested dewatering alternatives included using brownfield sites along the Detroit River, using an existing cell at the Pointe Mouillee CDF, polymer addition technology, and hydro-cyclone technology.
- 5) How extensive was sediment testing, and is there a possibility that additional dredging sites could be identified after the remediation is complete?
- 6) Will the water be safe for swimming after the dredging?
- 7) Are MDEQ permits required for sediment disposal because the sediments were classified as a solid waste?
- 8) Which alternatives, including natural recovery, would be considered?
- 9) What Class landfill (Class I, Class II, or Class III landfill) would accept the dewatered sediments?
- 10) Will permits be required for dewatering operations?
- 11) Will water used to clean barges and pipelines during the dredging process be contaminated? If so, how will it be handled?
- 12) What effect will the project have on navigation depths?

c. Problems and Opportunities

1) Problems

(a) Existing Conditions

The existing conditions of the Detroit River watershed, biota, and contaminant levels are presented as a basis for understanding the problems and opportunities regarding contaminated sediments in the Detroit River.

Detroit River Watershed. There are approximately four million people living in the 807 square mile watershed of the Detroit River (not including the drainage to Lake St. Clair); approximately 87 percent of those people are living in the U.S. Most of the water flow in the Detroit River is from Lake St. Clair. There are five Michigan tributaries and three Ontario tributaries to the Detroit River. These tributaries account for less than 5 percent of the flow into the Detroit River. The Rouge River (Michigan) is the largest tributary, draining an area of approximately 467 square miles. The Rouge River is an Area of Concern with its own RAP.

Biota. Benthic communities are degraded throughout the Detroit and Rouge Rivers, in deposition zones below former industrial sites and CSOs. The majority of the severely impacted zones are along the lower U.S. shoreline. The degraded benthic communities are generally dominated by pollution

insensitive species. Currently 65 native and exotic species of fish live in the Detroit River. At one time, there were 40 other species inhabiting or migrating through the river.

Six species of fish in the Detroit River are listed on the Michigan fish consumption advisory for PCBs, dioxins, and/or mercury. The species include carp, freshwater drum, northern pike, redhorse sucker, walleye, and yellow perch. All of these species are reported to have PCBs; mercury was reported in the freshwater drum and walleye; dioxins were reported in the carp. The 1996 Detroit River RAP reported that carp and walleye were sampled from the Detroit River in 1990, 1992, 1993, and 1994, as part of a statewide fish trend monitoring effort. The Detroit River had one of the highest levels of PCBs, with mean concentrations in carp of 3.75 mg/kg. Fish tissue monitoring continued in 1998 and 1999. The concentrations of PCBs and mercury appear to have leveled off in the 1990s. In the Spring of 2000, the Great Lakes Institute for Environmental Research (GLIER) reported that muskellunge in the Detroit River still exceed human consumption guidelines for mercury and organic contaminants, including PCBs. Liver tumors at levels exceeding background have been found in five species of live fish.

The Detroit River is an important habitat and migration flyway for birds. Twenty-seven species of waterfowl are found in the Detroit River's wetlands, and at least 17 species of raptors live in, or migrate through, the area. More than 48 other bird species are resident or migrate annually along the river. Although there are no documented bird or animal deformities associated with the Detroit River, a study of ducks has concluded that the Detroit River/Western Basin of Lake Erie corridor is a major source of PCBs to migrating ducks.

Among the aquatic plants, wild celery (*Vallisneria americana*) is a valuable food for migrating waterfowl. The production of wild celery buds have decreased 72 percent from 1950 to 1985, thereby reducing the amount of food available to migrating ducks and the number of canvasback ducks, redhead ducks, and scaup using the Detroit River migration routes.

Contaminants—Types and Sources. Former historical industries and combined sewer overflows (CSOs) have been primary contributors of cadmium, copper, lead, mercury, PCBs, and zinc to Detroit River sediments. In general, contaminant loadings have declined two- to three-fold between the 1980s and 1990s for mercury and PCBs. While source controls appear to be having a positive effect, several major sediment depositional zones in the Detroit River remain highly contaminated with heavy metals and synthetic organic chemicals. The 1996 Detroit River RAP report summarized the range of concentrations for contaminants in the Detroit River and background concentrations in Lake St. Clair and from the lowermost interval of a Detroit River sediment core (Table 1). The Lake St. Clair concentrations are from 12 cores reported in 1988. The Trenton Channel sediment concentrations were taken from the 1997 Trenton Channel Study (sediment cores collected 1993-1996). All of the metals in the top range of the Detroit River sediments are well above the background levels in the top range represented by Lake St. Clair sediments in the stable zone. The

maximum reported mercury concentration in the Trenton Channel (Table 1) is 940 times higher than the background mercury concentration shown in Table 1 for the Lake St. Clair sediments.

Table 1. Contaminants in the Detroit River Identified in the Detroit River and Background Concentrations (ppm dry weight)

Contaminant	Lake St. Clair (Background)	Detroit River Sediment Range RAP Stage 1	Trenton Channel 1993-1996 (max)
Arsenic	8.4	0.86 - 36	
Cadmium	0.78 – 2.5	<0.1 - 41	40
Chromium	11 – 23	4 – 680	500
Copper	5.1 – 11.8	0.5 – 280	630
Iron		2600 – 180,000	137,000
Lead	0.0 – 13.1	<1.0 – 810	580
Manganese		71 – 2800	2,090
Mercury	0.017	<0.01 – 55.8	16
Nickel	8.5 – 21.1	3 – 300	251
Zinc	29.4 – 55.4	6 - 53,000	3,320
PCB, total		<0.001 - 40	18
Solvent Extractables (Oil & Grease)		20 - 47,226	71,000

Twenty-six “hotspots” in the Detroit River were identified based on degradation of the benthos or mercury concentrations in the sediments (Figure 2). The hotspots are primarily downstream of former industries, including a chloralkali plant, and were selected because of their high mercury concentrations in the sediments. Many of these sites have closed and therefore no additional controls are planned. Combined sewer overflows (CSOs) have also been identified as major sources of contamination. These are being addressed by Wayne County and the City of Detroit through their EPA-sponsored Wet Weather Demonstration Project and new controls on CSOs. Stormwater runoff is also considered a major source of contaminants.

Combining both historical data and results from the Trenton Channel Project, six major sediment contaminant areas were identified in the Trenton Channel, which have an estimated 483,000 CY of contaminated sediment. These depositional areas consist primarily of fine sand and silt. The six areas are Allied Fuel Oil Slip, Nicholson South Slip, Firestone Steel Area, Black Lagoon, Elizabeth Park North Canal, and Elizabeth Park South Canal-Inlet. Contamination is due predominantly to historical practices and loadings have been dramatically reduced. The primary contaminants of concern are mercury, PCBs, PAHs, heavy metals, and oil and grease.

Contaminated sediments hold the largest mass of pollutants in the Detroit River, and consequently the sediments are now the largest source of mercury to the system. A review of mercury mass balance modeling and loadings (UGLCC Mass Balance, WSU ASDM Model, USGS CSO Study) in the Lake

Huron–Lake Erie corridor reveal that in-place sediments in the Detroit River are the single largest source of input of mercury to the corridor. Combined with St. Clair River sediment inputs, sediments account for close to 60 percent of the mercury input to the system. Given that the sources of PCBs have stopped, the contaminated sediments are also most likely the largest source of PCBs to the river.

Superfund Sites. A query of the U.S. EPA CERCLIS (list of superfund sites) database identified 61 facilities in Wayne County having a Superfund Site ID. The only site currently on the Final National Priorities List (NPL) is the Lower Ecorse Creek Dump. Ecorse Creek discharges to the Detroit River at a point downstream of the Rouge River and upstream of Monguagon Creek.

(b) Expected Future Conditions

The Detroit River ecosystem has been degraded by the chemical contamination of sediments. Contaminated sediments have contributed to the following problems, which are expected to continue without contaminated sediment remediation.

- The Detroit River has been designated an Area of Concern (AOC) by the International Joint Commission and nine beneficial use impairments have been identified:
 1. Restrictions on wildlife and fish consumption
 2. Fish tumors and other deformities
 3. Tainting of fish and wildlife flavor
 4. Degradation of benthic communities
 5. Restrictions on dredging activities
 6. Taste and odor problems in the drinking water.
 7. Public beaches are closed
 8. Degradation of aesthetics
 9. Loss of fish and wildlife habitat
- Based on biological effects criteria, there are several identifiable areas of contaminated sediment in the U.S. portion of the Detroit River. Sediments are heavily contaminated with metals and organic contaminants.
- There have been historic and current cases of fish community degradation and contamination, as well as the issuance of fish consumption advisories. Recent studies have shown that concentrations of contaminants in fish from the Detroit River increase with the amount of exposure to sediments.
- Large portions of the system exhibit severely impacted benthic communities. The 1996 Detroit River RAP identified priority sites that have severely impacted benthos.

- Impairments to human health and the environment are likely to continue for many years unless there is remediation of the contaminated sediments in the Detroit River.
- Modeling studies at other Areas of Concern in the Great Lakes Region have shown that contaminated sediments can be expected to have an impact on fish and wildlife for over 100 years because of continual resuspension and movement of the contaminated sediments.

2) Opportunities

312(b) Ecosystem Restoration Benefits. Ecosystem restoration is a primary mission of the Corps Civil Works program; and the purpose of Civil Works ecosystem restoration activities is to restore significant ecosystem function, structure, and dynamic processes that have been degraded (EP 1165-2-502).

Removal or isolation of contaminated sediments would result in the following ecosystem benefits:

- Reduction in the bioavailability of contaminants to the biota of the Detroit River and associated Great Lakes system, which would lead to improved water quality and reduction in fish consumption advisories, which results in improved human health. The original major sources of contaminants to the Detroit River are either gone or controls appear to be in place. Therefore, removal of existing contaminated sediments should lead to a long-term improvement in physical, chemical, and biological integrity of the Detroit River.
- Wildlife habitat restoration and enhancement. The 1996 Detroit River RAP identified 19 sites for habitat restoration and more recent USGS studies have identified 80 to 90 sites. The RAP specifically highlighted five sites for immediate habitat restoration on the U.S. side of the Detroit River. They include Belle Isle, Grassy Island/Wyandotte National Wildlife Refuge, Humbug Bar, Navigational Channel Dikes, and Celeron Island (Figure 2). Habitat assessment research continues and could be evaluated in the feasibility study.

The MDEQ has identified approximately 483,000 CY of extremely contaminated sediments along the Michigan shore in the Trenton channel, 500,000 CY in the upper Detroit River, and 1,000,000 CY in the Lower Rouge River. In addition, the MDEQ estimates there are another 1,000,000 CY of contaminated sediment within the Detroit River and nearby AOCs that have not been specifically identified yet. The feasibility study will need to better define the sediment volumes and contamination levels to more accurately evaluate cleanup costs and alternatives.

Potential for 312(a) Navigation Benefits. Section 312(a) of WRDA 1990, as amended by Section 205 of WRDA 1996, provides for the removal of contaminated sediments outside the boundaries of or adjacent to a Federal navigation project as part of the operation and maintenance of the project. Given that the USACE-Detroit District oversees maintenance dredging of the Lower Rouge River and the Detroit River, there is potential for navigation benefits under the Section 312(a) authority in this study area to supplement the ecosystem restoration benefits. This especially is the case for the Rouge River

because the navigation channel spans a large portion of the river's cross section from the turning basin to the mouth.

Potential Benefits for Other Authorizations. Ecosystem-based restoration can also be pursued under Section 1135 of WRDA 1986, and/or the authority of Section 204 of WRDA 1992 for the beneficial use of dredged material, and/or Section 206 (Aquatic Ecosystem Restoration) of WRDA 1996. Those ecosystem restoration activities that involve modification of hydrology or aquatic substrates are most likely to be appropriate for Corps initiatives and include ecosystems classified as wetlands, riparian and other aquatic systems. These options should be evaluated in the feasibility study.

d. Planning Objectives

- 1) To restore the Detroit River ecosystem where it has been damaged by contaminated sediments.
- 2) To reduce the following impairments on beneficial uses, by removing and remediating contaminated sediments in the Detroit River:
 - Degradation of benthic communities
 - Restrictions on wildlife and fish consumption
 - Fish tumors and other deformities
 - Tainting of fish and wildlife flavor
 - Loss of fish and wildlife habitat
 - Restrictions on dredging activities
- 3) To identify alternative remediation plans that will maximize environmental benefits and minimize costs.

e. Planning Constraints

Potential planning constraints could consist of:

- Compliance with local land use plans
- Applicable Statutes, Regulations and Executive Orders
- Other

No constraints have been identified at this time. The potential constraints will be reviewed with the MDEQ during the feasibility phase.

f. Measures to Address Identified Planning Objectives

There is a range of approaches and technologies available to address contaminated sediments. A listing of categories of potential approaches, the associated general technologies, and the specific options for

implementation are displayed in Table 2. Only the more promising and demonstrated technologies are shown. There are a number of general technologies, such as in-situ biological or chemical treatment, that are not included in the table because they are ineffective, not demonstrated, or have significant implementation problems. The technologies and options retained in Table 2 are potentially viable approaches to managing contaminated sediment. These approaches will be evaluated systematically in the Feasibility Study to identify the most cost-effective technologies that accomplish the project objectives.

Table 2. Potential Actions for Addressing Contaminated Sediment

Category	General Technology	Specific Option
No Action	None	Not Applicable
Institutional Controls	Physical, Engineering or Legislative Restrictions	Consumption Advisories Access Restriction Dredging Moratorium
Containment	Capping	Sand Cap Armored Cap Composite Cap
Removal	Dredging	Hydraulic Dredging Mechanical Dredging
<i>Ex Situ</i> Treatment	Chemical/Physical	Sediment Washing
	Physical	Solidification Vitrification
	Thermal	Thermal Destruction/Cement Lock Technology
Dewatering	Mechanical	Centrifugation Belt Press Hydrocyclone Diaphragm Filter Press
	Gravity	On-Barge Dewatering Lagoons/Ponds Solidification
Disposal	In-River Disposal	Level Bottom Cap (relocate sediment and cap) Confined Disposal Facility (CDF)
	On-Land Disposal	Dedicated New Upland Landfill Existing Landfill (county, private, or industrial) Upland Confined Fill (commercial/industrial)

In addition to the categories in Table 2, there are implementation strategies that will be evaluated in the feasibility study. These will include phasing the implementation of the actions. The basis for the sequencing may be contaminant concentrations, preferred season for work in certain locations, upstream-to-downstream progression, prioritizing areas where contaminant sources to the river have already been removed, budget constraints, or other logical systems. Phased implementation does not materially retard the ecological benefits from the project, as ecological recovery has a natural delay associated with it, and environmental benefits accumulate incrementally. However, phased implementation must be sequenced to insure that movement of contaminated upstream sediments do not re-contaminate areas already restored downstream. Another implementation strategy that will be addressed in the feasibility study is

the integration of the sediment cleanup work with Michigan's efforts to clean up industrial and municipal discharges to the river.

g. Preliminary Plans

Preliminary plans that offer a range of approaches to addressing the contaminated sediment and to achieving the environmental benefits and planning objectives are presented here. Four alternatives are presented for consideration. Cost estimates, assumptions, and preliminary identification of benefits are included.

The areas and volumes of sediment to address have, to date, been identified in only a general way. Figures illustrating identified locations of contaminated sediment, and repeated here, were published in the 1996 *Detroit River Remedial Action Plan* (Figure 2) and the 1998 *Final Report of the Upper Great Lakes Connecting Channels Study* (Figure 3). These sources do not supply estimates of the volume or areas of contaminated sediment, nor do they contain the information needed to form satisfactory estimates of volumes or areas. For the purposes of estimating costs for the preliminary plans in this study, the volume suggested by a representative of MDEQ will be used: 3 million cubic yards. The area covered by the sediment is arbitrarily assumed to be 600 acres, corresponding to an average contaminated sediment thickness of 3 feet. It should be recognized that the volume and area estimates at this stage are very preliminary, and could easily change by more than a factor of 2 as more information is obtained during the additional studies.

The levels of cleanup and associated ecosystem restoration benefits to be achieved are very important in determining the volume and area of sediment to address. Additional information is needed to provide useable volume and area estimates for a range of cleanup levels of contaminated sediments to arrive at the net environmental benefits of each cleanup level. The feasibility study will include an analysis of the compiled information from past studies to guide the collection of the additional information.

The preliminary plans presented in this section are:

- 1) No Action
- 2) Dredging
- 3) Capping
- 4) Dredging and Capping

Prior to presenting these alternatives, several matters common to the alternatives, cost estimates, and the general approach for these preliminary plans are presented.

Cost estimates for the alternatives were developed using the planning-level unit costs that are consistent with costs for this type of work at other projects around the U.S.:

- Dredging (hydraulic or mechanical), dewatering and transport to CDF or transfer location: \$8/cy to \$16/cy
- Confined disposal facility (CDF) placement: \$12/cy
- Upland landfill placement, including transportation and stabilization: \$110/cy
- Capping (1.5 feet sand, 0.5 foot cobble armoring): \$18/sy

The cost estimates use a factor to account for the other work associated with the alternatives, such as mobilization, sampling and analysis, and engineering design and oversight that are not represented in the above unit costs. In addition, a contingency factor appropriate to the level of uncertainty associated with the sediment volumes and other factors that affect costs was applied to the cost estimates for the four alternatives.

Dredging and dewatering technologies are available to suit the conditions likely to be found in the Detroit River sediments. The advantages of mechanical versus hydraulic dredging for the sediments and specific conditions of the Detroit River, including minimizing downstream migration of contaminants during dredging, will be evaluated in the feasibility study. Sediment management includes dewatering the sediment, treating the dewatering water, and discharging treated water back to the Detroit River. The dewatering costs assume that water treatment consists of settling and sand filtration. No other treatment of the water was assumed. Costs for water treatment can increase significantly if there is no flexibility on discharge water quality requirements. Consequently, participation by the state in water management decisions will be of great importance.

Restoration of the river bottom may involve placement of habitat-enhancing materials, adding cover material, or allowing natural processes to cover the dredged areas. The cost of restoration is not included in these estimates, but may be considered in the feasibility study as a value-added option, if appropriate. This type of restoration may require justification under other Corps environmental restoration authorities.

For upland disposal, the cost of using existing landfills is considered to be representative for either using existing landfills or developing a new landfill. The tipping fees at a landfill capture the real cost of siting a landfill, purchasing the land, placing the sediment, and maintaining, securing, monitoring, and ensuring the long-term integrity of the containment, so the cost estimates include typical commercial landfill tipping fees. The potential locations for a new facility (if needed) will be identified during the feasibility study in coordination with County waste management personnel. Landfills in the four-county area near the Detroit River will be contacted during the feasibility study to determine their potential capacity, tipping fees, and potential practicability issues with using their facility.

CDF disposal may be at an existing facility (including some expansion, if needed), or at a new facility. The feasibility study evaluation of potential locations for establishing a new CDF will favorably consider the beneficial effects of possible CDF locations on protection of other environmental resources. Once the

contaminated sediments have been removed to a CDF or other repository, they will be highly amenable to treatment, should others so desire.

One further possibility for sediment disposal is use as landfill cover material (daily cover or final cover), or as fill beneath a cover or cap, such as at the Allen Creek Park Mine. In general, these uses could be considered for lightly contaminated sediments only. Sediment disposal by beneficial reuse is noted here in the reconnaissance study, but further evaluation is reserved for the feasibility study.

The four alternatives presented below are based on the evaluations and assumptions discussed above. With each alternative is a brief summary of environmental benefits expected from that alternative. A summary table for all four alternatives is presented in Table 3.

1) No Action

No Action is used as a future baseline condition against which to compare other alternatives. No Action assumes no major Federal project is implemented. This option involves no project costs other than those already planned or resources already expended, as described in Section 4 above. Under the No Action alternative, the degraded benthic communities, impaired aquatic plants, and fish consumption advisories described earlier in the Existing Conditions section will persist. The adverse environmental and ecosystem consequences will continue without mitigation. This remedy relies on the natural processes of erosion and sedimentation to remove and cover contaminated sediments. This process can be expected to extend over many decades. Ecological resources may suffer periods of degrading conditions as well as periods of improving conditions, because the contaminated sediment remains in the ecosystem.

2) Dredging

The dredging alternative assumed 3 million cubic yards of contaminated sediments would be removed and placed in a containment system, either a CDF or a landfill. The estimated cost is from \$120 million with CDF disposal to \$700 million with upland disposal. No O&M or post-project water quality monitoring was assumed in this estimate. No portion of the sediment was assumed to require disposal as a hazardous waste. The dredging in this alternative would be expected to address the “hotspots” identified on Figure 2. The likely extent of dredging in these areas has not been characterized in the reports reviewed for this study.

The dredging alternative will reduce the bioavailability of contaminants to the biota of the Detroit River and associated Great Lakes system. This is expected to improve water quality and may lead to a reduction and eventual elimination of fish consumption advisories. Dredging also creates the opportunity for habitat restoration and enhancement. Without removal or management of the contaminated sediment, the merits or benefits of habitat improvement projects would be questionable.

3) Capping

The capping alternative assumes that the contaminated sediments are located in areas conducive to capping: water depth, flow velocities, and river use are compatible with capping. As these conditions may not be found at all contaminated sediment locations, a range of additional dredging volumes, from 10 to 30 percent of the 3-million cubic yard estimate, was assumed in addition to 600 acres of cap construction. The cost estimate also assumes annual O&M of 4 percent of the original cap construction cost, to account for cap repair and replacement. The present worth of this annual cost was included in the cost estimate. Water quality monitoring or other monitoring was not included.

The estimated cost for capping is from \$180 million to \$380 million. The area that would be capped is not defined by the available information. This alternative would be expected to cap the hotspots shown on Figure 2, after dredging if needed. The Detroit River RAP identified degraded benthos over the area shown on Figure 3. That area is on the order of 20 square miles, whereas the area capped in this alternative is about 1 square mile.

The benefits from capping will be similar to those of dredging, but with several important limitations. Since the sediments would be left in place, they will continue to slowly release their contaminants, potentially having an adverse impact on water quality and the benthic community in the capped areas. The capped areas themselves may not be desirable habitat features, as the capped areas, with their potentially degraded water quality would be located at contaminated sediment deposits. However, capped areas could be designed to provide environmental enhancement if found to be feasible. This should be explored in the feasibility phase.

4) Dredging and Capping

The dredging and capping alternative combines dredging of portions of the sediment and capping of other areas. Dredging would be implemented in areas where conditions are unfavorable to capping or other factors favor dredging. Capping would be implemented in areas unlikely to require significant maintenance (replacement or repair) for the cap, including some areas where dredging may be supplemented by capping.

The appropriate combination of dredging and capping will be based on evaluations conducted during the feasibility study. For this reconnaissance estimate, the assumed proportions are 1.5 million cubic yards dredging and 400 acres capping. The estimated cost of this alternative is \$160 million to \$450 million. This estimate allows for limited dredging in some areas that will be capped.

The dredging and capping alternative is intended to blend the benefits of the dredging alternative and the capping alternative, while minimizing the disadvantages. The cost estimate for this alternative assumes O&M costs of 2 percent of the cap construction cost.

The benefits of this alternative would be very similar to those of the Dredging alternative: reduced bioavailability of contaminants to the biota of the Detroit River and associated Great Lakes system, improved water quality, eventual lifting of fish consumption advisories, and corollary benefits to the health of fish consumers. Improved production of aquatic vegetation would be expected, with benefits to migrating waterfowl. The cap portion of this alternative would still suffer from the potential disadvantage of poor water quality within the cap. Well-selected capping sites may enhance the benthic environment for some ecological purposes.

Table 3. Detroit River 905(b) Alternatives Comparison Summary

	No Action	Dredging	Capping	Dredging and Capping
Cost	0	\$120–\$700 million	\$180–380 million	\$160–\$450 million
Benefits				
Aquatic/Benthic Habitat	Degraded	Improved	Moderately Improved	Improved
Biota Contamination	Degraded	Improved	Moderately Improved	Improved
Public Perception of Residual Risk	High	Low	Moderate	Low
Other Considerations				
Dredging (312(a)) Savings	None	Moderate	Minimal	Moderate
Land Use	River not improved	Potential need to site new landfill or new CDF	Placement of material into river rather than removal	Possible need to site new landfill or CDF
Social Effects	Continued concern with contaminated condition of river.	Likely public opposition to disposal in CDFs and/or landfills. Major public support for cleaning the river.	Likely public opposition to leaving contaminated sediments in place.	Likely public opposition to disposal in CDFs and/or landfills. Major public support for cleaning the river.

5) Black Lagoon and BASF (BASF, Riverview and Monguagon) Sites

The State of Michigan Department of Environmental Quality (MDEQ) has expressed a desire to expedite the feasibility and design for two (2) sites, those being the Black Lagoon site in Trenton, Michigan and the BASF (BASF, Riverview, and Monguagon) site in Riverview, Michigan. The primary reason for expediting study and implementation on each of the sites is due to the amount of existing contaminate analysis and delineation data as well as engineering and design work at each location. The MDEQ has expressed a great desire to remediate these two sites as soon as possible. The MDEQ considers each of the sites to be high priority and high public visibility. A great part of the MDEQ's willingness to participate as a cost share partner in a broad based study of the Detroit River is based on the expediting of the Black Lagoon and BASF sites. A summary description of each of these sites follows.

In order to expedite the study and implementation efforts at each of the sites it is recommended that each site be reported on under the Continuing Authorities Program (CAP), specifically Section 206 of the Water Resource Development Act of 1996.

The Michigan Department of Environmental Quality has indicated that neither the Black Lagoon nor the BASF site have potentially responsible parties identified for the contamination present.

a. Black Lagoon

Black Lagoon is located along the Trenton Channel of the Detroit River in the City of Trenton, Michigan. Specifically, the area called Black Lagoon is located in the immediate vicinity of where King Road comes to a dead end at the edge of the Trenton Channel. The MDEQ and the U.S. EPA conducted sediment sampling and analysis along the Trenton Channel from 1993-1996. The MDEQ-EPA identified the Black Lagoon as a priority site for implementation of sediment remedial measures. The MDEQ prepared a Remedial Action Plan (RAP) specific to Black Lagoon to address site remediation alternatives with the primary goal of removing the contaminated sediments and restoring habitat. Finally, the MDEQ has contracted with the Detroit District, Corps of Engineers to initiate plans and specifications for dredging of the Black Lagoon.

Black Lagoon is an exposed cove about 3.5 acres in size. MDEQ estimates about 20,625 cubic yards of contaminated sediments exist at the site. Sedimentation of the lagoon resulted from contaminants discharged from the former McLouth Steel-Trenton Steel Mill plant located directly north of the lagoon. McLouth-Steel is no longer in business. The flow from Trenton Channel of the Detroit River circles in Black Lagoon and suspended sediments settle out. The lagoon acted as a settling basin and is currently filled. Identified contaminants include: oil and grease, heavy metals, mercury, PAH's and PCB's. These constituents were dispersed throughout the organic silt layer, followed by clean clay.

Site and vicinity maps as well as total project costs for the feasibility and implementation phase will be determined during preparation of the Preliminary Restoration Plan (PRP) for the proposed Section 206 study. A schedule for the feasibility and plans and specifications phases is provided below.

Black Lagoon Site – Detroit River, Michigan
Feasibility Study (Section 206 – Aquatic Habitat Restoration)

18 December 2001

Feasibility Study Schedule				
Activity	Initiate (Week #)	Duration (Weeks)	Complete (Week #)	Lead
Funds Received to Initiate Feasibility Study of for Removal and Disposal of Contaminated Sediments	1	1	1	
The following activities are complete: Data Collection, hydrographic and topographic surveys and mapping, geo-technical surveys and mapping, hydraulics and hydrology analysis	Done	Done	Done	
Plan Formulation.	1	9	10	
Provide preliminary R.O.W. to Real Estate Division, if applicable, for Black Lagoon	11	1	12	
Design -alternatives/recommendation of plan.	12	7	19	
Coordinate w/sponsor relative to property map and prepare/approve "Gross Appraisal"	20	7	27	
RE Writeup- (include RE Plan & LERRDS costs)	28	3	31	
Construction cost estimate for both sites.	20	2	22	
Economic analysis (Environmental and Economic Benefits) for both sites.	22	4	26	
Draft Feasibility Report and Environmental Assessment.	22	10	32	
Independent Technical Review of Draft Feasibility Study and EA	33	3	36	
Incorporate Comments, Revise Draft Feasibility Study and EA	37	2	39	
Revise, if necessary, & mail-out of Feasibility Study and EA to sponsor/public for 30-day review	40	1	41	
30-Day Public Review. Sponsor/public comments on Draft Feasibility Study and EA	42	4	46	
Feasibility Study and EA finalized/FONSI signed by DE	47	4	51	
Division Level Approval	52	4	56	
TIME ADJUSTMENT PERIOD			56	

Black Lagoon Site – Detroit River, Michigan

Plans & Specifications (Section 206 – Aquatic Habitat Restoration)

18 December 2001

Plans and Specifications (P&S) Schedule for Black Lagoon				
Activity	Initiate	Duration (Weeks)	Complete	Lead
Funds Received to Initiate expedited Plans & Specifications for Black Lagoon				
Preparation of P&S (50% complete)	Complete			
Preparation of P&S (100% substantial completion)	1	5	6	
Provide sponsor copy of P&S; request a letter of intent (confirmation); invite to BCOE review conference	7	3	10	
Letter of intent received from sponsor			10	
BCOE comments incorporated by appropriate office(s)	9	1	10	
Route P&S for in-house concurrence	11	1	12	
Request for project construction approval to CELRD	11	1	12	
Receipt of project approval/commitment of construction funds	13	1	14	
Notify affected Congressional Delegation; also notify District elements	15	1	16	
PCA executed/non-Fed funds received	15	4	19	
Advance Notice to Bidders prepared	20	1	21	
Advance Notice to Bidders mailed out	22	2	24	
Advertisement (30-day)	25	4	29	
Bid opening		1 day		
Request for construction funding	29	1	30	
TIME ADJUSTMENT PERIOD			30	

b. BASF

The BASF site (BASF, Riverview and Monguagon Creek Locations) is located above and below the Grosse Ile toll bridge in Riverview, Michigan. Similar to the Black Lagoon site, the MDEQ has conducted sediment analysis and contaminant delineation at the BASF site. The MDEQ identifies the BASF site as the Firestone Steel Area – primarily and the area in front of Monguagon Creek. MDEQ estimates that 61,215 cubic yards of impacted sediments exist at the Firestone Steel Area and 58,212 cubic yards of impacted sediments exist at the area in front of Monguagon Creek. Contaminants of concern in the area include: heavy metals, PAH's, PCB's, and oil and grease that are primarily concentrated in depositional pockets of fine sand and silt. The Firestone Steel site has the highest concentration of Mercury of an Trenton Channel Project Site and high levels of total PCB's and elevated levels of total PAH's and oil and grease.

Site and vicinity maps as well as total project costs for the feasibility and implementation phase will be determined during preparation of the Preliminary Restoration Plan (PRP) for the proposed Section 206 study. A schedule for the feasibility and plans and specifications phases is provided below.

BASF Site – Detroit River, Michigan

Feasibility Study (Section 206 – Aquatic Habitat Restoration)

18 December 2001

Feasibility Study Schedule				
Activity	Initiate (Week #)	Duration (Weeks)	Complete (Week #)	Lead
Funds Received to Initiate Feasibility Study for Removal and Disposal of Contaminated Sediments	1	1	1	
Data Collection. Prior MDEQ Sediment Testing and Reconnaissance Reports	1	2	3	
Hydrographic and Topographic Surveys and Geo-technical Borings and Sediment Testing (Scope of Work, Negotiate Work Order, and Field Work)	1	6	7	
Survey Mapping and Geo-technical Report.	8	4	12	
Hydraulics and Hydrology Analysis.	8	4	12	
Plan Formulation.	13	9	22	
Provide preliminary R.O.W. to Real Estate Division, if applicable, for BASF	23	1	24	
Design -alternatives/recommendation of plan.	24	7	31	
Coordinate w/sponsor relative to property map and prepare/approve "Gross Appraisal"	32	7	39	
RE Writeup- (include RE Plan & LERRDS costs)	40	3	43	
Construction cost estimate for both sites.	32	2	34	
Economic analysis (Environmental and Economic Benefits) for both sites.	34	4	38	
Draft Feasibility Report and Environmental Assessment.	34	10	44	
Independent Technical Review of Draft Feasibility Study and EA	45	3	48	
Incorporate Comments, Revise Draft Feasibility Study and EA	49	2	51	
Revise, if necessary, & mail-out of Feasibility Study and EA to sponsor/public for 30-day review	52	1	53	
30-Day Public Review. Sponsor/public comments on Draft Feasibility Study and EA	54	4	58	
Feasibility Study and EA finalized/FONSI signed by DE	59	4	63	
Division Level Approval	64	4	68	

BASF Site – Detroit River, Michigan

Plans & Specifications (Section 206 – Aquatic Habitat Restoration)

18 December 2001

Plans and Specifications (P&S) Schedule for BASF				
Activity	Initiate	Duration (Weeks)	Complete	Lead
Funds Received to Initiate Plans & Specifications	1	1	1	
Preparation of P&S (50% complete)	1	5	6	
Preparation of P&S (100% substantial completion)	7	5	12	
Provide sponsor copy of P&S; request a letter of intent (confirmation); invite to BCOE review conference	13	3	17	
Letter of intent received from sponsor			17	
BCOE comments incorporated by appropriate office(s)	16	1	17	
Route P&S for in-house concurrence	18	1	19	
Request for project construction approval to CELRD	18	1	19	
Receipt of project approval/commitment of construction funds	20	1	21	
Notify affected Congressional Delegation; also notify District elements	22	1	23	
PCA executed/non-Fed funds received	24	4	28	
Advance Notice to Bidders prepared	29	1	30	
Advance Notice to Bidders mailed out	31	2	33	
Advertisement (30-day)	34	4	38	
Bid opening		1 day		
Request for construction funding	38	1	38	
TIME ADJUSTMENT PERIOD			38	

h. Conclusions from the Preliminary Screening

The following conclusions can be made after reviewing the existing information concerning the problems, opportunities, and potential solutions associated with the Lower Rouge River and the Detroit River:

- 1) The Detroit River and the Lower Rouge River have very highly contaminated sediments and degraded aquatic ecosystems;
- 2) Opportunities exist to achieve significant ecosystem restoration benefits by various alternatives methods;
- 3) Depending on the location, quantity, and type of contamination in the sediments, some combination of dredging and capping appears to be cost-effective, socially acceptable and would provide sufficient ecosystems restoration benefits to justify the costs;
- 4) Significant additional information and investigation is needed before any specific alternative could be properly evaluated and potentially implemented; and
- 5) Significant interest has been expressed by local, State, Federal and Canadian entities in the restoration of the beneficial uses of the Detroit and Lower Rouge rivers. The Michigan Department of Environmental Quality has expressed interest in being the lead non-Federal entity in the development of a solution.
- 6) Due to the preliminary nature of this evaluation, specific dredged material disposal alternatives and sites will be identified in the feasibility phase, as necessary.
- 7) Further detailed feasibility studies to examine environmental restoration improvements on the Detroit River, Michigan are warranted.

6. Federal Interest

Since ecosystem restoration is a project output with a high budget priority and ecosystem restoration is the primary output of the alternatives to be evaluated in the feasibility phase, there is a strong Federal interest in conducting the feasibility study. There are over 65 species of fish that live in the Detroit River and over 92 species of birds that live in or migrate through the area. Mercury and organic contaminants, including PCBs, from the Detroit River and surrounding area, appear to be responsible for elevated levels of contaminants in several species of birds and fish. There is also a Federal interest in other related outputs of the alternatives including commercial navigation benefits that could be developed within existing policy. Based on the preliminary screening of alternatives, there appears to be potential project alternatives that would be consistent with Army policies, costs, benefits and environmental impacts. The authorization of a Greenway Corridor study in the potential project area underscores the importance of the

river corridor to the region. Also, the designation of the Detroit River as an American Heritage River in 1998 formalized the national commitment to support restoration and protection of the environmental, economic, cultural, and historic values of the Detroit River. An improved riverine ecosystem would be an integral component to a greenway corridor and would support the goals of the American Heritage River program. The location of the potential project outputs on the International waterway shared jointly with Canada provides the opportunity of supporting good relations with Canada.

7. Preliminary Financial Analysis

As the non-federal sponsor for the feasibility phase of the project, the MDEQ will be required to provide 50 percent of the cost of the feasibility phase. The MDEQ is also aware of its cost-sharing obligations for the construction phase, which would be 35 percent of the project cost, should the project be implemented. A letter of intent from the MDEQ stating its willingness to pursue the feasibility study and to share in its cost is included as Attachment 1 to this report.

8. Assumptions and Exceptions

a. Feasibility Phase Assumptions

Existing data and information from other pertinent studies and projects will be used to the maximum extent possible.

b. Streamlining Initiatives

The study will be conducted in accordance with the Principles and Guidelines and the Corps of Engineers regulations. A list of exceptions to the established guidelines that will streamline the feasibility process without adversely impacting the quality of the feasibility study are expected to include the following:

- Close coordination and liaison will be conducted with the cost-sharing non-Federal sponsor and other state resource agencies throughout the study.
- Additional field data will be collected only as necessary to provide essential water and sediment quality data to establish a sound environmental basis for ecosystem restoration through environmental dredging.
- Engineering evaluations of alternatives and the screening of alternatives would focus on the use of existing information and experience. Plans that meet the needs of the non-Federal sponsor will receive greatest attention.
- Detailed real estate information will be developed for the recommended plan only.

9. Feasibility Phase Milestones

The following table lists the proposed milestones and schedule for the broad based feasibility study of the Detroit River.

Milestone	Description	Duration (mo)	Cumulative (mo)
Milestone F1	Initiate Study	0	0
Milestone F2	Public Workshop/Scoping	2	2
Milestone F3	Feasibility Scoping Meeting	11	13
Milestone F4	Alternative Review Conference	9	22
Milestone F4A	Alternative Formulation Briefing	5	27
Milestone F5	Draft Feasibility Report	2	29
Milestone F6	Final Public Meeting	1	30
Milestone F7	Feasibility Review Conference	1	31
Milestone F8	Final Report to SPD	4	35
Milestone F9	DE's Public Notice	1	36
—	Chief's Report	4	40
—	Project Approval	4	44

10. Feasibility Phase Cost Estimate

The following table lists the breakdown of studies expected during the feasibility phase of the broadf based study of the Detroit River:

WBS#	Description	Cost
JAA00	Feas. – Surveys and Mapping except Real Estate	\$35,000
JAB00	Feas. – Hydrology and Hydraulics Studies/Reports (Coastal)	\$42,500
JAC00	Feas. – Geotechnical Studies/Report	\$13,300
JA00	Feas. – Engineering Design Reports	\$157,400
JB000	Feas. – Socioeconomic Studies	\$73,200
JC000	Feas. – Real Estate Analysis/Report	\$43,000
JD000	Feas. – Environmental Studies/Report (Except USF & WL)	\$1,813,400
JE000	Feas. – Fish and Wildlife Coordination Act Report	\$39,800
JF000	Feas. – HTRW Studies/Report	\$12,000
JG000	Feas. – Cultural Resources Studies/Report	\$90,300
JH000	Feas. – Cost Estimates	\$35,300
JI000	Feas. – Public Involvement Documents	\$189,800
JJ000	Feas. – Plan Formulation and Evolution	\$106,800
JK000	Feas. – Draft Report Documentation	\$66,000
JL000	Feas. – Final Report Documentation	\$19,000
JM000	Feas. – Washington Level Report Approval (Review Support)	\$50,000
JP000	Feas. – Management Documents (PPMD)	\$44,500
LA000	PMP – Final PMP	\$22,000
Q0000	PED Cost Sharing Agreement	\$12,600
	Contingencies	\$434,100
Total		\$3,300,000

11. Views of Other Resource Agencies

The U.S. EPA and MDEQ support conducting the feasibility study.

12. Potential Issues Affecting Initiation of Feasibility Phase

No issues have been identified at this time.

13. Project Area Map

Maps of the study area are provided as Attachment . These maps include:

- Figure 1. Location of Detroit River Study Area
- Figure 2. Priority Hotspots in Detroit River RAP
- Figure 3. Macrobenthos Distribution in the Detroit River

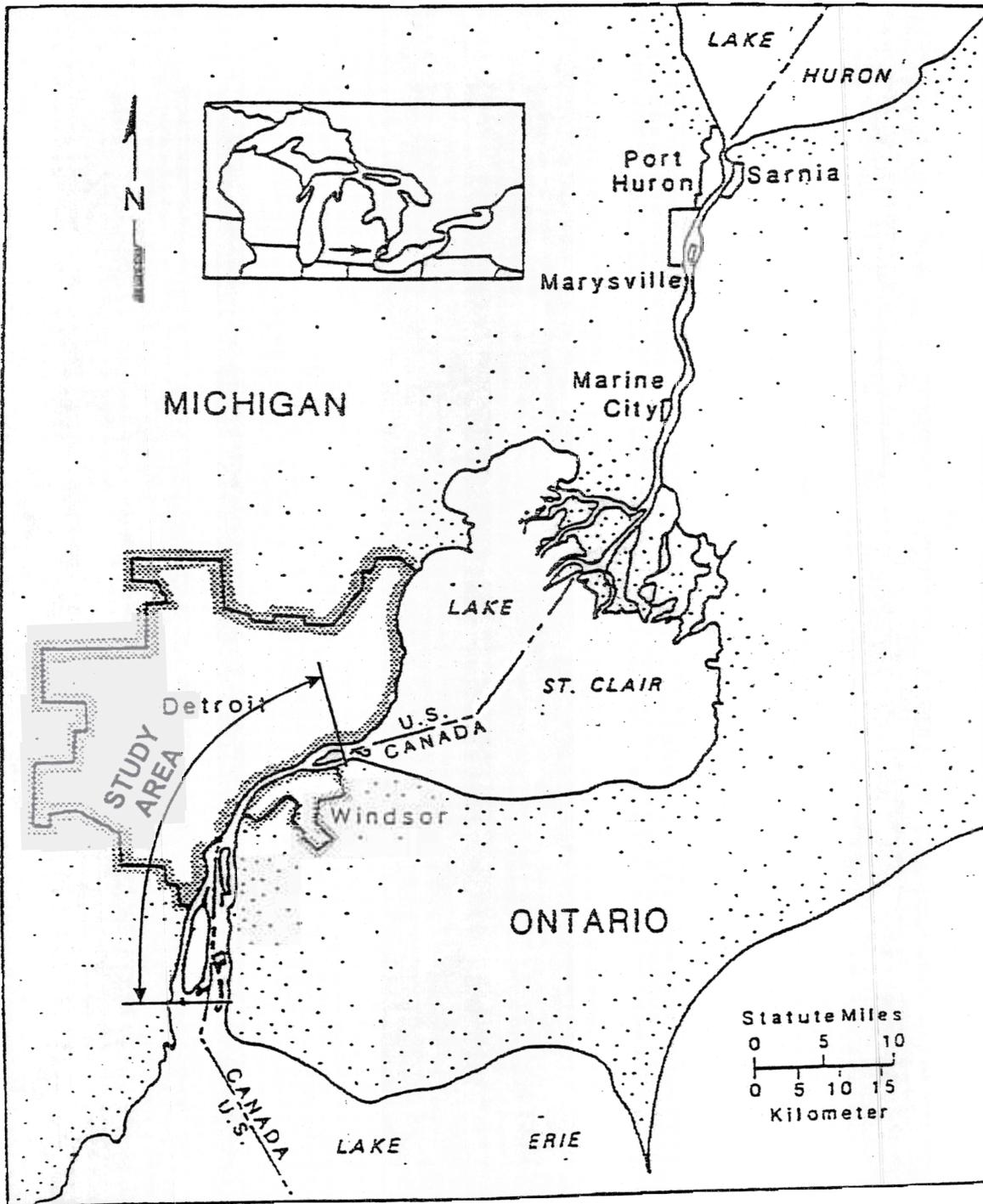
14. Recommendations

The results of this 905(b) analysis indicate that further Federal participation in detailed studies to determine if Federal assistance in implementing environmental restoration measures via Section 312(b) in the Detroit River, Michigan is warranted. I recommend that the Detroit District proceed with the negotiation of a Feasibility Cost Sharing Agreement and detailed feasibility studies on a prospective environmental restoration project on the Detroit River, Michigan. I also recommend separating the Black Lagoon and BASF sites from the broad based study of the Detroit River and accomplishing the feasibility and implementation phases for those two sites under Section 206 of the Water Resource Development Act of 1996.



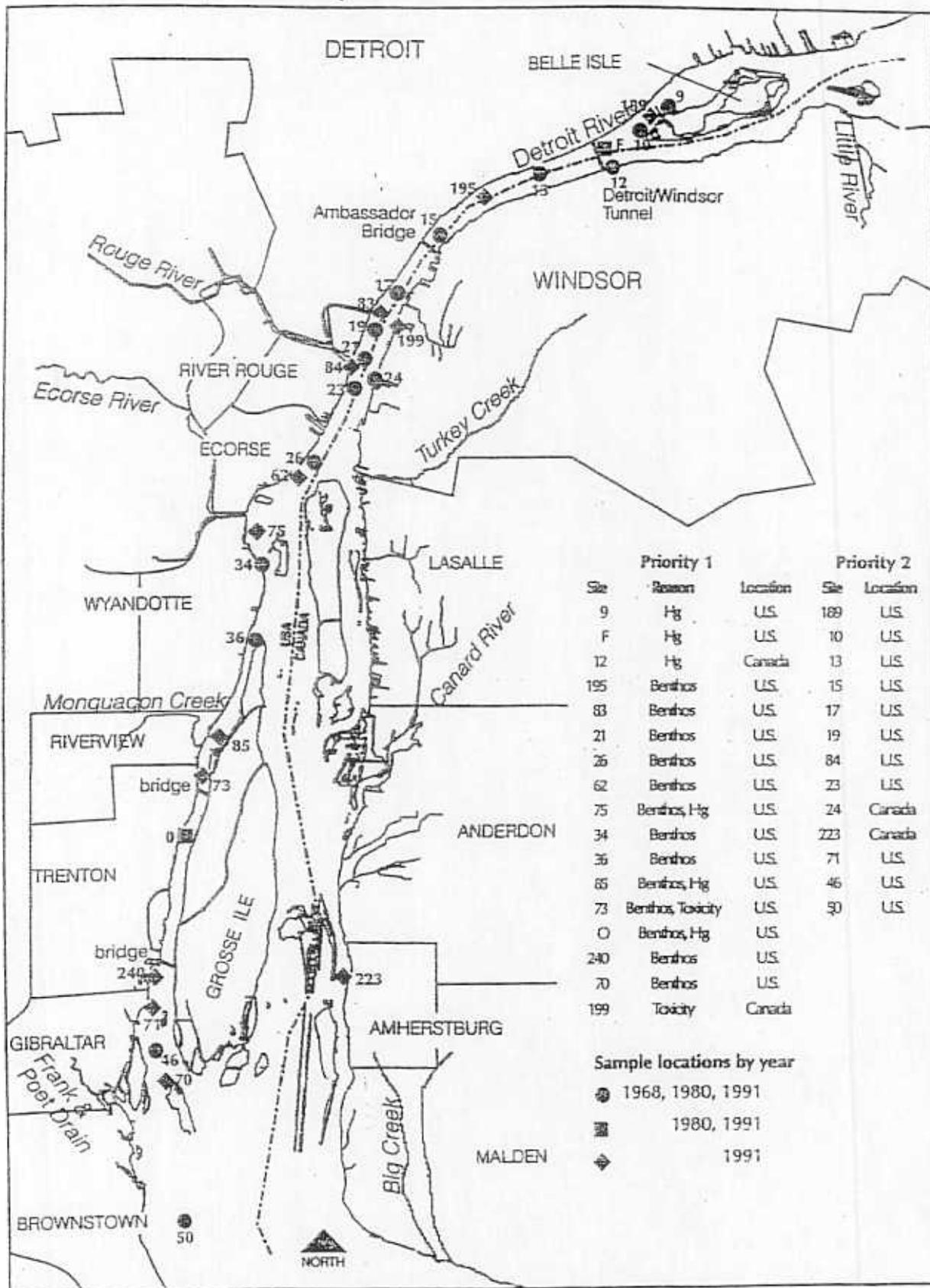
Richard J. Polo, Jr.
Lieutenant Colonel, U.S. Army
District Engineer

Figures



SOURCE: UGLCCS 1988

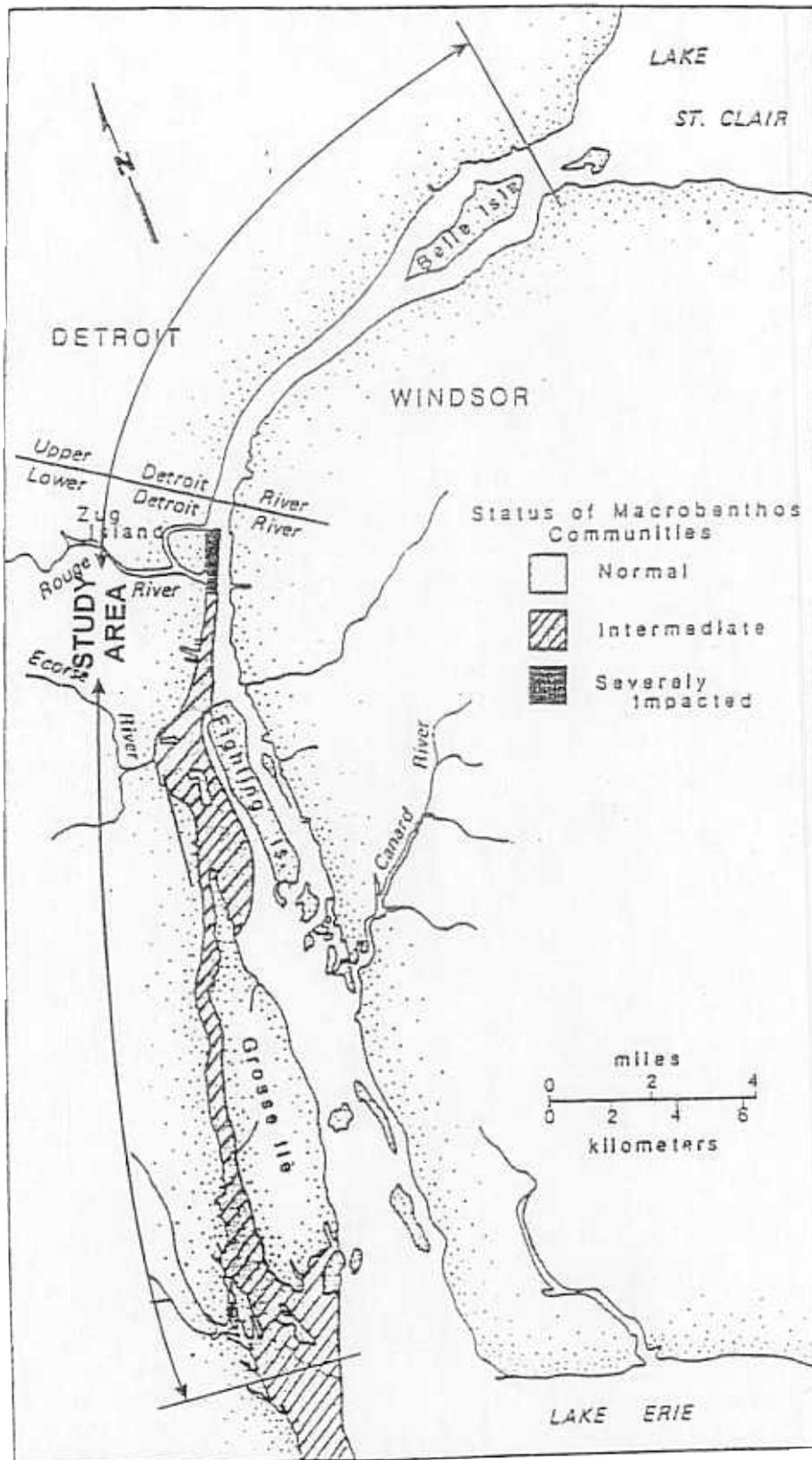
Figure 1
LOCATION OF DETROIT RIVER STUDY AREA



SOURCE: 1996 Detroit River Remedial Action Plan Report

Figure 2

PRIORITY HOTSPOTS IN DETROIT RIVER RAP



SOURCE: UGLCCS 1988

Figure 3
 MACROBENTHOS DISTRIBUTION IN THE DETROIT RIVER

Attachments

STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

"Better Service for a Better Environment"

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RUSSELL J. HARDING, Director

REPLY TO:

SURFACE WATER QUALITY DIVISION
KNAPPS CENTRE
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LANSING MI 48909-7773

March 1, 2001

for
Lieutenant Colonel Richard J. Polo, District Engineer
United States Army Corps of Engineers
Detroit District
P.O. Box 1027
Detroit, Michigan 48231-1027

Dear Lieutenant Colonel Polo:

We have reviewed the reconnaissance studies for the Detroit River, Muskegon Lake, and White Lake that were developed by the United States Army Corps of Engineers (USACE) pursuant to Section 905(b) of the Water Resource Development Act of 1986, as amended. We agree to enter into negotiations with the USACE as potential study partners concerning feasibility level studies for these waterbodies and associated costs. It is our understanding that the goal of these negotiations is to finalize the content of Project Management Plans for each of the sites. It is also our understanding that the Michigan Department of Environmental Quality (DEQ) or the USACE may choose to discontinue the project development process at any time before entering into an agreement to implement the project (i.e., sampling and other studies).

If you have any questions, please contact Mr. William Creal, Great Lakes and Environmental Assessment Section, Surface Water Quality Division, at 517-335-4181, or you may contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "David A. Hamilton".

David A. Hamilton, Chief
Surface Water Quality Division
517-335-4176

dah:nj:dp

cc: Mr. William Creal, DEQ
Mr. Mark Oemke, DEQ
Mr. Roger Jones, DEQ