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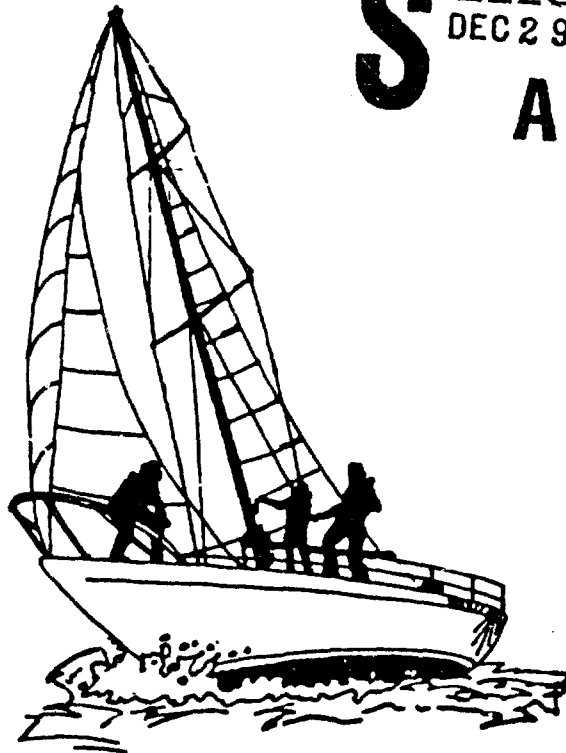
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Final Limited Reevaluation Report

Ottawa River Harbor Michigan and Ohio

Main Report
and
Appendices

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US Army Corps
of Engineers
Buffalo District

92-33062



July 1992

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report is a limited reevaluation report to investigate alternatives to deepen the Ottawa River Harbor, Michigan and Ohio channel. Siltation of the harbor and low lake levels make navigation of the harbor unsafe. The Buffalo District commander recommends that this limited reevaluation investigation be terminated by this report, due to the lack of support by local interests and because no alternative plan could be identified with sufficient high priority outputs to justify federal interest.		



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

17 December 1992

**PUBLIC NOTICE OF COMPLETION
OF THE
FINAL LIMITED REEVALUATION REPORT
FOR
OTTAWA RIVER HARBOR
MICHIGAN AND OHIO**

This is a public notice that the Final Limited Reevaluation Report on the Ottawa River Harbor, Michigan and Ohio has been completed by the District Engineer at Buffalo, New York and the Division Engineer at North Central Division, Chicago, Illinois, of the U.S. Army Corps of Engineers. The conclusion of the report is that there is no Federal interest in participating in a navigation project in the Ottawa River.

AUTHORITY

This study of Ottawa River Harbor was initiated based on a Resolution by the Committee of Public Works of the United States House of Representatives on August 15, 1961. A earlier favorable interim survey report was prepared and submitted to Congress on October 1, 1970. A project was recommended and adopted by the Senate Public Works Committee on December 17, 1970 and the House Public Works Committee on December 15, 1970. The project was deauthorized on December 31, 1989 due to the lack of local support. However, increased public support provided for the continued authorization of the project under Section 107 of the Water Resources Development Act of 1990 (Public Law 101-640).

BACKGROUND

Area residents have long desired a navigation project which would provide a deepened channel in the Ottawa River and into Lake Erie to relieve the siltation problem. This proposed channel deepening would provide an added measure of safety for boats entering the harbor when strong southwest winds depress the water surface. During periods of low lake level and resulting shallow river depths, passage by all but the shallowest draft small boats is prohibited. Even during periods of higher lake levels, depths required for recreational boats often restrict the classes of pleasure craft able to safely navigate the river, due to the shoals and shallow depths in the river and bay channels.

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ALTERNATIVES CONSIDERED

This reevaluation report investigated the authorized project as presented in the November 1976 - General Design Memorandum (GDM) and developed several scaled down alternatives. A summary of the alternatives is as follows:

- Alternative 1 - No Action
- Alternative 2 - GDM Plan - This plan was presented in the 1976 GDM. The major features include dredging the Ottawa river channel from Suder Avenue to Summit Street to 5 feet below Low Water Datum (LWD), from Summit Street to the mouth of the river to 6 feet below LWD, and the bay channel from the mouth to the Toledo Harbor shipping channel to 8 feet below LWD. Dike disposal and open lake disposal were recommended for the dredged material in the 1976 GDM. For purposes of comparison, the cost for a new confined disposal site was estimated for this alternative. Total cost = \$42,518,600
- Alternative 3 - Plan 1A - This plan's major features include dredging (deepening) the Ottawa River channel downstream of Summit Street at Mudjaw Creek downstream to the mouth to 4 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 5 feet below LWD. Island 18 (Grassy Island) was the recommended location for disposal of the dredged material during the formulation of this plan. The total cost would be \$2,637,300. However, after the Draft Final Limited Reevaluation Report was prepared in March 1992, the U.S. Army Corps of Engineers and the Toledo Port Authority made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor shipping channel during fiscal years 1993 and 1994. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as required in Alternative 4.
- Alternative 4 - Plan 1B - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 4 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 5 feet below LWD. Dredged material would be disposed of in a new Confined Disposal Facility (CDF) to be constructed in Lake Erie adjacent to the bay channel. The total cost would be \$13,271,800.
- Alternative 5 - Plan 2A - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 5 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 6 feet below LWD. Island 18 (Grassy Island) was the recommended location for disposal of the dredged material during the formulation of this plan. The total cost would be \$3,789,600. However, after the Draft Final Limited Reevaluation Report was prepared in March 1992, the U.S. Army Corps of Engineers and the

Toledo Port Authority made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor shipping channel during fiscal years 1993 and 1994. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as required in Alternative 6.

- Alternative 6 - Plan 2B - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 5 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 6 feet below LWD. Dredged material would be disposed of in a new Confined Disposal Facility (CDF) to be constructed in Lake Erie adjacent to the bay channel. The total cost would be \$21,367,000.

ANALYSIS OF ALTERNATIVES

Based on the evaluations performed during this Limited Reevaluation Report Phase, it is concluded that:

- The authorized plan (Alternative 2) is not implementable since the Confined Disposal Facilities (CDF's) cannot be constructed as proposed originally in the 1976 GDM. Michigan will not grant permission to use their lands for a CDF site, another CDF site is in a wetland area, and open lake disposal is prohibited. The construction of a new CDF site is cost prohibitive;

- Additional alternatives (Alternatives 3 -6) were formulated that were reduced in scale but would still address most of the area needs.

- An incremental analysis of economic efficiency revealed that including the low priority outputs (recreational boating benefits), three alternatives (Alternatives 3, 4, and 5) would have favorable benefit to cost ratios. Alternatives 3 and 5 were dependent on the use of Island 18 for containment of the dredged material.

- Only one alternative (Alternative 3) was developed that has sufficient high priority outputs (commercial benefits) that result in a Federal interest. However during the time period between the Draft and Final Reevaluation Reports the U.S. Army Corps of Engineers and the Toledo Port Authority made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor commercial shipping channel during fiscal years 1993 and 1994, and possibly into the future. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as demonstrated in the unjustified Alternatives 4 and 6 (Plans 1B and 2B). Alternatives 4 and 6 were determined to be unjustified based on the lack of sufficient high priority outputs.

- To proceed with any alternative in which there is a Federal interest, a non-Federal

sponsor (local or state government agency) must provide a Letter of Intent. The city of Toledo in a letter dated March 12, 1992 stated that "... the city of Toledo is in no position to accept the financial and other obligations as the local sponsor for the Ottawa River Dredging Project". As further stated in the letter, the City has contacted the other governmental jurisdictions in the project area, yet no local sponsor was identified.

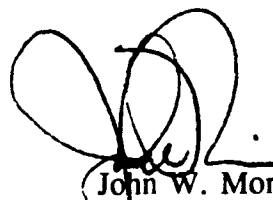
RECOMMENDATIONS

The recommendation of the Final Limited Reevaluation Report is that, based on Department of Army policy and the recent decision that Island 18 is not available for disposal of dredged material from the authorized Ottawa River project, there are insufficient high priority outputs (commercial navigation benefits) to warrant Federal interest. In addition, the local and state governments are unable to provide a Letter of Intent. Therefore, the selected alternative is the No Action Plan.

PUBLIC COORDINATION

This project has been reclassified as deferred. Copies of this Final Limited Reevaluation Report will be provided to other Federal, State, County, and Local agencies and offices that were active in the development of this report. An informal meeting will be held with these agencies after the public release of this report, to describe the reports findings. Copies of the report will be sent to local libraries, where it will be available for review by the general public. Additional copies of the report can be obtained (for the cost of reproduction) from the U.S. Department of Commerce, National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; (703) 487-4650.

Since this project has been reclassified as deferred, there will be no public review of this report.



John W. Morris
Colonel, US Army
Commanding

EXECUTIVE SUMMARY

This study of Ottawa River Harbor was initiated based on a Resolution by the Committee of Public Works of the United States House of Representatives on August 15, 1961. A favorable interim survey report was prepared and submitted to Congress. A project was recommended and adopted by the Senate Public Works Committee on December 17, 1970 and the House Public Works Committee on December 15, 1970. The project was deauthorized on December 31, 1989. Increased public support provided for the reauthorization of the project under Section 107 of the Water Resources Development Act of 1990 (Public Law 101-640).

Area residents have long desired a project to dredge a channel in the Ottawa River into Lake Erie to relieve the siltation problem and provide an added measure of safety for entering the harbor when strong southwest winds depress the water surface. During periods of low lake level and resulting shallow river depths, passage by all but the shallowest draft small boats is prohibited. Even during periods of higher lake levels, depths required for recreational boats often restrict the classes of pleasure craft able to safely navigate the river, due to the shoals and shallow depths in the river and bay channels.

This reevaluation report investigated the authorized project as presented in the November 1976 - General Design Memorandum (GDM) and developed several scaled down alternatives. A summary of the alternatives is as follows:

○ Alternative 1 - No Action

○ Alternative 2 - GDM Plan - This plan was presented in the 1976 GDM. The major features include dredging the Ottawa river channel from Suder Avenue to Summit Street to 5 feet below Low Water Datum (LWD), from Summit Street to the mouth of the river to 6 feet below LWD, and the bay channel from the mouth to the Toledo Harbor shipping channel to 8 feet below LWD. Dike disposal and open lake disposal were recommended for the dredged material in the 1976 GDM. For purposes of cost comparison a new confined disposal site was cost estimated for this alternative.

○ Alternative 3 - Plan 1A - This plan's major features include dredging (deepening) the Ottawa River channel from of Summit Street at Mudjaw Creek

downstream to the mouth to 4 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 5 feet below LWD. Island 18 (Grassy Island) was the recommended location for disposal of the dredged material during the formulation of this plan. However, after the Draft Final Limited Reevaluation Report was prepared in March 1992, the U.S. Army Corps of Engineers and the Toledo Port Authority have made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor shipping channel during fiscal years 1993 and 1994. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as required in Alternative 4.

○ Alternative 4 - Plan 1B - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 4 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 5 feet below LWD. Dredged material would be disposed of in a new Confined Disposal Facility (CDF) to be constructed in Lake Erie adjacent to the bay channel.

○ Alternative 5 - Plan 2A - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 5 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 6 feet below LWD. Island 18 (Grassy Island) was the recommended location for disposal of the dredged material during the formulation of this plan. However, after the Draft Final Limited Reevaluation Report was prepared in March 1992, the U.S. Army Corps of Engineers and the Toledo Port Authority have made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor shipping channel during fiscal years 1993 and 1994. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as required in Alternative 6.

○ Alternative 6 - Plan 2B - This plan's major features include dredging the Ottawa River channel downstream of Summit Street at Mudjaw Creek to the mouth to 5 feet below LWD and the bay channel from the mouth to the Toledo Harbor shipping channel to 6 feet below LWD. Dredged material would be disposed of in a new Confined Disposal Facility (CDF) to be constructed in Lake Erie adjacent to the bay channel.

Plan views of these alternatives are included at the end of the main report.

The total project costs for these alternatives are presented in the following table.

PROPOSED ALTERNATIVES - OTTAWA RIVER HARBOR	
Alternative / Plan	Total project cost
Alternative 1 - No Action	\$ 0
Alternative 2 - GDM Plan	\$ 42,518,600
Alternative 3 - Plan 1A	\$ 2,637,300
Alternative 4 - Plan 1B	\$ 13,271,800
Alternative 5 - Plan 2A	\$ 3,789,600
Alternative 6 - Plan 2B	\$ 21,367,000
* Costs computed at September 1991 price levels and includes Interest During Construction.	

The average annual costs are compared to the high priority outputs (recreational boat damage avoided benefits) and the total outputs (including recreational boating benefits) in the next table.

BENEFIT TO COST COMPARISON - HIGH AND LOW PRIORITY OUTPUTS - OTTAWA RIVER HARBOR					
Alternative / Plan	Average Annual Costs	High Priority Outputs		Total High & Low Priority Outputs	
		Average Annual Benefits	Benefit Cost Ratio	Average Annual Benefits	Benefit Cost Ratio
Alternative 2 - GDM Plan	\$ 4,107,100	\$ 247,900	0.06	\$1,617,400	0.39
Alternative 3 - Plan 1A	\$ 431,600	\$ 218,900	0.51	\$1,401,200	3.25
Alternative 4 - Plan 1B	\$ 1,349,183	\$ 218,900	0.16	\$1,401,200	1.04
Alternative 5 - Plan 2A	\$ 614,051	\$ 243,500	0.40	\$1,582,300	2.58
Alternative 6 - Plan 2B	\$ 2,125,494	\$ 243,500	0.11	\$1,582,300	0.74
September 1991 price levels, 8 1/2 % interest rate, and 50 year project life					

Current Department of Army policy mandates that for a project to have a Federal interest, high priority annual benefits must exceed one half of the project's annual cost. Thus, at least one alternative must have a benefit-cost ratio of 0.51 or greater based solely on high priority benefits to establish federal interest. The above table, reflects sufficient high priority average annual benefits for one alternative (Alternative 3) to generate a benefit cost ratio of 0.51 or greater. However, there is no Federal interest to continue with the reevaluation phase beyond this limited reevaluation report because the previously selected confined disposal facility (Island 18) is not available. This effectively eliminates Alternatives 3 and 5 from consideration.

When the high and low priority outputs (including recreational navigation benefits) are combined, three alternatives (Alternatives 3, 4, and 5) have favorable benefit cost ratios. However, current policy regards recreational projects as having a low priority. This additional analysis of recreational benefits is beneficial to non-Federal agencies to judge the merits of the proposed alternatives for harbor improvement. The non-Federal interest may also choose to proceed with the harbor improvements independently based on the recreational benefits. Though Alternative 3 is not viable because the selected disposal facility (Island 18) is no longer available, Alternative 4 could be implemented by non-Federal interests.

No local or state government agency, including the city of Toledo, Ohio, has provided a Letter of Intent to cost share in this project, therefore, the selected Federal alternative is the No Action Plan. The Buffalo District Commander recommends that this Limited Reevaluation investigation be terminated by this report, due to the lack of support by local interests and because no alternative plan could be identified with sufficient high priority outputs to justify Federal interest.

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- APPENDIX C - Economic Evaluation
- APPENDIX D - Correspondence

1 - THE STUDY AND REPORT

1.1 Introduction

This Limited Reevaluation Report was initiated in October 1991. This report is a product of a design reevaluation to determine if the authorized project could be scaled down in dimensions, yet maintain the critical design features that would alleviate the current navigation problems and meet the regional needs. Another critical element of this report is the economic reevaluation to measure and analyze the high priority outputs (commercial related navigation benefits) and low priority outputs (recreational benefits) to determine if there are sufficient benefits to meet Administration policy for further Federal action. This study is limited in scope and excluded detailed recreational boater surveys, channel surveys, testing of sediments, and detailed designs. Also, due to this limited scope, this limited reevaluation report does not contain a revised Environmental Impact Statement. If a Federal interest is identified, then this Reevaluation Report will be continued and expanded.

1.2 Authority

A resolution to consider a plan for improved usage of the Ottawa River Harbor for navigational purposes was adopted by:

Resolution by the Public Works of the United States House of Representatives on August 15, 1961. A favorable interim survey report was subsequently prepared and submitted to the United States House of Representatives on October 1, 1970. The project recommended in the report was published as House Document 91-396 and authorized under the provisions of Section 201 of the Flood Control Act of 1965 followed by resolutions adopted by the Senate Public Works Committee on December 17, 1970 and the House Public Works Committee on December 15, 1970. The project was de-authorized as of December 31, 1989. Continuation of Authorization for the project was provided for under Section 107 of the Water Resources Development Act of 1990 (Public Law 101-640).

The authorized project provided for an improved channel 6 feet deep, 100 feet

wide, and about 16,500 feet long in the Ottawa River from its mouth to Suder Avenue and a channel 8 feet deep, 200 feet wide, and about 15,000 feet long from the mouth of the Ottawa River to the Toledo Harbor Shipping Channel in Maumee Bay. The proposed course for the channel in Maumee Bay was selected to provide the shortest route to deep water. Material dredged from the river section was to be disposed of in low, dike areas adjoining the river, while Maumee Bay spoil would be used to create two disposal islands in the bay. The authorized plan will be described in more detail later in this report.

The first fiscal year funds were received from the Energy and Water Development Appropriations Act of 1991 and additional funds were appropriated in fiscal year 1992.

1.3 Purpose of Study

The purpose of this Limited Reevaluation Study is to review the past project reports and prepare a Reevaluation Report to ascertain if the project meets current Administration policy regarding Federal interest and determine if there are sufficient benefits to justify a Federal project. The study will present study findings in sufficient detail to establish whether a plan can be identified that meets Administration policy for federal interest; reaffirms the authorized plan; provides the basis for a revised plan; or establishes no Federal action.

Recreational boating is a major activity in the western basin of Lake Erie. The geographic location of the Ottawa River, between the Toledo, Ohio and Detroit, Michigan metropolitan areas, indicate that a significant demand may exist to develop recreational boating infrastructure on the river. Dredging (deepening) the Ottawa River would improve the existing restrictive and sometimes hazardous conditions. It would encourage the future growth of locally based and transient fleets to their full potential and provide additional refuge facilities for shallow-draft craft cruising along the westerly coast of Lake Erie.

1.4 Scope of Study

This reevaluation report will be reduced in scope to be presented in the form of a Limited Reevaluation Report. Recent guidance from the Director of Civil Works in a letter dated November 5, 1991 states that:

A Limited Reevaluation Report (LRR) may be prepared to evaluate a specific portion of a plan under current policies, criteria and guidelines, and may be limited to economics and/or environmental effects. The annual budget Engineering Circular (EC) requires that a LRR, updating project economics, be prepared if more than two years has elapsed since the last approved economic analysis to show that the project remains justified. A LRR may also serve as the Post Authorization Change (PAC) document if a significant cost change requires re-authorization. In such an event, the LRR must contain enough information to fully describe the project and the cost changes that have occurred.

This Limited Reevaluation Study for Ottawa River Harbor consists of the following investigations:

- Review of data, technical documents and reports prepared by other Federal, non-Federal, and local agencies;
- Identification of problems and needs;
- Identify and assess the authorized project;
- Identify and assess other potential solutions;
- Describe the general socio-economic characteristics;
- Identify the potential for commercial and recreational navigation improvements;
- Investigate potential commercial and recreational navigation benefit categories; and
- Determine if an alternative plan of improvement that meets current Department of the Army policy for high priority outputs (commercial related navigation benefits) can be identified.

This study re-examines the authorized improvement of Ottawa River Harbor in terms of present needs, conditions and policies.

1.5 Report Format and Study Process

This study was prepared to be consistent with the planning requirements of the Water Resources Council "Principles and Guidelines" and other related policies, and in accordance with Engineering Regulation 1105-2-100, dated 25 December 1990. This Limited Reevaluation Report consists of a Main Report and Appendices which contains the supporting documentation.

The Main Report summarizes the study's methodology and conclusions. The report is written to present the non-technical reviewer and the general reader a clear understanding of the study, the study results, and the key conclusions and decisions reached. It discusses the resources and economy of the study area, the problems and needs, the alternatives considered, the economic evaluation, and a recommendation for a plan of improvement. Preliminary cost estimates for the alternatives are detailed in the appendices. The report documents the recommendation of the District Commander.

The Report also includes the Appendices which follow the Main Report:

- APPENDIX A - Design
- APPENDIX B - Cost Estimates
- APPENDIX C - Economic Evaluation
- APPENDIX D - Correspondence

The supporting documentation contained in the Appendices A - C provides the detailed technical information which supports the conclusions and recommendations of the Main Report. Appendix D contains copies of all correspondence significant to the development of the report.

1.6 Studies and Reports by Other Agencies

A comprehensive literature search and review of past reports relevant to Ottawa River Harbor was done by the Buffalo District as an early action item. No new recreational boater surveys, sediment sampling, or testing programs were conducted by the Corps of Engineers at this time. Buffalo District did conduct a marina survey in June 1991 and a boater survey for recreational boat damages (high priority outputs) in September 1991. The findings of each of the available reports have been evaluated by Buffalo District staff.

The Ohio Environmental Protection Agency has conducted some sampling of sediments in the Ottawa River to trace the migration of pollutants from upstream landfill areas. The Toledo Department of Health conducts regularly scheduled testing of the Ottawa River water quality.

1.7 Study Participants and Coordination

Ottawa River Harbor in the past several decades has been studied at Federal, State, local, and private levels. The primary agencies or offices that Buffalo District has coordinated with are as follows:

- Federal
 - Environmental Protection Agency
 - Department of Transportation, Coast Guard
 - Department of Interior, Fish and Wildlife Service
 - Department of Interior, Bureau of Outdoor Recreation
 - Department of Interior, National Park Service

- State
 - State of Michigan, Department of Natural Resources
 - Ohio Department of Natural Resources
 - Ohio Environmental Protection Agency

- Local
 - Lucas County, OH
 - Monroe County, MI
 - Washington Township, OH
 - City of Toledo, OH
 - Toledo Metropolitan Area Council of Governments (TMACOG)

- Private
 - Marina, Dock, and Yacht Club operators
 - Citizen's Task Force
 - Ottawa River Improvement Association

In addition to coordinating with the entities listed above, the Corps has participated in public workshops and public meetings during the formulation of the authorized plan.

An initial meeting with Congresswoman Marcy Kaptur and other local officials was held on February 4, 1991 in Toledo, Ohio. Information provided at the meeting indicated that there are very limited (and some even said no) charter boats operating within the project area. There was insufficient information available at that time to determine whether or not commercial navigation would be a primary project output.

There was a meeting held on February 5, 1991 with the city of Toledo and an ad hoc committee for the dredging of the Ottawa River. It was requested at this meeting that the city of Toledo provide a Letter of Intent. Examples of these letters were provided to the City.

On October 16, 1991, representatives of the Corps of Engineers, Buffalo District met with representatives from the city of Toledo, Division of Streets, Bridges, and Harbor. There was a discussion of the project relative to priority outputs; selection of an adequate Confined Disposal Facility (CDF) for dredged material; and procurement

of a Letter of Intent from the city of Toledo as the potential local sponsor.

1.8 Prior Corps Studies, Reports and Projects

A preliminary examination report dated March 10, 1938, proved unfavorable for navigation improvement of the Ottawa River Harbor, Michigan and Ohio. Following the authorization of a comprehensive report regarding the south shore of Lake Erie under Section 6 of the River and Harbor Act approved March 2, 1945, a preliminary examination report was submitted July 19, 1946 which recommended a comprehensive survey report on 33 localities listed for consideration. The Interim Survey Report of Ottawa River Harbor was subsequently submitted November 27, 1968 and recommended an authorized plan of improvement.

A Phase I General Design Memorandum (GDM) was completed by the Corps of Engineers, Detroit District in November 1976. Although the GDM reported a benefit/cost ratio (BCR) of 1.57 to 1, it recommended that preconstruction planning be terminated and the project be classified inactive because of a lack of a local cooperator for the project. As stated in the GDM "... it is apparent that no governmental body empowered to cooperate legally and financially with the Federal government would be willing to meet the local cooperation requirements." An Environmental Impact Statement (EIS) was filed in November 1977; and will need to be updated.

A flood control study of Point Place, Toledo, Ohio was authorized under the provisions of Section 201 of the 1965 Flood Control Act by the Senate and House Public Works Committees on October 12, 1972. There was a post authorization change dated December 24, 1975 and approved June 9, 1977.

Point Place lies on a peninsula which is bounded on the east by Maumee Bay and on the west by the Ottawa River. Generally, flooding occurs when strong winds blow from the northeast and raise the water levels in the western basin of Lake Erie. These high lake levels backup into the Ottawa River causing flooding of the shoreline areas.

The constructed flood protection project consists of a combination of three types of protective structures built along the shores of Maumee Bay, the Ottawa River, and Mudjaw Creek. These protective structures may be generally classified into three types of construction, namely: (1) levee or dike construction, (2) steel sheet pile wall construction, and (3) combination of both methods of construction. Improvements to the interior flood control system consisted of three new pumping stations, a total of approximately 5,500 linear feet of interceptors, and about 2,380 linear feet of gravity outfalls. This project, constructed between 1982 and 1984, provides 100-year flood protection.

2 EXISTING CONDITIONS

2.1 Natural Resources

2.1.1 Regional Area - Ottawa River Harbor is located in the southeast corner of Michigan and the northwest corner of Ohio, northwest of the city of Toledo (Figure 1). Ottawa River Harbor is located within the Ottawa River Drainage Basin, which is tributary to Lake Erie. The Ottawa River empties into the westerly end of Lake Erie about 3.5 miles northerly from the mouth of the Maumee River and Toledo Harbor, Ohio. The River has a total length of 41.6 miles, 41 miles lie on Lucas County, Ohio and the remainder including the mouth of the river is located in Monroe County, Michigan. Lake Erie, the second smallest lake of the Great Lakes, has a surface area of about 9,940 square miles, a length of 241 miles, and a maximum width of 57 miles. The western basin of Lake Erie is a flat shallow basin with a mean depth of 24 feet.

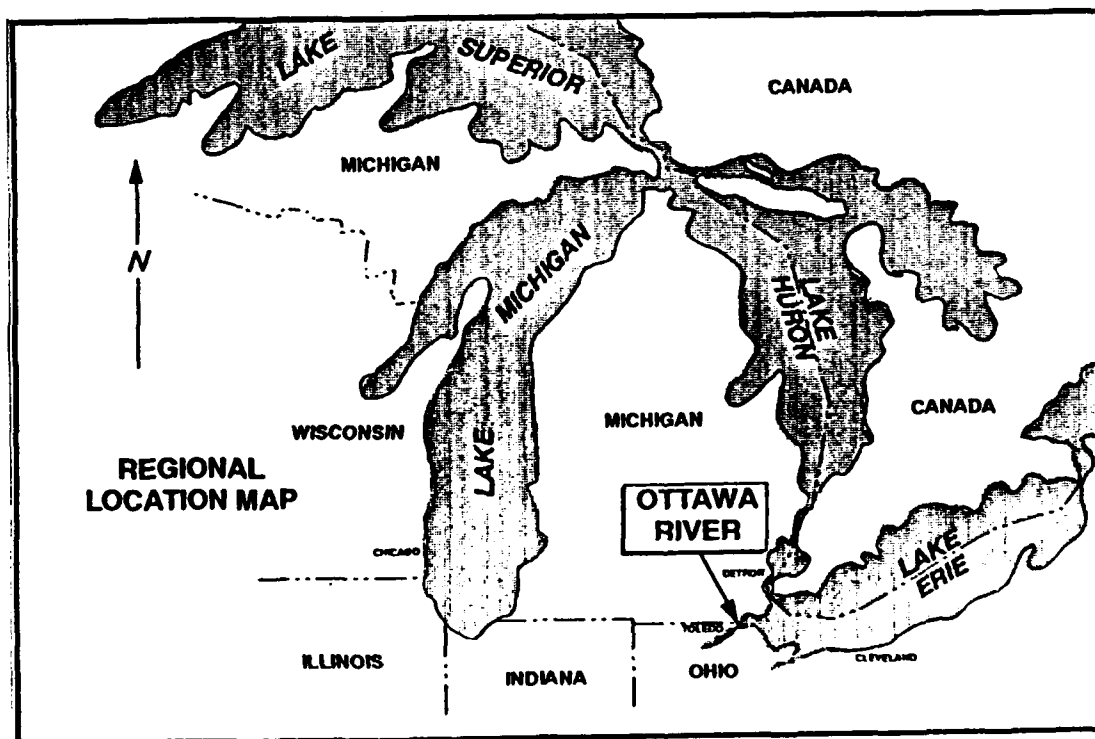


Figure 1 - Regional Location Map

2.1.2 Study Area - The Ottawa River Harbor study area is located along the Ottawa River (Figure 2). The Ottawa River discharges into Maumee Bay at the western end of Lake Erie. The mouth and lower 0.6 mile of the river are located in Michigan with the upstream reaches of the river located in Ohio. The specific study area includes a river channel from Suder Avenue, at the upstream terminus, to the mouth of the river. From the mouth of the river out into Lake Erie, the bay channel would continue to the junction with the Toledo Harbor Channel.

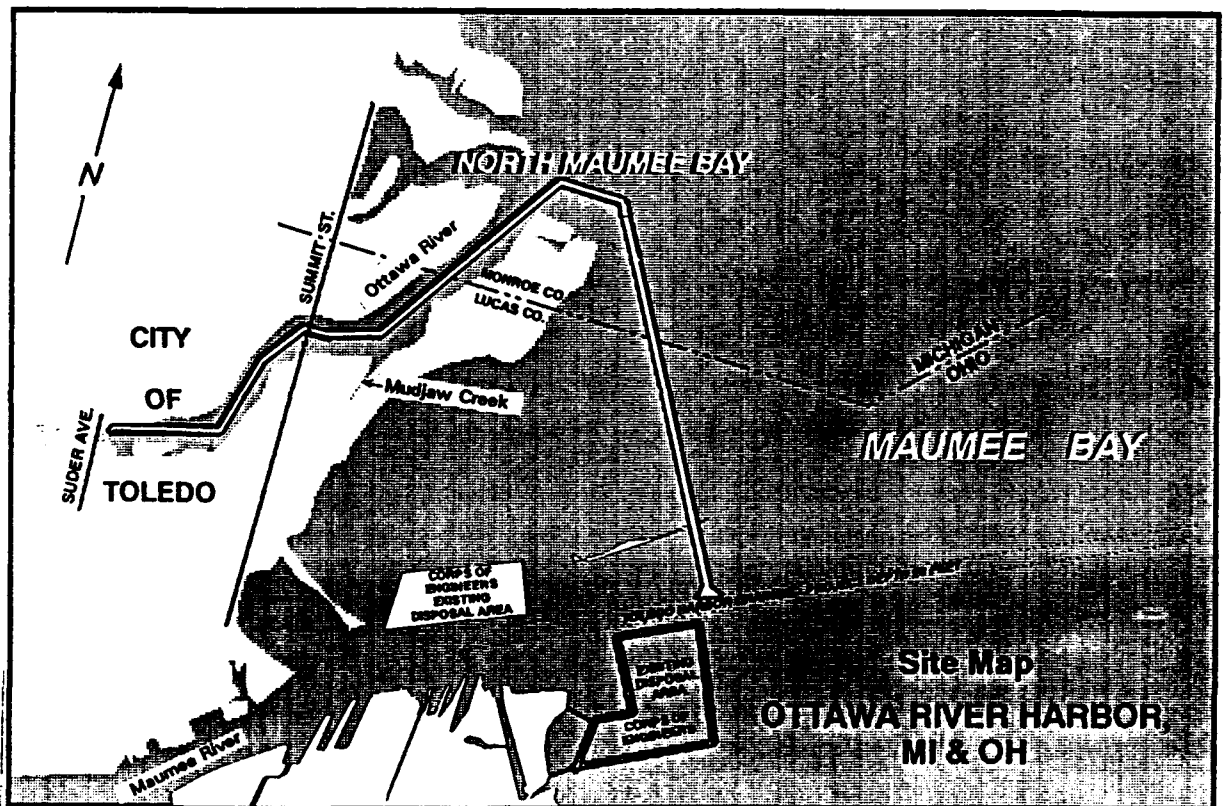


Figure 2 - Site Map

Between Maumee Bay and Suder Avenue, a distance of about three miles, the river has a maximum width of 1,500 feet, a minimum width of 500 feet, and an average depth of about 2 feet below Low Water Datum (LWD). Navigation is limited

upstream of Suder Avenue by the low (14 feet above LWD) vertical clearance under the Suder Avenue Bridge and other structures upstream. The Ottawa River has about 1,350 berths located at marinas and yacht clubs. The majority of the fleet is moored downstream of the confluence with Mudjaw Creek. This is due to the Suder Avenue Bridge low steel elevation of +14 feet LWD and inadequate river depths upstream. When the water level is at average or above average the clearance is significantly reduced.

2.1.3 Climate - The region containing Ottawa River Harbor has a climate classified as humid and temperate. The region is characterized by large annual and daily temperature ranges, although the presence of Lake Erie tends to moderate the temperature. The average temperature in January is in the mid-20's and in July in the mid-70's.

Cold air masses come from Canada during the winter months, but are modified by the relatively warm waters of Lake Erie, resulting in cloudiness and frequent snow from November through March. Precipitation is well distributed throughout the year with an annual average precipitation of 35 inches.

Prevailing winds in the study area are from the west through southwest directions. Winds over large, open bodies of water such as Lake Erie are an important parameter in the design of shoreline water resource projects. They have a significant effect on the wave climate, currents, and lake levels. The wind blows offshore toward the study area an average of 176 days per year. Drastic short term fluctuations in lake levels can be created by a wind seiche and a barometric pressure change on the lake surface. Wind setup and seiche can have a significant effect on lake levels, particularly at the eastern and western extremities of Lake Erie. For the study area, sustained winds blowing toward shore from the northeast tend to increase the water level, whereas westerly winds tend to reduce the water level at the shore.

2.1.4 Sediment Quality - The surface geology of the southwestern Lake Erie shoreline is mainly lacustrine deposits. These are composed of silt and clay which range in thickness from 5 to 50 feet. The material underlying these lacustrine deposits is mainly glacial till composed of sand, gravel, and clay. The immediate study area along Lake Erie is devoid of beaches and the shoreline and offshore bottom consists mainly of clay.

2.1.5 Lake Levels - Water levels on the Great Lakes vary spatially and temporally. The lake level is subject to seasonal rise and fall usually consisting of high levels in May and June, and low levels in January and February. Annual and seasonal fluctuations are caused by variations in the runoff and evaporation rates within the Great Lakes Basin. Short term fluctuations are caused by meteorological disturbances. Winds blowing over the lake surface create temporary water level

fluctuations, known as a seiche, which vary locally. The water level gage at Cleveland, Ohio has served as the master gage for Lake Erie, though the designation for the master gage was recently moved to Fairport, Ohio. Great Lakes Chart Datum is in feet above the mean water level at Father Point, Quebec. Approximately every 30 years the International Great Lakes Datum is adjusted to reflect ground swell. The ground swell, often called glacial rebound or crustal upheaval, accounted for 6 to 7 inches rise of the earth's crust in this year's new figures. Various locations in the Great Lakes Basin are rebounding at different rates. The International Great Lakes Datum 1985 was 568.6 feet, while the new International Great Lakes Datum 1985 is 569.2. The average and recorded lake levels for 1990 and 1991 are detailed on Figure 3.

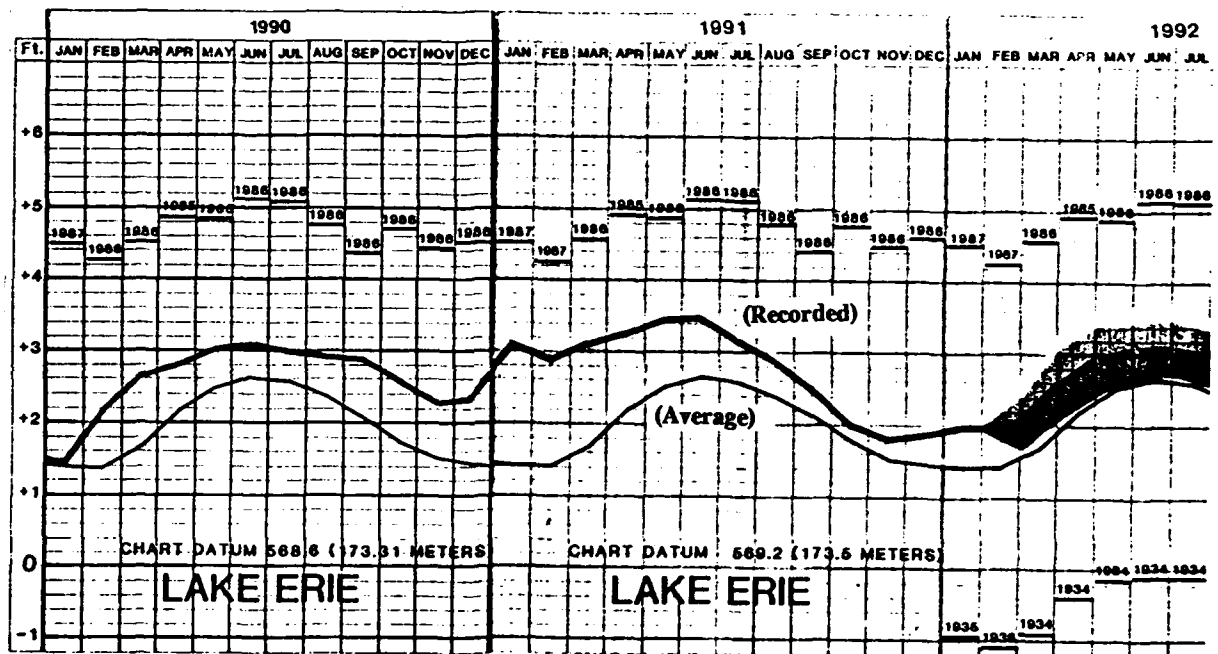


Figure 3 - Average and Recorded Lake Erie Water Levels

Lake levels at Toledo have ranged from 8.3 feet above Low Water Datum (LWD) to 7.5 feet below LWD in direct response to the effects of wind and seiche and seasonal variation.

The monthly mean lake level-duration curve for August was developed for application in this study. The August mean lake elevation-duration curve for the period 1900-1987 for the Cleveland gage is presented on Figure 4. For this phase of study the curve was considered representative for the entire boating season and is

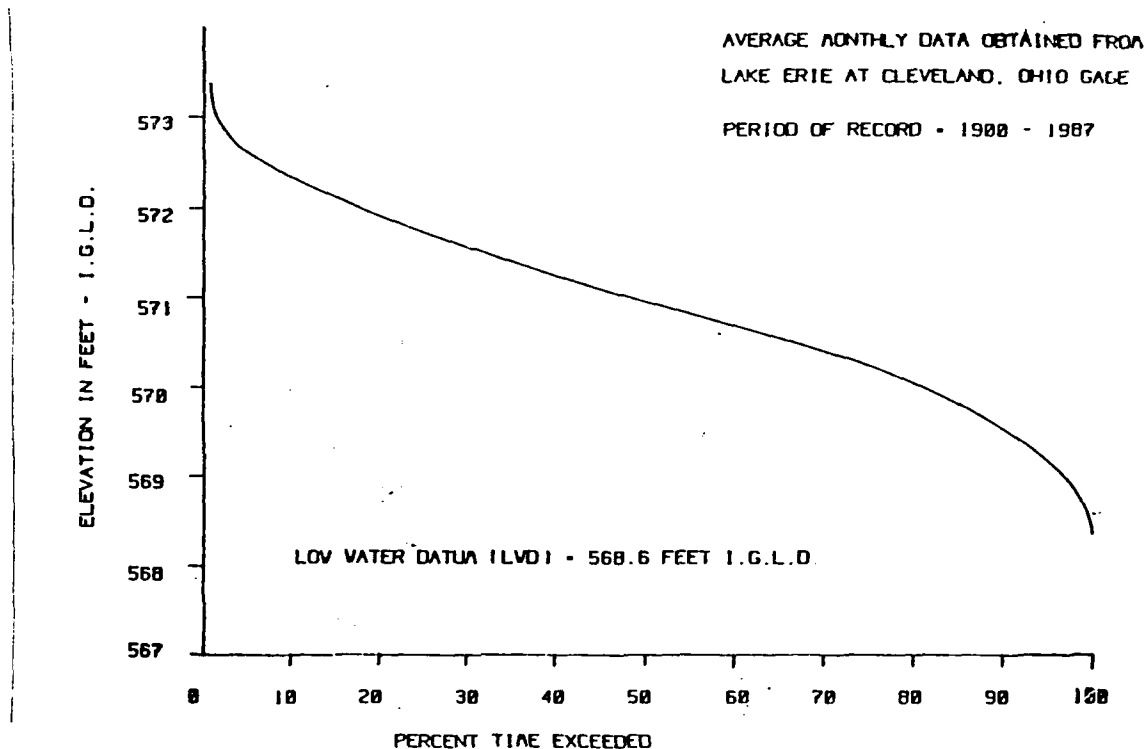
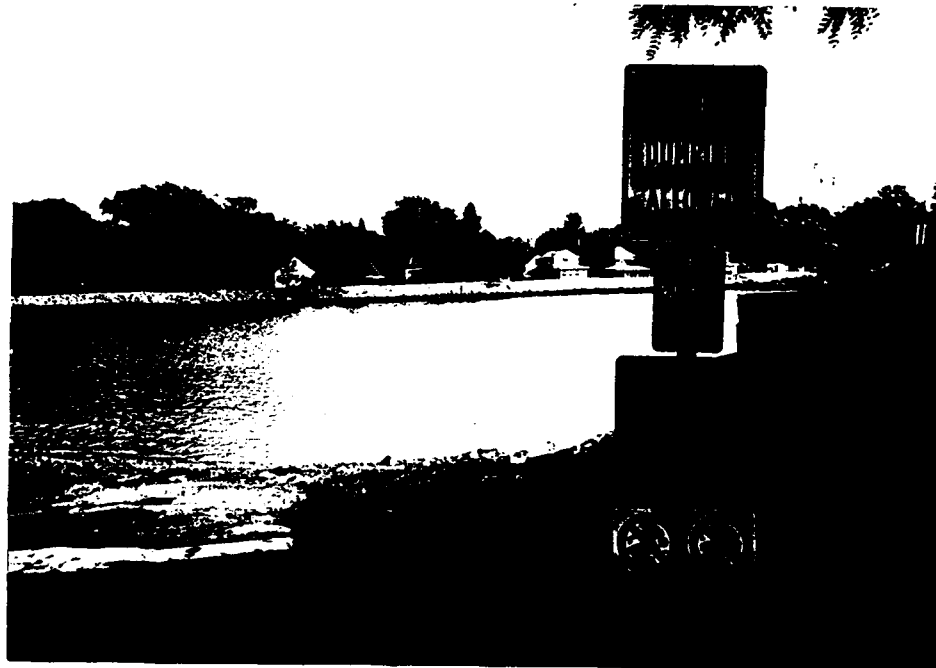


Figure 4 - Monthly Elevation - Duration Curve for August

used to determine the existing usage for the river by vessel size. This approach is limited in the sense that monthly average lake levels dampen the effect of instantaneous lake levels which vary widely in comparison to the monthly average. The monthly average is a flat water measure, whereas the instantaneous levels reflect wind, wave, barometric pressure and other short term effects on water conditions and elevations. The Cleveland gage was used for expediency of the economic evaluation contained in Appendix C to this report. The monthly means data was originally developed for the Ashtabula River, Ohio navigation study. There were no significant differences between the monthly water level means for the Toledo gage and the Cleveland gage. Along the Ottawa River, wave action is minimal with wave heights

of 0.5 feet considered typical. In Maumee Bay, a 2 foot wave is considered typical.

2.1.6 Water Quality - The water quality of the Ottawa River is classified as highly polluted in the lower reach near the mouth of the river. The river is posted by the Toledo District Health Department that "Due to water pollution this area of the river is unsafe for swimming, skiing, other water activities, and fishing. Fish caught in this area may be contaminated and unsafe to eat". The source of this pollution is from upstream landfills (including the Dura landfill), sewer outfalls, and agricultural runoff. This degraded water quality may also adversely impact upon the river bottom sediments. The Ohio Environmental Protection Agency (EPA) produced a report "Fish Tissue, Bottom Sediment, and Surface Water - Ottawa River/Tenmile Creek" dated May 17, 1991. The report summarized the analysis findings of recently collected fish tissue, sediment, and water samples, taken between 1986 through 1990. The sediment and water samples contained elevated concentrations of PCB's, organic compounds, pesticides, and heavy metals (copper, chromium, lead, and zinc). Additional sampling and testing of the sediments will need to be completed by the Corps of Engineers prior to final selection of a method of disposal of the dredged materials.



Posted Health Warning - Ottawa River



Ottawa River Downstream of Summit Street (1984)



Marinas along the Ottawa River (looking upstream)



Island 18 - Confined Disposal Site (1984)

2.2 Human Environment

2.2.1 Recreational Navigation - The Ottawa River serves both local based and transient water craft. Most local based recreation craft are owned by residents residing in the surrounding communities. Upstream of the Summit Street bridge, private residences with private docks line the shoreline. Downstream of the Summit Street bridge numerous marinas and yacht clubs are located along the river. There are no existing ramp sites along the Ottawa River. Transient craft from harbors located at Toledo, Sandusky, Lorain, and Cleveland, Ohio and Detroit, Michigan visit the Ottawa River only when conditions allow easy access. Existing traffic in the Ottawa River consists entirely of recreational craft. No commercial fishing boats are known to be based in the river. There are no known charter boats permanently based in the Ottawa River. The existing fleet mix on the Ottawa River was based on a June 1991 survey conducted by Buffalo District and is contained in Table I.

Table I - Fleet Mix of Ottawa River

Fleet Mix - Ottawa River						
Type/Length	< 16 feet	16-26 feet	26-39 feet	40-64 feet	> 64 feet	Totals
Outboard	24	44	35	8		111
Inboard		107	247	40		394
In/Outboard		548	63	2		613
Sailboat	2	193	40			235
TOTAL	26	892	385	50	0	1353
Source: June 1991 survey conducted by Buffalo District						

3 - PROBLEM IDENTIFICATION

3.1 Introduction

The major water resource problem in the Ottawa River is restricted navigation access due to limited depths in the river and bay channels. Though Lake Erie levels have remained slightly above average in recent years, the silt restricted channel depths have adversely affected commercial and recreational boating potential.

3.2 Problems, Needs, and Opportunities

3.2.1 Navigation Problems - There currently is a lack of adequate harbor facilities for present and future commercial (charter boats) and recreational craft on western Lake Erie. Dredging (deepening) the Ottawa River would improve the existing restrictive and sometimes hazardous conditions. It would encourage the future growth of locally based and transient fleets to their full potential and provide additional refuge facilities for shallow-draft craft cruising along the westerly coast of Lake Erie.

3.2.2 Other Needs - The public has expressed anticipation that this project will help to improve the river bottom sediment and water quality conditions with the dredging and removal of contaminated sediments. It is unlikely that the limited dredging at the mouth of the river will have any significant impact on the water quality until the upstream pollution sources are addressed.

3.2.3 Pollution Problems - The sources of Ottawa River pollution are from upstream landfills, including the Dura landfill, sewer outfalls, and agricultural runoff. This degraded water quality may also adversely impact upon the river bottom sediments. Sampling, testing, and classification of the sediments will need to be completed prior to final selection of a method of disposal for the dredged material.

3.3 Planning Objectives

3.3.1 National Objective - Current Federal policy, as developed by the President's Water Resources Council, requires that alternative water and related land resource plans be formulated in accordance with the national objective of National Economic Development (NED). National Economic Development is achieved by increasing the value of the nation's output of goods and services and improving economic efficiency consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Traditionally, the NED objective will be achieved through construction of a project or projects where the benefits are greater than costs.

3.3.2 Specific Planning Objectives - Specific planning objectives are the National, State, and local water and related land resource management needs specific to a study area that can be addressed to enhance National Economic Development. The specific objectives of this Limited Reevaluation study are:

- To enhance National Economic Development by recommending measures to improve the navigation depths of the Ottawa River Harbor;
- To provide safe trafficking for the mix of recreational and commercial boats using Ottawa River Harbor;
- To produce a safe harbor to encourage commercial boating development (charter boat operations and marina operations);
- To preserve, protect, or enhance the quality of fish and wildlife where possible in the Ottawa River Harbor;
- To ensure safe disposal of potentially polluted sediments;
- To improve quality of life - social well being; and
- To preserve the cultural resources in the Ottawa River Harbor area.

3.4 Planning Constraints

At the onset of this Limited Reevaluation study, there were no known charter boats (commercial navigation benefits) based within the project area. There was insufficient information available until to determine whether or not commercial navigation would be a primary project output. If the project outputs do not include significant high priority benefits, the project would not be in accordance with the Department of

Army's policies. The instructions accompanying the FY91 Work Allowance for Ottawa River do not specify the course of action on continuation of the Reevaluation Report to completion if the high priority criterion (commercial benefits greater than 50% of the costs), is not met. Based on this current policy for priority outputs, the results of this Limited Reevaluation report will be used as the basis for the recommendation to terminate or continue with Preconstruction Engineering and Design (PED).

The identification of a local sponsor is key to the progress of the current study and the overall project. Normally, this is done during feasibility, however, in 1976 at the conclusion of the Phase I GDM, the Detroit District recommended the project be classified inactive due to the lack of a local sponsor. Renewed interest in the project has resulted in reauthorization and initial funding in FY 91. As a result, the city of Toledo demonstrated an interest in being the local sponsor. The Project Management Branch, Buffalo District had been coordinating with the city of Toledo to obtain a letter of intent from them indicating their willingness to act as a local sponsor.

There are two executive orders that directly affect water resource planning procedures. Executive Order 11988 (May 24, 1977) states that no Federal agency should undertake actions directly or indirectly that will induce growth in the floodplain unless no practical alternative exists. Executive Order 11990 (May 24, 1977) directs Federal Agencies to avoid projects that will destroy or degrade wetlands, unless no practical alternatives to such projects exist. This project is not anticipated to impact upon the floodplain or on wetlands.

3.5 Without Project Conditions

As a base condition, the most "probable future" is the scenario and conditions that would exist over the planning horizon, if no coordinated Federal action were taken. This is referred to as the "Without Project Condition". It does not mean that no actions would be taken, but that any proposed Federal actions are compared to the "Without Condition" to determine their merits.

4 - FORMULATION OF ALTERNATIVES

4.1 Plan Formulation Rationale

The objective of plan formulation in this investigation is to develop alternatives that will address the problems and needs in the Ottawa River Harbor area consistent with the Federal objective. The Plan Formulation process attempts to develop the most efficient set of alternatives that solve the problems and still meet the Federal criteria for investment. It is important to proceed with a quantitative analysis to assure that the alternatives formulated will identify the most efficient solution. To accomplish this, an economic analysis was required.

The plans will be formulated in accordance with Corps of Engineers planning guidance provided in Engineering Regulation (ER) 1105-2-100.

4.2 Formulation and Evaluation Criteria

In water resources planning, plans must be formulated to meet the needs of the area with due regard to benefits and costs, both tangible and intangible, and the effects on the environment and social well-being of the community. Investment decisions will need to be made on economic, engineering, environmental and social well-being criterion. Identifying the most efficient solutions with the participation of the non-Federal partner is critical to formulating a solution that is both efficient and responsive to the public's needs.

Within the structure of the overall planning framework, other more specific criteria must be established relative to: general policies, technical engineering, economic principles, social and environmental values, and local conditions. These criteria, noted as "Technical", "Economic", and "Socioeconomic and Environmental" are as follows:

4.2.1 Technical Criteria - Improvement alternatives for this study are limited to the Ottawa River, the Ottawa River Harbor, and the Bay area. The recreational boating fleet mix for the report was presented in Section 2. The depths for dredging are determined by the required draft of the existing fleet. Table II presents the existing fleet drafts by length of each vessel class.

Additional factors were also identified and considered to establish required depths for dredging. The fluctuations in water level, wave conditions, under-keel clearance, and degree of safety must be accounted for. The movement of a vessel will cause a lowering of the water surface due to the change in the velocity, resulting in a

Table II - Fleet Mix Draft by Length of Vessel - Ottawa River

Fleet Mix Draft by Length of the Vessel - Ottawa River					
Type/Length	< 16 feet	16-26 feet	26-39 feet	40-64 feet	> 64 feet
Outboard	2.0	2.5	3.0	3.0	
Inboard		3.5	4.0	4.5	
In/Outboard		3.0	3.0	4.0	
Sailboat	2.0	3.0	5.0		

Source: June 1991 survey conducted by Buffalo District

lowering of the vessel; this is known as squat. This must also be factored in the requirements.

4.2.2 Economic Criteria - An economic evaluation of the existing Ottawa River fleet with a primary emphasis on the identification of commercial boating benefits (charter boat fishing) will be accomplished in this report along with all components that make up the required benefit categories in accordance with Principles and Guidelines and the Policy and Planning Guidance (ER 1105-2-100). This will require research, field investigations, analysis, and documentation of findings.

4.2.3 Socioeconomic and Environmental Criteria - All significant adverse and beneficial economic, social, and environmental effects of planned developments will be considered and evaluated during the reevaluation. The criteria for socioeconomic and environmental considerations in water resources planning are prescribed by the National Environmental Policy Act of 1969 (PL 91-190) and Section 122 of the River and Harbor Act of 1970, (PL 91-611).

4.2.4 Mitigation Factors - The Environmental Impact Statement (EIS) would determine if mitigation measures would be required as a part of this project. Preliminary indications from the previous EIS indicate that the impacts to the regional environment would be limited to temporary construction-related impacts.

4.2.5 Other Criteria - According to current Federal legislation, the construction of the project must be cost-shared between the Federal government and non-Federal interests. Formal assurances of local cooperation must be furnished by a non-Federal sponsor capable of fulfilling all items of local cooperation. Coordination efforts were undertaken to negotiate a Letter of Intent with the City of Toledo.

4.3 Plan Development and Description

Within the prescribed planning framework and established criteria, possible solutions were identified and will be evaluated in a two-stage iterative process to address the needs of the study area and the overall planning objectives. Each stage includes the four functional planning tasks of problem identification, formulation of alternatives, impact assessment, and evaluation. Emphasis shifts from the identification to evaluation task as this iterative process is refined in the next stage of the study process.

This document reports the results of the Limited Reevaluation Phase analysis. The level of study performed is consistent with the objective of evaluating a broad range of possible solutions and identifying a general plan for satisfying the navigation needs of the Ottawa River Harbor study area with one of the goals being to determine if there is a Federal interest in proceeding to the Final Reevaluation stage of study.

4.4 Alternatives

The General Design Memorandum dated 1976 recommended a project that would now cost about \$42,518,600, at September 1991 price levels (and assuming construction of a new confined disposal facility). During preliminary Ottawa River investigations following the reauthorization of this project, it was determined that the potential magnitude of high priority project outputs (commercial navigation benefits) was very limited. It was unlikely the 1976 GDM plan would meet current Department of Army Policy for Federal interest. Therefore, during this limited reevaluation, two scaled down plans were developed with reduced channel widths and depths. This resulted in the design of two plans (Plan 1 and Plan 2) that were significantly less expensive to construct and could be supported by the demand for recreational boating improvements to reduce boat damages and increase resource utilization. Each of these two plans was then formulated with two different methods of dredged material disposal to form four separate plans (Plan 1A, Plan 1B, Plan 2A, and Plan 2B). Plans 1A and 2A would use the existing confined disposal facility (CDF) at Island 18, while Plans 1B and 2B would require construction of a new CDF site adjacent to the bay channel. A detailed description for each of the alternatives is contained in Section 5, Evaluation of Alternatives.

The alternatives carried forward in this Limited Reevaluation report are as follows:

<u>Alternative</u>	<u>Dredging Depths (River - Bay)</u>	<u>Method of Disposal</u>
○ Alternative 1 - No Action	No Change	N/A
○ Alternative 2 - Authorized GDM Plan	5' to 6' - 8'	New CDF
○ Alternative 3 - Plan 1A	4' - 5'	Island 18
○ Alternative 4 - Plan 1B	4' - 5'	New CDF
○ Alternative 5 - Plan 2A	5' - 6'	Island 18
○ Alternative 6 - Plan 2B	5' - 6'	New CDF

These alternatives will be evaluated in detail in the next section - Evaluation of Alternatives.

5 - EVALUATION OF ALTERNATIVES

5.1 General

This section groups the alternatives presented in Section 4 to address the basic planning objectives. This section also provides the rationale for choosing a selected plan. These alternatives require more study which the Corps could do if it proceeded to the Final Reevaluation Phase. A summary of the alternatives is presented in the shaded area to the right.

The evaluation of these alternatives was based primarily on a preliminary design analysis, a cost engineering analysis, and economic evaluation.

Summary of Alternatives

- *Alternative 1 - No Action*
- *Alternative 2 - Authorized General Design Memorandum Plan*
- *Alternative 3 - Plan 1A*
- *Alternative 4 - Plan 1B*
- *Alternative 5 - Plan 2A*
- *Alternative 6 - Plan 2B*

5.2 Evaluation

For this Reevaluation Report, the alternatives which are listed above, were first evaluated to determine if they met the public needs. Project maps for each of the alternatives (Alternatives 2 - 6) are provided at the end of the main report.

The Design Appendix (A) provides a detailed analysis of the alternatives and lays out the characteristics of each alternative. While the 1976 General Design Memorandum proposed a plan (Alternative 2) that would maximize use of the channel, funding constraints dictate a smaller plan. The fleet using the Ottawa River, indicated two potential plans (Plan 1 (A & B) and Plan 2 (A & B)) that would allow use of the river channel most of the time with moderate amounts of dredging. Table III shows the percent of expected usage of Ottawa River Harbor under with and without project conditions for the alternatives listed above. The upstream limits for these reduced scale plans (Alternatives 3 - 6) would be at Mudjaw Creek, rather than Suder Avenue for the authorized plan (Alternative 2). The conditions upstream of Mudjaw Creek are restrictive to many boats due to the low steel elevation on the bridges at Summit Street and Suder Avenue.

Table III - Percent usage of Ottawa River Harbor - With and Without Conditions

Percent Usage of Ottawa River Harbor With and Without Conditions				
Fleet Type	Without Conditions	Alternative 2 GDM Plan	Alternatives 3&4 Plans 1A & 1B	Alternatives 5&6 Plans 2A & 2B
Permanent- Based	30%	100%	87%	97% - 98%
Private	43%	100%	93%	99%
Transient	30%	100%	86%	97%

5.2.1 Alternative 1 - No Action - The No Action plan would not meet any of the planning objectives. In particular, it would not meet the primary planning objective to improve the existing restrictive and sometimes hazardous navigation conditions in the Ottawa River. During low water conditions, navigation traffic would be halted or restricted to shallow draft boats only. The existing fleet could use Ottawa River Harbor only 30 to 43 percent of the boating season. Damages to boats would continue, due to the shallow depths that would continue to exist in the river and bay channels. Existing marinas along the Ottawa River would continue to be restricted in their operations due to current and future limiting conditions. The Social Well-Being criteria of improving health and human safety would not be achieved. The No Action plan should, therefore, only be selected in the event that no plans for navigation improvement are feasible.

5.2.2 Alternative 2 - Authorized General Design Memorandum Plan - The authorized project provided for the following elements:

Dredge a channel 7,630 feet long having a depth of 5 feet below LWD, a bottom width of 80 feet; and side slopes of 1 on 20 from the Suder Avenue bridge downstream to the Summit Street bridge. Disposal of the dredged spoil would be in an in-water dike containment area located southeast of Suder Avenue having an area of 12.5 acres. This CDF is no longer available due to the presence of wetlands in the area.

Dredge a channel 8,260 feet long having a depth of 6 feet below LWD, a bottom width of 80 feet, and side slopes of 1 on 20 from the Summit Street bridge to the

mouth of the Ottawa River. Disposal of the dredged material, as detailed in the 1976 GDM, would be in a dike containment area located in Erie Township on land owned by the State of Michigan having an area of 33 acres. This CDF is no longer available, Michigan will not grant permission to use this site.

Dredge a channel 16,700 feet long having a depth of 8 feet below LWD, a bottom width of 100 feet, and side slopes of 1 on 3 from the mouth of the Ottawa River to the Toledo Harbor shipping channel. Dredged spoil would be disposed of by open water dumping in deep waters of Lake Erie. Open water disposal has been curtailed in recent years

The methods of disposal, as outlined above, were proposed in the 1976 General Design Memorandum. However, conditions have changed and these methods of disposal are not longer viable. For comparison to the other alternatives, a disposal cost, involving the construction of a new CDF adjacent to the Bay channel, has been included at current price levels. However, it is unlikely this plan would be economically justified because of the high cost to construct a new disposal facility.

5.2.3 Alternative 3 - Plan 1A - This plan proposes to dredge a channel along the Ottawa River from the confluence with Mudjaw creek (downstream of the Summit Street bridge) to the mouth of the Ottawa River. The channel would have a depth of 4 feet below LWD, a bottom width of 80 feet and side slopes of 1 on 20. Also a Bay Channel from the mouth of the Ottawa river to the Federal commercial navigation channel will be dredged. In addition, the Bay Channel would have a depth of minus 5 feet LWD, a bottom width of 80 feet, and a side slope of 1 on 3. The dredging volumes include one foot of over-depth dredging over the length of the channels.

The dredged material is proposed to be deposited in Island 18, an existing Confined Disposal Facility (CDF). Island 18 is located to the north of Federal navigation channel between Toledo Harbor and the mouth of the Ottawa River. This CDF has sufficient capacity for the initial dredging and for the maintenance dredging.

5.2.4 Alternative 4 - Plan 1B - This plan is identical to the Alternative 3 - Plan 1A, except that the method of disposal is different. For this plan it was assumed that the dredged material would be disposed of in a newly constructed CDF adjacent and west of the bay channel. The city of Toledo has also identified several additional upland sites that could be used. A recommended CDF site has not been negotiated with the local sponsor (city of Toledo) at this time. However, for purposes of this report, the proposed new CDF adjacent to the bay channel will be used for cost estimating purposes.

5.2.5 Alternative 5 - Plan 2A - This alternative differs from alternatives 3 and 4 because it primarily provides an extra foot of dredged channel depth to more effectively accommodate a deeper draft fleet. The percent of increased usage for this alternative is presented in Table III. This plan proposes to dredge a channel along the Ottawa River from the confluence with Mudjaw creek (downstream of the Summit Street bridge) to the mouth of the Ottawa River. The channel would have a depth of minus 5 feet Low Water Datum (LWD), a bottom width of 80 feet and side slopes of 1 on 20. In addition, a Bay Channel from the mouth of the Ottawa river to the Federal commercial navigation channel will be dredged. The Bay Channel would have a depth of minus 6 feet LWD, a bottom width of 80 feet, and a side slope of 1 on 3. The dredging volumes include one foot of over-depth dredging over the length of the channels.

The dredged material is proposed to be deposited in Island 18, an existing Confined Disposal Facility (CDF). Island 18 is located to the north of Federal navigation channel between Toledo Harbor and the mouth of the Ottawa River. This CDF has sufficient capacity for the initial dredging and for the maintenance dredging.

5.2.6 Alternative 6 - Plan 2B - This plan is identical to the Alternative 6 - Plan 2A, except that the method of disposal differs. For this plan it was assumed that the dredged material would be disposed of in a newly constructed CDF adjacent and west of the Bay Channel. The city of Toledo has also identified several upland sites that could be used. The determination of a recommended site has not been made.

5.3 Design Considerations

Several methods of dredging were investigated and it was found that the most efficient method would be to use a hydraulic cutter suction dredge. The particular method of dredging would be most advantageous due to the distances to the proposed CDF sites (about 13,000 feet to Island 18 and 12,000 feet to one of the proposed New CDF site, across from the Toledo Dike Disposal Area north of the Toledo Harbor Channel and west of the Ottawa River Entrance Channel. The depths of the river entrance would also be suitable to the clearances of the hydraulic cutter suction dredge.

More details on the design of these alternatives can be found in Appendix A - Design.

5.4 Cost Estimates

Cost estimates have been prepared for all alternatives, except the no action plan. The cost estimates are presented in Table IV, Table V, Table VI, Table VII, and Table VIII on the following pages. Alternative 2, the authorized project detailed in the 1976 General Design Memorandum, has been updated to September 1991 price levels. The cost estimates for the other alternatives were also prepared at September 1991 price levels.

The cost estimates for the dredging are based on the assumption that a hydraulic cutter suction dredge would be used. Additional booster pumps would be needed to pump the material to the confined disposal sites.

The cost estimates for the dikes include all required materials; riprap cover stone, cushion stone, clay, granular fill, and construction of a weir.

The mobilization and de-mobilization cost pertains only to the channel dredging work. The mobilization and de-mobilization as related to the containment dike is included in the unit price related to the feature.

Periodic maintenance of the channels would be required every 3 years for each of the alternatives. For each alternative, the estimated quantity of material to be removed every three years for maintenance dredging is:

Alternative 2 - 109,000 Cubic Yards
Alternatives 3 and 4 - 36,300 Cubic Yards
Alternatives 5 and 6 - 61,800 Cubic Yards

Table IV - Alternative 2 - Authorized Plan from the 1976 General Design Memorandum, Dredging (5, 6, & 8 foot depths) and disposal.

Alternative 2 - Authorized GDM Plan (September 1991 Price Levels)				
Description	Estimated Quantity	Unit	Unit Cost	Total Amount
Mob. and Demob.		L.S.		\$ 250,000
Dredging	828,200	C.Y.	\$8.00	\$ 6,625,200
Dike Disposal Areas	2,572,200	C.Y.	\$8.65	\$22,249,530
Contingency			+/- 20%	\$ 6,925,270
Total Construction Costs				\$36,050,000
Planning, Engineering, and Design				\$ 1,440,000
Construction Management				\$ 2,160,000
Aids to Navigation				\$ 35,000
Total First Cost IDC				\$39,685,000
TOTAL PROJECT COST				\$ 2,833,630
				\$42,518,630
Annual Maintenance Cost				
Mob. & Demob. Annual Maintenance Dredging		L.S.		\$ 430,900
TOTAL ANNUAL MAINTENANCE COST				\$ 430,900

C.Y. - Cubic Yards L.S. - Lump Sum IDC - Interest During Construction

Table V - Alternative 3 - Plan 1A - Dredging (4 & 5 foot depths) and Disposal at Island 18

Alternative 3 - Plan 1A - Dredging and Disposal in Island 18 (September 1991 Price Levels)				
Description	Estimated Quantity	Unit	Unit Cost	Total Amount
Mob & Demob Dredging and Disposal Contingency	150,000	L.S. C.Y.	\$ 8.00 +/-20%	\$ 250,000 \$ 1,192,000 \$ 298,000
Total Construction Cost				\$ 1,740,000
Planning, Engineering, and Design				\$ 660,000
Construction Management				\$ 140,000
Aids to Navigation				\$ 35,000
Total First Cost IDC				\$ 2,575,000
TOTAL PROJECT COST				\$ 2,637,325
Annual Maintenance Cost				
Mob & Demob Annual Maintenance Dredging		L.S.		\$ 203,600
TOTAL ANNUAL MAINTENANCE COST				\$ 203,600

C.Y.- Cubic Yards L.S. - Lump Sum IDC - Interest During Construction

Table VI - Alternative 4 - Plan 1B - Dredging (4 & 5 foot depths) and Disposal at a New Confined Disposal Facility

Alternative 4 - Plan 1B - Dredging and Disposal in a New CDF (September 1991 Price Levels)				
Description	Estimated Quantity	Unit	Unit Cost	Total Amount
Mob. & Demob.		L.S.		\$ 250,000
Dredging and Disposal	149,000	C.Y.	\$ 8.00	\$ 1,192,000
New Dike	729,800	C.Y.	\$ 8.65	\$ 6,312,770
Contingency			+/- 20%	\$ 1,875,230
Total Construction Cost				\$ 9,630,000
Planning, Engineering, and Design				\$ 1,125,000
Construction Management				\$ 810,000
Aids to Navigation				\$ 35,000
Total First Cost				\$ 11,600,000
IDC				\$ 1,671,841
TOTAL PROJECT COST				\$ 13,271,841
Annual Maintenance Cost				
Mob & Demob Annual Maintenance Dredging		L.S.		\$ 201,700
TOTAL ANNUAL MAINTENANCE COST				\$ 201,700

C.Y.- Cubic Yards L.S. - Lump Sum IDC - Interest During Construction

Table VII - Alternative 5 - Plan 2A - Dredging (5 & 6 foot depths) and Disposal at Island 18

Alternative 5 - Plan 2A - Dredging and Disposal in Island 18 (September 1991 Price Levels)				
Description	Estimated Quantity	Unit	Unit Cost	Total Amount
Mob & Demob Dredging and Disposal Contingency	248,000	L.S.		\$ 250,000
		C.Y.	\$ 8.00 +/-20%	\$ 1,984,000
				\$ 466,000
Total Construction Cost				\$ 2,700,000
Planning, Engineering, and Design				\$ 720,000
Construction Management				\$ 220,000
Aids to Navigation		L.S.		\$ 35,000
Total First Cost IDC				\$ 3,675,000
TOTAL PROJECT COST				\$ 114,625 \$ 3,789,625
Annual Maintenance Cost				
Mob & Demob Annual Maintenance Dredging	62,500	C.Y.	\$ 8.00	\$ 286,400
TOTAL ANNUAL MAINTENANCE COST				\$ 286,400

C.Y. - Cubic Yards L.S. - Lump Sum IDC - Interest During Construction

Table VIII - Alternative 6 - Plan 2B - Dredging (5 & 6 foot depths) and Disposal at a New Confined Disposal Facility

Alternative 6 - Plan 2B - Dredging and Disposal in a New CDF (September 1991 Price Levels)				
Description	Estimated Quantity	Unit	Unit Cost	Total Amount
Mob & Demob		L.S.		\$ 250,000
Dredging and Disposal	248,000	C.Y.	\$ 8.00	\$ 1,984,000
New Dike	1,236,800	C.Y.	\$ 8.65	\$ 10,698,320
Contingency			+/- 20%	\$ 3,147,680
Total Construction Cost				\$ 16,080,000
Planning, Engineering, and Design				\$ 1,200,000
Construction Management				\$ 1,370,000
Aids to Navigation				\$ 35,000
Total First Cost IDC				\$ 18,685,000
TOTAL PROJECT COST				\$ 2,682,031
				\$ 21,367,031
Annual Maintenance Cost				
Mob & Demob Annual Maintenance Dredging		L.S.		\$ 278,100
TOTAL ANNUAL MAINTENANCE COST				\$ 278,100

C.Y. - Cubic Yards L.S. - Lump Sum IDC - Interest During Construction

The average annual cost of each alternative (Alternatives 2 - 6) is included in Table IX. The average annual cost is a total of the amortized project cost plus interest during construction and the annual maintenance cost. Average annual costs are based upon September 1991 price levels, a project interest rate of 8 1/2 %, and 50 year project life. The average annual costs range from \$431,623 for Alternative 3 (Plan 1A) to \$4,107,061 for Alternative 2 (GDM Plan).

Table IX - Alternatives - Average Annual Costs

Alternatives - Average Annual Costs				
Alternatives	Total Project Cost	Interest and Amortization	Annual Maintenance	Total Average Annual Costs
Alternative 2 - GDM Plan	\$42,518,630	\$ 3,676,161	\$ 430,900	\$ 4,107,061
Alternative 3 - Plan 1A	\$ 2,637,325	\$ 228,023	\$ 203,600	\$ 431,623
Alternative 4 - Plan 1B	\$13,271,841	\$ 1,147,483	\$ 201,700	\$ 1,349,183
Alternative 5 - Plan 2A	\$ 3,789,625	\$ 327,651	\$ 286,400	\$ 614,051
Alternative 6 - Plan 2B	\$ 21,367,031	\$ 1,847,394	\$ 278,100	\$ 2,125,494

September 1991 price levels, 8-1/2% interest rate, and 50-year project life.
Amortization (0.08646)

5.5 Economic Analysis

An economic evaluation of the proposed alternatives included analysis of the existing boat fleet in the Ottawa River Harbor area with a primary emphasis on the identification of high priority outputs (charter boat fishing and recreational boat damages avoided). This was accomplished in accordance with Principles and Guidelines and the Policy and Planning Guidance (ER 1105-2-100). Field surveys of the study were conducted to identify existing conditions of development and recreational boating fleet characteristics and project future conditions with and without a Federal project in place. Information from marinas, yacht club operators, and boat owners was obtained from questionnaires and through personal interviews.

Both with and without project conditions have been evaluated. The with project conditions are reflected in the added utilization of existing docks in private marinas. The yacht clubs were projected to be nearly 100% occupied throughout the without project evaluation period. The proposed project would draw potential boaters to the area that were previously unsure of navigational safety or were unwilling to relocate due to concerns about being able to navigate during the entire boating season.

There are currently no charter boats or commercial fishing boats berthed or moored on the Ottawa River. The with project conditions will result in improvements to navigational conditions for potential captains. However, little or no interest was expressed for the return or expansion of charter boat fishing on the river, because the Ottawa River is too far from the prime fishing grounds to the east of Toledo.

The benefit categories for low priority output are recreational experience benefit categories. The benefit category for high priority output is recreational boat damages avoided. A summary of these benefits is provided in Table X - Summary of Benefits. The benefits were based on September 1991 price levels, an 8 1/2 percent interest rate, and a 50 year project life.

The economic efficiency of all alternatives is shown on Table XI and Table XII based on high priority outputs and total project outputs, respectively.

Table X - Summary of Benefits

Summary of Benefits			
(September 1991 price levels, 8-1/2% Interest, and 50 year project life)			
Benefit Category	Alternative 2 (GDM Plan)	Alternatives 3 & 4 (Plans 1A & 1B)	Alternatives 5 & 6 (Plans 2A & 2B)
High Priority Benefits			
Recreational Boat Damages Avoided	\$ 247,900	\$ 218,900	\$ 243,500
Low Priority Benefits			
Recreational Boating	\$ 749,000	\$ 628,200	\$ 728,200
Permanent-Based	\$ 589,900	\$ 529,100	\$ 581,200
Private/Other	\$ 30,600	\$ 25,000	\$ 29,400
Transient			
Low Priority Benefit Subtotal	\$ 1,369,500	\$ 1,182,300	\$ 1,338,800
TOTAL	\$ 1,617,400	\$ 1,401,200	\$ 1,582,300

Table XI - Economic Efficiency - Benefit Cost Comparison - High Priority Benefits - September 1991 Price Levels

Alternative Plan 1/	Total Investment Cost 2/	Average Annual Benefits	Average Annual Costs	Net Discounted Benefits	Benefit/Cost (B/C) Ratio
Alt 2 - GDM Plan	\$42,518,600	\$ 247,900	\$ 4,107,100	- \$3,859,200	0.06
Alt 3 - Plan 1A	\$ 2,637,300	\$ 218,900	\$ 431,600	- \$ 212,700	0.51
Alt 4 - Plan 1B	\$13,271,800	\$ 218,900	\$ 1,349,200	- \$1,130,300	0.16
Alt 5 - Plan 2A	\$ 3,789,600	\$ 243,500	\$ 614,100	- \$ 370,600	0.40
Alt 6 - Plan 2B	\$21,367,000	\$ 243,500	\$ 2,125,500	- \$1,882,000	0.11

Note: 1/ Based on 8 1/2% interest rate and 50-year project life.
 2/ Total costs include interest during construction.

Table XII - Economic Efficiency - Benefit/Cost Comparison - Total Benefits - September 1991 Price Levels

Alternative Plan 1/	Total Investment Cost 2/	Average Annual Benefits	Average Annual Costs	Net Discounted Benefits	Benefit/Cost (B/C) Ratio
Alt 2 - GDM Plan	\$15,543,900	\$ 1,617,400	\$ 4,107,100	- \$2,489,700	0.39
Alt 3 - Plan 1A	\$ 2,637,300	\$ 1,401,200	\$ 431,600	\$ 969,600	3.25
Alt 4 - Plan 1B	\$28,867,900	\$ 1,401,200	\$ 1,349,200	\$ 52,000	1.04
Alt 5 - Plan 2A	\$ 3,789,600	\$ 1,582,300	\$ 614,100	\$ 968,200	2.58
Alt 6 - Plan 2B	\$46,881,100	\$ 1,582,300	\$ 2,125,500	- \$ 534,200	0.74

Note: 1/ Based on 8 1/2% interest rate and 50 year project life.
 2/ Total costs include interest during construction.

5.6 Federal Interest

Using this economic evaluation, there is a Federal interest to continue with the reevaluation phase beyond this limited reevaluation report. Based on current Department of Army guidelines for economic evaluation; to carry an alternative plan forward for approval it must have sufficient high priority benefits to achieve a BCR equal to or greater than 0.51. Based on high priority average annual benefits, as presented in Table XI, only one of the alternatives meets the BCR criterion of 0.51 when the average annual costs are compared to the average annual benefits (recreational boat damages avoided). The high priority benefits are greater than 50% of the total benefits for Alternative 3. Based on current Department of Army policies and guidelines, only Alternative 3 is in the Federal interest. Alternative 3 maximizes the net discounted benefits.

If low priority outputs (recreational benefits) were combined with the high priority benefits as presented in Table XII, there are three alternatives (Alternatives 3, 4, and 5 that would be economically justified. However, recreational benefits have a low priority based on current Department of Army guidelines. This additional analysis of recreational benefits is beneficial to non-Federal agencies to judge the merits of the

proposed alternatives for harbor improvement.

5.7 Proposed Local Cooperation

The identification of a local sponsor is critical to the progress of the current study and to the overall proposed project. Normally this is accomplished during the feasibility phase. However, in 1976 at the conclusion of the Phase I GDM, the Detroit District recommended the project be classified inactive due to the lack of a local sponsor. Renewed interest in the project has resulted in re-authorization and initial funding in fiscal year 1991. As a result, the city of Toledo indicated an interest in being the local sponsor during a 4 February 1991 interagency meeting. At a meeting on February 5, 1991, representatives of the city of Toledo, an ad hoc committee and Buffalo District meet to discuss the need for a Letter of Intent (LOI). Further discussions occurred throughout the year with city of Toledo officials. On 16 October 1991, they restated their interest in sponsorship of the project. Since the project would cross state boundaries, the City had been considering co-sponsorship by both the Ohio and Michigan Departments of Natural Resources (ODNR and MDNR). The ODNR has shown limited interest in supporting this project while the MDNR has not conveyed support at this time. However, the city of Toledo could be the project sponsor if the States of Michigan and Ohio conveyed to them the underwater rights to lands necessary for dredging. Buffalo District had transmitted a letter to the City in November 1991 outlining the requirements for use of Island 18 and requesting a LOI. In a letter dated March 12, 1992 from the city of Toledo (letter contained in Appendix D), Buffalo District was informed that the city of Toledo, Ohio can not commit to the responsibility of being the Local Sponsor for the subject project. The city of Toledo does not have the resources at this time to commit to the long term maintenance for disposal of the dredged material. As further stated in the letter, the City has contacted the other governmental jurisdictions in the project area, yet no local sponsor was identified.

6 - STUDY MANAGEMENT

6.1 Final Reevaluation Methodology

This section outlines the planning/design procedures and products that would follow if a Federal interest were determined in this limited reevaluation report.

6.1.1 Final Reevaluation Report - The final reevaluation report would be a continuation of the limited reevaluation report, providing more in-depth investigations and detailed engineering analysis. The reevaluation report would document the analyses undertaken in the reevaluation study, which is similar to a feasibility study. The general reevaluation guidelines are presented in draft ER 1105-2-100 which describes the information to be provided for agency review to ensure endorsement of the general reevaluation study. In brief, these guidelines provide formulation criteria that includes:

- A description of the water resource related problems;
- The most likely without project including key assumptions made will be documented and justified;
- As required alternative plans (with project condition) including key assumptions made will be documented and justified;
- All reasonable alternatives that address the identified problem(s) will be systematically formulated and evaluated in accordance with Principles and Guidelines. A well documented formulation process is essential to ensure that the scale and scope of the project are appropriate and that the most cost-effective recommended plan has been identified; and
- Federal participation in the proposed project is not to be recommended unless the outputs are in accord with departmental policies governing Federal participation. The general (re)evaluation guidelines also include:
 - Sensitivity analysis that includes as a minimum the benefit cost ratio (BCR) for the recommended plan.
 - Economic/Financial criteria used in scaling and scoping the project by using NED criteria and identification of the NED plan. The non-Federal sponsor's

preliminary financial analysis must also be included.

- Cost estimates are to be developed including final cost, life cycle project cost (in Code of Account format), contingencies and trade-off analysis.
- Legal/Institutional criteria presenting the non-Federal sponsor's acceptance of the applicable items of local cooperation along with their authority to implement their responsibilities.
- Environmental criteria, documenting that the NEPA process and other applicable Federal and state environmental laws and regulations have been and/or will be complied with, including an evaluation of the effects of alternative plans on environmental quality (EQ).

6.1.2 Final Environmental Impact Statement - The Environmental Impact Statement (EIS) prepared in 1976 and approved in March 1977 will require updating by an EIS Supplement. An EIS Supplement is a document which supplements the project's final EIS if required for compliance with NEPA. As the study progresses, existing data will have to be compiled along with new data from field surveys, sediment sampling, fishing resources, etc., and other agencies. Key to this process is adherence to applicable Federal and state laws, rules and regulations and coordination with USEPA, USEF&WS, Ohio EPA, Ohio and Michigan DNR, city of Toledo and other local agencies, i.e. TMACOG. In addition to the EIS, the following will be developed: 404(b)(1) Evaluation and Public Notice, 401 Water Quality Certification and the Record of Decision (ROD) signed by the Division Commander.

6.1.3 Design Report - Once the Limited Reevaluation study has progressed to the point that a decision can be made that an alternative or project is justified (affirmation), work can begin on the design analysis phase of the Final Reevaluation/Design Report. This work can be accomplished concurrently with the development of the Final Reevaluation report.

The first step is obtaining necessary field data and performing certain field investigations including:

- Hydrographic surveys of those areas where potential channel alignments are being considered, taken at appropriate intervals to allow for quantifying data used in the design.
- Sediment sampling and testing program to determine type, quality, and

concentration of pollutants in the material to be dredged. This program will be coordinated with the United States Environmental Protection Agency and Ohio EPA and will be accomplished by a qualified contractor.

- Topographic surveys of the adjacent and surrounding areas being considered for the project and dike disposal areas, to be accomplished by qualified survey contract or aerial mapping service.
- Geological sampling and testing of those areas where channel dredging and dike disposal facilities might be constructed would be accomplished by a qualified contractor(s) and laboratory. Subsurface exploration in the channel and in potential disposal sites would be required in the next phase to ensure that a proposed alternative is justified and can be constructed.

The studies and reports that would make up the design analysis portion of the Final Reevaluation/Design Report will include:

- Coastal Engineering Study and Appendix that provides all the data developed and used in the determination of the optimum alignment and dimension of the proposed channel.
- Geotechnical Engineering Design and Appendix that provides all the data developed and used in the dredging plan and the design of the dike disposal facilities.
- Dredging plan and design that delineates and dimensions the alignment of and typical cross sections of the channel for the selected plan.
- Dike disposal facilities designs and plan, developed in close coordination with the local sponsor, for the confinement of dredged material from initial construction and subsequent maintenance. Since the requirement for these facilities are a non-Federal responsibility, the local sponsor may elect to have us do this or do it themselves. If they do it, we will still have to review their designs to ensure they meet appropriate criteria and standards.
- Cost estimates of alternative plans would be developed during the reformulation process as required. An M-CACES estimate of the selected plan is necessary as this will serve as the basis for project justification, upward reporting and preparation of budgetary documents.

The work summarized above basically completes the Planning, Engineering, and Design (PED) phase, with the exception of LCA requirements. The Reevaluation/Design Report, along with a negotiated draft LCA and drafts of the

sponsor's Statement of Financial Capability and Financing, would be submitted to higher authority for review and approval.

6.1.4 Local Cooperation Agreement (LCA) Requirements - Although this project was authorized in 1970, it has not yet undergone construction, therefore, the cost sharing, or Local Cooperation Agreement (LCA), must be in accordance with the provisions of Section 103 of the Water Resources Development Act of 1986 (PL 99-662). As a part of the LCA package, four items are required to be submitted:

- **Local Cooperation Agreement** - The LCA would be prepared in accordance with the Model LCA and requirements of ER 1165-2-131. As such, the draft LCA is to be prepared in conjunction with the local sponsor after funds are allotted to initiate PED. The first step in this process is obtaining from the local sponsor a letter of intent to participate in the project and provide the items of local cooperation.

Under the provisions of the Local Cooperation Agreement (LCA), the local sponsor is to provide all lands, easements, rights-of-way, relocations and dike disposal areas (LERRD). The acquisition plan and LERRD are a non-Federal responsibility that would be reviewed and approved by the Real Estate Office as to what, how and why that procurement for the proposed acquisition is planned. A real estate plan provides the schedule and cost associated with the land requirements (LERRD) for the project. This effort will include a real estate planning report and a gross appraisal report, updated and modified, as appropriate, as the project progresses.

- **Statement of Financial Capability** - The statement of financial capability is a clear and convincing description, submitted by the non-Federal sponsor, of its capability to meet its financial obligations for the project in accordance with the project funding schedule.

- **Financing Plan** - A financing plan consists of a clear and convincing description of how the non-Federal sponsor plans to meet its financial obligations for the project in accordance with the project funding; and Operation and Maintenance, Right of Ways, Relocation, and Real Estate (OMRR&R) schedules.

- **Assessment of Financial Capability** - The District Commander's assessment of the non-Federal sponsor's financial capability is to determine if it is reasonable to expect that ample funds will be available to satisfy the non-Federal sponsor's financial obligations for the project.

The Final Reevaluation/Design Report for the project would include the negotiated draft LCA and drafts of the supporting materials mentioned earlier in this section. Upon approval of the draft(s) the LCA and supporting materials will be prepared in

final form for negotiation with the local sponsor and approval up through the chain of command by the Assistant Secretary of Army for Civil Works ASA(CW). Once the project has been selected as a new construction start, procedures will be set in motion to have the LCA executed by the local sponsor and the ASA(CW).

6.1.5 Plans and Specifications - The Plans and Specifications would be prepared to provide a set of contract documents that reflects the selected plan which has been elaborated in the design analysis. The plans and specifications would be prepared by Engineering and Planning Division in accordance with ER 1110-2-1200 under the reins of the assigned Technical Manager. This will include preparation of construction drawings for the channel work and the dike disposal areas, whether prepared by in-house personnel or the local sponsor, as well as the specifications covering all work involved. This effort also includes all necessary technical and Biddability, Constructibility, and Operability (BCO) reviews and approvals that results in the package that will go to Contracting Division for advertising, bid opening, contract award and eventual construction.

6.1.6 Real Estate Requirements - Real estate assessment, acquisition, and certification would be performed prior to and during negotiation of the Local Cooperation Agreement. Public Law 99-662 dated November 17, 1986, states that the non-Federal interests for the project shall provide all lands, easements, rights-of-way, and dredged material disposal areas required for the project and perform all necessary relocation. The value of any contribution under the preceding sentence shall be included in the non-Federal share of the project. EP 1165-2-1, dated February 1989, further states " In planning new navigation projects, the present policy is to require local interests to provide without cost to the United States all suitable areas required for initial and subsequent disposal of dredged material and all necessary retaining dikes, bulkheads, and embankments therefore, or the costs of such retaining works".

THE FOLLOWING SECTION 6 PARAGRAPHS ARE NOT REQUIRED SINCE THIS A NEGATIVE REPORT AND THE FINAL REEVALUATION PHASE WILL NOT BE COMPLETED.

6.2 Final Reevaluation Study Schedule

6.3 Final Reevaluation Schedule Costs

6.4 Final Reevaluation Public Involvement and Coordination

7 - CONCLUSIONS


Based on the evaluations performed during this Limited Reevaluation Report Phase, it is concluded that:

- The authorized plan (Alternative 2) is not implementable since the Confined Disposal Facilities (CDF's) cannot be constructed as proposed originally in the 1976 GDM. Michigan will not grant permission to use their lands for a CDF site, another CDF site is in a wetland area, and open lake disposal is prohibited. The construction of a new CDF site is cost prohibitive;
- An incremental analysis of economic efficiency revealed that including the low priority outputs (recreational boating benefits), three alternatives (Alternatives 3, 4, and 5) would have favorable benefit to cost ratios.
- One alternative (Alternative 3) was developed that has sufficient high priority outputs that result in a Federal interest, however during the time period between the Draft Final and Final Reevaluation Reports the U.S. Army Corps of Engineers and the Toledo Port Authority made an agreement to use Island 18 for disposal of dredged material from the Toledo Harbor shipping channel during fiscal years 1993 and 1994. Therefore, this alternative would no longer be viable, since a new disposal facility would need to be constructed as demonstrated in the unjustified Alternatives 4 and 6 (Plans 1B and 2B).
- To proceed with any alternative in which there is a Federal interest, a non-Federal sponsor (local or state government agency) must provide a Letter of Intent. The city of Toledo in a letter dated March 12, 1992 stated that "... the city of Toledo is in no position to accept the financial and other obligations as the local sponsor for the Ottawa River Dredging Project". As further stated in the letter, the City has contacted the other governmental jurisdictions in the project area, yet no local sponsor was identified.

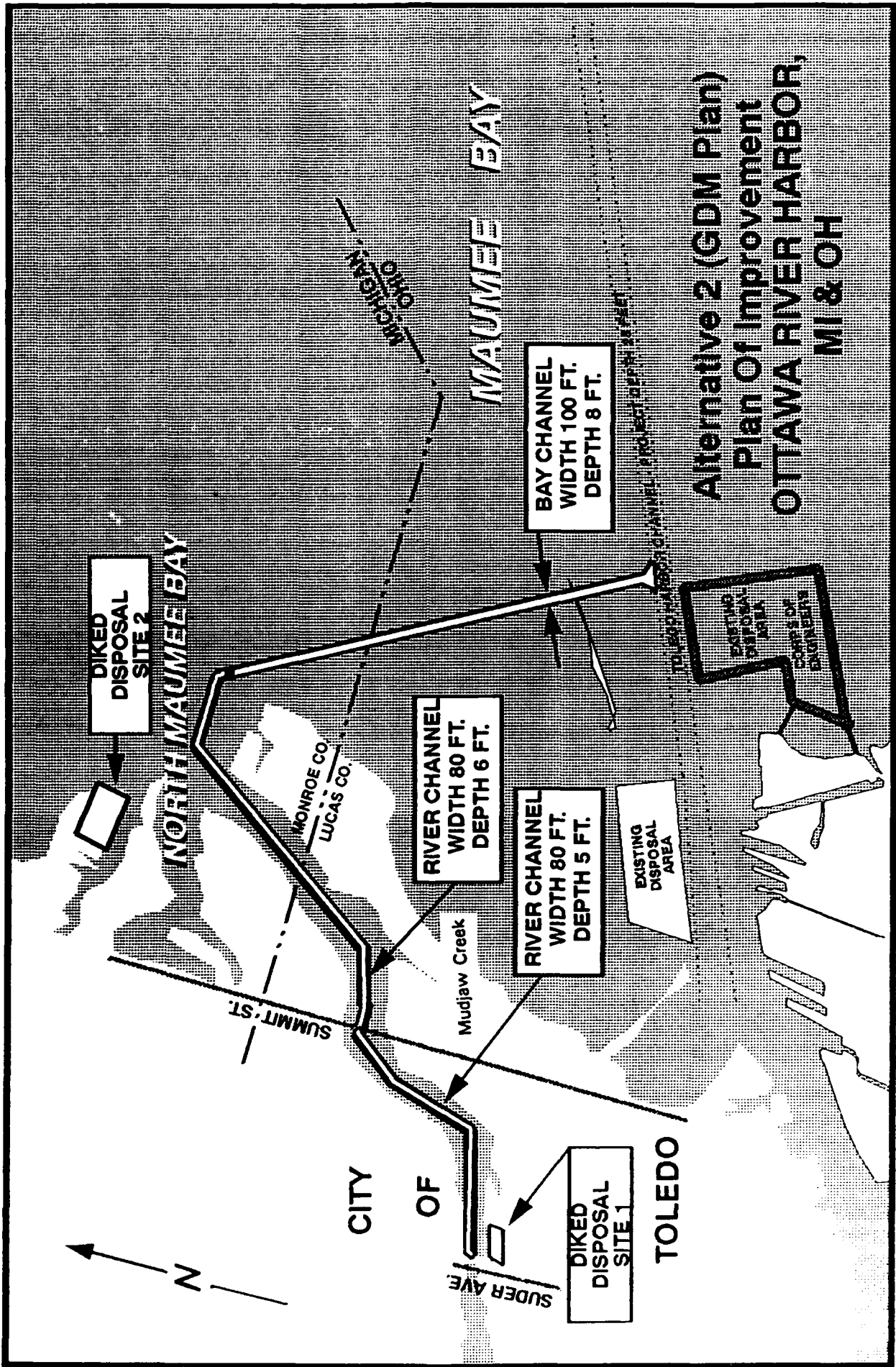
8 - RECOMMENDATIONS

The Buffalo District has reviewed the authorized project and developed additional alternatives, that are reduced in scale but would still address most of the area needs. The conclusion of this report is that, based on Department of Army policy and the recent decision that Island 18 is not available for disposal of dredged material from the authorized Ottawa River project, there are insufficient high priority outputs (commercial navigation benefits) to warrant Federal interest. In addition, the local and state governments are unable to provide a Letter of Intent.

Therefore, the selected alternative is the No Action Plan. It is recommended that this study be terminated.

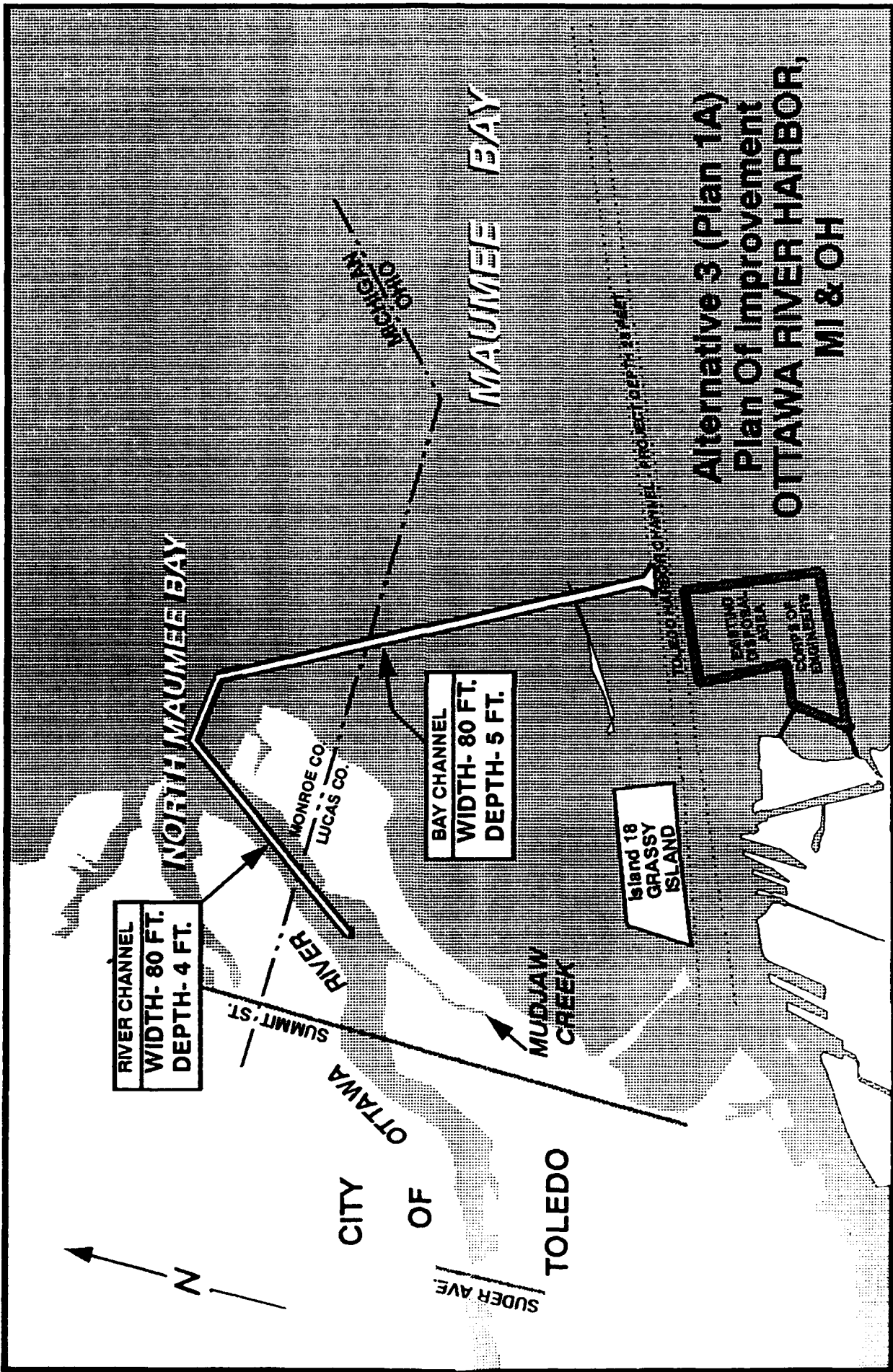


John W. Morris
Colonel, US Army
Commanding

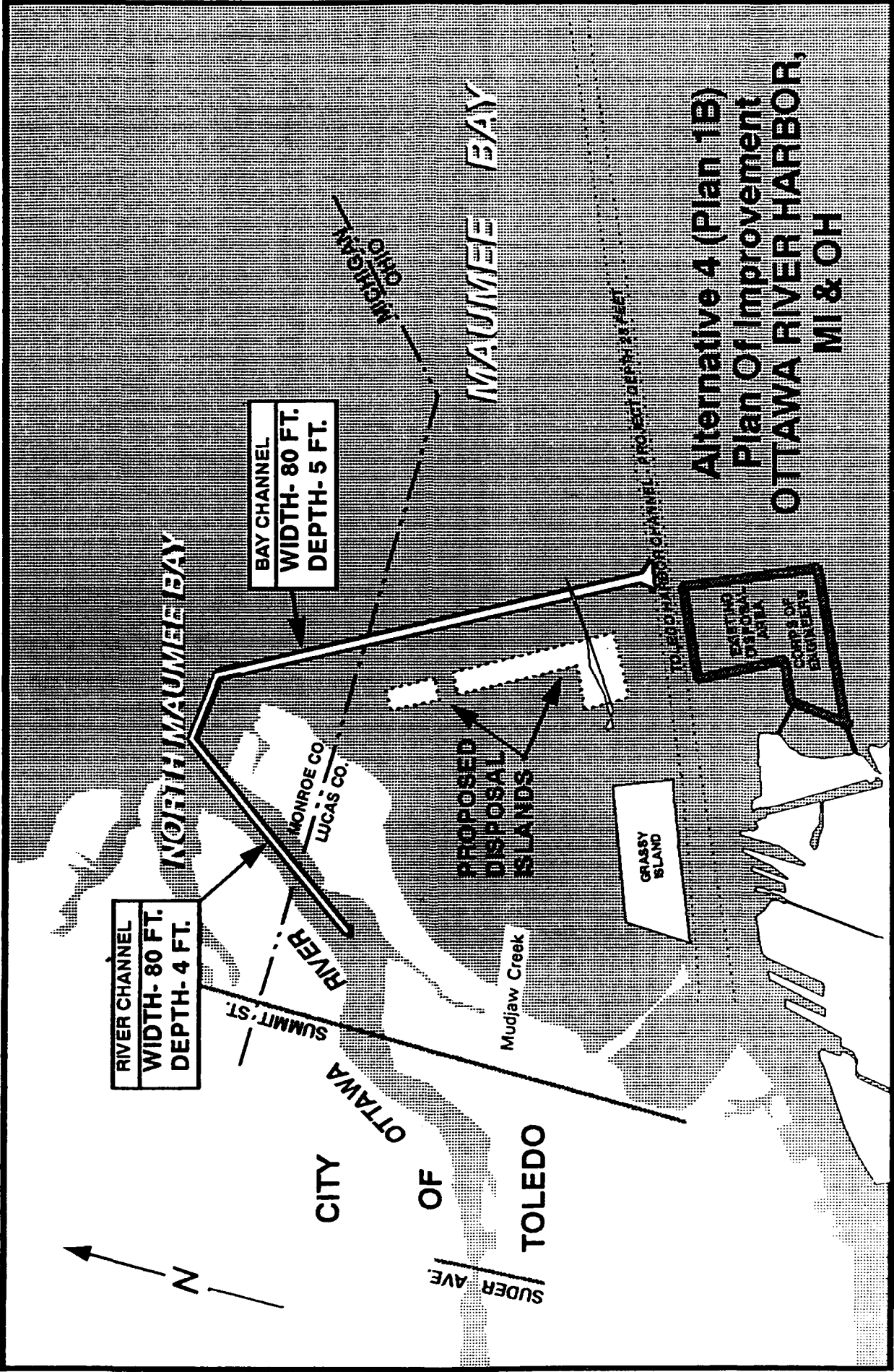


**Alternative 2 (GDM Plan)
 Plan of Improvement
 OTTAWA RIVER HARBOR,
 MI & OH**

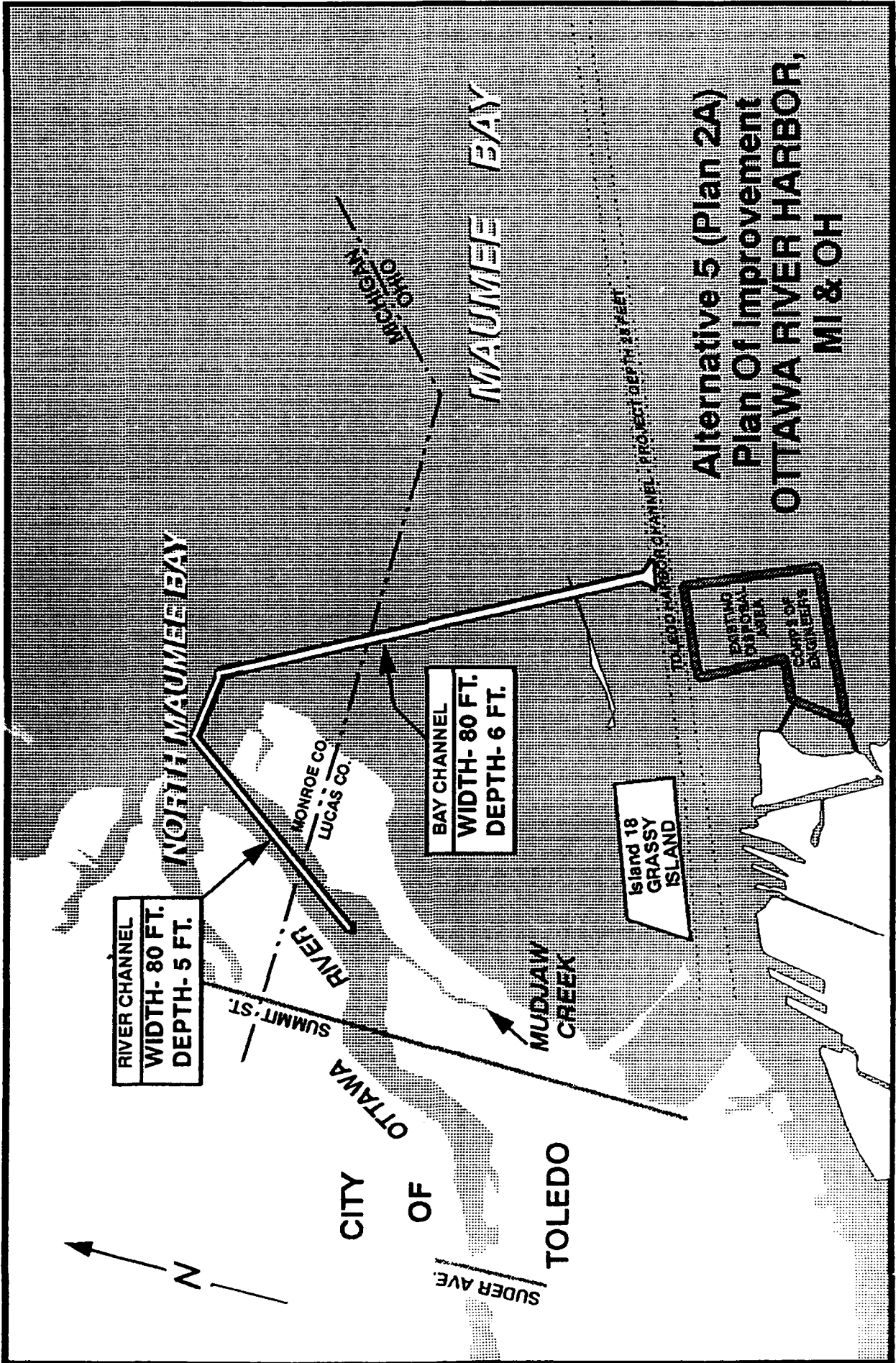
EXISTING DISPOSAL DATA
 CORP'S OF ENGINEERS



**Alternative 3 (Plan 1A)
Plan Of Improvement
OTTAWA RIVER HARBOR,
MI & OH**

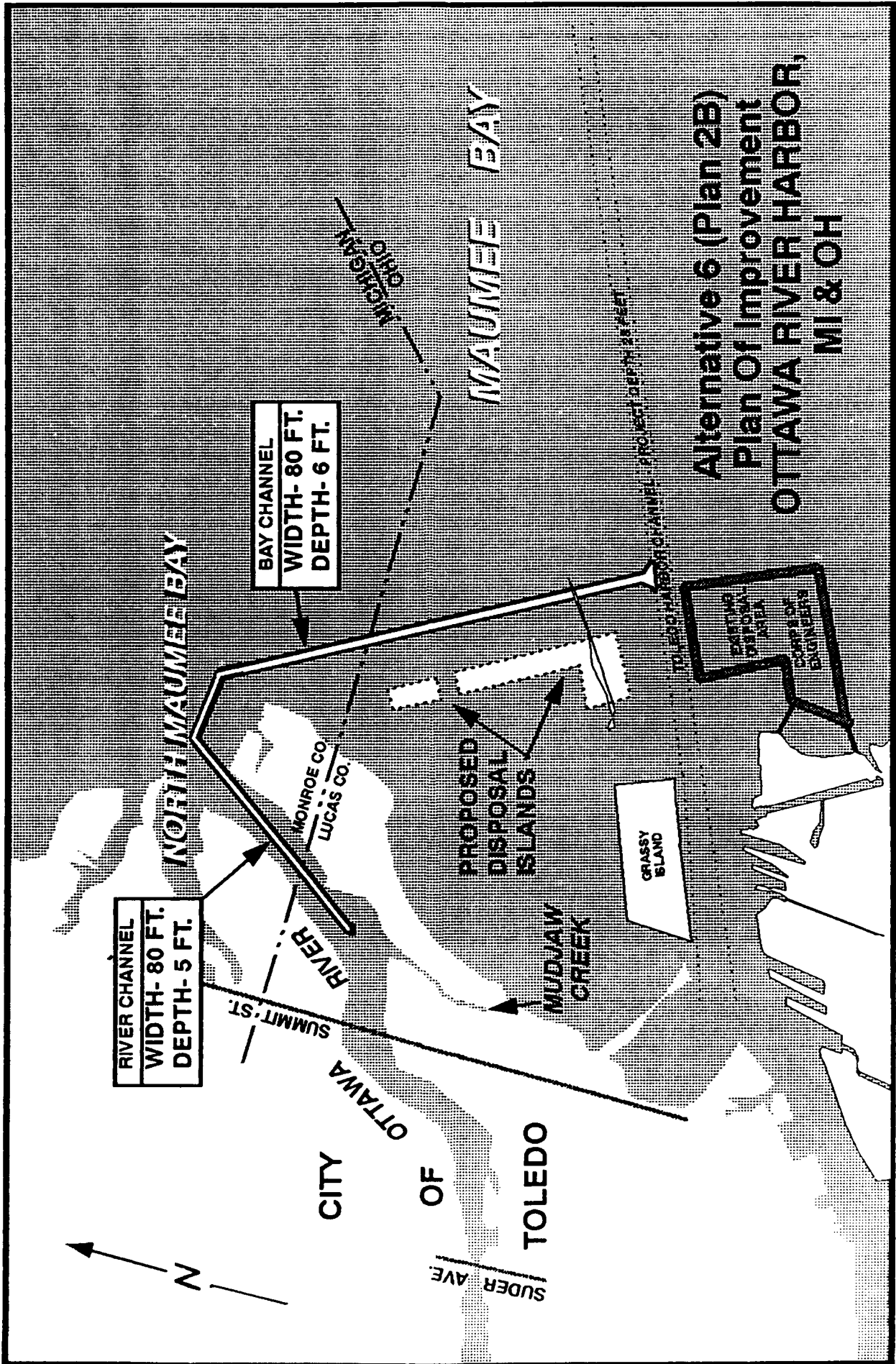


**Alternative 4 (Plan 1B)
 Plan Of Improvement
 OTTAWA RIVER HARBOR,
 MI & OH**



**Alternative 5 (Plan 2A)
Plan Of Improvement
OTTAWA RIVER HARBOR,
MI & OH**

EXISTING
GENERAL
LAYOUT
COMP. BY
ENGINEERS



**Alternative 6 (Plan 2B)
Plan Of Improvement
OTTAWA RIVER HARBOR,
MI & OH**

LEADING
NATIONAL
OFFICIAL
AREA
CORPORATE
ENGINEERS

APPENDIX A

OTTAWA RIVER HARBOR
MICHIGAN & OHIO

DESIGN

OTTAWA RIVER HARBOR, OHIO & MICHIGAN

DESIGN ANALYSIS

1. INTRODUCTION

The Ottawa River discharges into Maumee Bay in the western end of Lake Erie. The reach from Lake Erie to Suder Avenue in Toledo has been used for recreational navigation, although the majority of the fleet is moored downstream of the confluence with Mudjaw Creek. This is due to the low clearance of the Summit Street bridge, which has a low steel elevation of +14 feet LWD and inadequate river depths upstream. Silting in the Ottawa River is continually reducing the depth and area which can be used for operating and docking pleasure craft. A project to dredge a channel into Lake Erie is required to alleviate the problem of inadequate navigation depth.

2. PREVIOUS STUDIES

The US Army Engineer District Detroit developed a plan in 1976 to alleviate the problem (Ottawa River Harbor Michigan and Ohio, Phase 1, Plan Formulation, General Design Memorandum, US Army Engineer District Detroit, November 1976). The plan provided a channel for recreational craft from Suder Avenue to deep water in Lake Erie. The elements of the plan were as follows:

- Dredge a channel 7,630 feet long having a low water datum depth of 5 feet, a bottom width of 80 feet, and side slopes of 1 on 20 from the Suder Avenue bridge to the Summit Street bridge. Disposal of the dredged spoil would be in an in-water diked containment area located southeast of Suder Avenue having an area of 12.5 acres.

- Dredge a channel 8,250 feet long having a low water datum depth of 6 feet, a bottom width of 80 feet, and side slopes of 1 on 20 from the Summit Street bridge to the mouth of the Ottawa River. Disposal of the dredge spoil would be in a diked containment area located in Erie township on land owned by the State of Michigan having an area of 33 acres.

- Dredge a channel 16,700 feet long having a low water datum depth of 8 feet, a bottom width of 100 feet, and side slopes of 1 on 3 from the mouth of the Ottawa River to the Toledo Harbor shipping channel. Dredged spoil would be disposed of by open water dumping in deep waters of Lake Erie.

This plan is shown on figure 1.

3. EXISTING FLEET MIX

The Economics Section of the US Army Engineer District Buffalo obtained the existing fleet mix in the Ottawa River during a field investigation in June 1991. This is summarized in table 1. The draft distribution by vessel size obtained using the data collected during the Ashtabula Study (Ashtabula River Dredging and Confined Disposal, Summary Report, Ashtabula Recreational Channel Reformulation/Economic Analysis, US Army Engineer District Buffalo, May 1990) is presented in figure 2. This information was used to determine the average boat draft for varying vessel lengths and is presented in table 2. The cumulative frequency distribution by vessel draft for the Ottawa River fleet is shown on figure 3.

TABLE 1 - EXISTING FLEET MIX

TYPE	LENGTH				
	<16'	16-26'	26-39'	40-64'	>64'
OUTBOARD	24	44	35	8	0
INBOARD	0	107	247	40	0
I/O	0	548	63	2	0
SAILBOAT	2	193	40	0	0
	--	---	---	--	-
TOTAL	26	892	385	50	0

TOTAL FLEET = 1353 BOATS

TABLE 2 - VESSEL DRAFT BY LENGTH

TYPE	LENGTH			
	<16'	16-26'	26-39'	40-64'
OUTBOARD	2	2.5	3	3
INBOARD		3.5	4	4.5
I/O		3	3	4
SAILBOAT	2	3	5	

4. RIVER/BAY DEPTHS

A navigation channel should supply sufficient depth to accommodate for fluctuations in water level, wave conditions, vessel draft and safety. The project depth is the water column resulting from the summation of these factors subtracted from the design water level. Water levels on the Great Lakes vary spatially and temporally. The lake level is subject to seasonal rise and fall usually consisting of high levels in May and June and low levels in January and February. Annual and seasonal fluctuations are caused by variations in the runoff and evaporation rates within the Great Lakes Basin. Short-term fluctuations are caused by meteorological disturbances. Winds blowing over the lake surface create temporary water level fluctuations which vary locally. The water level gage at Cleveland serves as the master gage for Lake Erie.

In order to assist in the benefit evaluation presented in the Economic appendix and to establish the appropriate proposed channel depths, the monthly mean lake level -duration curve for August was developed. The August mean lake elevation - duration curve for the period 1900 - 1987 for the Cleveland gage is presented on figure 4 (Ashtabula Study, 1990). For simplicity this curve was considered representative for the entire boating season and is used to determine the existing usage for the river by vessel size. During the next study phase, the complete set of monthly curves during the boating season shall be used during the evaluation.

Along the River, wave action is minimal and wave heights of 0.5 feet are considered typical. In the Bay, a 2 foot wave is considered typical. Hence, half-wave heights of 0.25 feet and 1.0 feet were selected respectively.

A moving vessel will cause a lowering of the water surface due to the change in velocity around the vessel, resulting in a lowering of the vessel with respect to the bottom, known as squat. The squat for sailboats within the river is considered insignificant due to their slow speed and only 0.25 feet in the Bay. However the squat for power boats is considered to be 0.5 feet in the River and 0.75 feet in the Bay.

EM1110-2-1615 recommends that in the interest of safety, a clearance minimum of 2.0 feet is needed for channels with soft bottoms and 3.0 feet for hard bottoms. This is the same recommendation given for deep-draft navigation channels. Because the majority of the craft using the Ottawa River have a static draft less than 4.0 feet and due to the presence of a soft bottom, this criteria was relaxed and a safety clearance of 1.0 foot was adopted.

The minimum required water column for the recreational craft based upon the above values is presented in table 3.

TABLE 3 - MINIMUM REQUIRED WATER COLUMN

ELEMENT	SAILBOAT		POWER BOAT	
	RIVER	BAY	RIVER	BAY
1/2 WAVE HEIGHT	0.25'	1.0'	0.25'	1.0'
SQUAT	0	0.25'	0.5'	0.75'
DRAFT (VARIABLE)	D	D	D	D
SAFETY	1.0	1.0	1.0	1.0
	---	---	---	---
TOTAL	1.25+D	2.25+D	1.75+D	2.75+D

Existing bottom elevations within the Ottawa River vary between -1 to -5 feet LWD. From the mouth of the Ottawa River to the Federal commercial navigation channel, bottom elevations vary from -3 to -6 feet LWD. Based upon the location of docks along the Ottawa River, the existing controlling elevation in the river is -2 feet LWD. In the bay, the controlling elevation is -3 feet LWD. Figure 5 presents the existing bottom elevation from the Federal channel to the confluence of Mudjaw Creek with the Ottawa River following the proposed channel alignment discussed subsequently.

Review of table 3 and the controlling navigation elevations in the river and the bay indicate that the river is the governing condition for use along the entire pathway to the Federal channel. The percent use of the system (river/bay) is determined by coupling the monthly elevation-duration curve with the values in tables 1 & 2 and the controlling elevation. This computation is shown in table 4 and resulted in an average annual use of the

system by the entire fleet of 30 percent.

TABLE 4 -EXISTING PERCENT USE

BOAT TYPE	DRAFT FT	MIN WATER COLUMN FT	MINIMUM REQ WATER SURFACE FT LWD	FRACTION OF TIME OF WATER	FRACTION OF FLEET	USE
SAIL	2	3.25	1.25	.84	.0015	.00126
POWER	2	3.75	1.75	.715	.0177	.0127
POWER	2.5	4.25	2.25	.535	.0325	.0174
SAIL	3	4.25	2.25	.535	.1426	.0763
POWER	3	4.75	2.75	.365	.4369	.1595
POWER	3.5	5.25	3.25	.10	.1256	.0126
POWER	4	5.75	3.75	.10	.1840	.0184
POWER	4.5	6.25	4.25	.025	.0296	.00074
SAIL	5	6.25	4.25	.025	.0296	.00074
TOTAL WEIGHTED USE =						.29964
SAY =						30%

5. PROPOSED MODIFICATIONS

While the 1976 proposed plan would allow maximum use of the channel, funding constraints dictate a smaller plan. The fleet draft mix indicated two potential plans which would allow use most of the time with moderate amounts of dredging. Channel widths for the entire project would be 80 feet with the project extending from the Mudjaw Creek confluence with the Ottawa River to the Federal commercial navigation channel. The two plans are as follows:

Plan 1 - Dredge a channel along the Ottawa River from the confluence with Mudjaw creek to the mouth having a depth of -4 feet LWD, a bottom width of 80 feet and side slopes of 1 on 20. Dredge the remaining channel to the Federal commercial navigation channel at a depth of -5 feet LWD, a bottom width of 80 feet and side slopes of 1 on 3.

Plan 2 - Dredge a channel along the Ottawa River from the confluence with Mudjaw creek to the mouth having a depth of -5 feet LWD, a bottom width of 80 feet and side slopes of 1 on 20. Dredge the remaining channel to the Federal commercial navigation channel at a depth of -6 feet LWD, a bottom width of 80 feet and side slopes of 1 on 3.

The two plans are shown on figures 6 and 7. It should be noted that use of 1:20 side slopes in the Ottawa River portion of the channel was based upon the recommendation presented in the 1976 report previously referenced. During the next study phase, the need for this extremely mild slope should be ascertained, particularly due to the minimum dredging depths proposed. Construction at that slope may prove difficult.

Dredging volumes which include one foot of overdepth for varying depths were determined using the specific channel

width/side slope for that reach and the bottom profile (figure 5) and are presented in figure 8. The total dredging volume for the two plans are shown in table 5.

TABLE 5 - DREDGING VOLUMES (INCLUDES 1 FT OVERDEPTH)

PLAN	EXCAVATION VOLUME IN CUYDS			TOTAL
	RIVER	BEND 1 TO BEND 2	BEND 2 TO FED CHANNEL	
1	84000	12000	53000	149000
2	141000	20000	87000	248000

The increase in navigable depths due to the two plans result in average annual use of 87% and 99%. This was determined following the same methodology as was done for existing conditions with the computations presented in tables 6 and 7.

TABLE 6 - PLAN 1: USE

BOAT TYPE	DRAFT	MIN WATER COLUMN	MINIMUM REQ WATER SURFACE	FRACTION OF TIME OF WATER	FRACTION OF FLEET	USE
	FT	FT (1)	FT LWD			
SAIL	2	3.25	-0.75	1.0	.0015	.0015
POWER	2	3.75	-0.25	1.0	.0177	.0177
POWER	2.5	4.25	0.25	.98	.0325	.03185
SAIL	3	4.25	0.25	.98	.1426	.1397
POWER	3	4.75	0.75	.93	.4369	.4063
POWER	3.5	5.25	1.25	.835	.1256	.1049
POWER	4	5.75	1.75	.72	.1840	.1325
POWER	4.5	6.25	2.25	.53	.0296	.0157
SAIL	5	6.25	2.25	.53	.0296	.0157

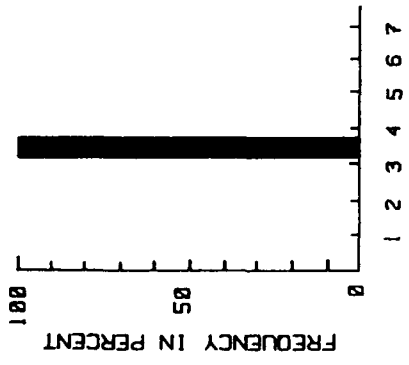
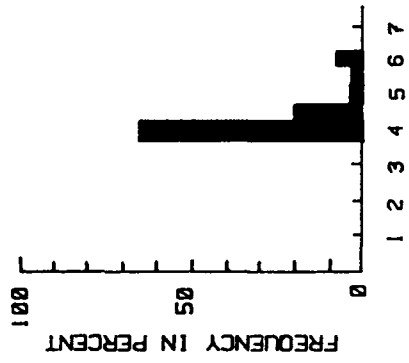
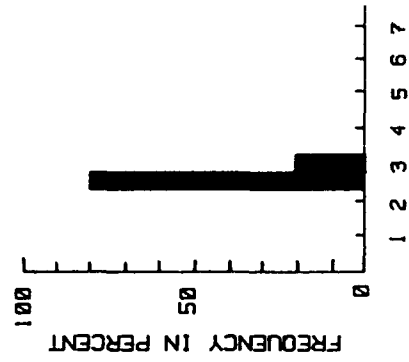
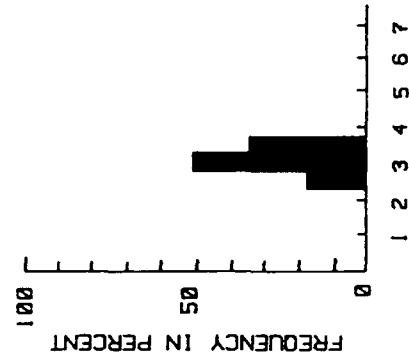
TOTAL WEIGHTED USE = .8659
SAY = 87%

(1) In river. Minimum water column in the bay is one foot more. This is balanced by dredging an extra foot in the bay.

TABLE 7 - PLAN 2: USE

BOAT TYPE	DRAFT FT	MIN WATER COLUMN FT (1)	MINIMUM REQ WATER SURFACE FT LWD	FRACTION OF TIME OF WATER	FRACTION OF FLEET	USE
SAIL	2	3.25	-1.75	1.0	.0015	.0015
POWER	2	3.75	-1.25	1.0	.0177	.0177
POWER	2.5	4.25	-0.75	1.0	.0325	.0325
SAIL	3	4.25	-0.75	1.0	.1426	.1426
POWER	3	4.75	-0.25	1.0	.4369	.4369
POWER	3.5	5.25	0.25	.98	.1256	.1231
POWER	4	5.75	0.75	.93	.1840	.1803
POWER	4.5	6.25	1.25	.835	.0296	.0247
SAIL	5	6.25	1.25	.835	.0296	.0247

TOTAL WEIGHTED USE = .994
SAY = 99%



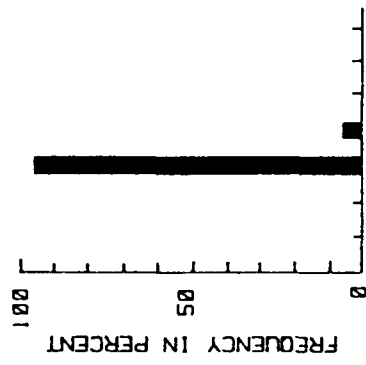
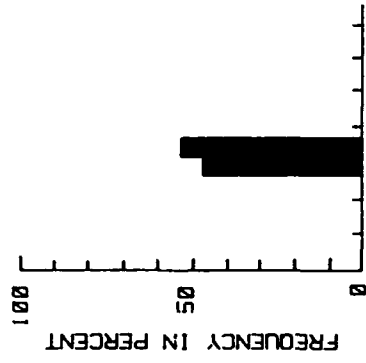
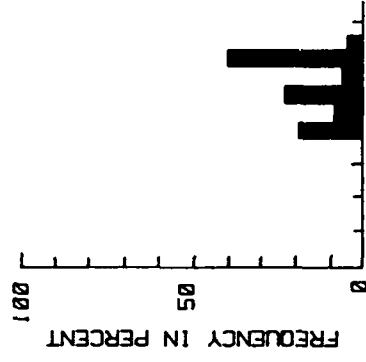
BOAT DRAFT IN FEET
1/0 16 - 26'

BOAT DRAFT IN FEET
OUTBOARD > 26'

BOAT DRAFT IN FEET
INBOARD > 26'

BOAT DRAFT IN FEET
INBOARD 16 - 26'

REF. ASHTABULA RECREATION
NAVIGATION BOATING
SURVEY, 1989



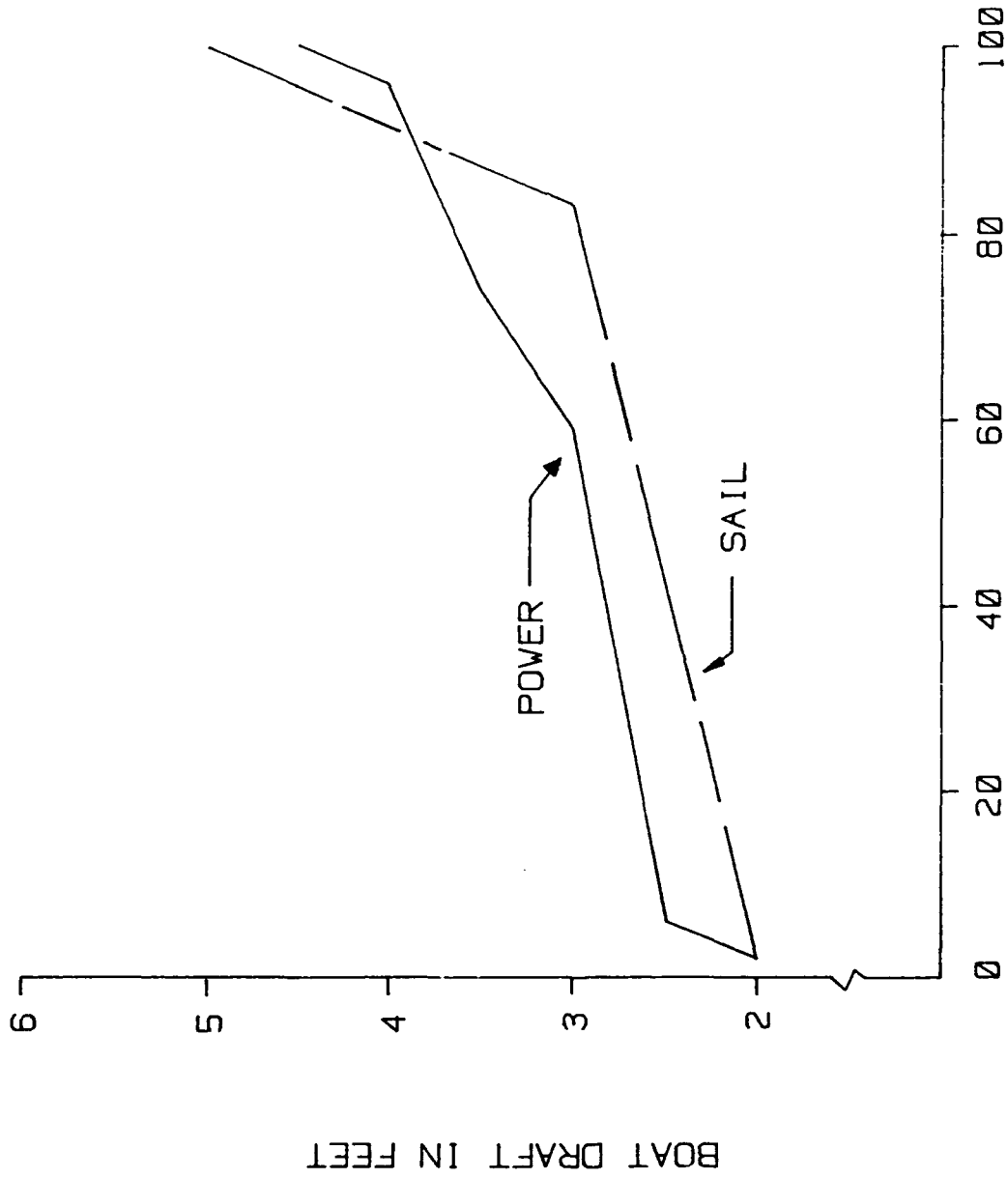
OTTAWA_3.DVG

BOAT DRAFT IN FEET
SAIL > 26'

BOAT DRAFT IN FEET
SAIL 16 - 26'

BOAT DRAFT IN FEET
1/0 > 26'

FIGURE 2 - BOAT DRAFT vs. BOAT LENGTH/TYPE DISTRIBUTION



CUMULATIVE FREQUENCY IN PERCENT

OTTAWA_4.DWG

FIGURE 3 - OTTAWA RIVER BOAT DRAFT DISTRIBUTION

AVERAGE MONTHLY DATA OBTAINED FROM
LAKE ERIE AT CLEVELAND, OHIO GAGE
PERIOD OF RECORD - 1900 - 1987

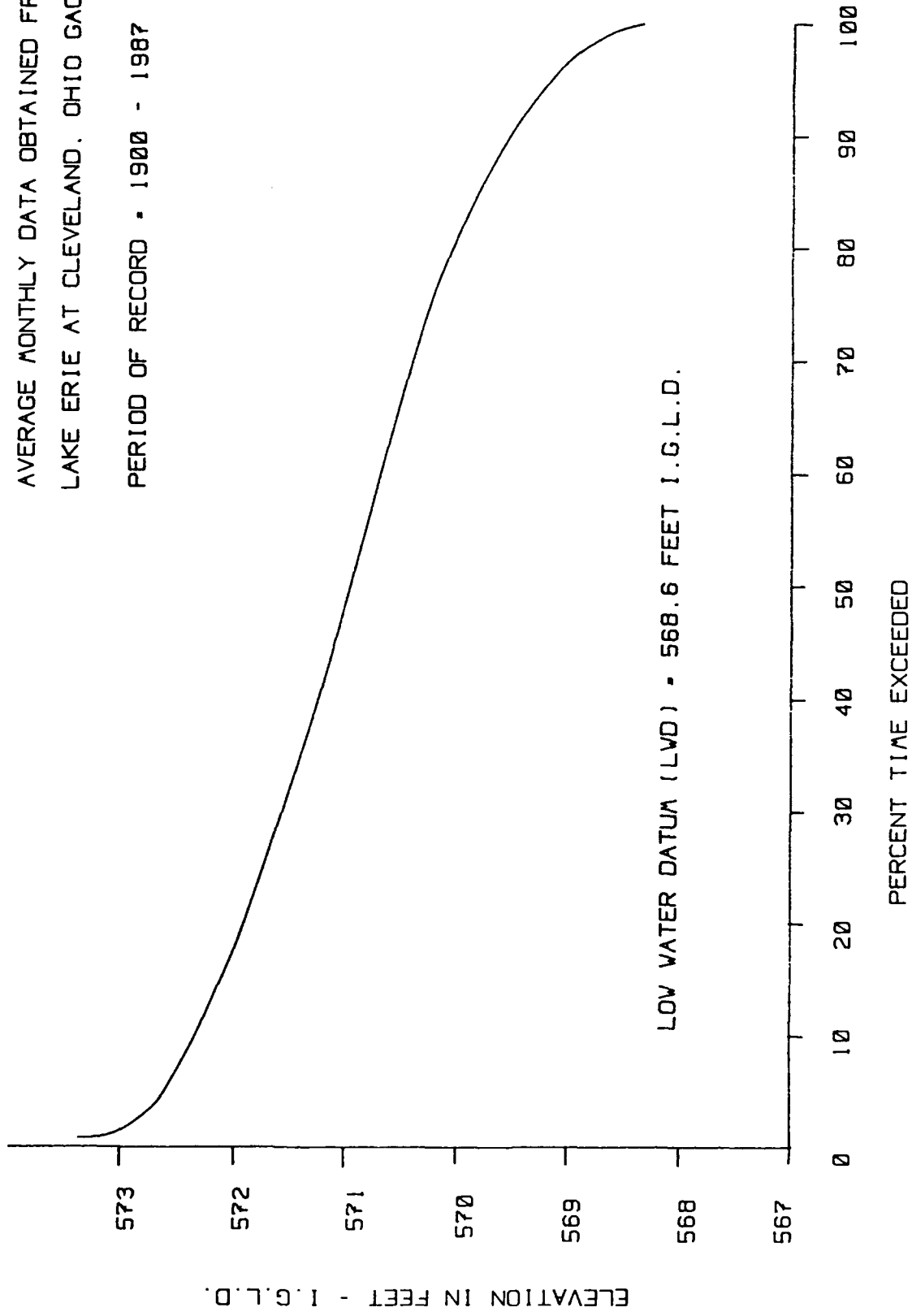
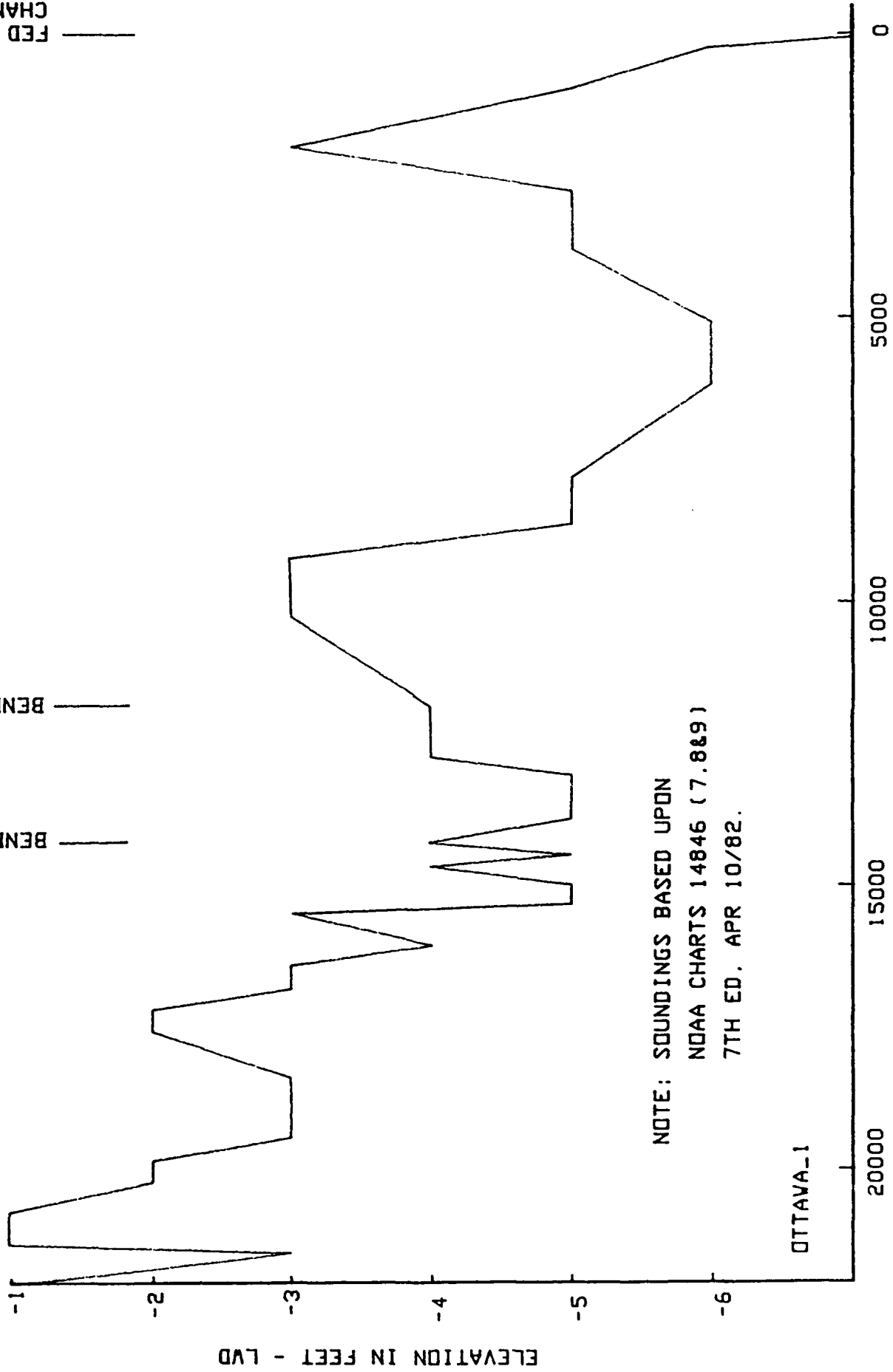


FIGURE 4 - MONTHLY ELEVATION - DURATION CURVE FOR AUGUST
OTTAWA_5.DWG

FED NAV
CHANNEL

BEND 2
BEND 1



NOTE: SOUNDINGS BASED UPON
NOAA CHARTS 14846 (7.8&9)
7TH ED. APR 10/82.

OTTAVA-1

FIGURE 5.

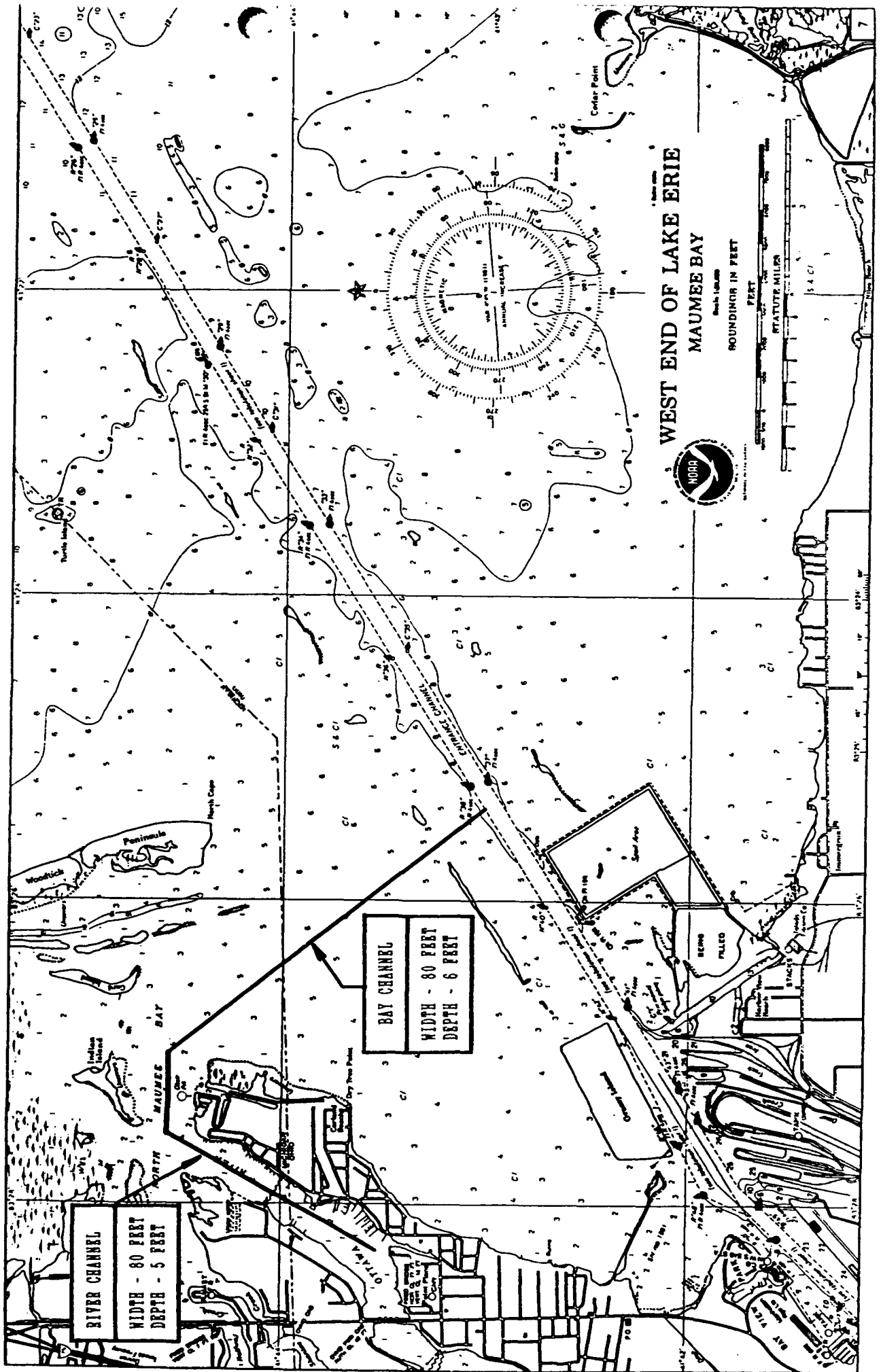


FIGURE 7 . OTTAWA RIVER RECREATION CHANNEL, PLAN 2

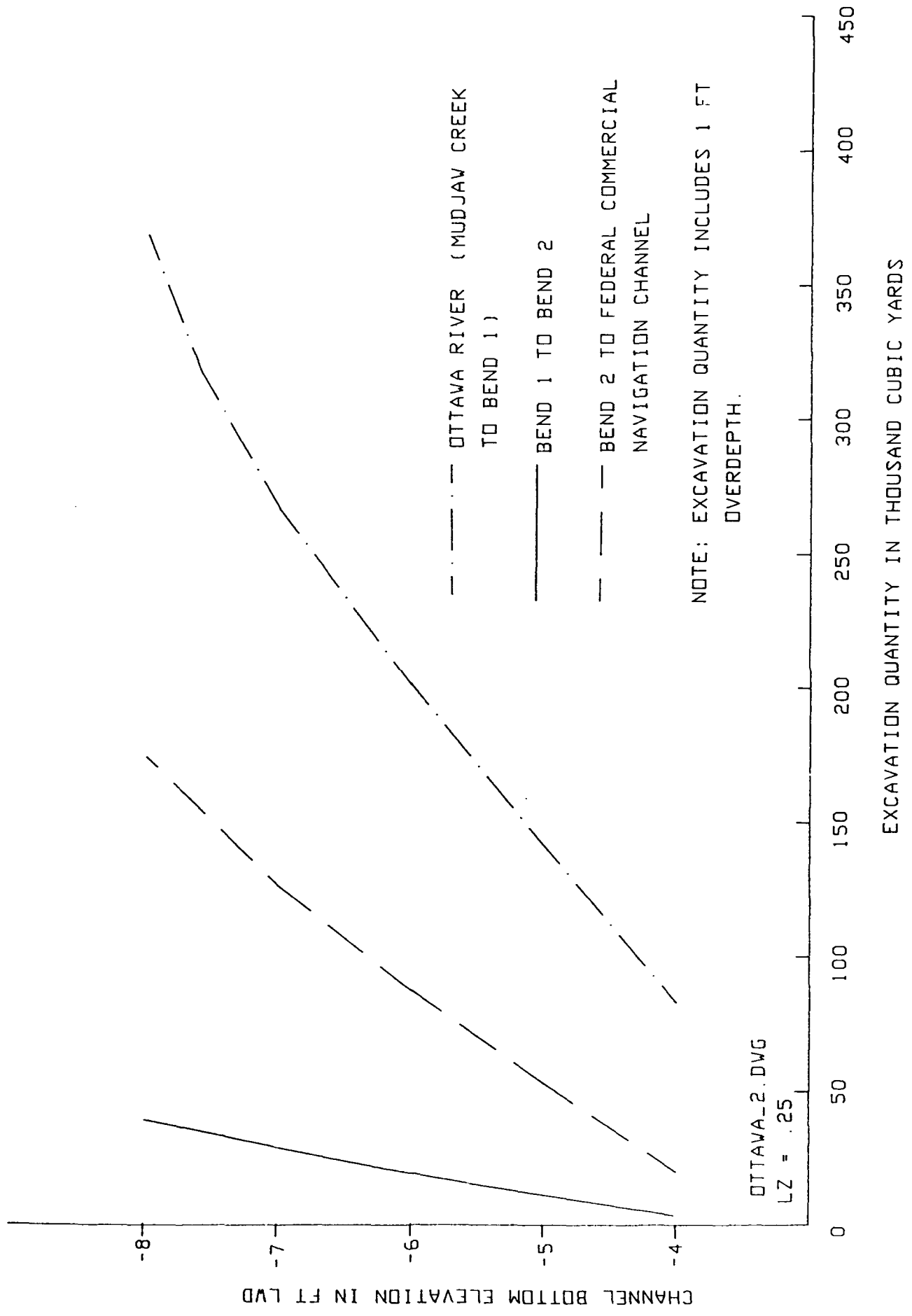


FIGURE 2

APPENDIX B

OTTAWA RIVER HARBOR
MICHIGAN & OHIO

COST ESTIMATES

OTTAWA RIVER HARBOR, MICHIGAN AND OHIO

1. PURPOSE

This appendix contains the summaries of the cost estimates prepared for the plans of considered improvement for the project at Ottawa River, Michigan and Ohio, originally authorized by the House and Senate Public Works Committees in 1970 under Section 201 of the Flood Control Act of 1965 (PL 89-298), deauthorized as of December 31, 1989 by the Water Resources Development Act of 1986, and subsequently reauthorized by the Water Resources Development Act of 1990.

Additional supporting information to assist in review of the estimates is also presented.

2. THE PROJECT

The project as originally authorized provided a navigation channel 8 feet deep, 200 feet wide and about 15,000 feet long between the existing Federal channel in Maumee Bay and the mouth of the Ottawa River, and a channel 6 feet deep, 100 feet wide and about 16,500 feet long from the mouth of the river, upstream to the Suder Avenue Bridge. The material dredged from the river was to be disposed into diked areas adjoining the river and the material dredged from the bay was to be disposed in open water alongside the channel.

The Phase 1 Plan Formulation Memorandum of General Design Memorandum subsequently prepared in 1976 by CENCE, recommended providing a 16,700 feet long channel, 8 feet deep by 100 feet wide, from the Maumee Bay channel to the mouth of the river; a 8260 feet long channel, 6 feet deep by 80 feet wide, from the mouth of the river to the Summit Street Bridge; and a 7360 feet long channel, 5 feet deep by 80 feet wide, from Summit Street to the Suder Avenue Bridge.

Under this plan, the material dredged between Suder Avenue and Summit Street would be disposed into a diked area on the south side of the channel adjacent to Suder Avenue. The disposal site for the material dredged from Summit Street to the mouth of the river was located onshore, approximately 3500 feet northwest of the mouth of the river. The remaining channel excavation was considered not to require confinement and would be disposed in a deepwater, open lake site.

As illustrated on Plate 1 of the Phase 1 GDM, the channel depths specified in the project authorization and the Phase 1 GDM, are measured below Low Water Datum (LWD).

3. CONSIDERED MODIFICATIONS

During the current course of study, it was recognized that constraints on construction funds would require reducing the scope of the plans. Two plans were developed which sought to minimize costs while maximizing usability by the existing fleet.

Plan 1 provides a channel 80 feet wide, dredged to -5 feet LWD, from the Maumee Bay channel to the mouth of the Ottawa River, and a channel 80 feet wide, dredged to -4 feet LWD from the mouth of the river to Summit Street.

Plan 2 provides channels of like width and reach, but dredged an additional foot; to -6 feet LWD in the bay and -5 feet LWD in the river.

All the material removed under these two plans is considered to require confined disposal. Consideration of two disposal options has generated 'A' and 'B' alternatives for each of the two plans. Under the 'A' alternatives, use would be made of a now 'dormant' site known as Island 18 adjacent to the Maumee Bay channel. This site was previously used for confinement of material removed during maintenance of the Toledo Harbor project. Under the 'B' alternatives, new disposal islands would be constructed in Maumee Bay, adjacent to the proposed channel.

4. ESTIMATES FOR INITIAL CONSTRUCTION

4.1 General

The nature of the material to be excavated, the relatively shallow existing depths, and the method of disposal serve to make this project well suited to construction by a hydraulic cutterhead dredge. Recent experience with use of a 16" hydraulic cutterhead dredge and the availability of the associated cost data led to selection of like equipment for this project. Due to the long disposal distances, use of two booster pumps was included.

Island 18 has not been used for disposal of dredged material since 1976, when it was considered full. Consolidation of the material since that time has generated additional capacity, currently estimated to be in excess of 500,000 cubic yards. An amount of \$50,000 has been included in the mobilization cost items to prepare this site to receive material.

No designs have been prepared for the new disposal islands proposed for construction in Maumee Bay. Lacking this information, unit costs for confinement were developed from similar work recently considered for construction at Cleveland Harbor. The estimated first cost for the plans where dredged material is disposed in new disposal islands, includes the cost for initial construction of sufficient capacity to confine the entire quantity of material dredged during the project's 50 year life.

The estimated costs of the 30. Engineering and Design and the 31. Construction Management accounts, and the cost of navigation aids for all plans were provided by the project manager.

4.2 The GDM Plan.

The estimate for the GDM plan is based on the excavation quantities previously developed in the GDM. The two disposal sites recommended for use in the GDM for confining the material excavated from the channels within the Ottawa River are no longer available. Also, in light of current opposition to continued open lake disposal of material dredged from the Maumee Bay navigation channel, it is anticipated that confined disposal will now be required for the material to be dredged from the new channel within Maumee Bay.

Since the dredging quantity required for initial construction of the GDM plan (828,200 cubic yards), exceeds the available capacity of Island 18, the estimate is based on disposing of this entire quantity in new disposal islands along the proposed channel in the bay.

4.3 Plans 1 and 2.

No surveys of the proposed channel alignment were available for use in estimating the excavation quantities for Plans 1 and 2. Lacking this, calculations were performed by the Coastal/Geotechnical Engineering Branch using information available on the NOAA Lake Survey Charts. These quantities include the volumes in the sideslopes and one foot of overdepth.

While the quantities calculated from this information can only be considered rough estimates, they are considered conservative due to the nature and purpose for which the charts are prepared, and adequate for the purposes of this limited report.

5. OPERATION AND MAINTENANCE

Lacking any historical record of surveys for the project vicinity, other sources of information were investigated in order to estimate the required volumes and frequencies of maintenance dredging for the various plans.

It was determined from conversations with the authors of studies on the hydrology and sedimentology of the Ottawa River that the river in the vicinity of the proposed project behaves as an estuary, and as such, stream bedload should be considered to make little or no contribution to shoaling. Shoaling in the river channel would be influenced by suspended sediments from flows originating upstream and from Maumee Bay during flow reversals induced by elevated lake stages.

Considering this information, along with the District's maintenance experience at West Harbor, Ohio, it was concluded that an average shoaling rate equal to one foot every three years was reasonable and appropriate, and should be applied to all areas within the channel requiring dredging for initial construction.

While this same rate is applied to all of the plans, increasingly larger maintenance dredging volumes are generated for the plans providing deeper channels since the deeper plans require dredging over larger areas of the channel bottom.

The initial dredging quantities for all plans include

removal of a foot of overdepth. The plan for maintenance therefore allows the channel overdepth to re-shoal for three years between maintenance dredging events minimizing impacts on the project users.

As was done for the cost of the initial dredging, the unit cost of maintenance dredging was based on recent contract experience, modified to include the additional cost of booster pumps required to convey the material the longer distances to the disposal sites.

Under the GDM Plan, Plan 1B and Plan 2B, sufficient capacity for confinement of the entire initial and 50 year maintenance dredging volume is constructed up front and included in the project first cost. Under Plan 1A and Plan 2A, which employ disposal in existing Island 18, some capacity will remain in the facility after initial construction, but it will be insufficient to confine the 50 Year maintenance volume.

For Plan 1A, sufficient capacity is provided by constructing a dike to raise the fill elevation by four feet over one half of the disposal site. This cost will occur in year 27.

For Plan 2A, capacity is provided by constructing a dike to raise the fill elevation by five feet over one half of the site in year 12, and raising the three sides of the remaining half similarly in year 33.

The costs for this work are based on unit costs of embankment developed from estimates for similar work currently programmed at Site 14 in Cleveland, Ohio.

An amount of \$25,000 is included in the mobilization cost for each maintenance event (under all plans), to cover the costs for preparation of the disposal areas.

The required maintenance volumes for each of the respective plans is illustrated in Table 1, Schedule of Expenditures and Dredging Quantities.

Table B1

Schedule of Expenditures and Dredging Quantities

All Costs at September 1991 Price Levels

Year	GDM Plan		Plan 1A		Plan 1B		Plan 2A		Plan 2B	
	Dredging Quantity (cy)	Cost	Dredging Quantity (cy)	Cost	Dredging Quantity (cy)	Cost	Dredging Quantity (cy)	Cost	Dredging Quantity (cy)	Cost
Init. Const.	828,200	\$39,650,000	149,000	\$2,540,000	149,000	\$11,565,000	248,000	\$3,640,000	248,000	\$18,650,000
Aids to Nav.	LS	35,000	LS	35,000	LS	35,000	LS	35,000	LS	35,000
3	109,000	1,410,000	36,300	660,000	36,300	660,000	61,800	910,000	61,800	910,000
6	"	"	"	"	"	"	"	"	"	"
9	"	"	"	"	"	"	"	"	"	"
12	"	"	"	"	"	"	"	"	"	"
"	"	"	"	"	"	"	"	"	"	"
15	109,000	1,410,000	36,300	660,000	36,300	660,000	raise disp.	225,000	61,800	910,000
18	"	"	"	"	"	"	"	"	"	"
21	"	"	"	"	"	"	"	"	"	"
24	"	"	"	"	"	"	"	"	"	"
27	"	"	"	"	"	"	"	"	"	"
"	"	"	raise disp.	204,000	"	"	"	"	"	"
30	109,000	1,410,000	36,300	660,000	36,300	660,000	61,800	910,000	61,800	910,000
33	"	"	"	"	"	"	"	"	"	"
"	"	"	"	"	"	"	"	"	"	"
36	109,000	1,410,000	36,300	660,000	36,300	660,000	raise disp.	174,000	61,800	910,000
39	"	"	"	"	"	"	"	"	"	"
42	"	"	"	"	"	"	"	"	"	"
45	"	"	"	"	"	"	"	"	"	"
48	"	"	"	"	"	"	"	"	"	"
Total 50 yr.										
Dredge Qty.	2,572,200		729,800		729,800		1,236,800		1,236,800	

FEASIBILITY ESTIMATE
 (SEPT. 1991 PRICE LEVELS)
 OTTAWA RIVER DREDGING AND NEW CONFINED DISPOSAL PROJECT
 GDM PLAN

COST ACCOUNT CODE NO.	DESCRIPTION FEATURE	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT	CONTINGENCY	TOTAL AMOUNT
12.0.A	MOB & DEMOB	--	L.S.	--	250,000	50,000	300,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	828,200	C.Y.	8.00	6,625,600	1,324,400	7,950,000
12.04.B	CONTAINMENT COST NEW DIKE	2,572,200	C.Y.	8.65	22,249,530	5,550,470	27,800,000
	TOTAL CONSTRUCTION FIRST COSTS				29,125,130	6,924,870	36,050,000
30.	PLANNING, ENGINEERING & DESIGN				1,200,000	240,000	1,440,000
31.	CONSTRUCTION MANAGEMENT (CM)				1,800,000	360,000	2,160,000
	SUB-TOTAL				32,125,130	7,524,870	39,650,000
	AIDS TO NAVIGATION						35,000
	TOTAL PROJECT FIRST COST						\$39,685,000

PERIODIC MAINTENANCE COSTS PER EVENT

12.0.A	MOB & DEMOB		L.S.		210,000	40,000	250,000
12.04.B	MAINTENANCE DREDGING	109,000	C.Y.	8.00	872,000	178,000	1,050,000
	MAINTENANCE CONTRACT COST				1,082,000	218,000	1,300,000
	PLANNING, ENGINEERING & DESIGN				36,000	7,000	43,000
	CONSTRUCTION MANAGEMENT				56,000	11,000	67,000
	TOTAL PERIODIC MAINTENANCE COST				1,174,000	236,000	1,410,000

FEASIBILITY ESTIMATE
 (SEPT. 1991 PRICE LEVELS)
 OTTAWA RIVER DREDGING AND DISPOSAL IN ISLAND 18
 PLAN 1A

COST ACCOUNT CODE NO.	DESCRIPTION FEATURE	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT	CONTINGENCY	TOTAL AMOUNT
12.0.A	MOB & DEMOB	--	L.S.	--	250,000	50,000	300,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	149,000	C.Y.	8.00	1,192,000	248,000	1,440,000
12.04.B							0
	TOTAL CONSTRUCTION FIRST COSTS				1,442,000	298,000	1,740,000
30.	PLANNING, ENGINEERING & DESIGN				550,000	110,000	660,000
31.	CONSTRUCTION MANAGEMENT (CM)				115,000	25,000	140,000
	SUB-TOTAL				2,107,000	433,000	2,540,000
	AIDS TO NAVIGATION						35,000
	TOTAL PROJECT FIRST COST						\$2,575,000

PERIODIC MAINTENANCE COST PER EVENT

12.0.A	MOB & DEMOB		L.S.		210,000	40,000	250,000
12.04.B	ANNUAL MAINTENANCE DREDGING	36,300	C.Y.	8.00	290,400	59,600	350,000
	MAINTENANCE CONTRACT COST				500,400	99,600	600,000
	PLANNING, ENGINEERING & DESIGN				25,000	5,000	30,000
	CONSTRUCTION MANAGEMENT				25,000	5,000	30,000
	TOTAL PERIODIC MAINTENANCE COST				550,400	109,600	660,000

FEASIBILITY ESTIMATE
 (SEPT. 1991 PRICE LEVELS)
 OTTAWA RIVER DREDGING AND NEW CONFINED DISPOSAL PROJECT
 PLAN 1B

COST ACCOUNT CODE NO.	DESCRIPTION FEATURE	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT	CONTINGENCY	TOTAL AMOUNT
12.0.A	MOB & DEMOB	--	L.S.	--	250,000	50,000	300,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	149,000	C.Y.	8.00	1,192,000	248,000	1,440,000
12.04.B	CONTAINMENT COST NEW DIKE	729,800	C.Y.	8.65	6,312,770	1,577,230	7,890,000
	TOTAL CONSTRUCTION FIRST COSTS				7,754,770	1,875,230	9,630,000
30.	PLANNING, ENGINEERING & DESIGN				940,000	185,000	1,125,000
31.	CONSTRUCTION MANAGEMENT (CM)				675,000	135,000	810,000
	SUB-TOTAL				9,369,770	2,195,230	11,565,000
	AIDS TO NAVIGATION						35,000
	TOTAL PROJECT FIRST COST						\$11,600,000

PERIODIC MAINTENANCE COSTS PER EVENT

12.0.A	MOB & DEMOB		L.S.		210,000	40,000	250,000
12.04.B	MAINTENANCE DREDGING	36,300	C.Y.	8.00	290,400	59,600	350,000
	MAINTENANCE CONTRACT COST				500,400	99,600	600,000
	PLANNING, ENGINEERING & DESIGN				25,000	5,000	30,000
	CONSTRUCTION MANAGEMENT				25,000	5,000	30,000
	TOTAL PERIODIC MAINTENANCE COST				550,400	109,600	660,000

FEASIBILITY ESTIMATE
 (SEPT. 1991 PRICE LEVELS)
 OTTAWA RIVER DREDGING AND DISPOSAL IN ISLAND 18
 PLAN 2A

COST ACCOUNT CODE NO.	DESCRIPTION FEATURE	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT	CONTINGENCY	TOTAL AMOUNT
12.0.A	MOB & DEMOB	--	L.S.	--	250,000	50,000	300,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	248,000	C.Y.	8.00	1,984,000	416,000	2,400,000
TOTAL CONSTRUCTION FIRST COSTS					2,234,000	466,000	2,700,000
30.	PLANNING, ENGINEERING & DESIGN				600,000	120,000	720,000
31.	CONSTRUCTION MANAGEMENT (CM)				185,000	35,000	220,000
					3,019,000	621,000	3,640,000
AIDS TO NAVIGATION							35,000
TOTAL PROJECT FIRST COST							\$3,675,000

PERIODIC MAINTENANCE COST PER EVENT

12.0.A	MOB & DEMOB		L.S.		210,000	40,000	250,000
12.04.B	MAINTENANCE DREDGING	61,800	C.Y.	8.00	494,400	95,600	590,000
MAINTENANCE CONTRACT COST					704,400	135,600	840,000
PLANNING, ENGINEERING & DESIGN					25,000	5,000	30,000
CONSTRUCTION MANAGEMENT					33,000	7,000	40,000
TOTAL PERIODIC MAINTENANCE COST					762,400	147,600	910,000

FEASIBILITY ESTIMATE
 (SEPT. 1991 PRICE LEVELS)
 OTTAWA RIVER DREDGING AND NEW CONFINED DISPOSAL PROJECT
 PLAN 2B

COST ACCOUNT CODE NO.	DESCRIPTION FEATURE	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT	CONTINGENCY	TOTAL AMOUNT
12.0.A	MOB & DEMOB	--	L.S.	--	250,000	50,000	300,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	248,000	C.Y.	8.00	1,984,000	416,000	2,400,000
12.04.B	CONTAINMENT COST NEW DIKE	1,236,800	C.Y.	8.65	10,698,320	2,681,680	13,380,000
TOTAL CONSTRUCTION FIRST COSTS					12,932,320	3,147,680	16,080,000
30.	PLANNING, ENGINEERING & DESIGN				1,000,000	200,000	1,200,000
31.	CONSTRUCTION MANAGEMENT (CM)				1,140,000	230,000	1,370,000
SUB-TOTAL					15,072,320	3,577,680	18,650,000
AIDS TO NAVIGATION							35,000
TOTAL PROJECT FIRST COST							\$18,685,000

PERIODIC MAINTENANCE COST PER EVENT

12.0.A	MOB & DEMOB		L.S.		210,000	40,000	250,000
12.04.B	MECHANICAL DREDGING & DISPOSAL	61,800	C.Y.	8.00	494,400	95,600	590,000
MAINTENANCE CONTRACT COST					704,400	135,600	840,000
PLANNING, ENGINEERING & DESIGN					25,000	5,000	30,000
CONSTRUCTION MANAGEMENT					33,000	7,000	40,000
TOTAL PERIODIC MAINTENANCE COST					762,400	147,600	910,000

APPENDIX C

OTTAWA RIVER HARBOR
MICHIGAN & OHIO

ECONOMIC
CONSIDERATIONS AND
METHODOLOGIES

ECONOMICS APPENDIX
LIMITED REEVALUATION
OTTAWA RIVER, OHIO AND MICHIGAN

Description

Ottawa River empties into the westerly end of Lake Erie about 3-1/2 miles northerly from the mouth of the Maumee River and Toledo Harbor, Ohio; and about three-fourths of a mile northerly from the Michigan-Ohio state line. Federal harbors in the area which are used by small boats include Toledo Harbor, Ohio, Monroe Harbor, Michigan and Bolles Harbor, Michigan.

The Ottawa River flows in a generally northeasterly direction, discharging into Lake Erie at North Maumee Bay. It has a total length of 41.6 miles, 41 miles of which lie in Lucas County, Ohio and the remainder including the river mouth, is in Monroe County, Michigan. Between Maumee Bay and Suder Avenue, a distance of about three miles, the river has a maximum width of 1,500 feet, a minimum width of 500 feet and an average depth of about 2 feet. Navigation is terminated by the low vertical clearance of the Suder Avenue Bridge and other structures upstream. The Ottawa River has about 1,353 berths located at marinas and yacht clubs. The majority of the fleet is moored downstream of the confluence with Mudjaw Creek. This is due to the low clearance of the Summit Street bridge, which has a low steel elevation of +14 feet LWD and inadequate river depths upstream. Silting in the Ottawa River is continually reducing the depth and area which can be used for operating and docking pleasure craft. A project to dredge a channel into Lake Erie is required to alleviate the problem of inadequate navigation depth. Adjoining the Ottawa River mouth on its westerly side is the mouth of a natural channel formed by the confluence of Halfway Creek and Shantee Creek.

The Ottawa River serves both locally-based and transient craft. Most locally-based craft are owned by area residents who reside in nearby communities. Transient craft visit Ottawa River from harbors located in the popular recreational boating centers at Toledo, Sandusky, and Cleveland, Ohio and Detroit, Michigan. Transient craft also visit from Canada.

The harbor area is well serviced by primary and secondary roads. Interstate Highway 75 and U.S. Highways between Detroit and Toledo pass by the harbor. The hinterland is served by a network of primary and secondary roads. The metropolitan area of Toledo, Ohio had a 1990 population of 614,218. The 1990 population of Monroe, Michigan was 22,902. Both areas are within short driving distances from Ottawa River. The Detroit Metropolitan area, with a 1990 population of over 1 million at 1,027,974, is one of the Nation's largest recreational boating centers. Craft located in the Detroit area are within a one-day, round trip sailing distance from the Ottawa River. Craft from other sections of Lake Erie including Cleveland and Buffalo also cruise the west end of Lake Erie in the vicinity of the Ottawa River.

Existing and Prospective Commerce

Existing commerce in the Ottawa River consists entirely of recreational craft. No commercial fishing boats are known to be based in the river. Providing adequate channel depths as proposed would stimulate recreational boating activity and result in the growth of both locally-based and transient recreational fleets. There are also no charter boats based on the Ottawa River currently.

Recreational Boat Traffic

The navigation restrictions imposed by existing conditions have limited the present use and potential growth of the locally-based and transient craft fleets. Improvements of the waterway as requested would serve to improve the existing restrictive and sometimes hazardous conditions, afford a near optimum usage and encourage the future growth of these fleets to their full potential.

Navigation difficulties in the Ottawa River restrict the present use and preclude the future growth of both locally-based and transient fleets. Many persons are reluctant to purchase boats because of the present hazardous channel conditions. Others have disposed of their boats because little or no use could be made of the craft during periods of shallow water.

Boater Registration

The demand area for recreational boaters along the Ottawa River includes Lucas County, Ohio and Monroe County, Michigan. The rates of growth for the period 1977-1990 for the counties are 1.004 and 1.024 as shown in Table 1. The future rate of growth is expected to decline due to increased costs of owning a boat, user fees, slower rates of growth in the economy, and decreased rates of growth in boater participation.

Table 1 - Boater Registration Data

	Lucas County Ohio	Monroe County Michigan
1990	15,950	10,189
1988	16,739	9,165
1987	16,899	8,822
1986	15,971	8,719
1981	16,497	7,473
1980	13,605	8,438
1979	14,190	7,526
1978	14,864	8,342
1977	15,066	7,465

Existing Fleet Mix

The existing permanent-based fleet mix was obtained during a field investigation in June 1991. The fleet mix is summarized in

field investigation in June 1991. The fleet mix is summarized in Table 2. The boats are based at marinas and yacht clubs as shown on Figure 1. There are no existing launch ramp sites on the Ottawa River. The Ottawa River is not currently utilized by trailered craft because there are superior launch ramp access sites located on Maumee Bay. The launch ramp traffic can avoid navigational difficulties such as restriction of the Ottawa River channel and low water depths at the alternative areas. In addition, the Ottawa Riverfront areas have limited public access sites. Much of the riverfront property consists of private residential properties.

Table 2 - Fleet Mix Ottawa River

Length	<16'	16-26'	26-39'	40-64'	>64'
Type					
Outboard	24	44	35	8	
Inboard		107	247	40	
I/O		548	63	2	
Sailboat	2	193	40		
	==	===	===	==	
TOTAL	26	892	385	50	

Source: June 1991 survey conducted by Buffalo District.

In addition to dock sites at yacht clubs and marinas, there are private docks located along the riverfront north and south of the Fred C. Young bridge. The private docks include individual owners and members of associations located along the riverbank. The associations are Ottawa River private boat owner associations. Non-members are tallied as private dock owners. A total of 1,457 are estimated to be located along the river bank.

There are also transient docks located on the river which are used by an equivalent of 66 permanent-based boats. Based on interviews with marina operators, there are no expected additions to the number of transient docks at the marinas and yacht clubs in the study area.

The vessel draft by length is provided in Table 3. Sailboats in the 26' - 39' length category have the deepest draft requirements of 5.0 feet.

Table 3 - Vessel Draft by Length

TYPE	<16'	16-26'	26-39'	40-64'
OUTBOARD	2	2.5	3	3
INBOARD		3.5	4	4.5
INBOARD/OUTBOARD		3	3	4
SAILBOAT	2	3	5	

Benefit Evaluation

A navigation channel should supply sufficient depth to

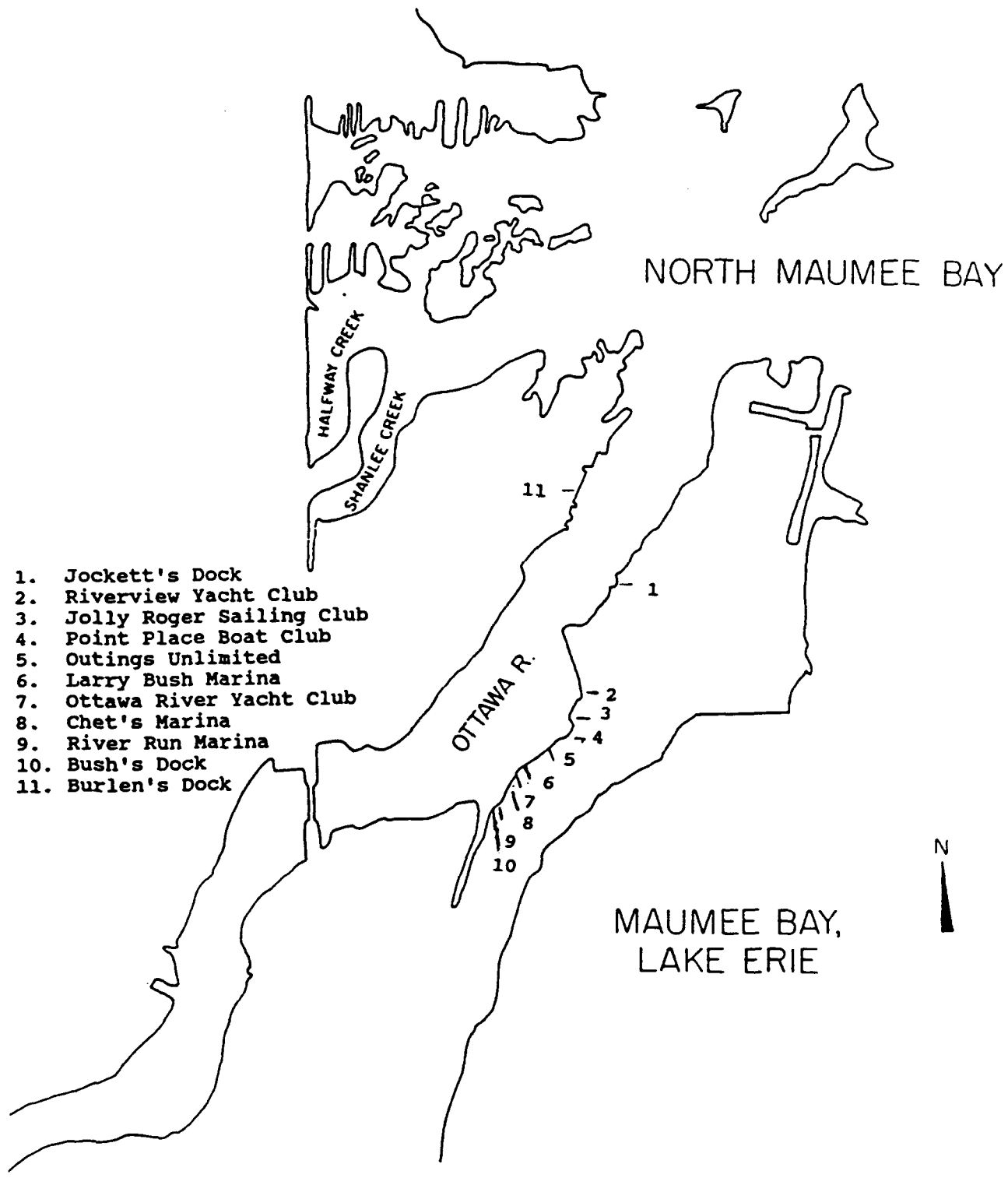


Figure 1

accommodate for fluctuations in water level, wave conditions, vessel draft and safety. Currently the recreational craft is having difficulty entering and leaving the harbor. Water levels on the Great Lakes vary spatially and temporally. The lake level is subject to seasonal rise and fall usually consisting of high levels in May and June and low levels in January and February. Annual and seasonal fluctuations are caused by variations in the runoff and evaporation rates within the Great Lakes Basin. Short-term fluctuations are caused by meteorological disturbances. Winds blowing over the lake surface create temporary water level fluctuations which vary locally. The water level gage at Cleveland serves as the master gage for Lake Erie.

The monthly mean lake level-duration curve for August was developed. The August mean lake elevation-duration curve for the period 1900-1987 for the Cleveland gage is presented on Figure 2. For this phase of study the curve was considered representative for the entire boating season and is used to determine the existing usage for the river by vessel size. The Cleveland gage was used for expediency. The monthly means data was developed for the Ashtabula River study. There is no significant difference between the monthly means for the Toledo gage and the Cleveland gage. Along the Ottawa River, wave action is minimal and wave heights of 0.5 feet are considered typical. In Maumee Bay, a 2 foot wave is considered typical. Hence, half-wave heights of 0.25 feet and 1.0 feet were selected respectively.

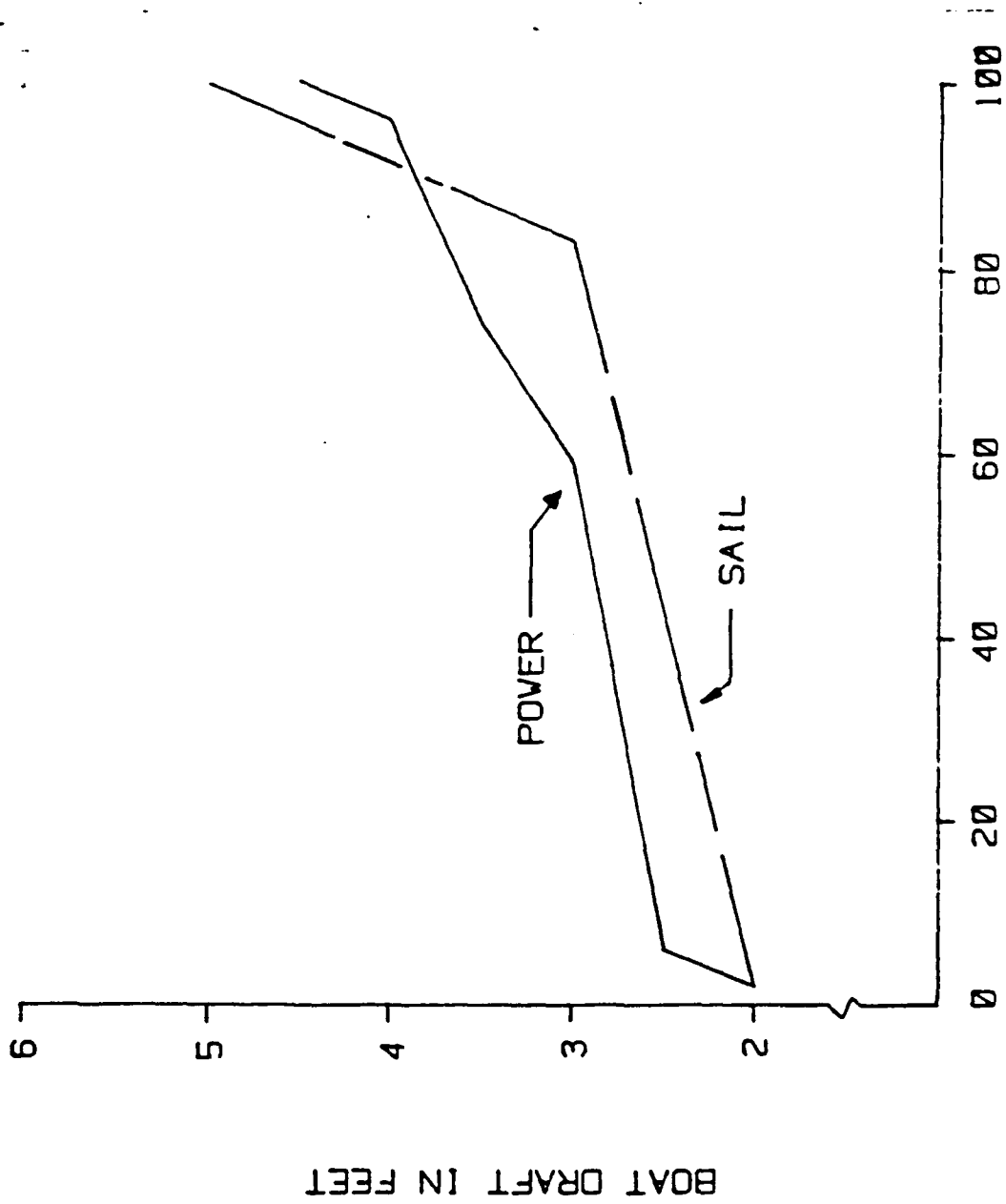
A moving vessel will cause a lowering of the water surface due to the change in velocity around the vessel, resulting in a lowering of the vessel with respect to the bottom, known as squat. The squat for sailboats within the river is considered insignificant due to their slow speed and only 0.25 feet in the Bay. However the squat for power boats is considered to be 0.5 feet in the River and 0.75 feet in the Bay.

Due to the nature of the fleet in the Ottawa River, the safety clearance of 1.0 foot was adopted. The minimum required water column for the recreational craft based upon the above values is presented in Table 4.

Table 4 - Minimum Required Water Column

Element	Sailboat		Power Boat	
	River	Bay	River	Bay
1/2 Wave Height	0.25'	1.0'	0.25'	1.0'
Squat	0	0.25'	0.5'	0.75'
Draft (Variable)				
Safety	1.0	1.0	1.0	1.0
TOTAL	1.25+D	2.25+D	1.75+D	2.75+D

Existing bottom elevations within the Ottawa River vary between -1 to -5 feet LWD. From the mouth of the Ottawa River to the Federal commercial navigation channel, bottom elevations vary from -3 to -6 feet LWD. Based upon the location of docks along the Ottawa River, the existing controlling elevation in the river



OTTAVA_4.DWG

CUMULATIVE FREQUENCY IN PERCENT

FIGURE 3 - OTTAVA RIVER BOAT DRAFT DISTRIBUTION

is -2 feet LWD. In the Bay, the controlling elevation is -3 feet LWD. Figure 3 presents the existing bottom elevation from the Federal channel to the confluence of Mudjaw Creek with the Ottawa River following the proposed channel alignment discussed subsequently.

Review of Table 4 and the controlling navigation elevations in the river and the bay indicate that the river is the governing condition for use along the entire pathway to the Federal channel. The percent use of the system (river/bay) is determined by combining the monthly elevation-duration curve with the values in Tables 2 & 3 and the controlling elevation. This computation is shown on Table 5. Average annual use by the existing permanent-based recreational fleet on the Ottawa River is 30 percent, thus on average the fleet only has sufficient water depths to navigate the channels 30% of the time during the boating season.

Table 5 - Existing Percent Use

Boat Type	Draft Ft.	Min. Water Column Ft.	Min. Req. Water Surface Ft. LWD	Fraction of Time of Water	Fraction of Fleet	Use
Sail	2	3.25	1.25	.84	.0015	.00126
Power	2	3.75	1.75	.715	.0177	.0127
Power	2.5	4.25	2.25	.535	.0325	.0174
Sail	3	4.25	2.25	.535	.1426	.0763
Power	3	4.75	2.75	.365	.4369	.1595
Power	3.5	5.25	3.25	.10	.1256	.0126
Power	4	5.75	3.75	.10	.1840	.0184
Power	4.5	6.25	4.25	.025	.0296	.00074
Sail	5	6.25	4.25	.025	.0296	.00074
=====						
Total Weighted Use						= .29964
SAY						30%

The private docks and association docks, totaling 1,457 have a percentage use rate of 43% under without project conditions. The transient docks have a usage rate of 30% under without project conditions. Private docks are portrayed as having a higher use rate due to a fleet mix which includes lesser lengths in boat distributions.

Recreational Boating Values

The net willingness to pay (WTP) user values used in this analysis were obtained from a survey conducted in the fall of 1988 of recreational boaters in a four county area in New York. The survey results were updated from 1989 to 1991 price levels. The Olcott Harbor data was used because it is the most recent CVM survey conducted by the District for recreational harbor studies. The net WTP values in October 1991 dollars are portrayed in Table 6.

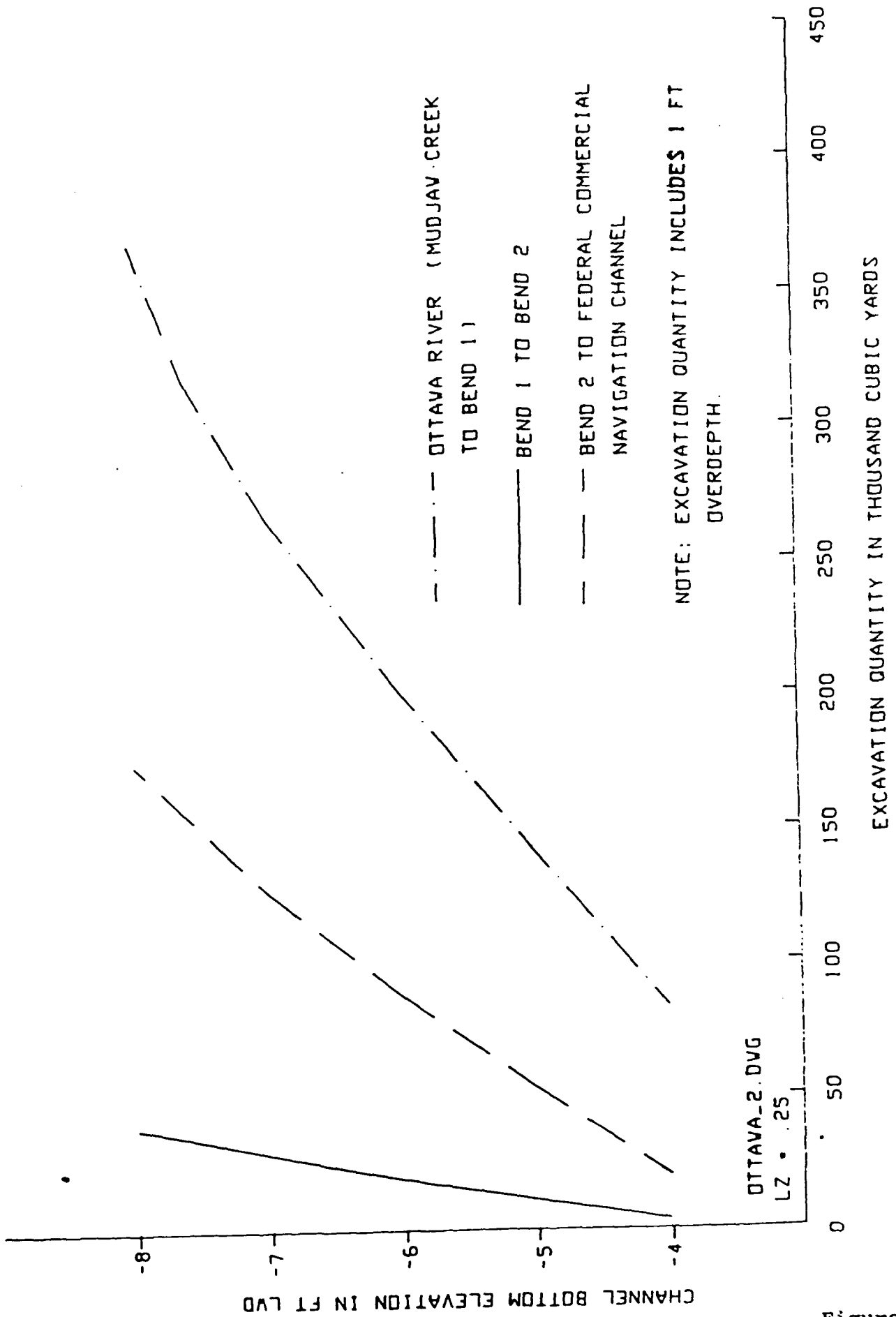


Figure 3

Table 6 - Net Willingness to Pay Values

Category	(\$1989)	(SEPT \$1991)
With Project	549.50	596.10
Without Project	409.83	444.67

Without Project Recreational Value

The without project recreational value is computed by multiplying the annual percentage use rates by the number of boats in the fleet mix times the recreational value per boat (CVM value). Total without project value for the permanent-based fleet mix is computed as follows:

$$1,353 \text{ (boats)} \times .30 \text{ (percentage use rate)} \times \$444.67 \text{ (CVM value without project)} = \$180,492.$$

The without project recreational values are summarized in Table 7 for each boating category along the Ottawa River. Total without project recreational value is \$467,900.

Table 7 - Without Project Recreational Boating Value

Boating Category	\$
Permanent-Based Recreational Fleet	180,500
Private and Other Fleet	278,600
Transient Fleet	8,800
	=====
	\$467,900

Charter Boats

The without project conditions for the charter boats will be a continuance of the existing conditions. No charter boats are expected to come to the area under without project conditions. The without project value for the charter boats is \$0. The channel depths will continue to be inadequate to accommodate the charter fishing industry on the river. The harbor would be a recreational harbor under without project conditions.

Recreational Boating Damages Without Project Conditions

The recreational boat damages along the Ottawa River include primarily prop damages. Navigational conditions are resulting in prop damages entering and leaving the channel. The southwest winds also create a navigational hazard by lowering already shallow depths in the entrance channel at Ottawa River. The river is silting and existing depths are -1 to -6 feet LWD. In addition to insufficient depths, the Ottawa River also suffers from contamination and pollution. The boaters have also been hindered by foreign objects floating in the river. The boaters also have difficulty due to poorly marked channels.

Navigational difficulties have resulted in prop damages

ranging from \$50 - \$350. Other damages include damages to the shaft and/or outdrive. The most commonly reported damage by boaters was to propellers. The damages are incurred on an annual basis because water depths are insufficient at the channel most of the boating season as outlined in the recreational methodology. The average annual boating damages can be related to boats entering or leaving the channel.

Without project damages are based on a survey conducted by the economics section in the fall of 1991. A total of 106 boat owners were sampled during the high priority output survey. There were 63 owners with boats \geq 26 feet in length and 43 owners with boats $<$ 26 feet in length. The average damages for boats \geq 26' were \$122 for the period 1987-1991. Boats $<$ 26' also were damaged due to insufficient navigational depths with average dollar damages of \$63 for the 5-year period. The estimate of damages is based on a 5-year average. The damages were added for 5 years and then divided by 5 to determine the average annual damage for each boater surveyed. Some of the boaters in the survey sample did not have any damages during the 5-year period. The nature of the river bottom is mud and silt. The damages reported would be greater if the bottom materials were rocky.

Recreational boat damages are a composite of damages to boats in the private fleet, transient fleet and permanent based fleet. The average damage estimate of \$63 is applied to boats $<$ 26 feet in length while \$122 is applied to boats \geq 26 feet in length. The total damages for without project condition by boat category are displayed in Table 8.

Table 8 - Without Project Recreational Boat Damages

Boat Category	Number		\$	
	$<$ 26'	\geq 26'	$<$ 26'	\geq 26'
Permanent-Based	435	918	27,405	111,996
Private and Other	1,287	170	81,081	20,740
Transient	23	43	1,449	5,246
TOTAL	1,745	1,131	109,935	137,982

The damages are expected to continue under the without project evaluation period. Total without project recreational boat damages are \$247,917.

Federal Plans of Improvement

The proposed plans of improvement would allow use most of the time with moderate amounts of dredging. Channel widths for the entire project would be 80 feet with the project extending from the Mudjaw Creek confluence with the Ottawa River to the Federal commercial navigation channel.

Plans 1A and 1B would include dredging to a depth of 4 feet in

the Ottawa River and 5 feet in Maumee Bay. Plans 2A and 2B would consist of dredging to a depth of 5 feet in the river and 6 feet in the Bay. Dredging disposal would be on Island 18.

The GDM Phase I plan was also evaluated for this report. The GDM Phase I plan of improvement would provide a recreational craft channel from Suder Avenue to deep water in Lake Erie. The old plan of improvement includes dredging to a depth of -5 feet LWD from the Suder Avenue Bridge to the Summit Street Bridge. A depth of -6 feet LWD would be dredged from the Summit Street Bridge to the mouth of the Ottawa River. A depth of -8 feet LWD would be dredged from the mouth of the Ottawa River to the Toledo Harbor shipping channel.

Recreational Boating With Project Conditions

The with project conditions are reflected in the added utilization of existing docks in private marinas. The yacht clubs were projected to be nearly 100% occupied throughout the without project evaluation period. The increase in additional slip occupancy for the dredging depth proposals, Plan 1, Plan 2 and GDM Phase I plan are 288. The provision of the dredging plans would attract potential boaters currently unsure of safety in the entrance channel or unwilling to locate currently on the Ottawa River due to inability to use their boats all season long. Recreational benefits for new boaters are expected to begin accruing in project year 5. The percent usage for the permanent-based fleet mix is computed in Table 9 for Plan 1 and Plan 2 for project years 1-4. The percentage recreational use is 87% for the with project fleet mix under Plan 1 and 97% for with project conditions under Plan 2. Percentage recreational use for project years 5-50 are 87% for Plan 1 and 98% for Plan 2. The private fleet, 1,457 boats has an annual recreational use rate of 93% for Plan 1 and 99% for Plan 2. Transient boaters have usage ratios of 86% and 97% for Plans 1 and 2, respectively. The GDM Phase I plan will allow 100% recreational use for the permanent-based fleet, private boats and transient boats.

Table 9 - Future Percent Use

PLAN 1 Boat Type	Draft Ft.	Min. Water Column Ft.	Min. Req. Water Surface Ft. LWD	Fraction of Time of Water	Fraction of Fleet	Use
Sail	2	3.25	1.25	1.0	.0015	.0015
Power	2	3.75	1.75	1.0	.0177	.0177
Power	2.5	4.25	2.25	.98	.0325	.0318
Sail	3	4.25	2.25	.98	.1426	.1397
Power	3	4.75	2.75	.93	.4369	.4063
Power	3.5	5.25	3.25	.835	.1256	.1049
Power	4	5.75	3.75	.72	.1840	.1325
Power	4.5	6.25	4.25	.53	.0296	.0157
Sail	5	6.25	4.25	.53	.0296	.0157
						=====
Total Weighted Use =						.8658
SAY						87%

Plan 2 Boat Type	Draft Ft.	Min. Water Column Ft.	Min. Req. Water Surface Ft. LWD	Fraction of Time of Water	Fraction of Fleet	Use
Sail	2	3.25	1.25	1.0	.0015	.0015
Power	2	3.75	1.75	1.0	.0177	.0177
Power	2.5	4.25	2.25	1.0	.0325	.0325
Sail	3	4.25	2.25	1.0	.1426	.1426
Power	3	4.75	2.75	1.0	.4369	.4369
Power	3.5	5.25	3.25	.98	.1256	.1231
Power	4	5.75	3.75	.93	.1840	.1711
Power	4.5	6.25	4.25	.835	.0296	.0247
Sail	5	6.25	4.25	.835	.0296	.0247
						=====
Total Weighted Use =						.9748
SAY						97%

Recreational Boating Value With Project

The with project recreational value is computed by multiplying the annual percentage use rates by the number of boats in the fleet mix times the recreational value per boat (CVM value). Total with project value for the permanent-based fleet mix is determined for Plan 1 and 2. The fleet mix for years 1-4 totals 1,353 while the fleet mix for years 5-50 totals 1,641. The corresponding recreational values are \$701,675 for years 1-4 and \$851,034 for years 5-50 under Plan 1. The recreational values for Plan 2 are \$782,328 for years 1-4 and \$958,636 for years 5-50. The recreational values for the old plan are \$806,523 for years 1-4 and \$978,200 for years 5-50. The average annual recreational values for the permanent-based fleet for Plan 1 is

\$808,700 while Plan 2 average annual recreational value is \$908,700 and the GDM Phase I average annual recreational value is \$929,500.

The with project recreational values are summarized in Table 10 for each boating category along the Ottawa River. Total with project recreational value is \$1,650,200 for Plan 1, \$1,806,700 for Plan 2, and \$1,837,400 for the GDM Phase I plan.

Table 10 - With Project Recreational Values

Boat Category	Plan 1 \$	Plan 2 \$	GDM Phase I \$
Permanent-Based Fleet	808,700	908,700	929,500
Private and Other Fleet	807,700	859,800	868,500
Transient Fleet	33,800	38,200	39,400
	=====	=====	=====
TOTAL	1,650,200	1,806,700	1,837,400

Charter Boats

The with project conditions will result in improvements in navigational conditions for potential charter captains. There was little or no interest expressed for the return or expansion of charter boat fishing on the river. The prospective for charter captains is poor because the Ottawa River is too far from the better fishing grounds including walleye, perch and bass. The startup of charter operations would be modest with project improvements. Only 3 full time charter captains are expected to be based at Ottawa River with a project.

Net Income Charter Boats

The net income determinations are made for full time operations. The costs include variable costs/trip and fixed costs. The summary of variable costs/trip is given in Table 11. Opportunity cost of time is \$20.70/trip. Fixed costs are computed for charter captains. Publicity, dockage, insurance and boat-loans are totaled for the fixed cost component. They are provided in Table 12 for full time captains.

Table 11 - Variable Cost/Trip

Item	Costs \$
Boat Fuel	50.00
Boat Maintenance	25.00
Equipment Repair	9.50
Boat Repair	12.00
Miscellaneous	20.00
Labor (Opportunity Cost)	20.70
	=====
Total	137.20

Table 12 - Fixed Cost/Boat

Item	Costs \$
Publicity	1,200.00
Dockage	1,995.00
Insurance	3,500.00
	=====
Total	6,695.00

With Project Charter Boat Recreational Value

The with project recreational value is computed as total net income for 3 full time charter captains. Given a net income of \$9,585/ captain, total net income would be \$28,755. The area is not expected to attract additional charter interests during the project evaluation period. The industry is already well represented in the western end of Lake Erie. The existing charter captains are not interested in locating along the Ottawa River because the best fishing grounds are located nearer Port Clinton and Cooley Canals, both of which are within reasonable driving distances of Toledo.

Recreational Boat Damages

The average annual damages under with project conditions were determined by multiplying the percentage of boats that would have inadequate depths in the channel by plan. The damages reduced are determined the same way as the recreational benefits gained by dredging the channel. The fleet mix for boats is varied for transient, permanent-based boats and the private fleet mix. The damages reduced are also computed for boats <26' in length and boats >= 26' in length. The with project conditions will result in a reduction in damages to private recreational boats. The owners will have adequate channels depths under with project conditions to insure usage rates determined in the recreational evaluation. The percentage use rates are used to compute residuals for boat damages avoided.

Future boat damages are \$27,405 for project years 1-4 and \$32,508 for project years 5-50 for the permanent-based fleet, given an additional 288 boats for with project conditions. The damages for boats >= 26' are \$111,996 for years 1-4 and \$137,250 for years 5-50. Average annual damages are \$31,062 for boats <26' and \$130,093 for boats >=26'. Total with project damages of \$161,155 would be reduced by 87% for Plan 1, 98% for Plan 2 and 100% for the GDM Plan. In the permanent-based fleet mix, the damages avoided under Plan 1 are \$140,205. The residual damages are \$20,950. The transient fleet mix would have residual damages of \$937. Other private and association docks have residual damages of \$7,127 under Plan 1. Plan 2 residual damages are as follows: Permanent-Based - \$3,223; Other private - \$1,018; and Transient - \$201. The GDM Phase I plan will eliminate recreational boat damages.

The with and without recreational benefits are subtracted by

boat category to yield the project benefits by plan in Table 13. Project benefits by plan are as follows:

Table 13 - Recreational Damages Avoided by Plan

PLAN 1

Boat Category	Without Project \$	With Project \$	Benefits \$
Permanent-Based	139,401	20,950	118,451
Private and Other	101,821	7,127	94,694
Transient	6,695	937	5,758
	=====	=====	=====
	247,917	29,014	218,903

PLAN 2

Boat Category	Without Project \$	With Project \$	Benefits \$
Permanent-Based	139,401	3,223	136,178
Private and Other	101,821	1,018	100,803
Transient	6,695	201	6,494
	=====	=====	=====
	247,917	4,442	243,475

GDM PLAN

Boat Category	Without Project \$	With Project \$	Benefits \$
Permanent-Based	139,401	0	139,401
Private and Other	101,821	0	101,821
Transient	6,695	0	6,695
	=====	=	=====
	247,917	0	247,917

Summary of Benefits

A summary of benefits is provided in Table 14 for Plans 1 and 2 of the dredging evaluations. The GDM plan is also presented in Table 14. The benefit categories for low priority output are recreational boating and charter boat fishing. High priority output categories include recreational boat damages avoided and net income loss avoided. Total benefits for Plan 1 are \$1,401,200 and \$1,582,300 for Plan 2. Total benefits for the GDM plan are \$1,617,400.

Table 14 - Summary of Benefits (1)

Benefit Category	\$	
	Plan 1A/ PLAN 1B	Plan 2A/ PLAN 2B
Low Priority Benefits		
Recreational Boating	1,182,300	1,338,800
Permanent-Based	(628,200)	(728,200)
Private and Other	(529,100)	(581,200)
Transient	(25,000)	(29,400)
High Priority Benefits		
Recreational Boat Damages Avoided	218,900	243,500
TOTAL	1,401,200	1,582,300

Benefit Category	\$	
	GDM Phase I	
Low Priority Benefits		
Recreational Boating	1,369,500	
Permanent-Based	(749,000)	
Private and Other	(589,900)	
Transient	(30,600)	
Recreational Boat Damages Avoided	247,900	
Total	1,617,400	

(1) Given September 1991 price levels, 8-1/2% interest rate and 50-year project life.

Summary of Costs

The total costs for the Ottawa River methods of dredging are summarized in Table 15. Interest during construction is computed for each plan evaluation. There is a distance of 13,000 feet to Island 18.

The Mobilization and Demobilization costs were also developed from the average bids from the 1991 Toussaint River Project and adjusted for the two additional booster pumps that are needed at the Ottawa River project. These costs are combined with annual maintenance dredging costs to obtain total annual maintenance cost. Dredging quantities for Plans 1A and 1B are 36,300 cubic yards every 3 years while Plans 2A and 2B have dredging requirements of 61,800 cubic yards every 3 years. The average annual costs by plan are as follows: Plan 1A - \$431,600; Plan 1B - \$1,349,200; Plan 2A - \$614,100 and Plan 2B - \$2,125,500. The average annual costs include interest and amortization and annual maintenance dredging costs.

The GDM Phase I plan of improvement was updated to September 1991 price levels from April 1976 price levels. Total costs for this plan are \$42,518,600. The plan will include dredging in three distinct areas as described previously.

Table 15 - Summary of Costs Ottawa River Dredging (1)

Plan 1A - Ottawa River Dredging and Disposal in Island 18

	\$	
Total First Cost	2,575,000	
IDC (2)	62,325	
	=====	
Total Costs	2,637,325	
Interest & Amortization (.08646)	228,023	
Annual Maintenance	203,600	
	=====	
Total Average Annual	431,623	say \$431,600

Plan 1B - Ottawa River Dredging and Disposal in Island 18

	\$	
Total First Cost	11,600,000	
IDC (3)	1,671,841	
	=====	
Total Costs	13,271,841	
Interest & Amortization (.08646)	1,147,483	
Annual Maintenance	201,700	
	=====	
Total Average Annual	1,349,183	say \$1,349,200

Plan 2A - Ottawa River Dredging and Disposal in Island 18

Total First Cost	3,675,000	
IDC (2)	114,625	
	=====	
Total Costs	3,789,625	
Interest & Amortization (.08646)	327,651	
Annual Maintenance	286,400	
	=====	
Total Average Annual	614,051	say, \$614,100

Plan 2B - Ottawa River Dredging and Disposal in Island 18

Total First Cost	18,685,000	
IDC (3)	2,682,031	
	=====	
Total Costs	21,367,031	
Interest &		
Amortization (.08646)	1,847,394	
Annual Maintenance	278,100	
	=====	
Total Average Annual	2,125,494	say, \$2,125,500

GDM Phase I Plan

Total First Cost	39,685,000	
IDC (4)	2,833,630	
	=====	
Total	42,518,630	
Interest &		
Amortization (.08646)	3,676,161	
Annual Maintenance	430,900	
	=====	
Total Average Annual	4,107,061	say, \$4,107,100

(1) Given September 1991 price levels, 8-1/2% interest rate and 50-year project life.

(2) Interest during construction (IDC) is computed for an 8-month construction period.

(3) Interest during construction (IDC) is computed for a 32-month construction period.

(4) Interest during construction (IDC) is computed for an 18-month period.

Economic Efficiency

The net discounted benefits and B/C ratio are computed for each project dredging plan. The net discounted benefits are average annual benefits less average annual costs. The B/C ratio represents average annual benefits divided by average annual costs. They are given in Table 16 for each plan of the Ottawa River study for high priority outputs.

In accordance with current Corps of Engineers policy, 51% of the benefits must be high priority benefits. They are non-recreational in nature and are based, for example, on damages avoided to recreational or commercial structures. Maintenance costs avoided or construction costs avoided are also included in high priority output calculations. The Ottawa River has recreational boat damages sufficient to equal 51% of the proposed project plan costs. As shown in Table 16, Plan 1A recreational boat damages avoided are 51% of total project costs. The high priority benefits are sufficient to warrant further Federal participation in the Ottawa River Harbor study.

Table 16 - Economic Efficiency - High Priority Outputs (1)

Plan	Total Costs	Average Annual Benefits	Average Annual Costs	Net Discounted Benefits	B/C Ratio
1A	2,637,300	218,900	431,600	-212,700	.51
1B	13,271,800	218,900	1,349,200	-1,130,300	.16
2A	3,789,600	243,500	614,100	-370,600	.40
2B	21,367,000	243,500	2,125,500	-1,882,000	.11
GDM	42,518,600	247,900	4,107,100	-3,859,200	.06

(1) Given September 1991 price levels, 8-1/2% interest rate and 50-year project life.

The B/C ratio and net discounted benefits are given in Table 17 for all benefits evaluated. This summary table includes recreational benefits. When recreational benefits are included in the economic evaluation, Plans 1A, 1B and 2A are justified.

The current Federal policy only allows the Federal interest to proceed with the study if there are 51% high priority benefits. The criteria is met with Plan 1A. Net discounted benefits are maximized with Plan 1A at \$969,600. Since Plan 1A maximizes net discounted benefits, it is the recommended plan for further Federal study.

Table 17 - Economic Efficiency - Total Benefits (1)

Plan	Total Costs	Average Annual Benefits	Average Annual Costs	Net Discounted Benefits	B/C Ratio
1A	2,637,300	1,401,200	431,600	969,600	3.25
1B	13,271,800	1,401,200	1,349,200	52,000	1.04
2A	3,789,600	1,582,300	614,100	968,200	2.58
2B	21,367,000	1,582,300	2,125,500	-534,200	.74
GDM	42,518,600	1,617,400	4,107,100	-2,489,700	.39

(1) Given September 1991 price levels, 8-1/2% interest rate and 50-year project life.

APPENDIX D

OTTAWA RIVER HARBOR
MICHIGAN & OHIO

CORRESPONDENCE

NOV 26 1991

Project Management Branch

SUBJECT: Ottawa River Harbor, Michigan and Ohio

Mr. Gary M. Krasniewski, P.E.
Commissioner, City of Toledo
Division of Streets, Bridges & Harbor
1189 West Central Avenue
Toledo, Ohio 43610

26 NOV 91 13 52
GENERAL INVESTIGATION

Dear Mr. Krasniewski:

On October 16, 1991 representatives from the Buffalo District met with your Administrator, Messrs. William Franklin and Edward Hammer of your staff to discuss the Ottawa River shallow-draft Navigation Project. Enclosed is a copy of the Memorandum for Record (MFR) of that meeting.

Key to developing an economically justified project is the confined disposal facility (CDF) which must be provided by the local sponsor. As mentioned in the MFR several different sites are being considered for the CDF. Two possible sites discussed were the city's Hoffman Road landfill, and the Corps' previously used CDF, Island 18. This site was built by the Corps of Engineers for the confinement of dredged materials in the early 1960's and used until the present CDF was brought on line. Island 18 presently has a remaining capacity of from 600,000 to 800,000 cubic yards. This would be sufficient for the dredging of a reduced scope project plus 10 to 15 years of maintenance dredging following construction. If it could be used the City of Toledo would have to accept ownership of the facility, and maintain it in the future to insure no polluted material confined there reenters the waters of Maumee Bay. The question arose at the meeting as to the maintenance cost of this facility. Since 1980 the Buffalo District has maintained Island 18 at a minimal cost averaging \$3,000 to \$5,000 annually.

If the City of Toledo is interested in taking over Island 18 for their use in the construction and maintenance of the Ottawa River project, we will need a letter from the city stating their intentions and desire to accept ownership of the facility. However, before Island 18 is eligible to be turned over to anyone it must be excessed. Part of the excessing process is offering Island 18 first to other Federal agencies, next to the State of Ohio, and then to other non Federal government agencies such as

Project Management Branch
SUBJECT: Ottawa River Harbor, Michigan and Ohio

the City of Toledo. Some Federal and State agencies have in the past expressed some interest in the facility, this then would make consideration of the Hoffman Road landfill, or other sites provided by the city feasible alternatives.

In addition, and in order to continue our planning engineering and design (PED), we need a Letter of Intent from the city. The content of the letter should follow examples previously furnished on February 5, 1991. Presently, we are completing an Economic Evaluation for the project. Preliminary indications are that project benefits will not support the full scale project previously presented as stated in the enclosed MFR. Our schedule calls for completing a limited Reevaluation Report, which includes the economic evaluation and reduced scope plan formulation, and submitting to our headquarters by February 1992 for review and approval to either terminate our work or to continue on with further analyses and design. A copy of your Letter of Intent must be included to recommend continuance of PED.

I would appreciate your response within 30 days so as to keep this project on schedule. My point of contact pertaining to this subject is Mr. Brian M. Troyer of my Programs and Project Management Branch who can be contacted by calling 716 879-4316 (FTS 292-4316), or writing to his attention at the address shown above.

Sincerely,

SIGNED

John W. Morris
Colonel, U.S. Army
Commanding

Enclosure

Project Management Branch

SUBJECT: Interagency Meeting for Ottawa River Harbor, Michigan and Ohio

Dear :

You are requested to attend a meeting concerning the Ottawa River Harbor, Michigan and Ohio project. Representative Marcy Kaptur will chair the meeting which will be held at the Point Place Public Library, 2744 110th Street, Toledo, Ohio at 10:30 a.m. on Monday, February 4, 1991. A map is enclosed showing the location of the Library.

The project was reauthorized under Section 107 of the Water Resources Development Act of 1990, Public Law 101-640. Initial funding has been received in FY 91 to begin Planning, Engineering and Design (PED). The purpose of the meeting is to bring together all interested parties to surface and discuss issues which might impact on the project.

My point of contact pertaining to this matter is Mr. Brian M. Troyer, Individual Project Manager, of my Programs and Project Management Division, who can be contacted at commercial number 716-879-4316 or by writing to his attention at the address shown above.

Sincerely,


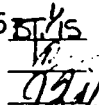
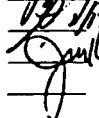


DAVID P. PLANK
MAJ, EN
Deputy District Commander

David P. Plank
Major, U.S. Army
Acting District Commander

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Enclosure

CF:
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CENCB-PE-PF
CENCB-PP-PM

Guido ^{1/15}  Troyer/jf/4316 ^{1/15} 
Cadet
Zorich
Brooks
Kumor
ODC




OTTAWA RIVER DREDGING PROJECT - COMMITTEE :LING LIST

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①
PROSPECTIVE PARTICIPANTS IN OTTAWA RIVER DREDGING MEETING

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Monroe, Michigan 48161
313 242-7093

16th DISTRICT LIST OF OFFICIALS FOR OTTAWA RIVER
HARBOR MEETING

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Chief
Division of Land and Water Management
Michigan Department of Natural Resources
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Lansing, MI 48909-7704
(517) 373-1170

Kaptur¹⁵ announces harbor funding

Congresswoman Marcy Kaptur announced that HR 5314, the Water Resources Development Act, passed the House and contained authorization of \$6,530,000 for continued navigation of the Ottawa River Harbor. The project cost is \$13,200,000 and requires matching funds from local interests.

Ms. Kaptur stated, "The Water Resources Development Act provides needed help for the Ottawa River to rejuvenate economic activity for the harbor. The Act authorizes funds to clean up and expand the use of the Ottawa River by dredging a six-foot channel from Suder Avenue to the tip of the Lost Peninsula in Michigan, and an eight-foot channel from there to the Toledo ship channel."

The Ottawa River project was first authorized as an eligible pro-

ject for 50 percent federal funding participation in December 1970 under provisions of the 1965 Flood and Control Act. In 1977, the Army Corps of Engineers put the project on hold based on notification from the Ohio and Michigan departments of natural resources because local matching funds were not appropriated. The project was deauthorized under the Water Resources Development Act of 1986, which deauthorized projects that have not had funds designated to them for 10 years.

She has consistently fought for the Ottawa River project in Congress. In June, Ms. Kaptur secured \$300,000 for the Army Corps of Engineers to reevaluate the Ottawa River Harbor dredging project through the 1991 Energy and Water Appropriations Bill.

CITY OF TOLEDO OHIO

ONE GOVERNMENT CENTER
SUITE 2220
TOLEDO, OHIO 43604

THOMAS R. HOOVER
CITY MANAGER

92 MAR 16 (419) 245-1010
AM 11:43



March 12, 1992

Colonel John W. Morris
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Colonel Morris:

This is in response to your letter dated February 10, 1992, which provided an update on the status of the Ottawa River dredging project. Your letter also requested the City of Toledo to respond as to its ability and willingness to serve as local sponsor for the project.

First, as you know, the City has been supportive of the project and appreciates the conscientious efforts of you and your staff to obtain project reauthorization and Federal appropriations for the reevaluation study. The Buffalo District Army Corps of Engineers (Buffalo Corps) has also been very cooperative and timely throughout the development of their now completed Phase I Economic Analysis Report.

As you are aware, the revival of this project was sparked by strong citizen support which became apparent through citizen contacts to your office, Toledo City Council, and to the City's Division of Streets, Bridges and Harbor. In addition, petitions to reinitiate the project were circulated by the Ottawa River Improvement Association and were returned with more than 3,000 signatures of local residents. Two well attended public meetings were also held. The City, recognizing strong support for the project, assumed the role of a coordinating agency. As the coordinating agency, the City's Division of Streets, Bridges and Harbor along with City Councilman Mike Ferner hosted meetings on February 5, 1991, and February 21, 1991, involving various governmental jurisdictions, private organizations, and individuals as listed on the attached mailing list. At these meetings, the latest project information was disseminated and discussions occurred that focused on how to provide the required local matching funds. Also, all appropriate governmental jurisdictions were contacted directly in search of a lead agency and/or to get a commitment of at least some portion of the required local funds. The governmental jurisdictions contacted included: Ohio Department

Colonel John Morris
Re - Ottawa River Dredging
Page 2
March 12, 1992

of Natural Resources, Michigan Department of Natural Resources, Toledo-Lucas County Port Authority, Lucas County, Ohio, and Monroe County, Michigan. The committee also discussed and investigated the possibility of private funding assistance for all or part of the local funding requirements such as: special property tax assessments from the properties abutting the project limits, a piggyback fee to be collected with boat license fees, an annual additional dock fee to be paid by the 1,353 docks of the marinas and yacht clubs included in the project limits. Also, other Ohio recreational dredging projects were examined to gain information on their local funding arrangements. The Division of Streets, Bridges and Harbor also requested that some portion of the \$1,145,000 Federal appropriation be redirected from the study funding to local matching funds. We also inquired if the local sponsor project maintenance commitment could be waived and have the Corps maintain the project subsequent to the 1986 Water Resources Development Act. It was hoped that this project could be "grandfathered" to accomplish this arrangement since the project was originally authorized before 1986. The answer from Steve Katich of your office, who discussed these matters with the Buffalo Corps, was negative. Despite the above efforts neither a local sponsor nor significant viable funding sources were identified.

Since reinitiation of the project, the issue of a local sponsor has been discussed with your office, the Buffalo Corps and the City of Toledo. It was an agenda item at both the February 5, 1991, and October 16, 1991, meetings between the City's Division of Streets, Bridges and Harbor and the Buffalo Corps. Although all parties remained hopeful, it became apparent that the lack of a local sponsor once again threatened to stop the Ottawa River Dredging Project. The Buffalo Corps decided to continue the Phase I economic analysis study without a local commitment to keep the project on schedule to determine what size project would be economically justified and to better define the financial commitment of a local sponsor.

Even considering the costs of these scaled back alternatives, the local sponsor would have to provide an estimated \$1.29 million for construction of Proposal 1 and about \$1.84 million for construction of Proposal 2 with annual maintenance costs of about \$195,000 and \$280,000 respectively.

Another potentially major problem surfaced in a phone conversation last week between the Buffalo Corps and the Division of Streets, Bridges and Harbor. The project cost figures contained in your February 10, 1992, letter were based on using Island 18/Grassy Island as the Confined Disposal Facility (CDF) for The

Colonel John Morris
Re - Ottawa River Dredging
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disposal of both the initial construction dredgings and for 10-15 years of maintenance dredgings. The original concept proposed by the Corps was that Island 18 was first to be conveyed to the City of Toledo by the Army Corps of Engineers at no cost. The Buffalo Corps is not sure that it wants to lose possession of Island 18 based on recent developments in another dredging project being planned in conjunction with the Toledo-Lucas County Port Authority and involving the Ohio EPA. This project involves dredging the Maumee River commercial shipping channel which would certainly be more important to the region than a recreational boating project. If Island 18 is required as a CDF for the Maumee River project, an additional \$10 - \$15 million would be required to construct a new CDF for the Ottawa River Dredging Project. The Buffalo Corps stated that this scenario would terminate the project because it would no longer meet the economic justification requirements.

The Buffalo Corps has advised that they will not proceed with the next phase of the reevaluation study until a letter of intent is received from a local sponsor.

As to the City's ability to be that local sponsor, I must regretfully submit that we cannot commit to that responsibility at this time because of financial and other obligations the City would have to assume. As you know, Toledo's economy has been in a state of recession and, therefore, payroll tax revenues have declined very substantially. Since the Capital Improvements Fund (CIP) is funded by payroll tax revenues, it is currently stagnant. Additionally, in May, 1992, citizens will be voting on temporarily reallocating CIP funds to bolster the ailing general fund operating budget.

It is our understanding that the project is authorized for a period of five years from the time the Phase I Economic Analysis Report is approved. The Buffalo Corps indicates that approval of the report is 30 - 90 days away. If we have the five years of authorization it will be incumbent that all of us work together to find a local sponsor during that time.

We certainly appreciate all of your efforts to revive this popular and needed project. However, after exploring all possible avenues, we must very reluctantly advise you that the City of Toledo is in no position to accept the financial and other obligations as the local sponsor for the Ottawa River Dredging Project. Nevertheless, I look forward to continuing to work with you on this important matter.

Colonel John Morris
Re - Ottawa River Dredging
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Sincerely,

A handwritten signature in cursive script that reads "Thomas R. Hoover". The signature is written in dark ink and is positioned above the printed name and title.

Thomas R. Hoover
City Manager

TRH:GMK:bp

Attachment

cc: The Honorable Mayor and Members of City Council
Bernard J. Leite, Director, Public Service
Gary M. Krasniewski, Commissioner, Streets, Bridges and Harbor