FINDING OF NO SIGNIFICANT IMPACT
AND
ENVIRONMENTAL ASSESSMENT

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
LUCAS COUNTY, OHIO

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, NY 14207-3199

April 2009

PUBLIC REVIEW PERIOD ENDS: _____

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
LUCAS COUNTY, OHIO

The U.S. Army Corps of Engineers (USACE), Buffalo District has assessed the environmental impacts of the routine maintenance dredging activities at Toledo Harbor in accordance with the National Environmental Policy Act (NEPA) of 1969 and has determined a Finding of No Significant Impact (FONSI). The attached Environmental Assessment (EA) presents the results of the environmental analysis.

The primary purpose of the EA is to update previous environmental documentation prepared for the dredging and dredged material placement activities at Toledo Harbor. The quality of Toledo Harbor sediments has improved to the point that the majority of the dredged material now meets U.S. Environmental Protection Agency (USEPA)/USACE guidelines for open-lake placement. Consequently, this EA addresses an increase in the quantity of material being placed in the open-lake.

Toledo Harbor is located near the southwest shore of Lake Erie at the mouth of the Maumee River at the city of Toledo, Lucas County, Ohio. Appendix EA-A of the attached EA contains figures and maps depicting the Federal navigation project at Toledo Harbor. Federal navigation channels in the project area include the 18-mile Lake Approach Channel in Maumee Bay and Western Basin of Lake Erie and 7-mile River Channel in the Maumee River. These harbor channels are regularly maintenance-dredged to accommodate efficient and safe deep-draft commercial navigation. The Selected Plan is to annually dredge Toledo Harbor Federal navigation channels and manage the dredged material based on a determination as to whether it meets applicable USEPA/USACE guidelines for open-lake placement. Such a determination reflects the appropriate Federal responsibility for dredged material management. Recent sampling, testing and evaluation of sediments to be dredged from Toledo Harbor Federal navigation channels indicates that the majority of the sediments meet Federal guidelines for open-lake placement, except for those located in the River Mile 2 reach of the River Channel, which would continue to be placed in a Federal confined disposal facility (CDF). The placement of this dredged material at the designated open-lake area in the Western Basin of Lake Erie is appropriate because it would not have an unacceptable adverse impact on the aquatic ecosystem either individually or in combination with known and/or probable impacts of other activities affecting the ecosystem.

The Selected Plan involves dredging of shoals within Toledo Harbor Federal navigation channels to authorized depths and widths, with the dredging of up to an additional one-foot of material to ensure adequate depth. The method of dredging would be mechanical or hydraulic, and depend on the private Contractor performing the work. The appropriate environmental window for dredging of Toledo Harbor would be coordinated with the Ohio Department of Natural Resources (ODNR). ODNR recommends dredging and placement activities take place only between July 1 through March 15 across all Toledo Harbor Federal navigation channels. A maximum of 1,250,000 cubic yards of material dredged

from the harbor (except for that dredged from the River Mile 2) would be placed at the existing two-square mile open-lake placement area in the Western Basin of Lake Erie, located just north of the Lake Approach Channel near Lake Mile 11. Dredged material discharge will be restricted to the northeast portion of this area. The total volume of material to be dredged reflects typical annual dredging requirements of approximately 850,000 cubic yards, and may also include dredging required to remove shoals not dredged in previous years due to reduced funding were funding to become available. An estimated 100,000 cubic yards of sediments dredged from the River Mile 2 reach, which does not meet Federal guidelines for open-lake placement, would be placed in the existing USACE confined disposal facility (CDF) 3 - Cell 2 located at the mouth of the Maumee River. The majority (over 90%) of the material being placed in the open-lake in the Western Basin of Lake Erie is derived from the Lake Approach Channel, which is also located in the Western Basin. Pursuant to Section 401 of the Clean Water Act, the Ohio Environmental Protection Agency (OEPA) granted Water Quality Certification (WQC) for the placement of 360,000 and 840,000 cubic yards of dredged material at the open-lake area in calendar years 2008 and 2009, respectively.

Alternatives to the Selected Plan were considered in this evaluation, but it was ultimately determined that no practicable alternative to open-lake placement of dredged material currently exists. The “No Action” alternative was also considered but dismissed since it would not address the navigation needs and a viable alternative was identified. Upland (landfill) placement of the material was determined to be technically infeasible and economically nonviable. Several beneficial use of dredged material studies are currently being evaluated and are in various phases of study through the Buffalo District’s Regional Sediment Management (RSM) Program. However, at this time none of these studies have progressed to the point that they are ready to be implemented. There is currently no placement area outside the aquatic ecosystem available to the USACE that is accessible, economically feasible, and can accommodate the quantity of dredged material necessary to maintain the Federal navigation channels at Toledo Harbor on an annual basis and at a reasonable Federal cost.

Analysis has shown that the project is not a major Federal action which would result in significant adverse impacts on the quality of the human environment. Public coordination to date has not revealed any areas of significant environmental controversy that have not been sufficiently addressed. Based on these factors, it has been determined that an Environmental Impact Statement will not be required. Those who may have information that may alter this assessment and lead to a reversal of this decision should notify me within 30 days. If no comments that would alter this finding are received within the 30-day review period, or after such comments are sufficiently addressed, this FONSI will be signed and filed with the project documentation.

Date _____

Daniel B. Snead, P.E.
Lieutenant Colonel, U.S. Army
District Commander

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
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ENVIRONMENTAL ASSESSMENT

SECTION 1: PURPOSE AND AUTHORITY

1.1 PURPOSE - The purpose of this Environmental Assessment (EA) is to provide sufficient information on the potential environmental effects of the subject action, as proposed by the U.S. Army Corps of Engineers (USACE), Buffalo District. Analysis of the potential effects of the proposed project will determine if the project is a major Federal action significantly affecting the quality of the human environment. This EA facilitates compliance with the National Environmental Policy Act (NEPA) of 1969 and includes discussion of the need for the action, the affected environment, a description of the proposed action and alternatives, its environmental impacts, environmental compliance, and a list of agencies, interested groups and individuals consulted.

1.2 AUTHORITY - The existing Federal navigation project at Toledo Harbor, including its operation and maintenance, was authorized by the River and Harbor Acts of 1899, 1910, 1935, 1950, 1954, 1958 and 1960.

SECTION 2: NEED FOR THE PROPOSED ACTION

2.1 INTRODUCTION - The primary purpose and scope of this EA is to address an increase in the quantity of Toledo Harbor dredged material to be placed at the existing authorized open-lake placement area in the Western Basin of Lake Erie. This increase in quantity is attributable to a determination that most of this dredged material is now suitable for open-lake placement, as well as a potential increase in dredging to address a backlog of sediment in Toledo Harbor Federal navigation channels. Associated with the increased open-lake placement of this material is a decrease in the quantity of material that was hitherto placed into existing confined disposal facilities (CDFs) constructed by the USACE at Toledo Harbor.

2.2 NEED FOR ACTION - The identified problems at Toledo Harbor are shoaling of the authorized Federal navigation channels and the subsequent reduction in navigable depths for deep-draft commercial navigation. The need for maintenance dredging arises as shoals accumulate within the Federal navigation channels. Dredging restores these channels to authorized project dimensions (both depth and width), which facilitates safe commercial and recreational navigation and their associated benefits.

Toledo Harbor, located at the mouth of the Maumee River in Lucas County, Ohio, is an important domestic and international port along the Great Lakes and St. Lawrence Seaway System (Figure 1). Toledo Harbor is the 49th leading U.S. port (7th on the Great Lakes, 2nd

on Lake Erie) with 12.5 million tons of material shipped or received in 2007. The Maumee River watershed is very large (approximately 4.2 million acres) and predominantly agricultural in nature, and consequently produces a substantial sediment load. Sediments from this watershed (Figure 2) and erosion from the streambanks of the Maumee River gradually deposit in the River Channel portion of the harbor. Bottom sediments from the river, Maumee Bay and the Western Basin of Lake Erie tend to accumulate in the Lake Approach Channel portion of the harbor. This creates shoals in the Federal navigation channels, which must be dredged and appropriately managed. For a number of years the USACE has not been able to dredge Toledo Harbor to the extent desired due primarily to funding constraints, which has resulted in a substantial reduction of Federal navigation channel dimensions. Consequently, over 2,700,000 cubic yards of shoal material has accumulated in these channels. Dredging of Toledo Harbor Federal navigation channels requires the need to manage the dredged material.

SECTION 3 – PROPOSED ACTION AND ALTERNATIVE CONSIDERATIONS

3.1 PROPOSED ACTION - The Federal navigation project at Toledo Harbor consists of the following features (Figures 3 and 4):

- Lake Approach Channel: This approximately 18-mile long channel in the Western Basin of Lake Erie has authorized dimensions of 28 feet deep and 500 feet wide from the mouth of the Maumee River (Mile 0), through Maumee Bay to deep water in Lake Erie (Lake Mile [LM] 18).
- Maumee River Channel: This approximately 7-mile long channel in the lower Maumee River has authorized dimension of 27 feet deep and 400 feet wide from Mile 0 to River Mile (RM) – 3; thence a channel 400 feet wide from RM-3 to RM-6.5 with depths of 27 feet over a least width of 200 feet, and 25 feet deep over the remainder of the 400-foot channel width; thence a channel 25 feet deep and 200 feet wide to the upper limit of the project, RM-7. Note that River channel section from RM-6.5 to RM-7 is no longer maintained.
- Lower Turning Basin: This turning basin is located in the Maumee River Channel opposite the American Shipbuilding docks at RM-2.7. The basin is 750 feet wide, 800 feet long and 20 feet deep. Note that this turning basin is no longer maintained.
- Middle Turning Basin: This turning basin is located in the Maumee River Channel just upstream from the old Fassett Street Bridge at RM-6.5. The 27 feet deep basin is semi-circular in shape with a radius of 730 feet.
- Upper Turning Basin: This turning basin is located at the upper limit of the Maumee River Channel at River Mile 7. The 8.25 acre basin has an authorized depth of 18 feet. Note that this turning basin is no longer maintained.

The selected operations and maintenance plan would involve dredging the authorized Toledo Harbor Federal navigation channels, and appropriate management of the associated dredged material.

The selected plan pivots around whether the material dredged from Toledo Harbor is suitable for open-lake placement. This is based on a determination as to which sediments meet Federal guidelines, and comply with promulgated State Water Quality Standards if placed in the designated open-lake area. USACE-Buffalo District regularly collects sediment samples from the Federal navigation channels and analyzes them in accordance with the Federal guidelines contained in the Great Lakes Dredged Material Testing and Evaluation Manual (GLDMTEM) (U.S. Environmental Protection Agency [USEPA]/USACE, 1998). USACE most recently collected sediment samples from Toledo Harbor Federal navigation channels in 2004 and 2006 (EEI 2004 and 2006; USAERDC, 2006 and 2007) and subjected them to physical, chemical, and biological analyses in accordance with the guidelines contained in the GLDMTEM (USEPA/USACE, 1998). An evaluation based on these data indicates that all sediments in the Federal navigation channels are suitable for open-lake placement, except for those located in River Mile 2 reach of the River Channel. This reach is depicted in Figure 4 and is defined as the area situated between RM-1 (Station 347+20) and RM-3 (Station 241+60). The placement of material that is determined to be suitable for open-lake placement into Federal CDFs is inconsistent with Public Law 94-587, which requires the Corps to use best management practices to extend the useful life of CDFs and minimize the need for new CDFs. Therefore, the proposed operation and maintenance plan is annual dredging of Toledo Harbor Federal navigation

channels, with placement of up to 1,250,000 cubic yards dredged from the harbor (except for that dredged from the River Mile 2 reach) at the existing authorized open-lake placement area, and placement of up to 100,000 cubic yards dredged from the RM-2 reach in a Federal CDF. This total quantity includes an estimate of annual dredging requirements (approximately 850,000 cubic yards), and would also include the removal of shoals that were not dredged in previous years should funding become available. The appropriate environmental window for dredging of Toledo Harbor would be coordinated with the Ohio Department of Natural Resources (ODNR). ODNR recommends dredging and placement activities take place only between July 1 through March 15 across all Toledo Harbor Federal navigation channels.

The existing authorized open-lake placement area is located in the Western Basin of Lake Erie, just north of the Lake Approach Channel near Lake Mile 11 (Figure 3). The center of this area is located 3.5 miles from the Toledo Harbor Light on an azimuth of 33º. It is a two-square mile area with average depths of 20 – 23 feet below LWD[1]. Dredged material placement would occur in the northeastern-most portion of this area. Sediments dredged from the River Mile 2 segment of the River Channel would be placed into a Federal CDF. CDF 3 – Cell 2 located just southeast of the Lake Approach Channel at the mouth of the Maumee River in Lake Erie (Figure 3) would be used for the placement of this dredged material. The existing Island 18 CDF, located north of the Lake Approach Channel between Mile 0 and LM-1 would not be used for the placement of this dredged material until such time that a permanent repair to a dike breach is completed. The majority (over 90%) of the material being placed in the open-lake in the Western Basin of Lake Erie is derived from the Lake Approach Channel, which is also located in the Western Basin.

The maintenance dredging would be performed by a private firm contracted by the Federal government. The contractor would determine the method of dredging and dredged material placement. In previous years, hopper, clamshell bucket and pipeline dredges have been used to complete the required work. Dredged material for open-lake placement would be transported to the placement area in dump scows or hopper dredge. After arrival at the placement area, the vessel would slow down, its bottom gates would be opened, and the dredged material would be allowed to settle to the bottom. The dredged material may also be delivered to the open-lake area via pipeline. Dredging and dredged material placement would not be performed during Lake Erie storm events. Dredged material not suitable for open-lake placement would be transported to a CDF and transferred into the facility mechanically or hydraulically. Measures would be incorporated to avoid transfer spillage.

The proposed plan was selected based on its ability to address the identified community needs and to sufficiently satisfy the national goals and planning objectives. It reasonably maximizes National Economic Development (NED) benefits consistent with protecting the Nation's Environmental Quality, pursuant to National environmental statutes, applicable Executive Orders, and other Federal planning requirements. The other alternatives considered could not be justified economically or by other accounts.

[1] Low Water Datum (LWD) for Lake Erie is defined as 569.2 feet above mean sea level at Rimouski, Quebec, Canada (IGLD 1985).

3.3 ALTERNATIVES TO THE PROPOSED ACTION - The following alternative plans and their associated environmental impacts were considered for the proposed project. The alternatives considered are as follows:

(a) *No-Action* - A No Action (Without Project Conditions) alternative serves as a baseline for comparison for other alternatives. With this alternative, dredging of Toledo Harbor Federal navigation channels would not be conducted. The channels would shoal in and commercial harbor operations would become economically less viable. This would reduce operating depths in the Federal navigation channels such that commercial interests would have to increase the number of vessel trips per year in order to move their commodities through the harbor. Note that the average shoaling rate in the Federal navigation channels of Toledo Harbor is on the order of one foot per year. As shoaling of the Federal navigation channels progresses due to lack of dredging, vessel transits through the harbor would eventually become less economical after which use of the harbor for commercial navigation could eventually decline. If the harbor were not dredged and is no longer available to commercial navigation traffic over time, commodities would need to be moved by alternative modes of transportation, such as rail or truck. Truck and rail transport is much less efficient than that of a Great Lakes carrier. A Great Lakes carrier travels 607 miles on one gallon of fuel per ton of cargo, compared to 202 miles for a freight train and 59 miles for a truck. In one delivery, a Great Lakes carrier supplies 70,000 tons of cargo, which would require nearly 3,000 semi truck loads. This vastly reduces fuel consumption. More importantly, a cargo of 1,000 tons transported by a Great Lakes carrier produces 90 percent less carbon dioxide as compared to the same cargo transported by truck and 70 percent less than the same cargo transported by rail (USACE, 2009). The transportation costs would then increase by $268 million annually, which is the estimate of rate savings benefits that the maintained port currently provides. In addition, it is estimated that there would be a loss of $126 million in regional revenues and 1,789 maritime-related jobs. Thus, this alternative would severely limit commercial navigation through the harbor, resulting in numerous adverse social and economic impacts.

(b) *Dredging, Dewatering, and Upland Placement of the Dredged Sediments* – This alternative, while feasible from an engineering standpoint, is impracticable from both an engineering and economic standpoint. A dewatering facility would need to be developed for the dredged material, and the transportation/disposal cost relative to placement of the dredged material in a landfill would be several times that of placement in the open-lake and/or a CDF. This increased cost in dredged material placement would be the responsibility of non-Federal sponsors. Additionally, to accommodate the volume of one year of Toledo Harbor dredged material, it is estimated that equipment hauling from a dewatering facility to a landfill would need to operate on an 8-hour per day, 5-day per week basis for 250 days (50 weeks). This estimate assumes the use of 40 tandem dump trucks operating on a 2-hour cycle. Therefore, this alternative was removed from consideration as it is not economically justified and will not be evaluated further in this assessment.

(c) *Beneficial Use of the Dredged Material* – Several beneficial use of dredged material studies are currently being evaluated and are in various phases of study through the Buffalo District's Regional Sediment Management (RSM) Program. However, at this time none of these studies have progressed to the point that they are ready to be implemented. Once a suitable and agreeable (to local cost-share sponsors) project(s) is identified relative to Toledo Harbor dredging, the project will be studied and evaluated through a separate authority and thus a separate NEPA document will be prepared. Until a beneficial use project is implemented, it will be necessary to continue dredging and open-lake placement and/or CDF placement to ensure the viability of Toledo Harbor as a major navigation ports in the Great Lakes and Nation. Also note that it is expected that open-lake placement and/or CDF placement of dredged material may need to continue into the foreseeable future due to the large quantity of material removed from the Toledo Harbor Federal navigation channels on an annual basis even after a beneficial use project is implemented.

In addition to the project alternatives described above, it should be noted that the USACE and other harbor interests continue to work toward the development other harbor dredged material management measures. Other on-going initiatives and measures include:

- Maumee River Watershed Best Management Practices (BMPs) - The U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS) is pursuing BMPs such as no till/conservation till farming, farm sedimentation collection ponds/wetlands, and buffer strips. NRCS is also working with the USACE - Buffalo District and other interests to assess the erosion and sedimentation problems in each component watershed as part of the on-going Western Lake Erie Basin Study (USACE, Buffalo 2007c).

- Maximizing Use of Existing CDFs - The USACE - Buffalo District and the Toledo – Lucas County Port Authority (TLCPA) maximize the use of existing facilities for appropriate materials (CDFs) through the use of consolidation measures, vertical expansion through the construction of interior berms, and provision for the beneficial use of dredged material.

SECTION 4 – AFFECTED ENVIRONMENT

4.1 GENERAL - The project area involves Toledo Harbor which is located near the southwest shore of Lake Erie at the mouth of the Maumee River at the city of Toledo, Lucas County, Ohio (Figure 1). The Federal navigation project at Toledo Harbor consists of an approximately 18-mile long 28 feet deep and 500 feet wide Lake Approach Channel that extends from the mouth of the Maumee River through Maumee Bay and Western Basin of Lake Erie to deeper water in Lake Erie. Also included is a 7-mile long River Channel which is located in the lower Maumee River that varies from 25 – 27 feet in depth and 200 – 400 feet in width with three associated turning basins (Figure 4). Toledo Harbor is an important domestic and international port along the Great Lakes and St. Lawrence Seaway System. The project area, including the lower Maumee River, Maumee Bay and Western Basin of Lake Erie is an important natural resource but has been degraded in part to urban development, and related point and non-point source pollution. The Maumee River watershed is very large (approximately 4.2 million acres) and produces a substantial sediment load to Maumee Bay (Figure 2). Maumee Bay is defined as that portion of Lake Erie which begins at the mouth of the Maumee River and extends laterally and lakeward toward two spits – the North Cape, which extends south from Michigan, and Little Cedar Point, which extends northwest from Ohio (Figure 3). The Maumee River, Ottawa River, and several small creeks enter Maumee Bay on the west. The Western Basin of Lake Erie is the area of Lake Erie west of a line drawn from Pelee Point, Canada to Scott Point on Catawba Island. The Western Basin comprises about one-fifth of Lake Erie, and is very shallow with an average depth of 24 feet and a maximum depth of 62 feet (USEPA and Government of Canada, 1995).

4.2 PHYSICAL/NATURAL ENVIRONMENT

4.2.1 Air Quality - The USEPA has developed maximum allowable concentrations of pollutant discharges into the air - referred to as National Ambient Air Quality Standards. Monitoring parameters include Ozone, PM 2.5 Particulates, PM 10 Particulates, SO2, Carbon Monoxide, Lead, and Nitrogen Dioxide. Each state has developed ambient air quality pollution control standards that may either be the same, or more restrictive than the USEPA standards. Essentially, air quality conditions in the Toledo Harbor vicinity do not contravene established air quality standards (USEPA, 2007; Toledo, 2005).

4.2.2 Water Quality - Generally, as the Maumee River flows toward Lake Erie through low, flat agricultural land, its waters degrade in quality as a considerable sediment load is collected before passing through Toledo, where urban runoff/discharges further reduce river water quality. A low level of dissolved oxygen, as well as elevated levels of coliform bacteria, nutrients, turbidity, suspended solids, and discharges of heavy metals and pesticides, also degrade water quality. The Maumee River's water quality is poorest in the lower river, followed by the Maumee Bay waters, which improve lakeward. The waters of Maumee Bay are more turbid than the lake, but less turbid than at the mouth of the Maumee River. Water quality violations of dissolved oxygen and fecal coliform are frequently recorded in the Maumee River and Bay. The main reasons for violations are combined and sanitary sewer overflows, urban runoff, failed septic systems, and upstream non-point source inputs.

The lower Maumee River has been identified as part of a Great Lakes Area of Concern (AOC) by the International Joint Commission. Identified Beneficial Use Impairments in 2005 included: restriction on fish and wildlife consumption, degradation of fish and wildlife populations, fish tumors and other deformities, degradation of benthos, restriction on dredging activities, beach closings, degradation of aesthetics, and loss of fish and wildlife habitat (Toledo Metropolitan Area Council of Governments [TMACOG], 2005/2006). Most are caused by historic and residual and some remaining watershed activities, habitat modifications, and contaminants. OEPA and TMACOG have developed and are pursuing remedial action plans to address these impairments.

4.2.3 Sediment Quality - The USACE - Buffalo District has characterized sediments within Toledo Harbor Federal navigation channels and lake environs through the completion of extensive sampling, testing and evaluation of harbor sediments relative to harbor maintenance dredging activities. Specific information pertaining to this is presented in the Section 404(b)(1) Evaluation presented in Appendix EA-B.

4.2.4 Plankton and Benthos

4.2.4.1 Plankton. Aquatic areas in the Western Basin of Lake Erie are utilized as habitat by a variety of plankton. Such organisms may consist of floating or weakly swimming plant and animal life in the water column, that are often microscopic in size which contribute to the food chain in the lake's ecosystem. A biological report on western Lake Erie by Herdendorf (1987) identifies some of the common plankton and epiphyses (organisms that live on the surface of plants) in this locale. The following is a brief summary of algae, protozoan/zooplankton phyla, including the number of families and species of these organisms represented in each phylum, mentioned in the report: Cyanophyta (blue-green algae) represented by 22 families and 124 species; Pyrrhophyta (fire algae) represented by 6 families and 10 species; Cryptophyla (cryptomonads) represented by 1 family and 4 species; Rhodophyta (red algae) represented by 3 families and 3 species; Euglenophyta (Euglenoids) represented by 3 families and 37 species; Protozoa represented by 29 families and 26 species; Coelenterata represented by 1 family and 1 species; Rotifera represented by 28 families and 78 species, and finally, the phylum Arthropoda represented by 14 families and 33 species.

Lake Erie, particularly the Western Basin, has been susceptible to harmful algal blooms since the early 1960s. In response to algal blooms in Lake Erie during the 1960s, the U.S. and Canada signed the 1972 Great Lakes Water Quality Agreement that led to a coordinated effort to reduce phosphorus inputs to the Great Lakes. Between the late 1960s and early 1980s there was an approximate 60% reduction in phosphorus loading to Lake Erie (USEPA, 2007b). Lake Erie responded with reduced phosphorus concentrations (Panek et al., 2003). Lower phosphorus concentrations reduced the amount of algae (Nicholls et al., 1977), including an 89% decline of the blue-green alga *Aphanizomenon flos-aquae* between 1970 and 1983-1985 (Makarawicz and Bertram, 1991).

Zebra mussels arrived in the Great Lakes in the mid-to late-1980s. The mussels are filter feeders capable of removing much of the planktonic algae (phytoplankton) from the water. Colonization of Lake Erie by zebra mussels resulted in several years of improved water clarity and dramatic food web changes, especially a shift in algal production from phytoplankton to bottom-dwelling algae and plants. In the 1990s, however, large late-

summer algal blooms began to reappear in western Lake Erie. Blooms occurred sporadically in the late 1990s, but have increased in frequency since at least 1992 (USEPA, 2007b).

Algal blooms in the summers of 2003-2006 varied in magnitude. These blooms have been dominated by the blue-green alga (cyanobacteria) *Microcystis aeruginosa. Microcystis* had been a common species in Lake Erie for at least a century, but rarely grew to nuisance bloom proportions. Blooms of *Microcystis* become most evident during calm periods when the cells float to the surface and form a scum. Continually windy weather may prevent the formation of surface scums, but the overall biomass of algae in the water may still be high (as in 2005). Blooms of *Microcystis* are of concern because *Microcystis* is poor food for the tiny grazing crustaceans (zooplankton) that are, in turn, important food for larval fish. *Microcystis* may contain a potent toxin called microcystin (USEPA, 2007b).

It appears from several research studies that recent algal blooms in western Lake Erie are linked to nutrient loading, nutrient releases by zebra mussels, and selective feeding by zebra mussels. Research performed by Great Lakes Environmental Research Laboratory (GLERL) and partners has provided hypotheses and some answers to explain the zebra mussel-*Microcystis* connection. Experiments at GLERL with water from Saginaw Bay and Lake Erie have shown that zebra mussels selectively filter and reject phytoplankton so as to promote and maintain *Microcystis* blooms (Vanderploeg, 2002). Using special video equipment, GLERL showed that mussels filter the water whether or not *Microcystis* is present, but they eject *Microcystis* back into the water. Thus, the competitors of *Microcystis* are removed. This may explain why *Microcystis* has been a dominant alga for many summers. At the same time this selective feeding process is occurring, the mussels are excreting nutrients (phosphate and ammonia) derived from the phytoplankton they consume as part of digestion and metabolic processes. These nutrients, in turn, serve to fertilize further growth of *Microcystis* (USEPA, 2007b).

4.2.4.2 Benthos. Maumee Bay contains a diverse macroinvertebrate community that appears to be dominated by aquatic worms (oligochaetes), dipteran (fly) larvae and midges (chironomids). Science Applications International Corporation (1988) collected and identified six groups of macroinvertebrate organisms at 15 sampling stations in Maumee Bay as a portion of a Maumee Bay Bottom Characterization Study. Tubificids (oligochaetes) and ostracods appeared to co-dominate the benthic faunal community. Nematodes (roundworms) and chironomids, which were most abundant in shallow sampling station stations, were the next most abundant taxa sampled. Psisidiidae and Naididae (aquatic worms) were also collected. In addition, T.P. Associates International Inc. (1987) collected eight benthic macroinvertebrate samples in the Western Basin of Lake Erie as part of an open-lake placement area survey. This area is currently used as the open-lake placement area for dredged material. The benthic survey showed a predominance of chironomids and oligochaetes in the benthic community. *Chironomus* spp. and *Procladius* spp. were the chironomids samples at the greatest relative abundance. The tubificid *Limnodrilus hoffmeisteri* appeared to dominate the oligochaete fauna. The mollusk (clam) group Sphariidae was also collected in this survey. A 2003 study on the macroinvertebrate community in the vicinity of the open-lake placement area (Heidelberg College, 2003) concluded that the taxonomic richness and abundance of invertebrates at the placement area were similar to other areas in the Western Basin of Lake Erie.

4.2.5 Aquatic Vegetation - The littoral zone of Maumee Bay contains a number of submerged aquatic macrophyte beds. A final U.S. Fish and Wildlife Service (USFWS) Coordination Act Report (USFWS, 1987) states that during an aerial survey of the Bay and lower Maumee River, a number of submerged aquatic plant beds were observed. The USFWS report indicated "seven areas containing small to moderate size beds along the Maumee Bay shoreline east of the Bayshore Power Plant discharge, a relatively large bed at the mouth of, and just upstream of Otter Creek, scattered beds northeast of Cullen Park peninsula, large beds in the Cullen Park embayment and smaller beds in the embayment just upstream of the Harrison Marina" were seen. The USFWS report also noted that an Ohio Environmental Protection Agency (OEPA) representative "observed aquatic beds in a large embayment on the north side of the Maumee River just upstream of the railroad bridge and along the northwest side of Grassy Island." Further, although aquatic beds are not unique to the bay locale, "they are a part of a habitat type that is relatively scarce in the area."

Herdendorf (1987) indicated that the open waters of the lake are mostly limited to submergent macrophytes such as curly pondweed, wild celery, sago pond-weed, water milfoil and water stargrass, whereas in bay areas of the lake, the main species of aquatic submergents are Richardson's pondweed, waterweed and coontail.

4.2.7 Fisheries - The Western Basin of Lake Erie, including Maumee Bay, supports an important commercial and sport fishery. Important sport fish, in terms of the number of fish harvested in District 1 (Western Basin) include yellow perch, walleye, white bass, white perch, channel catfish, freshwater drum, smallmouth bass, steelhead trout, and to a lesser extent largemouth bass, rock bass, bluegill, chinook salmon, white crappie and round goby (Ohio Division of Wildlife [ODW], 2008). In terms of hours spent by sport fisherman pursuing these species, walleye, yellow perch, smallmouth bass, largemouth bass, and white bass comprise the most popular species sought, with the others listed above representing primarily incidental catches (ODW, 2008). Fish species comprising the commercial catch in District 1 by pounds harvested include white perch, white bass, yellow perch, channel catfish, freshwater drum, quillback, buffalo, lake whitefish, carp, suckers, bullhead, gizzard shad, goldfish, and burbot. Other species present in the Western Basin that comprise the forage fish base include trout-perch, emerald shiner, gizzard shad, spottail shiner, rainbow smelt, alewife, and silver chub. Diet composition studies showed the primary diet of walleye and white bass in the Western Basin to be comprised of gizzard shard and emerald shiner (ODW, 2008). Sport fish sought in the Maumee River generally included walleye and white bass (ODW, 2008).

Both Maumee Bay and Maumee River provide spawning and/or nursery habitat for a number of the above mentioned fish species. Roseman et al. (2002) found evidence of large numbers of viable walleye eggs collected from various areas within Maumee Bay, including adjacent to the Toledo Harbor Lake Approach Channel. Walleye spawning areas in the Maumee River are located about 70 km upstream from Maumee Bay, with no known spawning areas between the two locations (Trautman, 1981; Mion et al., 1998).

4.2.8 Wetlands - Emergent wetlands are present in the general vicinity of Cedar Point (Cedar Point National Wildlife Refuge) and the Woodtick Peninsula. There are no wetlands present within the Federal navigation channels or open-lake placement area.

4.2.9 Terrestrial Vegetation - The Maumee River watershed lies within the eastern deciduous forest province, beech-maple forest section (Bailey 1976). A variety of oak along with a number of other hardwood tree species such as American basswood, black cherry, sycamore, elm, beech, hickory, black walnut, and butternut, have also established on upland terrain that has not been developed, abandoned, or is not in agricultural use. Shrubs, vines, herbaceous grasses and forbs populate idle fields, hedgerows and woodland understory, as well as on some scattered undisturbed riparian areas along the banks of the Lake Erie coastline and tributary waterways.

4.2.10 Wildlife - In general, wildlife in the Maumee River watershed includes species that utilize farmland, woodland and wetland habitats. Wildlife in the watershed includes white-tailed deer, fox, opossum, muskrat, moles, voles, mice, eastern chipmunk, raccoon, weasel, squirrel, woodchuck, ruffed grouse, song-birds, shorebirds, waterfowl and birds of prey such as various species of hawk and owl. A variety of reptiles and amphibians occur in the watershed. Among the reptiles are turtles (i.e., common snapping, spotted, midland painted, eastern box, banding's and eastern spring softshell) and snakes (i.e. northern red-bellied, northern brown, northern water, queen, eastern garter, eastern ribbon, eastern hognose and eastern massasauga) (USACE, 2002). Some of the amphibians in the watershed include mud-puppy, red-spotted newt, spotted salamander, marbled salamander, eastern tiger salamander, red-backed salamander, American toad, spring peeper, eastern gray tree frog, Blanchard's cricket frog, western chorus frog, as well as other frogs such as pickerel, leopard, green, wood and bullfrogs (Conant, 1958).

Waterfowl are an important resource in Maumee Bay and Western Basin of Lake Erie, which provides nesting, feeding and resting habitat. Herdendorf (1987) noted that large numbers of waterfowl are attracted to coastal marshes along the lake during migration periods. Spring migration starts around late February and lasts into May, whereas the fall migration peaks into the months of September and October. The Western Basin of Lake Erie has also been identified by the USFWS as a primary waterfowl migration or wintering area, and its coastal marshes as primary nesting and migration habitat. It has been noted that many of the waterfowl in the area are diving ducks (e.g., scaup, goldeneye, merganser, and ruddy ducks). Dabbling ducks such as mallards, black ducks, widgeon, gadwall and teal also use this area, but in more limited numbers.

Bird species typical of the shoreline areas of Maumee Bay include gulls (mainly herring), great blue herons, black-crowned night herons, and neo-tropical songbirds during migration periods and the summer. Woodtick Peninsula and Cedar Point Wildlife Refuge have been identified by USFWS as being attractive sites for large populations of migrating birds because of their geographical location and unique physical and vegetation characteristics. Woodtick Peninsula has been identified as being a passerine bird and hawk migration site and important to shorebird migrations. The Cedar Point National Wildlife Refuge is considered to have an important wetland complex that provides food and cover for migrating aquatic birds (e.g., waterfowl, shorebirds), as well as habitat for passerines (USACE, 2002).

4.2.11 Threatened and Endangered Species – In a letter dated September 11, 2007, USFWS states “The proposed project lies within the range of the Indiana Bat, Karner blue butterfly, eastern prairie fringed orchid, piping plover, eastern massasauga, and rayed bean, Federally listed endangered, threatened, or candidate species.” In a letter dated

September 27, 2007, ODNR noted a number of potential State-listed rare and endangered species in the harbor vicinity, including channel darter, bald eagle, and common tern.

Although the American bald eagle was removed from the endangered species list in July 2007, the species is still provided protection under the Bald and Golden Eagle Protection Act. Since this bird is known to nest at the nearby Ottawa National Wildlife Refuge located in the Western Basin of Lake Erie, it is possible that it also utilizes the shoreline and littoral zone of Maumee Bay to nest and as a forage area.

4.3 SOCIO-ECONOMIC ENVIRONMENT

4.3.1 Demographics (Population) - Table 1 (Appendix EA-A) provides some demographic (population) information for the Toledo Metropolitan Statistical Area Counties. The City of Toledo in Lucas County is the most urban community in the region, with the surrounding counties containing suburban and rural communities. Counties with a projected population growth include Fulton and Wood. Counties with a projected population decline include Lucas and Ottawa.

4.3.2 Associated Land Use and Developments - Figure 4 depicts development and waterfront industries in the vicinity of Toledo Harbor. Numerous piers, wharves, and docks are in use at the harbor, some of which are located along Maumee Bay just east of the mouth of the Maumee River. The remaining are equally divided along the right and left banks of the lower seven miles of the Maumee River. Land along the southern shore of Maumee Bay near the river mouth provides for various commercial and recreational uses. CDFs, Toledo Edison Company, Lakefront Dock and Railroad Company, C&O Railway Company, and the Toledo Harbor-Lucas County Port Authority properties are located in this area. Land use is less commercialized opposite this side of the river mouth. The U.S. Coast Guard and USACE properties are situated at the mouth, and further north on the bay are Bay View Yacht Club and residential properties. Acreage along the lower Maumee River is extensively developed for commercial use. Manhattan Sewage Disposal Plant, Toledo Edison Co., Sinclair Refining Co., as well as numerous oil tank and properties are situated along this area of the river (USACE , 2002). Table 2 provides some land cover information for the Toledo Metropolitan Statistical Area Counties.

The Maumee River watershed drains an area of about 4.2 million acres from the States of Michigan, Indiana, and Ohio (Figure 2). The watershed is relatively flat and consists primarily of farmland; 3.3 million acres of crop-land, 50,000 acres of pasture, 100,000 acres of farmsteads, and only 300,000 acres of forest (USACE, 2007c).

4.3.3 Business and Industry and Employment and Income - Toledo Harbor is an important domestic and international port along the Great Lakes and St. Lawrence Seaway system and is one of the most active ports on Lake Erie and the Great Lakes. Toledo Harbor is the 50th leading U.S. port (7th on the Great Lakes, 2nd on Lake Erie) with 11.2 million tons of material shipped or received in 2006. Toledo's location at the hub of a major North American market has made it a key player in Midwestern commerce and since the opening of Saint Lawrence Seaway a factor in global commerce as well. Primarily a transshipment point, its domestic waterborne commerce consists primarily of the shipment of coal and petroleum products to lake ports of the United States and Canada and the receipt of iron

ore from the Lake Superior region. Other commodities include: steel products, stone, gravel and sand, grain, and various general cargoes. Railroads and trucks provide transportation between the harbor facilities and the interior and manufacturing localities. Figure 4 identifies some key waterfront industries at the harbor. Port operations are responsible for thousands of jobs and have a significant influence on the local economy (USACE, 2002 and USACE, 2007).

Recreational and commercial fishing and boating is also popular in the western end of Lake Erie. Sport fisheries are important to the area, and thousands of boats and numerous charter fishing operations are supported through the Maumee Bay area. Hundreds of jobs and millions of business dollars are generated via recreational fishing and boating. In 2007, sport anglers made over one million trips to fish Lake Erie. Private sport fishing effort topped 5.0 million hours. Charter boat fishing effort was about 0.4 million hours (ODW, 2008). The Ohio commercial fishery had a very good year in 2007, with a total harvest of 4.49 million pounds. The yellow perch total harvest (1.95 million pounds) was the highest on record in the trap net era (since 1984). The total dockside value increased to $5.3 million, mostly attributed to the $4.45 million yellow perch harvest (ODW, 2008).

The Greater Toledo Area is also a leading commercial and manufacturing center. The Toledo Area represents the center of several large manufacturing industries in the U.S. Toledo is home to numerous major corporate headquarters and financial institutions. Major diversified manufacturing industries include automotive parts, glass and plastic container, food products, fabricated metal products, fiberglass, petroleum refining, coal products, and natural gas distribution. A strong agricultural base fostered by farming communities that harvest corn, wheat, soybeans, tomatoes, and pickles, has promoted the growth of food production, distribution, and transportation throughout the region. The region's industries include both small and large companies and all have highly trained workers (Ohio Department of Development, 2005; USACE, 2006).

Some of the major employers for the Toledo Metropolitan Statistical Area Counties include the following: **Fulton County:** ConAgra Inc. (Mfg), Dana Corp (Mfg), Fulton County Health Center (Ser), ITT Industries (Mfg), Lear Corp. (Mfg), North Star Blue Scope Steel LLC (Mfg), Sauder Woodworking Co. (Mfg), and TRW Automotive (Mfg); **Lucas County**: Andersons Inc. (Trd), DaimlerChrysler AG (Mfg), Dana Corp. (Mfg), General Motors Corp. (Mfg), HCR Manor Care (Ser), Libbey Inc. (Mfg), Medical College of Ohio (Govt), Mercy Health Partners (Ser), Owens Corning (Mfg), Owens-Illinois Inc. (Mfg), Promedica Health Systems (Ser), Toledo City Board of Education (Govt), United Parcel Service Inc. (Trans), and University of Toledo (Govt); **Wood County:** Bowling Green State University (Govt), Cooper Standard Automotive Inc. (Mfg), DaimlerChrysler AG (Mfg), Great Lakes Window (Mfg), Magna/ Norplas Inc. (Mfg), NFO World Group Inc. (Ser), Owens Community College (Govt), Perrysburg Exempted Village Board of Education (Govt), Rudolph-Libbe Companies (Const), Wood County Government (Govt), and Wood County Hospital Associates (Ser); **Ottawa County:** Benton-Carroll-Salem Local Board of Education (Govt), Brush Wellman Inc. (Mfg), First Energy Corp (Utl), Luther Home of Mercy (Ser), Magruder Hospital (Ser), Ottawa County Government (Govt), Port Clinton Exempted City Board of Education (Govt), Silgan Plastics Corp (Mfg), and USG Corp/US Gypsum Co.

Tables 3A, 3B, and 3C provide Civilian Labor Force, Employment by Sector, and Income information for the Toledo Metropolitan Statistical Area Counties from the year 2005.

4.3.4 Public Facilities and Services - Within the Toledo area, the project vicinity is serviced with water, sewer, gas, electric, telephone, police, fire, emergency (rescue) medical, transportation, and sanitation developments. All of the various utility agencies and companies that serve the City of Toledo have facilities in, provide service to, or are tied to the harbor in some way.

4.3.5 Water and Sewer Facilities - The Cities of Toledo and Oregon water intakes extend into Lake Erie (12,000 and 4,800 feet, respectively) from just east of Cedar Point and the Cedar Point National Wildlife Refuge. Toledo's 120 million gallons per day (mgd) capacity system (80 mgd average) services over 500,000 residents plus industrial customers. Oregon's 16 mgd system serves over 25,000 residents plus industrial customers. Facilities have been periodically modernized and are expected to meet projected needs for some time into the future (NOAA, 1993; TMACOG, 2006; City of Toledo, 2007; City of Oregon, 2007).

The Toledo (sewage treatment) Facility Planning Area services approximately 350,000 residents and pre-treatment industry needs. Toledo owns and operates wastewater treatment facilities and a collection system within its corporate limits. The Toledo Bay View Waste Water Treatment Plant (WWTP) is located just northeast of the river at the mouth of the Maumee River. The WWTP provides treatment services to a number of adjacent areas. The Toledo Bay View WWTP has an average daily capacity of 102 million gallons per day (mgd). Older parts of the city (~22%) are served by combined sewers which carry both sanitary waste and storm runoff. Presently, there are 17 associated combined sewer overflows along the Maumee River. The Bay View WWTP has treated an average of 73 mgd over the past decade, which is 11 mgd less than the previous decade. This reduction in flow is due to sewer system improvements, improved flow monitoring, loss of population and industry. The system has undergone a number of improvements over the years that have improved treatment and/or reduced sewage discharges. Most sewage sludge is applied to area agricultural land for beneficial use in soils and some for manufacture of beneficial use soils (TMACOG, 2007; City of Toledo, 2007). Water quality violations of dissolved oxygen and fecal coliform are frequently recorded in the Maumee River and Bay. The main reasons for violations are combined and sanitary sewer overflows, urban runoff, failed septic systems, and upstream non-point source inputs.

The Oregon (sewage treatment) Facility Planning Area services approximately 30,000 residents and pre-treatment industry needs. The City of Oregon owns and operates wastewater treatment facilities and collection system within its corporate limits. The waste water treatment plant is located off of Dupont Road (east of BP Refinery and south of Toledo Edison Bay Shore Plant) and provides treatment services to a number of adjacent areas. The treatment plant is capable of treating 8 mgd on a normal basis, and also treating 36 mgd during wet weather (with room for expansion). An outflow facility is located in the embayment just south of the Toledo Harbor CDF. The plant is expected to have capacity for future needs. The main challenge facing Oregon will be providing sewerage to un-sewered areas. Package plants, and in particular, failed septic systems, are a serious problem (TMACOG, 2006; City of Oregon, 2007).

4.3.6 Transportation - Toledo Harbor is one of the most active ports on Lake Erie and the Great Lakes. The Toledo Harbor Light is 72 feet above the water and has a square brick buff colored dwelling with an attached fog signal house. It is located on the northwest side of the entrance channel about 8.5 miles northeast of the river mouth. The light is listed on the National Register of Historic Places (NPS, 2007). Maumee Bay Entrance Light 2, about 8 miles northeast of the Toledo Harbor Light, is equipped with a radar transponder and fog signal. A Coastal Guard Marine Safety Office is located at Toledo on the northwest side of the mouth of the Maumee River. The Toledo Harbor Patrol maintains an office adjacent to the Coast Guard Station. Toledo is served by nine railroad lines and has good highway connections. Several airports are located near the city (City of Toledo, 2007).

4.3.7 Recreation (Water-Related) - Water related recreational developments/activities in the Toledo Harbor vicinity include those associated with parks, fishing, and general boating. Figure 4 depicts the Maumee Bay and Toledo Harbor developments including many water related recreational developments.

Two large game/refuge areas are located in the Western Basin of Lake Erie. The Erie Marsh State Game Area (includes Woodtick Peninsula) is located in Michigan in the vicinity of North Maumee Bay. The Cedar Point National Wildlife Refuge is located just southeast of Maumee Bay and Cedar Point. Carland Beach is located just north of Dry Tree Point. Cullen Park, Detwiler Park and Bayview Park are located along the southern shore of Maumee Bay. These parks provide a number of activities including beaches, hiking/biking trails, picnic areas, and golf courses.

Fishing is popular both from the shoreline and boats. Sport fisheries (particularly walleye) are important to recreation and associated business at Maumee Bay and the western end of Lake Erie.

Recreational boating is a significant activity in the Toledo Harbor and Maumee Bay vicinity. Numerous marinas and associated facilities are located along North Maumee Bay, the Ottawa and Maumee Rivers and other protected areas along the bay. Marinas provide seasonal dockage and storage, launch ramps, transient docking, hull and engine repair and services, fuel, ice and water, electricity, sewage pump-out, marine supplies and associated upland facilities (parking, restrooms, restaurants, fish cleaning stations, etc.). Thousands of boats and numerous sport fishing charters operate out of the Maumee Bay area. Since the bay is very shallow, Federal and local navigation channels are also important to many large recreational vessels, particularly those with deep draft fixed-keels.

Demand for water oriented recreational facilities continues to grow. This may be attributed to several factors, including community development changes, improved water quality and increased income and leisure time (USACE, 2002)

4.3.8 Property Value and Tax Revenue - Table 4 provides Land and Property Value information for the Toledo Metropolitan Statistical Area Counties. The value of prime Lakefront property would be expected to be considerably higher. Local tax revenues generally include revenue sharing (federal, state, local), and local property, corporate, service district, and sales taxes.

4.3.9 Noise and Aesthetics - Existing noise and aesthetics in the harbor area are associated with the various harbor area developments such as navigation facilities, industrial and commercial development, transportation facilities, recreational facilities (primarily parks, marinas), and some nearby residential developments. The primary sources of noise generation include industrial developments, and noise generated by motorized vehicles such as ships, boats, autos, trucks, trains, and planes. Areas of higher aesthetic value likely include shoreline areas with a view to or from the lake, park, marinas, and some residential and/or commercial (e.g., restaurant) areas. Areas of lower aesthetic value may include dilapidated former shorelines and some dilapidated upland developments.

4.3.10 Community Cohesion - Community cohesion is a result of a number of social and economic factors. Many Toledo area residents and entities have resided in the area for a long time. General community pride/cohesion is relatively strong and the harbor has played an important part in this development. While harbor facilities and associated businesses remain active, as in most areas, pursuit of environmental and recreational developments has received increased emphasis. Community efforts have sought to sustain business and industry, while pursuing these and alternative developments (including environmental and recreational) (USACE, 2002). Relative to continued harbor operation and maintenance, most interests agree that Toledo Harbor should be maintained to facilitate industry and commerce and associated community economic and social well being.

4.3.11 Cultural Resources - The National Register of Historic Places (NRHP)/National Park Service, Ohio State Historic Preservation Office (SHPO) as well as local interests were consulted in order to help identify significant cultural resources within the project area. The NRHP listed the following harbor-related properties (1) Toledo Harbor Light, (2) Toledo Yacht Club at Bay View Park, and (3) West Sister Island Light (National Park Service [NPS], 2007).

SECTION 5 – ENVIRONMENTAL IMPACTS

5.1 INTRODUCTION

This section presents the environmental assessment of alternatives used for evaluation and selection of the proposed project. The project is evaluated for engineering and economic feasibility, environmental and social acceptability, and for best meeting the project planning objectives.

5.2 PHYSICAL/NATURAL ENVIRONMENT IMPACTS

5.2.1 Air Quality

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, air quality in the vicinity of the harbor would continue to be similar to existing conditions. There would be no project-related dust or exhaust emissions from construction equipment that could contribute to the degradation of air quality.

Selected Plan - The operation of dredging equipment would result in an increased output of air emissions (suspended particulates, nitrogen dioxide, carbon monoxide, lead, etc.) into the local atmosphere. Air quality impacts in this regard would be minor, adverse and short-term. This increased output is not expected to result in any violations or interfere with the ability of the Toledo Air Quality Control Region to attain State air quality standards.

5.2.2 Water Quality

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, there would be no potential for any adverse impacts to water quality.

Selected Plan - Dredging results in the localized re-suspension of fine-grain sediments, increased turbidity, and a temporary decrease in dissolved oxygen levels in the vicinity of the dredging operation. Monitoring of plumes generated by dredging of the Lake Approach Channel in Maumee Bay in August showed that the turbidity plumes remained within a short distance of the dredging site (Reine et al., 2007). Water quality impacts in this regard would be minor, adverse and short-term.

A detailed evaluation of Toledo Harbor dredged material and sediments at the open-lake placement and reference areas is included in the Section 404(b)(1) Evaluation (Appendix EA-B). This evaluation is based on the application of a suite of physical, chemical and biological tests applied to these sediments in 2004 and 2006 (EEI, 2004 and 2006). The evaluation concludes that the open-lake placement of dredged material at the existing area in the Western Basin of Lake Erie meets Federal guidelines (USEPA/USACE, 1998), mainly because the dredged material is toxicologically similar to sediments in the lake environs. This is essentially based on the assessment that contaminants in the dredged material, when placed in the open-lake, would not be significantly more bioaccumulative or toxic relative to existing sediments in the Western Basin of Lake Erie. Biological tests (bioassays) also predicted that contaminant releases from the dredged material to the water column do not result in significant, adverse impacts. In addition, elutriate testing

applied to the dredged material indicate that open-lake placement complies with promulgated State Water Quality Standards (USAERDC, 2006).

Hoke et al. (1990) employed four test species to assay the toxicity of Toledo Harbor Lake Approach Channel sediments that are open-lake placed. Most notably, they used *Photobacterium phosphoreum* 15-minute bioluminescence inhibition (Microtox®), a very sensitive bioassay for sediment toxicity. The investigation concluded that the sediments from the Lake Approach Channel were suitable for open-lake placement based on the lack of observed toxicological effects. Further, it showed that the toxicity of the sediment at the open-lake placement area was similar to that of the sediments from other locations within the Western Basin of Lake Erie not impacted by dredged material placement.

Open-lake placement of dredged material results in the temporary re-suspension of fine-grain sediments, increased turbidity and a temporary decrease in dissolved oxygen levels in the water column at a small portion of the open-lake placement area. Water quality impacts associated with the open-lake placement of dredged material would be minor, adverse and short-term.

In response to concerns regarding the effects of open-lake placement of dredged material on water quality, monitoring programs were performed during 1985 and 1986 placement operations (ATEC, 1986). This program included field measurements of dissolved oxygen, pH and turbidity, and laboratory analysis of water samples for total phosphorus, dissolved phosphorus, suspended solids, and dissolved solids. During each placement action, dissolved oxygen increased at the placement area, but showed a decrease below ambient levels away from the placement area. This pattern was attributed to entrainment of air within the mass of dredged material dropped from the bottom of the split-hull dredge. As the dredged material falls to the bottom, it disperses creating a wave of sediment and bottom water which spreads out across the lake bottom. Fine materials rise off the bottom on the turbulence and exert their oxygen demand at a distance away from the placement area. Turbidity measurements conducted at the open-lake area immediately after the placement operation showed a dramatic decrease in water clarity. However, without exception, water clarity returned to pre-placement conditions within 2 hours. Samples collected before placement and 2 hours after were analyzed for dissolved phosphorus and total phosphorus. Based on mean concentration and individual samples, there was no apparent difference between the before and after samples for either total or dissolved phosphorus. During the spring of 1985, the open-lake placement operations did not cause any long-term degradation of water quality. Dissolved oxygen concentrations were reduced about 20 percent from what they might have been at that time of the year, but there were no violations of State Water Quality Standards. Dissolved phosphorus concentrations may have been increased slightly within the Mixing Zone, but not to such a degree that the placement operation could influence the production of algae in the Western Basin of Lake Erie (ATEC, 1986). A study on the effects of open-lake placement of Toledo Harbor dredged material on the available phosphorous in the Western Basin of Lake Erie indicate that the impact of open-lake placement on the annual available phosphorus budget appears to be insignificant (DePinto et al., 1986).

The 1986 ATEC study found that turbidity plumes did not contain a significant mass of sediment and always completely dissipated before they could have affected any public water supply intakes (ATEC, 1986). A preliminary investigation in 2007 showed that

turbidity plumes resulting from open-lake placement of dredged material dissipated relatively quickly and remained within the boundaries of the existing open-lake placement area (USAERDC, 2009). The physical similarity of the dredged sediments to those at the open-lake placement area (i.e., between about 70 and 98 percent silts/clays) indicates that the sediments would be subject to similar re-suspension forces as the in-situ sediments. A study by Ohio State University indicated that the discharge of sediment in the open-lake placement area imparts negligible impacts to near shore sensitive areas, including water supply intakes (Ohio State University, 1998).

Annual wind-induced resuspension of sediments in the Western Basin of Lake Erie ranges from 50 to 100 metric tons per square kilometer (MT/km^2). Using the lower estimate of 50 MT/km^2 alone, this converts to an annual bottom sediment resuspension of 150,000,000 MT/year (DePinto et al., 1986). Within this context, the open-lake placement of 1,250,000 cubic yards (1,450,000 MT) of dredged material is less than one percent of this lower estimate of ambient sediment resuspension. Therefore, open-lake placement is insignificant in comparison to typical sediment resuspension in the Western Basin of Lake Erie. This estimate is conservative and does not consider the fact that the vast majority of the dredged material placed in the Western Basin is from the Western Basin.

5.2.3 Plankton and Benthos

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, no significant change in the existing planktonic and benthic community would occur in the short-term. In the long-term, sediments would fill the deeper Federal navigation channels, which would provide substrate in shallower water upon which macroinvertebrates would colonize. This would potentially change the benthic and planktonic community structure in these areas.

Selected Plan - The excavation of bottom sediments would remove most of any benthic organisms from the area that is dredged. Resettling of re-suspended sediments could smother some benthic organisms in the area just down drift of the dredging area. Recolonization of these areas by benthos from the surrounding bottom substrate typically occurs rapidly following the dredging activities. Such impacts would be minor, adverse and short-term.

The placement of dredged material at the open-lake area may impact the resident macroinvertebrate community through smothering, which would result in the temporary localized loss of benthic organisms. However, the new bottom substrate at the area would be similar to pre-placement conditions and be recolonized by benthic organisms residing in the dredged material and surrounding lake bottom. Due to the similarity in the sediment grain size and chemistry between the dredged material and lake bottom sediments, significant long-term changes in the benthic community resulting from the placement of this new material are unlikely. Impacts to benthic organisms would be minor, adverse and short-term. The physical change in bottom elevation and contours at the open-lake area may diversify the benthic community to some degree from the surrounding lake bottom. A 2003 study on the macroinvertebrate community in the vicinity of the open-lake placement area (Heidelberg College, 2003) concluded that the taxonomic richness and abundance of invertebrates at the placement area were similar to other areas in the Western Basin of Lake Erie. Further, a cluster analysis showed that there was no association among

sampling areas in relation to their proximity to the placement area. These results strongly suggest that the open-lake placement of dredged material has no measurable effect on the quality of the benthic macroinvertebrate community either within or outside the placement area.

5.2.4 Aquatic Vegetation

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, no disturbance of existing sparsely established vegetation would be anticipated. Factors such as water depth, turbidity, and vessel traffic would likely continue contributing to limiting habitat quality in the harbor area for establishment and growth of submergent aquatic plants. In the long-term, sediments would fill the deeper Federal navigation channels, which would provide shallower water substrate in which submergent aquatic vegetation could potentially establish. This would change, and potentially improve, the aquatic habitat in these areas over the long-term.

Selected Plan – Dredging of the Federal navigation channels and open-lake placement of the dredged material would not significantly effect any submerged aquatic vegetation. Temporary increases in turbidity and suspended solids generated during dredging and dredged material placement activities may cause localized minor decreases in primary production and photosynthesis through reduced light penetration into the water column. A study conducted at Ashtabula, Ohio, showed no statistically significant differences in algal populations that exist between open-lake placement and unaffected open-lake areas (Sweeney, 1978). Impacts to aquatic vegetation would be minor, adverse and short-term.

5.2.5 Fisheries

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, fisheries would probably not be significantly altered in the short-term. Without dredging, the Federal navigation channels would start filling in with fine-grain sediment, thus making the water shallower. This would potentially improve habitat for fish in these areas over the long-term, mainly through the formation of shoals and establishment of submergent aquatic vegetation.

Selected Plan – Dredging of the Federal navigation channels would be performed in a manner that minimizes any potential significant, adverse impacts to fish spawning activities. Dredging would temporarily interfere with fish activities and result in minor, adverse, short-term impacts. Motile fish may move away and avoid the dredging area primarily due to physical disturbances (movement and noise) and generation of localized turbidity. Some fish may be attracted to forage near the dredging site as a result of the suspension of benthic macroinvertebrates in the water column. An investigation in Maumee Bay using walleye as an evaluation species indicated that dredging-related plumes in the Lake Approach Channel did not migrate outside the channel or encroach on any potential spawning habitat (Reine et. al., 2007). The appropriate environmental window for dredging of Toledo Harbor will be coordinated with ODNR. Based on a comment letter received on September 27, 2007 (Appendix EA-C), ODNR recommends dredging and placement activities take place only between July 1 through March 15 across all Toledo Harbor Federal navigation channels.

Placement of dredged material at the existing open-lake area would result in localized minor, adverse, short-term impacts to some fish. There are no notable fish spawning grounds within the open-lake placement area or in areas potentially impacted by turbidity plumes. Fish behavior relative to the open-lake placement of dredged material depends on the species being affected. They may avoid the area, feed on benthic macroinvertebrates suspended in the water column or swim through the turbidity plume. Intermittent, short-term increased turbidity generated by dredged material placement at the open-lake area would not have a significant adverse affect on fish. An historic study examining 16 species of warmwater fish in laboratory aquaria did not evidence any observable behavioral reactions to turbidity until total suspended solid (TSS) concentrations approached 20,000 mg/L (Wallen, 1951). Regarding sublethal responses in adult warmwater fish sensitive to suspended sediments, the minimum dose of TSS that elicited a sublethal effect in white perch was 650 mg/L after 5 days (Sherk et al., 1974). Given these studies in tandem with the preliminary plume investigation at the Toledo Harbor open-lake placement area which showed maximum measured TSS levels of 1,100 mg/L (within 10 meters of the actual discharge) decaying to background within a few hours (USAERDC, 2009), there appears to be a very low likelihood of turbidity-related adverse effects to fish.

No significant negative impacts to fish would accrue from a degraded benthic community because the results of a macroinvertebrate community survey (Heidelberg College, 2003) indicated that that open-lake placement of dredged material has no measurable effect on the quality of the benthic macroinvertebrate community in the vicinity of the placement area.

5.2.6 Wetlands

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, associated impacts to wetlands would not occur.

Selected Plan - Dredging and open-lake placement of dredged material would be far enough removed from any wetlands so that no impacts to wetlands would occur.

5.2.7 Terrestrial Vegetation

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, associated impacts to area terrestrial vegetation would not occur.

Selected Plan – Dredging and open-lake placement of dredged material would not significantly affect terrestrial vegetation.

5.2.8 Wildlife

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, no immediate affects to wildlife or wildlife habitat would occur. Without dredging, the Federal navigation channels would start filling in with fine-grain sediment, thus making the water shallower. This would potentially improve habitat for benthos and fish in these areas over the long-term, mainly through the formation of

shoals and establishment of submergent aquatic vegetation. This would result in more wildlife using the area as resting, feeding and breeding habitat.

Selected Plan - Disruption and disturbance by equipment during dredging operations would result in the short-term avoidance of the project area by some bird and other species. However, some bird species, such as gulls, may be attracted to dredging and dredged material placement activities while foraging. Wildlife impacts in this regard would be minor, adverse and short-term.

5.2.9 *Threatened and Endangered Species*

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, associated impacts to any Threatened or Endangered Species or their Critical Habitat would occur.

Selected Plan – In letter dated September 11, 2007, USFWS indicated that due to the project type, location, and on site habitat, no Threatened and Endangered species would be expected within the project area, and no impacts to such species would be expected. Although the American bald eagle was removed from the Endangered Species list in August 2007, it is afforded protection under the Bald and Golden Eagle Protection Act. USFWS has noted in the past that Maumee Bay and vicinity lies within the range of the American bald eagle. A bald eagle nest was present near the mouth of the Maumee River, but has recently moved inland and would not be affected by the dredging activities. In letter dated September 27, 2007, ODNR identified a number of potential rare and State endangered species in the harbor vicinity. However, due to the project type, location, and on-site habitat, none of the species would be expected within the project area, and no impacts to the species would be expected.

5.3 SOCIO-ECONOMIC IMPACTS

5.3.1 Community and Regional Growth; Business and Industry/Labor Force; Employment and Income; Public Facilities and Services; Community Cohesion

No Action (Without Project Conditions) - If Federal navigation channels were not maintained in the Toledo Harbor vicinity, both commercial and recreational navigation and associated enterprises would be adversely affected, hindering community economic and social well-being and continued community and regional growth and cohesion. Developments would be altered. Associated employment and income would be reduced. Public facilities and services would have to be altered accordingly.

Since this alternative involves no dredging or dredged material management, the Federal navigation channels would shoal in over time, thereby significantly limiting deep-draft commercial navigation in the harbor. It is expected that within two years, accumulated sediments would reduce port utilization to some degree. Consequently, individuals and enterprises dependent on this mode of transportation for their livelihood would suffer economically. A number of primary and secondary enterprises would also be impacted. In turn, associated deep-draft harbor community and regional benefits would be diminished. Business, industry, employment, and income would be adversely affected. Associated land use dilapidation or redevelopment would likely occur in the long term. Industrial and

commercial processes, transportation interfaces, and public facilities, services and utilities would also be altered. Several community sustenance and cohesion factors would be disrupted. Such impacts would be significant, adverse and long-term.

Selected Plan - Maintenance of Federal navigation channels would facilitate continued harbor and associated community facilities and activities (including associated public facilities and services), and would likely help to preserve the area's potential for desirable community and regional growth and cohesion.

Dredging and dredged material management activities would result in a short-term increase in business/employment/ income opportunities, specifically in the marine trades. The maintenance of a functional commercial harbor at Toledo would help to preserve existing business/ employment/ income opportunities associated with shipping and cargo handling. Dredging and dredged material management activities would not adversely affect any public services or facilities. No public water sources should be affected by project implementation. A preliminary plume investigation has shown that turbidity plumes resulting from the open-lake placement of dredged material at the existing open-lake area do not migrate outside the boundary of the placement area (USAERDC, 2009). Since the placement area is located about 7.5 miles west northwest of the two closest public water intakes (PWIs), the plume cannot physically extend to, and therefore affect the quality of water at these PWIs. To further ensure there are no potential impacts on public water supply, the open-lake placement area has been sited north of the Lake Approach Channel and 7.5 miles north and east of the Toledo and Oregon PWIs. Dredged material placement would occur in the northeastern-most portion of this area to keep placement activities at the greatest distance from the public water intakes.

5.3.2 Displacement of People/Displacement of Farms

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, the Federal navigation channels would shoal in over time, thereby significantly limiting deep-draft commercial navigation in the harbor. If Federal navigation channels were not maintained, interests dependent on these harbor facilities would be adversely impacted and could eventually be displaced to areas that better provide for their needs (e.g., cost of goods). Such impacts would be significant, adverse and long-term.

Selected Plan - Maintenance of the Federal navigation channels would facilitate continued harbor and associated community facilities and activities. No displacement of people/farms would be anticipated as a result of the proposed project.

5.3.3 Recreational Resources

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, the Federal navigation channels would shoal in over time. Recreational navigation and associated enterprises would be not be significantly adversely affected.

Selected Plan – Maintenance of Federal navigation channels would facilitate continued harbor operations for recreational watercraft and associated facilities.

Dredging and dredged material management activities may temporarily disrupt some commercial and recreational vessel traffic due to restrictions within the vicinity of the dredging operations. All dredging equipment would be adequately marked and lighted to avoid any potential navigation hazards with recreational boating.

5.3.4 Property Value and Tax Revenue

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, the Federal navigation channels would shoal in over time, thereby significantly limiting deep-draft commercial navigation in the harbor. Commercial navigation and associated enterprises would be adversely affected, ultimately impacting tax revenues and land values associated with these activities. Land use would likely change to lesser value developments. Associated property value and tax revenue would likely decrease. Such impacts would be significant, adverse and long-term.

Selected Plan - Maintenance of the Federal navigation channels would facilitate the continued economic viability of the harbor and associated facilities and activities, thus helping to sustain property values.

5.3.5 Noise and Aesthetics

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, noise associated with dredging operations would not occur.

Selected Plan - Dredging equipment would be observed in the project area and activities would result in a short-term increase in local noise levels. Noise generated by the dredging operation would not exceed ambient noise levels in the harbor area nor would it be expected to affect any sensitive noise receptors (e.g.; schools, hospitals).

Water color and clarity in the vicinity of the dredging operations may be altered for several hundred feet downstream/drift due to the generation of turbidity for a relatively short period of time. The turbidity plumes generated would dissipate before affecting shoreward areas. Organic matter contained in the dredged material could result in the liberation of short-term, localized malodors. Such impacts would be minor, adverse and short-term.

5.3.6 Health and Safety

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, no immediate effects to human health would occur. The overall value of the harbor as a water resource to commercial navigation would progressively deteriorate to a point at which deep-draft commercial vessels would no longer be able to navigate the harbor due to inadequate depths, thereby presenting navigational safety concerns. Such impacts would be significant, adverse and long-term.

Selected Plan - Maintenance of Federal navigation channels would facilitate safe commercial navigation. The concentration of heavy equipment in the project area during dredging operations could potentially pose a navigation hazard. However, standard

USACE contract specifications require the maintenance of a safe, restricted work area during these periods. The contractor is required to prepare a detailed job hazard analysis of each major phase of work, including all anticipated hazards and specific actions which would be taken to prevent personal injury. The contractor is required to comply with Occupational Safety and Health Administration Standards. The human health impacts associated with this alternative would be indiscernible.

5.3.7 Cultural Resources

No Action (Without Project Conditions) - Since this alternative involves no dredging or dredged material management, there is no potential for project related impacts to occur to cultural resources in the harbor vicinity.

Selected Plan - Maintenance of the Federal navigation channels may facilitate preservation of cultural resources by helping to maintain facilities and developments and the economic viability of the region. The Federal navigation channels, open-lake placement area, and CDF facilities were addressed in previous environmental documentation (USACE, 1976 – 2002). No historic properties or archaeological sites listed in or eligible for listing in the National Register of Historic Places would be affected by the proposed action.

5.4 SUMMARY AND CUMULATIVE IMPACTS

Implementation of the Selected Plan would work toward sustaining the integrity of Toledo Harbor from the economic and social perspectives. Dredging and dredged material management would have construction-related, minor, adverse short-term effects. However, the long-term beneficial effect of the dredging on the region's socio-economic condition would outweigh these temporary and localized adverse effects. Maintenance of the Federal navigation channels would also facilitate continued harbor and associated community facilities and activities. It would substantially benefit community and regional sustenance and growth needs.

Placement of dredged material at the open-lake area creates a mound, which results in some local bottom surface relief. This mound is subject to settling and lake currents in the Western Basin of Lake Erie, which tend to flatten the mound over time following the cessation of dredged material placement operations. Available relevant evidence indicate that the aquatic ecosystem at the open-lake placement area is resilient, and that the periodic disturbance created by open-lake placement of dredged material is absorbed or accommodated by the ecosystem because its structure and function has not fundamentally changed to a different state. Ecosystem resilience signifies ecosystem health (gauged by species diversity) and stability (the probability that all species persist) (e.g., Scrimgeour and Wicklum, 1996). There is no relevant scientific evidence that indicates that the placement of material dredged from Toledo Harbor at the open-lake placement area would result (or has, in the past, resulted) in any significant adverse effects to the aquatic ecosystem.

SECTION 6 – COMPLIANCE WITH ENVIRONMENTAL PROTECTION REQUIREMENTS

Compliance with pertinent Federal and State environmental statutes and executive orders is summarized as follows:

6.1 ***Archaeological and Historical Preservation Act, as Amended; National Historic Preservation Act, as Amended; Executive Order 11593 (Protection and Enhancement of the Cultural Environment).*** The project's impact on cultural resources has been evaluated in accordance with Engineer Regulation (ER) 1105-2-50 and 36 CFR 800. The impact assessments for the Federal navigation channels and open-lake placement area were addressed in previous planning and environmental documentation. USACE has consulted with the National Park Service, Ohio State Historic Preservation Office (SHPO) and Great Lakes Historical Society with a Scoping Fact Sheet issued on August 7, 2007. No comments were received in this regard. This EA has been submitted to the National Park Service and SHPO for final review and comment on this determination.

6.2 ***Clean Air Act, as Amended.*** Copies of this EA have been sent to the Regional Administrator of the USEPA requesting comments in compliance with the Clean Air Act.

6.3 ***Clean Water Act, as Amended.*** USACE has prepared Section 404(a) Public Notice and Section 404(b)(1) Evaluation for the project pursuant to the Clean Water Act (Appendix EA-B). On August 7, 2007, USACE submitted an application to OEPA for Section 401 Water Quality. WQC was granted on July 31, 2008 relative to the 2008 and 2009 dredging operations.

6.4 ***Coastal Zone Management Act, as Amended***. The proposed project has been analyzed with respect to the 41 management policies presented in the State of Ohio Coastal Management Program and Final Environmental Impact Statement (March 1997). This analysis determined that the proposed maintenance dredging activities would be consistent, to the maximum extent practicable, with this program. A Coastal Management Program Federal Consistency Determination was prepared and coordinated with the ODNR on August 8, 2007, and is included with this EA as Appendix EA - C. It was determined that the project is consistent with the State Coastal Management Program to the extent practicable. Concurrence on this determination from ODNR was received on October 4, 2007, conditional upon the receipt of WQC from OEPA.

6.5 ***Endangered Species Act, as Amended***. Consultation with the USFWS and ODNR relative to the possible presence of threatened or endangered species or their critical habitat within the affected area was initiated on August 8, 2007. USFWS noted that the proposed project lies within range of the following Federally listed endangered (E) and candidate (C) species: Indiana bat (*Myotis sodalis*) (E); piping plover (*Charadrius melodus*) (E); and eastern massassauga (*Sistrurus catenatus catenatus*) (C). Due the project type and location, USFWS concluded that the proposed project would have no effect on these species.

6.6 ***National Environmental Policy Act.*** With the circulation of this EA and FONSI, the proposed project is in partial compliance with the Act. Full compliance will be attained

once the public review period has been concluded, no significant adverse impacts are identified, and the FONSI is signed.

6.7 ***River and Harbor Act of 1970.*** USACE planning actions have fulfilled the requirements of the Act. All 17 points identified in Section 122 of the Act (P.L. 91-611) have been evaluated in this EA.

6.8 ***Fish and Wildlife Coordination Act.*** Coordination on the proposed project was initiated with the USFWS and ODNR on August 8, 2007. A USFWS Coordination Act Report letter dated September 11, 2007 is included with this EA in Appendix EA - D. The USFWS and ODNR provided information on fish and wildlife resources in the project areas, and provided comments relative to the expected impacts of alternative measures and plans.

6.9 ***Wild and Scenic Rivers Act.*** The lower Maumee River where the project area is located is not designated as a wild, scenic or recreational river.

6.10 ***Federal Water Project Recreation Act; and Land and Water Conservation Act.*** In planning the proposed project, full consideration has been given to opportunities afforded by the project for outdoor recreation and fish and wildlife enhancement. Review copies of this EA have been provided to the U.S. Department of the Interior in regard to recreation, and fish and wildlife activities for conformance with the comprehensive nationwide outdoor recreation plan formulated by the Secretary of the Interior.

6.11 ***Watershed Protection and Flood Prevention Act.*** Based on evaluation of the project, no significant adverse impacts to watershed protection or flood prevention would be expected.

6.12 ***Executive Order 11990, Protection of Wetlands, 24 May 1977.*** Not applicable.

6.13 ***Executive Order 11988, Flood Plain Management, 24 May 1977.*** The USACE has concluded that there is no practicable alternative to the proposed action, which would occur within the base (100-year) flood plain of Lake Erie, and that the recommended action is in compliance with the Order.

6.14 ***Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994; Executive Order 12948, Amendment to Executive Order 12898, January, 30, 1995***. The proposed project would not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations.

6.15 ***Analysis of Impacts on Prime and Unique Farmlands, CEQ Memorandum, 30 August 1976***. Since the proposed project would not affect prime or unique farmlands in any manner, the recommended action is in compliance with this memorandum.

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OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
LUCAS COUNTY, OHIO

APPENDIX EA-A: TABLES AND FIGURES

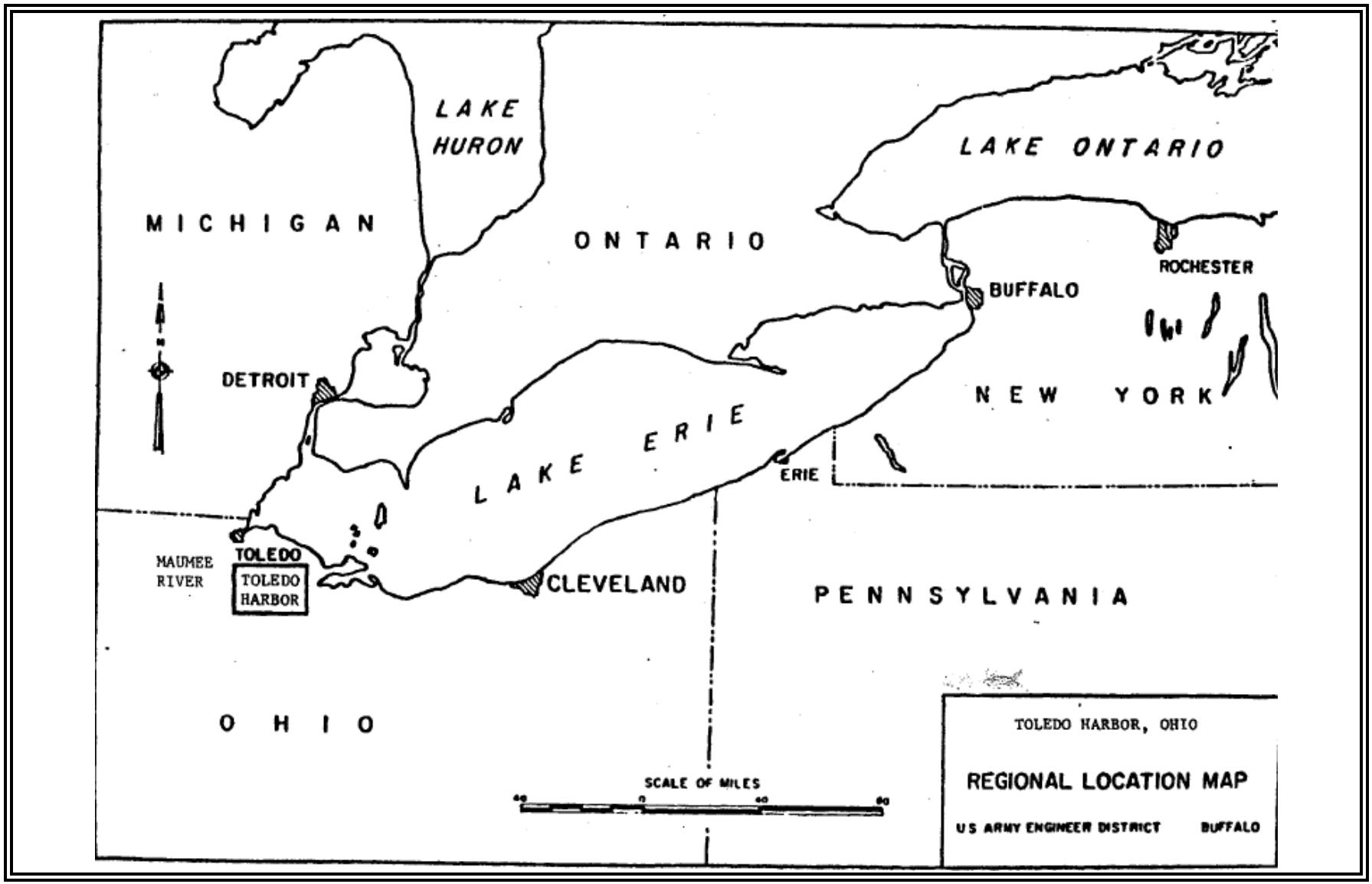


FIGURE 1: TOLEDO HARBOR REGIONAL LOCATION MAP

FIGURE 2: MAUMEE RIVER WATERSHED

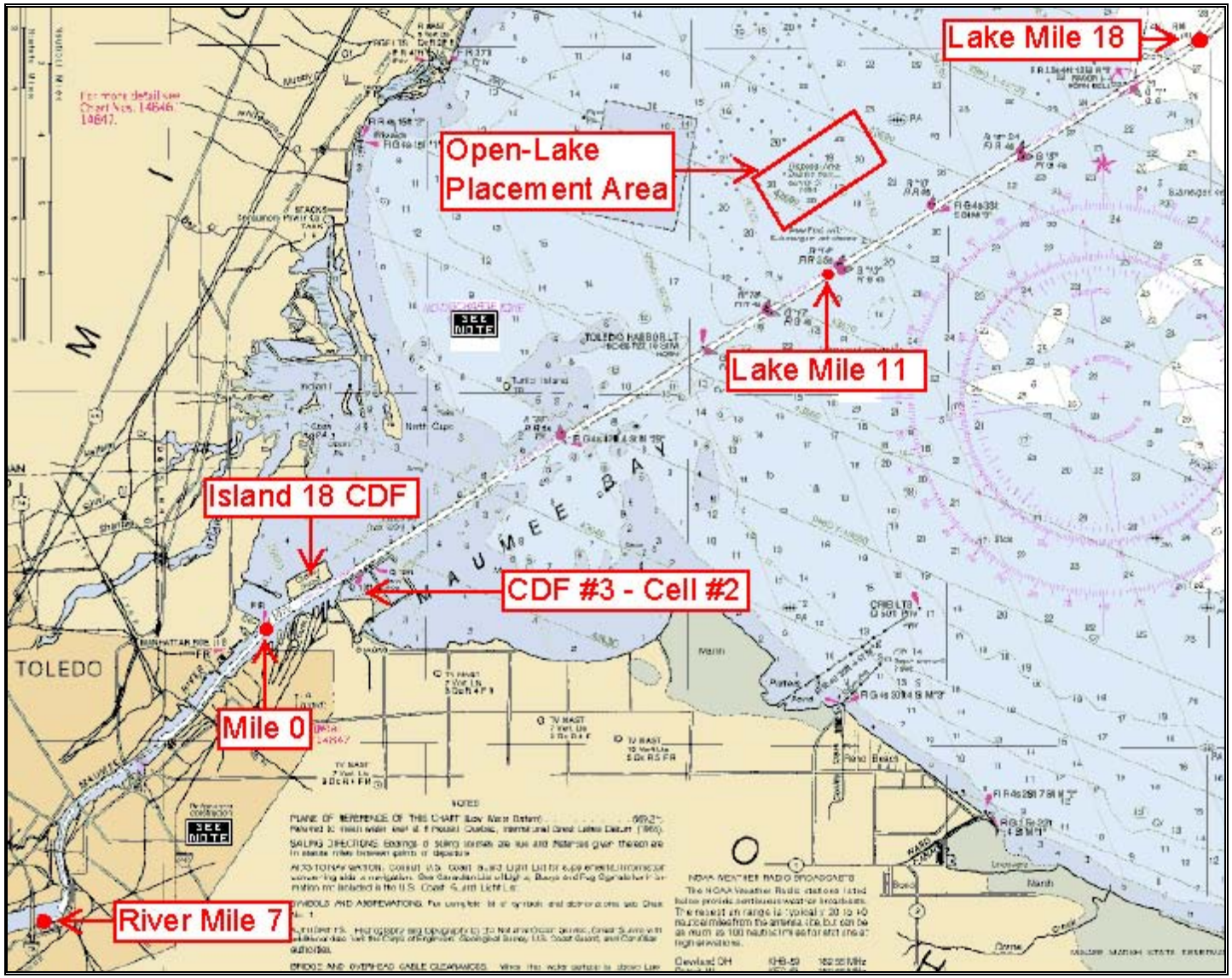
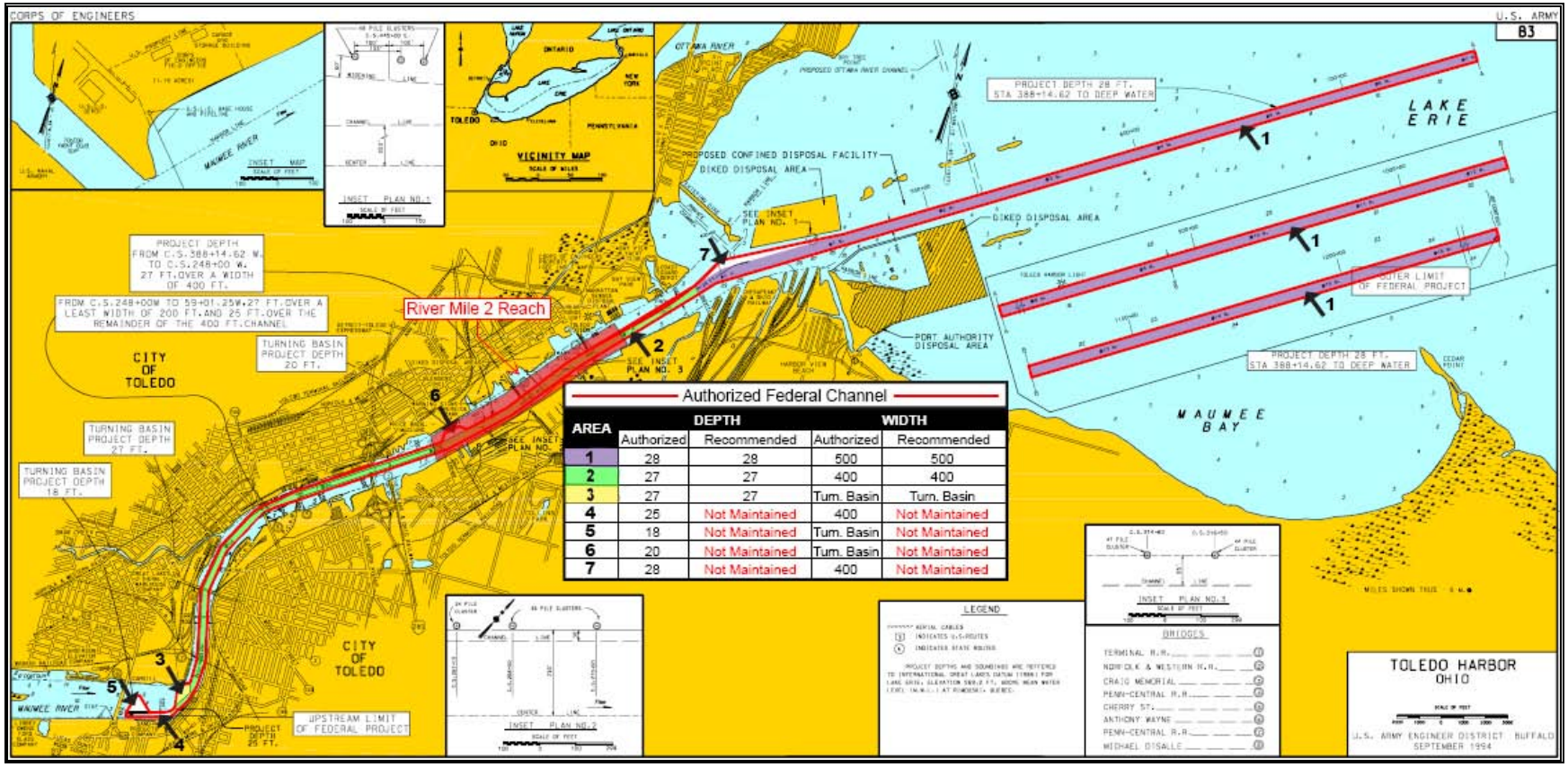


FIGURE 3: TOLEDO HARBOR DREDGING OPERATIONS



Authorized Federal Channel

AREA	DEPTH		WIDTH	
	Authorized	Recommended	Authorized	Recommended
1	28	28	500	500
2	27	27	400	400
3	27	27	Turn. Basin	Turn. Basin
4	25	Not Maintained	400	Not Maintained
5	18	Not Maintained	Turn. Basin	Not Maintained
6	20	Not Maintained	Turn. Basin	Not Maintained
7	28	Not Maintained	400	Not Maintained

FIGURE 4: TOLEDO HARBOR PROJECT MAP

Table 1 - Population (Toledo Metropolitan Statistical Area Counties)

Toledo Metropolitan Statistical Area Counties	Fulton	Lucas (includes Toledo)	Wood	Ottawa
Population 2004 (Estimated)	42,919	450,632 (304,973)	123,278	41,407
Population 2020 (Projected)	47,211	434,648	133,326	40,269
Population Base (2000)	42,084 (100%)	455,054 (100%)	121,065 (100%)	40,985 (100%)
Male #	20,564 (48.9%)	218,764 (48.1%)	58,604 (48.4%)	20,230 (49.4%)
Female #	21,520 (51.1%)	236,290 (51.9%)	62,461 (51.6%)	20,755 (50.6%)
White	40,228 (95.6%)	352,261 (77.4%)	114,610 (94.7)	39,541 (96.5%)
African American	119 (< 0.3%)	76,721 (16.9%)	1,733 (1.4%)	301 (0.7%)
Other	1,725 (~ 4.1%)	25,938 (5.7%)	4,722 (3.9%)	1,148 (2.8%)
Age 0 - 17	11,880 (28.3%)	119,291 (26.2%)	28,580 (23.7%)	9,517 (23.2%)
Age 18 - 64	24,836 (59.0%)	276,029 (60.6%)	79,325 (65.5)	24,751 (60.3%)
Age 65 plus	5,368 (12.8%)	59,734 (13.1%)	13,160 (10.9%)	6,717 (16.4%)
Median Age	36.1	35.0	32.6	41.0

Source: Ohio County Profiles, Ohio Department of Development.
U.S. Census Bureau

Table 2 - Land Cover (Toledo Metropolitan Statistical Area Counties)

Toledo Metropolitan Statistical Area Counties	Fulton	Lucas	Wood	Ottawa
Total (Acres)	260,779.0	221,980.3	397,969.1	170,608.7
Urban (open impervious surfaces)	2,250.7	39,247.1	9,148.9	8,596.5
Agriculture/Open Urban Areas	231,972.4	120,024.3	357,750.1	124,845.1
Shrub/Scrub	351.0	2852.8	950.9	556.3
Wooded	20,865.4	45,547.6	22,128.1	17,636.7
Open Water	377.3	4,937.8	2,080.2	7,098.4
Non-forested Wetlands	4,788.1	8,689.9	5,430.1	10,230.0
Barren	174.1	680.8	480.8	1,645.7

Source: Ohio County Profiles, Ohio Department of Development.

Table 3A - Civilian Labor Force (Toledo Metropolitan Statistical Area Counties)

Toledo Metropolitan Statistical Area Counties	Fulton	Lucas	Wood	Ottawa
Civilian Labor Force (2004)	22,600	225,800	66,600	21,400
Employed	21,200	209,200	62,700	19,700
Unemployed	1,400	16,600	3,800	1,700
Unemployment Rate	6.3	7.4	5.7	8.1

Source: Ohio County Profiles, Ohio Department of Development.

Table 3B - Employment by Sector

Counties	Fulton	Lucas	Wood	Ottawa
Total (2003)	20,551	223,063	57,066	14,352
Private Sector	18,239	195,595	46,813	12,217
Agriculture, Forestry, Fishing & Hunting	*	436	224	138
Mining	*	111	57	122
Utilities	*	841	48	*
Construction	1,017	10,353	2,821	552
Manufacturing	8,939	27,659	13,751	2,417
Wholesale Trade	846	9,220	3,039	*
Retail Trade	1,767	28,656	6,237	1,765
Transportation/ Warehousing	*	7,346	2,185	427
Information	128	3,687	725	105
Finance/Insurance	438	6,280	859	404
Real Estate, Rental, Leasing	171	3,307	845	162
Professional and Technical Services	*	9,565	1,229	*
Management of Companies and Enterprises	*	2,325	232	*
Administrative and Waste Services	436	15,552	2,701	*
Educational Services	*	3,726	434	52
Health Care and Social Assistance	*	34,843	4,407	1,320
Arts, Entertainment, and Recreation	377	3,400	475	627
Accommodation and Food Services	1,103	19,840	4,626	1,956
Other Services Except Public Administration	362	8,450	1,920	571
State & Local Govt.	2,313	27,468	10,253	2,135
State Government	153	7,896	*	198
Local Government	2,160	19,572	*	1,937
Federal Govt.	104	2,105	232	164

* indicates suppressed for confidentiality
Source: Ohio County Profiles, Ohio Department of Development.

Table 3C - Income (Toledo Metropolitan Statistical Area Counties)

Toledo Metropolitan Statistical Area Counties	Fulton	Lucas	Wood	Ottawa
Per Capita Personal Income (2003)	$ 28,860	$ 30,171	$ 29,073	$ 31,451
Median Household Income (2003) #	$ 46,317	$ 40,093	$ 45,615	$ 45,579
Persons Below Poverty (2003) #	6.6%	12.8%	7.7%	6.9%

Sources: Ohio County Profiles, Ohio Department of Development.
U.S. Census Bureau

Table 4 - Land and Property Value (Toledo Metropolitan Statistical Area Counties)

Toledo Metropolitan Statistical Area Counties	Fulton	Lucas	Wood	Ottawa
Average Estimated Market Value of Farm Land and Buildings Per Acre (2002)	$ 2,654	$ 3,365	$ 2,764	$ 2,177
Total Housing Units (2000)	16,232 (100%)	196,259 (100%)	47,468 (100%)	25,532 (100%)
Occupied Housing Units	15,480 (95.4%)	182,847 (93.2%)	45,172 (95.2%)	16,474 (64.5%)
Vacant Housing Units	752 (4.6%)	13,412 (6.8%)	2,296 (4.8%)	9,058 (35.5%)
Median Value for Specified Owner Occupied Housing Units (2000)	$ 108,300	$ 90,700	$ 120,000	$ 113,000

Source: 2002 Census of Agriculture
Ohio County Profiles, Ohio Department of Development.

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
LUCAS COUNTY, OHIO

APPENDIX EA-B: CLEAN WATER ACT SECTION 404(a) PUBLIC NOTICE and SECTION 404(b)(1) EVALUATION

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

REPLY TO
ATTENTION OF

Environmental Analysis Section

08 AUG 2007

PUBLIC NOTICE

(CLEAN WATER ACT - SECTION 404(a) - PUBLIC NOTICE)

TOLEDO HARBOR
OPERATIONS AND MAINTENANCE (DREDGING)
LUCAS COUNTY, OHIO

This Public Notice has been prepared and distributed pursuant to Section 404 of the Clean Water Act (33 USC 1344) and 33 Code of Federal Regulation (CER) 337.1, "Practice and Procedure: Discharge of Dredged Material into Waters of the U.S. or Ocean Waters; Operation and Maintenance; Final Rule" (53 Federal Register, page 14916,26 April 1988). Its purpose is to advise all interested parties of the proposed placement of dredged material into US Waters and to provide an opportunity to submit comments, or request a public hearing.

In this case, the placement of dredged material pertains essentially to placement of dredged material (additional dredged material) at the existing open-lake placement area and continued periodic post particulate settled water discharge from the confined disposal facility (CDF) weirs.

The U.S. Army Corps of Engineers (USACE), Buffalo District, needs to dredge and place (open-lake, CDF, as appropriate/possible) material excavated from the Federal navigation channels of the Toledo Harbor project (Figures 1 through 5), in order to maintain sufficient depth/width for deep-draft commercial vessels. Included in the project are the Outer Harbor Channel (nineteen mile Lake Approach Channel) and Inner Harbor Channel (seven mile Maumee River Channel). The attached Figures (Figures 4 and 5) show the authorized limits and depths of the Federally maintained channels. Up to one additional foot of material may be removed to insure the minimum depth.

The open-lake placement area is located just north of the lake navigation channel about 12 miles northeast of Toledo Harbor in Lake Erie. Confined disposal facility (CDF) 3 – Cell 2 is located just southeast of the lake navigation channel and mouth of the river in Lake Erie. Island 18 CDF is located just north of the lake navigation channel and northeast of the mouth of the river in Lake Erie. Reference Figures 3, 4, and 5.

Dredging and associated placement of dredged material will be performed in a manner that minimizes potential negative impacts to fisheries. Dredging in the Lake Approach Channel, landward of Lake Mile 2, and River Channel will be conducted between 1 July and 15 March to avoid any significant adverse impacts on local fishery resources and activities. This work period is consistent with ODNR's "Statewide In-Water Work Restrictions" for Maumee River. In the Lake

Enclosure 2

Approach Channel lakeward of Lake Mile 2, no environmental window is proposed. Activities may be postponed during severe storm events.

Sediments will be removed from the channel bottom by a mechanical or hydraulic dredge and placed into hoppers aboard ship or scow for transport to the placement areas. The method of excavation will be determined by the Contractor performing the maintenance dredging. In previous years, hopper and pipeline (hydraulic) and clamshell bucket (mechanical) dredges have been used to complete the required work.

USACE - Buffalo District regularly collects sediment samples from the Federal navigation channels and analyzes sediment and water quality in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual (USEPA/USACE, 1998). In 2004, sediment samples were taken from the Lake Approach Channel (Lake Mile 0 through Lake Mile 10), the open-lake reference area , and the open-lake placement area. In 2006, sediment samples were taken from Lake Approach Channel (Lake Mile 0 through Lake Mile 2), the River Channel, the open-lake reference area, and the open-lake placement area. These were subject to physical, chemical, and biological analysis. The material to be dredged consists primarily of silts and clays and some fine sand. Current analysis has shown all sediment in the Federal navigation channels, except at River Mile 2, to be suitable for unconfined open-lake placement. Accordingly, it is proposed that those sediments be placed at the northeastern-most portion of the harbor open-lake placement area or possibly utilized as a component of a beneficial use project. Sediments dredged from River Mile 2 would be placed into CDF 3 – Cell 2 and/or Island 18 CDF.

The proposed project quantities (annually) over the next several years would include up to:

CDF Placement:	Open Lake Placement (or possibly utilized as a component of a beneficial use project)	Total
100,000 CY	1,250,000 CY	1,350,000 CY

Total volume includes an estimate of annual dredging requirements (approximately 850,000 cubic yards) and the removal of shoals that were not dredged in previous years due to lack of resources or an approved dredged material placement area. The amount dredged annually also assumes the availability of Federal funds.

Dredged material for open-lake placement would likely be transported to the placement area in bottom dump scows or hopper dredge. After arrival at the placement area, the vessel would come to a near-stop/stop, its bottom gates would be opened, and the dredged material would be allowed to settle to the bottom. Dredging and placement in the lake would not be performed during severe Lake Erie storm events.

Dredged material for CDF placement would be transported to the CDF site and transferred mechanically or hydraulically. Measures would be incorporated to avoid transfer spillage. The method of transfer will be determined by the Contractor performing the maintenance dredging. Placement will be controlled by the transfer method and located a significant distant from the CDF

overflow discharge weirs to allow for maximum water column settling within the CDF.

The CDFs have weir discharge structures that are used periodically, particularly when CDF fill material reaches above lake level. Return water from the CDF is a carrier water regulated as a Section 404 discharge under the Clean Water Act. Previous studies have demonstrated that particulate settling to 100 parts per million (ppm) or better prior to weir discharge reasonably meets water quality discharge regulations. Weir discharge structures essentially consist of drop structures with sluice board discharge control features. Particulates are allowed to settle (contaminants are primarily adsorbed to sediment) from ponded slurry and water is discharged via removal of sluice boards.

The environmental effects of the dredging and placement operation are historically documented in the ***Final Environmental Impact Statement, Operation and Maintenance, Toledo Harbor, Ohio (1976); Section 404 (b) (1) Evaluation, Operation and Maintenance, Toledo Harbor, Ohio (1984); Environmental Assessment (including Section 404(b)(1) Evaluation), Operation and Maintenance, Toledo Harbor, Ohio (1989); Final Environmental Impact Statement, CDF Cell 2, Toledo Harbor, Ohio (1990); Environmental Assessment (including Section 404(b)(1) Evaluation), Island 18, Toledo Harbor, Ohio (1990); Environmental Assessment, LTMP Interim Plan, Toledo Harbor, Ohio (1995); Environmental Assessment, LTMP, Toledo Harbor, Ohio (2002); Environmental Assessment, Island 18, Toledo Harbor, Ohio (2002); and pending Environmental Assessment (including Section 404(b)(1) Evaluation), Operations and Maintenance, Toledo Harbor, Ohio (2007)***. These documents, and supplemental documentation, are filed with the USEPA. Copies are also made available for examination at the Buffalo District office or web site www.lrb.usace.army.mil.

Assessment of the impacts of the placement of dredged material applying the guidelines for Specification of Disposal Sites for Dredged or Fill Material in 40 CFR 230 indicates that the proposed actions would not cause unacceptable disruption to the water quality uses of the affected aquatic ecosystem.

Designation of the proposed sites for receipt of dredged material associated with construction and operation of this project has been made through the application of guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, in conjunction with the Secretary of the Army.

Construction contractors would be required to comply with the Corps of Engineers Civil Works Construction Specification pertaining to "Environmental Protection" implementing practical measures to be applied during construction and operations to protect significant water and associated land environmental resources (i.e. noise, turbidity, containment, etc.)

A Clean Water Act Section 401 State Water Quality Certification from the Ohio Environmental Protection Agency is required for this action. Application is being coordinated with the Ohio Environmental Protection Agency.

Consultation with the Ohio Historic Preservation Office and an assessment of the project impacts indicate that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project. By this notice, the National Park Service is advised that

currently unknown archaeological, scientific, pre-historical or historical data may be lost or destroyed by the work to be accomplished.

Based upon the review of the available environmental data, and consultation with the U.S. Fish and Wildlife Service and the Ohio Department of Natural Resources, it has been determined that the proposed work will not affect any species proposed or designated by the U.S. Department of the Interior as threatened or endangered, nor will it affect the critical habitat of any such species. Therefore, unless information forthcoming indicates otherwise, no further consultation pursuant to Section 7 of the Endangered Species Act Amendments of 1978 will be undertaken with the U.S. Fish and Wildlife Service.

The work will be undertaken in a manner consistent to the maximum extent practicable with the State of Ohio Coastal Management Program, as determined by a Coastal Management Consistency Determination Report. State Concurrence is being requested.

The decision whether to perform dredging will be based on an evaluation of the probable impact, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may he relevant to the proposal will he considered including the cumulative factors thereof; among these are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

This activity is being coordinated with the following agencies, as well as other appropriate Federal, State and local agencies and organizations:

U.S. Environmental Protection Agency
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Coast Guard
Ohio Environmental Protection Agency
Ohio Department of Natural Resources
Ohio Historic Preservation Office

Any interested parties and/or agencies desiring to express their views concerning this proposed placement of dredged material may do so by filing their comments, in writing, no later than 30 days from the date of this notice. Any person who has an interest which may he affected by this placement may request a public hearing. The request must he submitted in writing to the undersigned within 30 days of the date of this Public Notice. The request must clearly set forth the interest which maybe affected, and the manner in which the interest may be affected, by this activity.

Questions and comments concerning this project should be directed to Mr. Tod D. Smith of my Environmental Analysis Section or Mr. Michael D. Asquith, the Dredging Program Manager, who maybe contacted by calling 716-879-4175 and 716-879-4352 (FAX 716-879-4357), respectively, or by writing to their attention at the following address:

U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, NY 14207-3199

This Public Notice is published in conformance with 33 CFR 337.1. All dredging and dredged material placement will be performed in conformance with Sections 313 and 404 of the Clean Water Act (33 USC 1323 and 1344, respectively).

Martin P. Wargo, Chief
Environmental Analyses Section

Attachments

NOTICE TO THE POSTMASTER: It is requested that the above notice he conspicuously displayed for 30 days from the date of issuance.

SECTION 404(b)(1) EVALUATION

OPERATIONS & MAINTENANCE
(DREDGING AND PLACEMENT OF DREDGED MATERIAL)
TOLEDO HARBOR
LUCAS COUNTY, OHIO

Section 404(b)(1) of the Clean Water Act (33 USC 1344) requires that placement sites and dredged fill material proposed for placement into waters of the United States be evaluated through the application of guidelines developed by the Administrator of the U.S. Environmental Protection Agency (USEPA) in conjunction with the Secretary of the Army. The purpose of this Section 404(b)(1) Evaluation is to assess any affect that may result from the placement of Toledo Harbor dredged material in Lake Erie. This evaluation updates previous environmental documentation prepared for Toledo Harbor, particularly a 1989 Environmental Assessment and Section 404(b)(1) Evaluation (USACE, 1989).

1. PROJECT DESCRIPTION

1.1 Location.

Toledo Harbor is located in Lucas County, Ohio and is situated near the southwestern shore of Lake Erie at the mouth of the Maumee River, approximately 90 miles west of Cleveland, Ohio and 50 miles south of Detroit, Michigan.

1.2 General Description.

The Federal navigation project at Toledo Harbor consists of the following features that support commercial navigation at this deep-draft harbor (Figure 1):

- Lake Approach Channel: This approximately 18-mile long channel in the Western Basin of Lake Erie has authorized dimensions of 28 feet deep and 500 feet wide from the mouth of the Maumee River (Mile 0), through Maumee Bay to deep water in Lake Erie (Lake Mile [LM] 18).
- Maumee River Channel: This approximately 7-mile long channel in the Maumee River has authorized dimensions of 27 feet deep and 400 feet wide from Mile 0 to River Mile (RM) – 3; thence a channel 400 feet wide from RM-3 to RM-6.5 with depths of 27 feet over a least width of 200 feet, and 25 feet deep over the remainder of the 400-foot channel width; thence a channel 25 feet deep and 200 feet wide to the upper limit of the project, RM-7. Note that River channel section from RM-6.5 to RM-7 is no longer maintained.
- Lower Turning Basin: This turning basin is located in the Maumee River Channel opposite the American Shipbuilding docks at RM-2.7. The basin is 750 feet wide,

800 feet long and 20 feet deep. Note that this turning basin is no longer maintained.

- Middle Turning Basin: This turning basin is located in the Maumee River Channel just upstream from the old Fassett Street Bridge at RM-6.5. The 27 feet deep basin is semi-circular in shape with a radius of 730 feet.
- Upper Turning Basin: This turning basin is located at the upper limit of the Maumee River Channel at River Mile 7. The 8.25 acre basin has an authorized depth of 18 feet. Note that this turning basin is no longer maintained.

The selected operations and maintenance plan would involve dredging the authorized Toledo Harbor Federal navigation channels, and appropriate management of the associated dredged material. Based on an evaluation of Toledo Harbor dredged material using joint USEPA/U.S. Army Corps of Engineers (USACE) guidelines, all sediments in the Federal navigation channels are suitable for open-lake placement, except for those located in River Mile 2 reach of the River Channel. This reach is depicted in Figure 1 and is defined as the area situated between RM-1 (Station 347+20) and RM-3 (Station 241+60). Therefore, the proposed operation and maintenance plan is annual dredging of Toledo Harbor Federal navigation channels, with placement of up to 1,250,000 cubic yards dredged from the harbor (except for that dredged from the River Mile 2 reach) at the existing authorized two-square mile open-lake placement area, and placement of up to 100,000 cubic yards dredged from the RM-2 reach in a Federal CDF. This total quantity includes an estimate of annual dredging requirements (approximately 850,000 cubic yards), and would also include the removal of shoals that were not dredged in previous years should funding become available.

The open-lake placement area is located in the Western Basin of Lake Erie just north of the Lake Approach Channel near Lake Mile 11 (Figure 2). Dredged material placement would occur in the northeastern half of this area. About 100,000 cubic yards of material dredged from the RM-2 reach will be placed in a Federal confined disposal facility (CDF). The appropriate environmental window for dredging Toledo Harbor Federal navigation channels would be coordinated with the Ohio Department of Natural Resources (ODNR). ODNR recommends that dredging and dredged material placement activities at Toledo Harbor occur between July 1 and March 15.

The maintenance dredging would be performed by a private firm contracted by the Federal government. The contractor would determine the method of dredging and dredged material placement. In previous years, hopper, clamshell bucket and pipeline dredges have been used to complete the required work. Dredged material for open-lake placement would be transported to the placement area in dump scows or hopper dredge. After arrival at the placement area, the vessel would slow down, its bottom gates would be opened, and the dredged material would settle to the bottom. The dredged material may also be delivered to the open-lake area via pipeline. Dredging

and dredged material placement would not be performed during Lake Erie storm events.

1.3 Authority and Purpose.

The existing Federal navigation project at Toledo Harbor, including its operation and maintenance, was authorized by the River and Harbor Acts of 1899, 1910, 1935, 1950, 1954, 1958 and 1960.

The purpose of the project is to maintain authorized dimensions (i.e., depths and widths) of the Federal navigation channels at Toledo Harbor. The identified problems at Toledo Harbor are shoaling of the authorized Federal navigation channels and the subsequent reduction in navigable depths for deep-draft commercial navigation. The need for maintenance dredging arises as shoals accumulate within the Federal navigation channels. Dredging restores these channels to authorized project dimensions (both depth and width), which facilitates safe commercial and recreational navigation and their associated benefits.

1.4 General Description of Fill Material.

1.4.1 *General Characteristics of Material*. Physical analyses of surface grab sediment samples collected from Toledo Harbor Federal navigation channels, and open-lake reference and placement areas, was conducted by Engineering and Environment, Inc. (EEI) (2004 and 2006). The particle size distribution data are summarized in Tables 1 and 2. The analyses showed that the Lake Approach Channel material is comprised of between 79.4% and 99.3% silts and clays, with the remainder sands. The River Channel material is comprised of between 72.9% (Upper River Channel) and 98.8% (Lower River Channel) silts and clays, with the remainder sands.

1.4.2 *Quantity of Material*. The proposed plan is to annually dredge up to 1,250,000 cubic yards of material from Toledo Harbor Federal navigation channels (except for from the River Mile 2 reach of River Channel), and place that material at the existing authorized open-lake placement area. Up to 100,000 cubic yards would be dredged from the River Mile 2 reach of the River Channel and placed in a Federal CDF.

1.4.3 *Source of Material*. Sediments dredged from Toledo Harbor Federal navigation channels originate from upstream erosion throughout the Maumee River watershed, including streambank and shoreline erosion. The Maumee River watershed is very large (approximately 4.2 million acres) and predominantly agricultural in nature, and consequently produces a substantial sediment load. Sediments from this watershed and erosion from the streambanks of the Maumee River gradually deposit in the River Channel portion of the harbor. The material deposited in the Lake Approach Channel is derived from the portions of the Western Basin of Lake Erie surrounding the channel. Western Lake Erie basin hydrodynamics such as winds and currents transport materials from the surrounding areas into the channel.

1.5 General Description of the Placement Site.

1.5.1 *Location*. The existing authorized open-lake placement area is located in the Western Basin of Lake Erie, just north of the Lake Approach Channel near Lake Mile 11 (Figure 2). The center of this area is on an azimuth of 33º at a distance of 3.5 miles from the Toledo Harbor Light.

1.5.2 *Size*. The designated open-lake placement area encompasses two square miles (1,280 acres). This site has depths that range from 20 to 23 feet below LWD[1]. Dredged material placement would be limited to the northeast half of this area (640 acres).

1.5.3 *Type of Site*. The open-lake placement area is unconfined.

1.5.4 *Type of Habitat*. The open-lake placement area is within a warmwater aquatic ecosystem that consists mainly of soft unstructured bottom and water column habitat.

1.5.5 *Timing and Duration of Placement*. Dredging with dredged material placement would be tentatively scheduled to occur between July 1 and March 15.

1.6 Description of Placement Method. At the open-lake placement area, dredged material would be discharged from scows, hopper dredge or pipeline. A scow or hopper dredge would move slowly through the center of the northeast half of the open-lake placement area while releasing its load of dredged material.

2. FACTUAL DETERMINATIONS

2.1 Physical Substrate Determinations.

2.1.1 *Substrate Elevation and Slope*. The placement of dredged material would slightly increase the elevation and bottom relief at the open-lake area, relative to the existing and surrounding lake bottom substrate. The slope of the placed material would be very gradual.

2.1.2 *Sediment Type*. Bottom sediments at the open-lake placement area consist primarily of silts and clays, as does the dredged material to be placed at the area.

2.1.3 *Dredged Material Movement*. Dredged material placed at the open-lake area would be subjected to the forces of lake hydrodynamics. The material would tend to flatten out and some migration of the material from the area would occur.

2.1.4 *Physical Effects on Benthos*. The placement of dredged material at the open-lake area may impact the resident macroinvertebrate community through smothering, which

1 Low Water Datum (LWD) for Lake Erie is defined as 569.2 feet above mean sea level at Rimouski, Quebec, Canada (IGLD 1985).

would result in the temporary localized loss of benthic organisms. However, the new bottom substrate at the area would be similar to pre-placement conditions and be recolonized by benthic organisms residing in the dredged material and surrounding lake bottom. Due to the similarity in the sediment grain size between the dredged material and lake bottom sediments, significant long-term changes in the benthic community resulting from the placement of this new material are unlikely. Impacts to benthic organisms would be minor, adverse and short-term. The physical change in bottom elevation and contours at the open-lake area may diversify the benthic community to some degree from the surrounding lake bottom. A study on the macroinvertebrate community in the vicinity of the open-lake placement area concluded that the taxonomic richness and abundance of invertebrates at the placement area were similar to other areas in the Western Basin of Lake Erie. Further, a cluster analysis showed that there was no association among sampling areas in relation to their proximity to the placement area (Heidelberg College, 2003). These results strongly suggest that the open-lake placement of dredged material has no measurable effect on the quality of the benthic macroinvertebrate community either within or outside the placement area.

2.1.5 *Other Effects*. Some compaction of the existing substrate at the open-lake area may occur as a result of dredged material placement.

2.1.6 *Actions Taken to Minimize Impacts*:

- Bottom sediments at the open-lake area are similar to the dredged material with respect to particle size. Therefore, significant alterations in physical sediment characteristics at the open-lake area would not occur. In addition, the placement methodology at the open-lake area is diffusive in nature resulting in a minimal effect on bottom slope and elevation.

2.2 Water Circulation, Fluctuation and Salinity Determinations.

2.2.1 *Water*:

a. Salinity – Not applicable.

b. Water Chemistry – Reference Section 2.3.2.

c. Clarity – Reference Section 2.3.1.

d. Color – Reference Section 2.3.1.

e. Odor – The atmospheric exposure of organic matter which may be contained in the dredged material would result in a short term, localized malodor.

f. Taste – No significant effect

g. Dissolved Gas Levels – Reference Section 2.3.2.

h. Nutrients – Reference Section 2.3.3.

i. Eutrophication – Reference Section 2.3.3.

2.2.2 *Current Patterns and Circulation*:

a. Current Pattern and Flow - No significant effects.

b. Velocity - No significant effects.

c. Stratification - No significant effects.

d. Hydrologic Regime - No significant effects.

2.2.3 *Normal Water Level Fluctuations*. No significant effects.

2.2.4 *Salinity Gradients*. Not applicable.

2.2.5 *Actions Taken to Minimize Impacts.* No further actions are deemed appropriate.

2.3 Suspended Particulate/Turbidity Determinations.

2.3.1 *Expected Changes in Suspended Particulates and Turbidity in the Vicinity of the Placement Site*. Open-lake placement of dredged material would result in the temporary re-suspension of fine-grain sediments, increased turbidity and a temporary decrease in dissolved oxygen levels in the water column at a small portion of the open-lake placement area. Turbidity plumes would be influenced by existing hydrodynamics at the open-lake area, and would generally dissipate within one to three hours. Turbidity measurements conducted at the placement area during a 1985-1986 monitoring program immediately after the placement operation showed a dramatic decrease in water clarity. However, without exception, water clarity returned to pre-placement conditions within two hours. During the spring of 1985, open-lake placement operations did not cause any long-term degradation of water quality. Turbidity plumes were created, but they did not contain a significant mass of sediment and always completely dissipated before they could have affected any public water supply intakes (Aqua Tech Environmental Consultants [ATEC], 1986).

A preliminary investigation in 2007 showed that turbidity plumes resulting from open-lake placement of dredged material dissipated relatively quickly and remained within the boundaries of the existing open-lake placement area (USAERDC, 2009). The physical similarity of the dredged sediments to those at the open-lake placement area (i.e., between about 70 and 98 percent silts/clays) indicates that the sediments would be

subject to similar re-suspension forces as the in-situ sediments. Annual wind-induced resuspension of sediments in the Western Basin of Lake Erie ranges from 50 to 100 metric tons per square kilometer (MT/km^2). Using the lower estimate of 50 MT/km^2 alone, this converts to an annual bottom sediment resuspension of 150,000,000 MT/year (DePinto et al., 1986). Within this context, the open-lake placement of 1,250,000 cubic yards (1,450,000 MT) of dredged material is less than one percent of this lower estimate of ambient sediment resuspension. Therefore, open-lake placement is insignificant in comparison to typical sediment resuspension in the Western Basin of Lake Erie. This estimate is conservative and does not consider the fact that the vast majority of the dredged material placed in the Western Basin is from the Western Basin.

2.3.2 *Effects on Chemical and Physical Properties of the Water Column*:

a. Light Penetration – Open-lake placement of dredged material would result in localized turbidity, and would temporarily decrease light penetration in the water column at the open-lake area.

b. Dissolved Oxygen – Due to the normally high oxygen demand associated with fine-grained dredged material, some oxygen depletion would occur at the open-lake placement area. Monitoring conducted in 1985-1986 indicated that during each placement action, dissolved oxygen increased at the placement area, but showed a decrease below ambient levels away from the placement area. This pattern was attributed to entrainment of air within the mass of dredged material dropped from the bottom of the split-hull dredge. As the dredged material falls to the bottom, it disperses creating a wave of sediment and bottom water which spreads out across the lake bottom. Fine materials rise off the bottom on the turbulence and exert their oxygen demand at a distance away from the placement area. This monitoring ultimately showed that dissolved oxygen concentrations were reduced about 20 percent, but no violations of State Water Quality Standards occurred. The degree of oxygen depletion would generally increase with depth and increasing concentrations of total suspended solids. Due to dilution and settling of the suspended material, dissolved oxygen levels would increase with increasing distance from the placement point (USACE, 1983).

c. Toxic Metals and Organics – Standard elutriate test (SET) data on the dredged material are summarized in Tables 3 through 10. These data indicate that releases of metals and organic contaminants during open-lake placement would comply with existing, applicable State Water Quality Standards for the Protection of Aquatic Life (Ohio Environmental Protection Agency [OEPA] 2009). Short-term fate (STFATE) modeling indicated that any contaminant level that exceeded the respective Lake Erie Aquatic Life Criterion would comply with the outside mixing zone maximum (OMZM) standard, after consideration of mixing in the water column (U.S. Army Engineer Research and Development Center [USAERDC], 2007).

d. Pathogens - No significant effects.

e. Aesthetics - Increased turbidity at the open-lake placement area during open-

lake placement of dredged material may be temporarily aesthetically displeasing. However, the turbidity plume generated would be localized and dissipate before affecting widespread areas. In addition, ambient turbidity levels may be sufficiently high at the time of the discharge so that any temporary increase in turbidity within these areas may not represent a substantial change.

2.3.3 *Effects on Biota*:

a. Primary Production and Photosynthesis – Temporary increases in turbidity and suspended solids generated during the open-lake placement of dredged material may cause temporary but minor decreases in primary production and photosynthesis. Sweeney (1978) found that no statistically significant differences in algal populations exist between open-lake placement and unaffected open-lake reference areas. SET data on the harbor sediments indicated no releases of phosphorus, nitrogen, or ammonia above State Water Quality Standards after consideration of mixing in the water column. Samples collected in the 1985-1986 monitoring study before and two hours after dredged material placement were analyzed for dissolved phosphorus and total phosphorus. Based on mean concentration and individual samples, there was no apparent difference between the before and after samples for either total or dissolved phosphorus. Dissolved phosphorus concentrations may have been increased slightly within the Mixing Zone, but not to such a degree that the dredged material placement operation could influence the production of algae in the Western Basin of Lake Erie (ATEC, 1986).

b. Suspension/Filter Feeders – Suspension/filter feeder populations in the vicinity of the open-lake area may be temporarily adversely affected by increases in suspended solids and turbidity during open-lake placement of dredged material. Such effects would be minor and localized

c. Sight Feeders – Temporary adverse impacts on sight feeders in the vicinity of the open-lake area may occur as a result of increases in suspended solid and turbidity levels from the placement of dredged material. Mobile organisms would temporarily avoid the area during placement operations. Sweeney (1978) found that nekton are only slightly impacted at open-lake areas after dredged material placement operations, and that recovery is relatively rapid.

2.3.4 *Actions Taken to Minimize Impacts*.

- The contractor would be required to minimize accidental spills of petroleum, oil or lubricants. The contractor would be required to prepare and implement an Environmental Protection Plan and Oil Spill Contingency Plan.
- No placement activities would occur during Lake Erie storm events so as to ensure accurate placement and minimal turbidity plume migration.

2.4 Contaminant Determinations. This evaluation pertains to the contaminant determination at 40 CFR 230.11(d), and its purpose is to determine the degree to which

the material proposed for discharge would introduce, relocate or increase contaminants. A comprehensive evaluation of Toledo Harbor Federal navigation channel dredged material proposed to be placed at the open-lake placement area, in accordance with the protocols and guidelines prescribed in USEPA/USACE (1998), is contained in "Evaluation of Toledo Harbor Federal Navigation Channel Sediments with Respect to Their Suitability for Open-Lake Placement" (USACE, 2008).

2.4.1 *Potential Sources of Sediment Contamination*. Major sources of contamination to bottom sediments in Toledo Harbor's Lake Approach Channel in Maumee Bay include sediments from Maumee River, Ottawa River and Western Basin of Lake Erie. The harbor's River Channel is situated within the Maumee River Area of Concern (AOC). Major sources of pollution to bottom sediments in the River Channel include: (1) non-point source agricultural runoff (i.e., phosphorus, nitrogen and pesticides); (2) urban storm water runoff (i.e., heavy metals, oil and PAHs), and commercial and residential development; (3) municipal and effluent industrial point source discharges (the Lucas County Wastewater Treatment Plant is a major local source of ammonia to Toledo Harbor); (4) combined sewer overflows (CSOs) (i.e., oil, sediment and bacteria); (5) sanitary sewer overflows; and (6) chemical leachate from waste disposal sites. Swan Creek is also a known source of pollutants to Maumee River sediments (USEPA 2009).

2.4.2 *Sediment Sampling/Testing*. Toledo Harbor dredged material was sampled, tested and evaluated under two recent efforts. In 2004, 11 surface grab samples were collected from the Lake Approach Channel between Lake Mile (LM) 0 and LM 10 (Sites LM-0 through LM-10), and four surface grab sediment samples were collected from both the open-lake reference area (Sites TL-1 through TL-4) and open-lake placement area (Sites TD-1 through TD-4) (Figure 3). In 2006, 16 surface grab samples were collected from the Upper Lake Approach Channel between LM-0 and 2 (Sites LM-0 through LM-2) and River Channel (Sites RM-1 through RM-7), and four and two samples were collected from the open-lake reference area (Sites TL-1 through TL-4) and open-lake placement area (Sites TD-1 and TD-2), respectively (Figure 4). All sediment samples were subject to bulk particle size analyses, and analyzed for the following: Inorganics—heavy metals, cyanide, ammonia, phosphorus, nitrogen, oil/grease and total organic carbon (TOC); and organics—Polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides (EEI 2004 and 2006). An SET for the same inorganic and organic contaminants was applied to all of the Federal navigation channel sediment samples. In addition, elutriate (water column) acute toxicity tests (bioassays) were applied to upper Lake Approach Channel samples (USAERDC 2006), and STFATE modeling was used to predict releases of ammonia associated with the open-lake placement of sediments dredged from throughout the Federal navigation channels (USAERDC 2007).

2.4.3 *Dredged Material Evaluation*. Both open-lake reference and placement area sediments were used to represent the environs in the Western Basin of Lake Erie. As such, contaminant concentrations in the Federal navigation channel sediment samples were compared to the contaminant concentrations in sediment samples from these

areas. Those contaminants that significantly exceeded lake sediment concentrations were identified as contaminants of concern (COCs) in the dredged material.

a. Bulk Inorganic Contaminants—Tables 11 and 12 summarize the bulk inorganics data on the sediments. With a few exceptions, most of the inorganic contaminant concentrations in the Federal navigation channel sediment samples did not significantly exceed those relative to the lake environs. Ammonia concentrations were significantly elevated at several sites, and ammonia was identified as a preliminary COC at Sites RM-1, LM-0, LM-0.25, LM-0.5, LM-1 and LM-3 (range 244 to 460 mg/kg). Nickel (49.1 mg/kg) and cyanide (0.65 mg/kg) were identified as COCs in sediments collected from RM-2.

b. Bulk Organic Contaminants—Tables 13 and 14, 15 and 16, and 17 and 18 summarize the bulk PCB, PAH and pesticides data on the sediments, respectively. With a few exceptions, most of the organic contaminant concentrations in the Federal navigation channel sediment samples did not significantly exceed those relative to the lake environs. At select sites, total PCB and chlordane concentrations were evaluated to ascertain whether they would bioaccumulate to levels higher than open-lake area sediments. Theoretical bioaccumulation potential (TBP) modeling (McFarland 1984) and/or subsequent sediment testing eliminated total PCBs and chlordane as COCs (USACE 2007). A total PAH concentration of 9.6 mg/kg at Site RM-2 appears marginal, and may be acutely toxic. Therefore, total PAHs at this site were identified as a COC based on existing information.

c. Elutriate (Water Column) Bioassays—To assess the toxicity of ammonia releases from sediments collected from Sites RM-2, LM-0, LM-0.25, LM-0.5, LM-1 and LM-3 to the water column, sediments with the highest concentrations in the Lower Lake Approach Channel between LM-1 and LM-2 (340 to 460 mg/kg) were subjected to laboratory water column bioassays (USEPA/USACE 1998). Ammonia is an atypical COC because it is not persistent. While it is toxic in sediment only at high concentrations, ammonia can temporarily reach high enough concentrations to become acutely toxic to fish in bioassays (invertebrates are typically not as sensitive as fish to ammonia levels [USEPA 1999]). Therefore, sediment ammonia toxicity is most appropriately characterized through its release to the water column. The following acute toxicity tests were performed on these sediments to determine lethal responses to elutriate: (1) 4-day exposure of fathead minnow (*Pimephales promelas*) to four elutriate treatments (100%, 50%, 10% and 0%) and a performance control, with survival as the measurement endpoint; and (2) 2-day exposure of the cladoceran (water flea) (*Ceriodaphnia dubia*) to four elutriate treatments (100%, 50%, 10% and 0%) and a performance control, with survival as the measurement endpoint. The results of these bioassays are summarized in Table 19 (USAERDC, 2006). Neither of the bioassays evidenced statistically significant reduced survival, except for the 100% treatment for

the *P. promelas* bioassay on both LM-1 and LM-2 sediment samples (54±17% and 66±15%, respectively). This reduced survival was prior to mixing in the water column. Subsequent elutriate modeling results indicated that open-lake placement of the dredged material would have no potential for violating the WQS for ammonia outside of the mixing zone at normal lake velocities (USAERDC 2007). Therefore, ammonia was eliminated as a COC.

2.4.4 Determination—This evaluation concludes that Toledo Harbor sediments dredged from the Lake Approach Channel, as represented by Sites LM-0 through LM-10 (Figure 3), as well as Sites LM-0, LM-0.25, LM-0.5, LM-0.75, LM-1, LM-1.25, LM-1.5, LM-1.75 and LM-2 (Figure 4), meet Federal guidelines for open-lake placement. In addition, sediments dredged from the River Channel, as represented by Sites RM-1, and RM-3 through RM-7 (Figure 4), meet Federal guidelines for open-lake placement. Sediments dredged from the River Channel, as represented by Site RM-2, do not meet Federal guidelines for open-lake placement based on existing information due to the presence of COCs in the sediments.

2.5 Aquatic Ecosystems and Organisms Determinations.

2.5.1 *Effects on Plankton*. Reference Section 2.3.3(a). Only minor short-term adverse impacts would be expected on plankton populations due to limited, temporary increases in suspended solid and turbidity levels during the open-lake placement of dredged material.

2.5.2 *Effects on Benthos*. Reference Section 2.1.4.

2.5.3 *Effects on Nekton*. Placement of dredged material at the existing open-lake area would result in localized minor, adverse, short-term impacts to some fish. There are no notable fish spawning grounds within the open-lake placement area or in areas potentially impacted by turbidity plumes. Fish behavior relative to the open-lake placement of dredged material depends on the species being affected. They may avoid the area, feed on benthic macroinvertebrates suspended in the water column or swim through the turbidity plume. Intermittent, short-term increased turbidity generated by dredged material placement at the open-lake area would not have a significant adverse affect on fish. An historic study examining 16 species of warmwater fish in laboratory aquaria did not evidence any observable behavioral reactions to turbidity until total suspended solid (TSS) concentrations approached 20,000 mg/L (Wallen, 1951). Regarding sublethal responses in adult warmwater fish sensitive to suspended sediments, the minimum dose of TSS that elicited a sublethal effect in white perch was 650 mg/L after 5 days (Sherk et al., 1974). Given these studies in tandem with the preliminary plume investigation at the Toledo Harbor open-lake placement area which showed maximum measured TSS levels of 1,100 mg/L (within 10 meters of the actual discharge) decaying to background within a few hours (USAERDC, 2009), there appears to be a very low likelihood of turbidity-related adverse effects to fish.

2.5.4 *Effects on Aquatic Food Web*. Only minor, temporary effects on the aquatic food web are expected to occur as a result of the open-lake placement of dredged material, due primarily to the smothering of some benthic organisms. Rapid re-colonization of the impacted area by benthos is anticipated and no significant long term degradation of the benthic community would be expected to occur. A macroinvertebrate community survey by Heidelberg College (2003) indicated that that open-lake placement of dredged material has no measurable effect on the quality of the benthic macroinvertebrate community in the vicinity of the open-lake area.

2.5.5 *Effects on Special Aquatic Sites*:

a. Sanctuaries and Refuges - Not applicable.

b. Wetlands – Not applicable.

c. Mud Flats - Not applicable.

d. Vegetated Shallows - Not applicable.

e. Coral Reefs - Not applicable.

f. Riffle and Pool Complexes - Not applicable.

2.5.6 *Threatened and Endangered Species*. Consultation with the USFWS and ODNR relative to the possible presence of threatened or endangered species or their critical habitat within the affected area was initiated on August 8, 2007. USFWS noted that the proposed project lies within range of the following Federally listed endangered (E) and candidate (C) species: Indiana bat (*Myotis sodalis*) (E); piping plover (*Charadrius melodus*) (E); and eastern massassauga (*Sistrurus catenatus catenatus*) (C). Due the project type and location, USFWS concluded that the proposed project would have no effect on these species.

2.5.7 *Other Wildlife*. Disruption and disturbance by equipment during the open-lake placement of dredged material would result in a short-term avoidance of the project area by local wildlife species, primarily aquatic birds.

2.5.8 *Actions Taken to Minimize Impacts*.

- Dredging operations would be scheduled to occur such that impacts to fish would be minimized, in coordination with ODNR. ODNR recommends that the dredging of Toledo Harbor Federal navigation channels be limited to July 1 and March 15.

- The contractor would be required to minimize turbidity and accidental spills of petroleum, oil or lubricants. The contractor would be required to prepare and

implement an Environmental Protection Plan and Oil Spill Contingency Plan.

2.6 Proposed Placement Site Determinations.

2.6.1 *Mixing Zone Determination*. The mixing zone has been designated as the one-mile by one-mile northeastern half of the existing open-lake placement area.

2.6.2 *Determination of Compliance with Applicable Water Quality Standards*. The proposed placement of dredged material would be in compliance with the State of Ohio's Water Use Designations (3745-1-07) and Standards Applicable to All Waters (3745-1-04) in that it would not introduce harmful or toxic conditions or substances. SET data on the dredged material indicate that releases of metals and organic contaminants during open-lake placement would comply with existing, applicable State Water Quality Standards for the Protection of Aquatic Life (OEPA 2009). STFATE modeling indicated that any contaminant level that exceeded the respective Lake Erie Aquatic Life Criterion would comply with the outside mixing zone maximum (OMZM) standard, after consideration of mixing in the water column (USAERDC, 2007). Water Quality Certification has been received from OEPA for the 2008 and 2009 dredging operations, pursuant to Section 401 of the Clean Water Act.

2.6.3 *Potential Effects on Human Use Characteristics*:

a. Municipal and Private Water Supply – Dredging and dredged material management activities would not adversely affect any public services or facilities. No public water sources should be affected by project implementation. A preliminary plume investigation has shown that turbidity plumes resulting from the open-lake placement of dredged material at the existing open-lake area do not migrate outside the boundary of the placement area (USAERDC, 2009). Since the placement area is located about 7.5 miles west northwest of the two closest public water intakes (PWIs), the plume cannot physically extend to, and therefore affect the quality of water at these PWIs. To further ensure there are no potential impacts on public water supply, the open-lake placement area has been sited north of the Lake Approach Channel and 7.5 miles north and east of the Toledo and Oregon PWIs. Dredged material placement would occur in the northeastern-most portion of this area to keep placement activities at the greatest distance from the public water intakes.

b. Recreational and Commercial Fisheries – Reference Section 2.5.3.

c. Water-related Recreation - Recreational vessels would need to temporarily avoid the open-lake area during the open-lake placement of dredged material.

d. Aesthetics – The placement of dredged material would temporarily increase suspended solid and turbidity levels, which may detract from the appearance of the open-lake area.

e. Parks, National and Historical Monuments, National Seashores, Wilderness

Areas, Research Sites, and Similar Preserves – Not applicable.

2.7 Determination of Cumulative Effects on the Aquatic Ecosystem. Placement of dredged material at the open-lake area creates a mound, which results in some local bottom surface relief. This mound is subject to settling and lake currents in the Western Basin of Lake Erie, which tend to flatten the mound over time following the cessation of dredged material placement operations. Available relevant evidence indicate that the aquatic ecosystem at the open-lake placement area is resilient, and that the periodic disturbance created by open-lake placement of dredged material is absorbed or accommodated by the ecosystem because its structure and function has not fundamentally changed to a different state. Ecosystem resilience signifies ecosystem health (gauged by species diversity) and stability (the probability that all species persist) (e.g., Scrimgeour and Wicklum, 1996). There is no relevant scientific evidence that indicates that the placement of material dredged from Toledo Harbor at the open-lake placement area would result (or has, in the past, resulted) in any significant cumulative adverse effects to the aquatic ecosystem.

2.8 Determination of Secondary Effects on the Aquatic Ecosystem. No significant effects.

FINDING OF COMPLIANCE

1. No Significant adaptations of the Section 404(b)(1)Guidelines were made relative to this evaluation.

2. The proposed plan was selected based on its ability to best address the identified community needs and to sufficiently satisfy national goals and planning objectives. It reasonably maximizes National Economic Development (NED) benefits consistent with protecting the Nation's Environmental Quality. The other alternatives considered could not be justified economically or by other accounts. The following alternative plans were considered:

(a) No action, under which the Federal Government would do nothing to maintain the harbor;
(b) dredging, dewatering, and upland placement of the dredged sediments; and
(c) beneficial use of the dredged material.

3. The placement of the proposed dredged material would not violate applicable State Water Quality Standards, nor will it violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. Use of the proposed placement area would not jeopardize the continued existence of any Federal-listed threatened or endangered species, or their designated critical habitat.

5. The proposed placement of dredged material would not contribute to significant degradation of waters of the United States, nor would it result in significant adverse effects on human health and welfare; municipal and private water supplies; recreation and commercial fishing; plankton, fish, shellfish, wildlife, or special aquatic sites; life stages of organisms dependent on the aquatic ecosystem; ecosystem diversity, productivity and stability; or recreational, aesthetic, and economic values.

6. Appropriate and practicable steps would be taken to minimize potential adverse impacts of the dredged material placement on the aquatic ecosystem.

7. On the basis of the guidelines, the existing open-lake area for the placement of dredged material is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution and adverse effects on the aquatic ecosystem.

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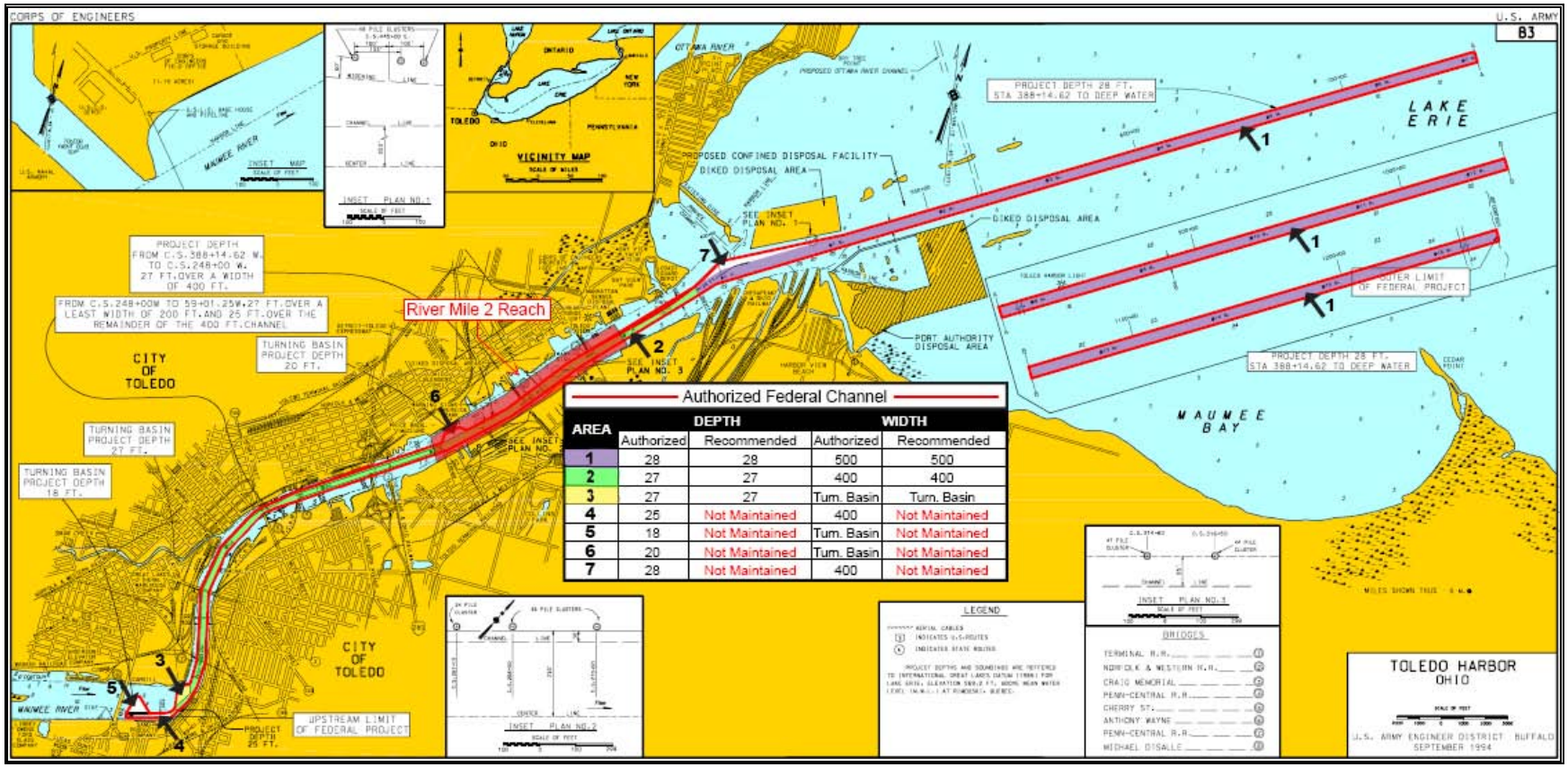

Authorized Federal Channel

AREA	DEPTH		WIDTH	
	Authorized	Recommended	Authorized	Recommended
1	28	28	500	500
2	27	27	400	400
3	27	27	Turn. Basin	Turn. Basin
4	25	Not Maintained	400	Not Maintained
5	18	Not Maintained	Turn. Basin	Not Maintained
6	20	Not Maintained	Turn. Basin	Not Maintained
7	28	Not Maintained	400	Not Maintained

FIGURE 1: TOLEDO HARBOR PROJECT MAP

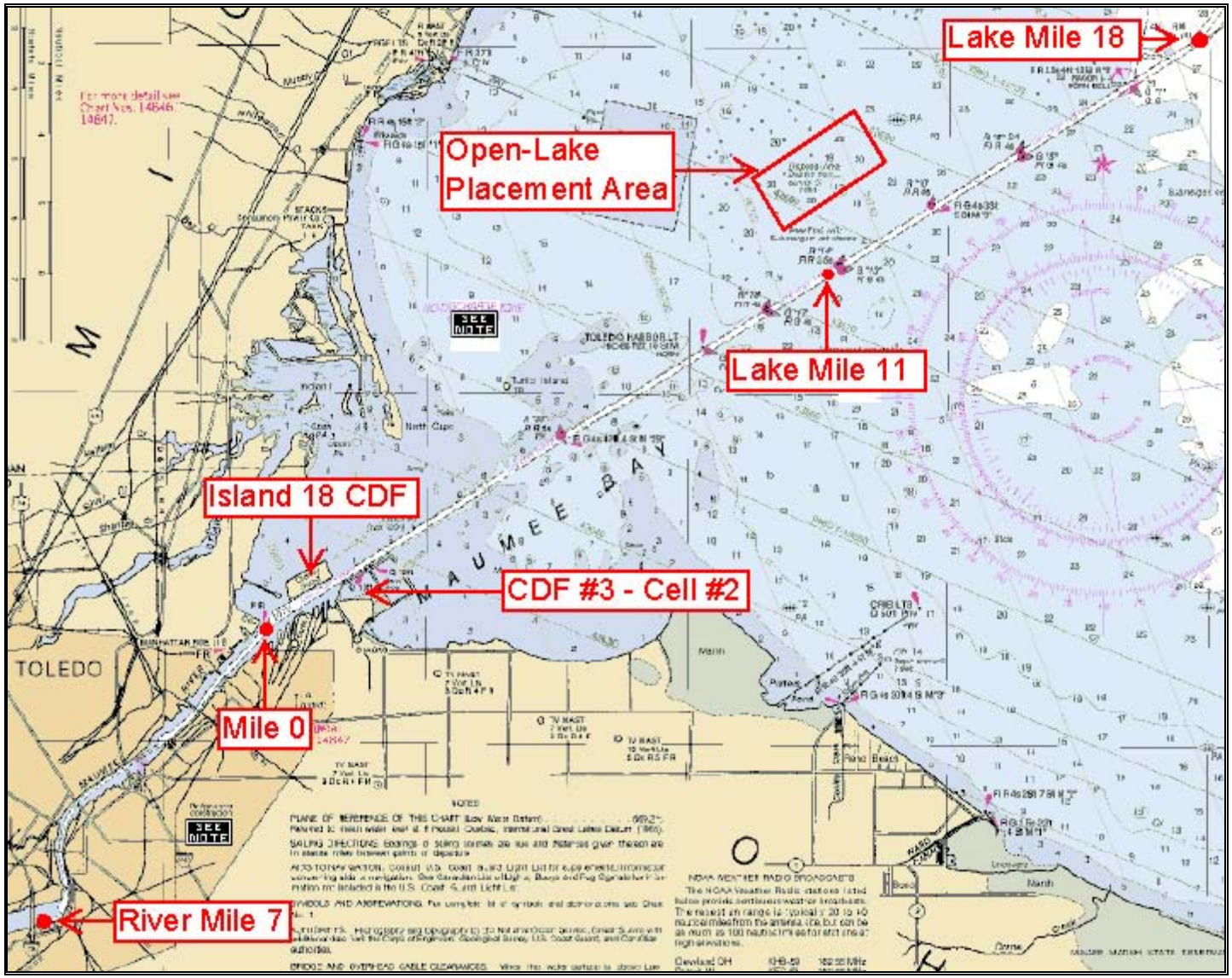

FIGURE 2: TOLEDO HARBOR DREDGING OPERATIONS

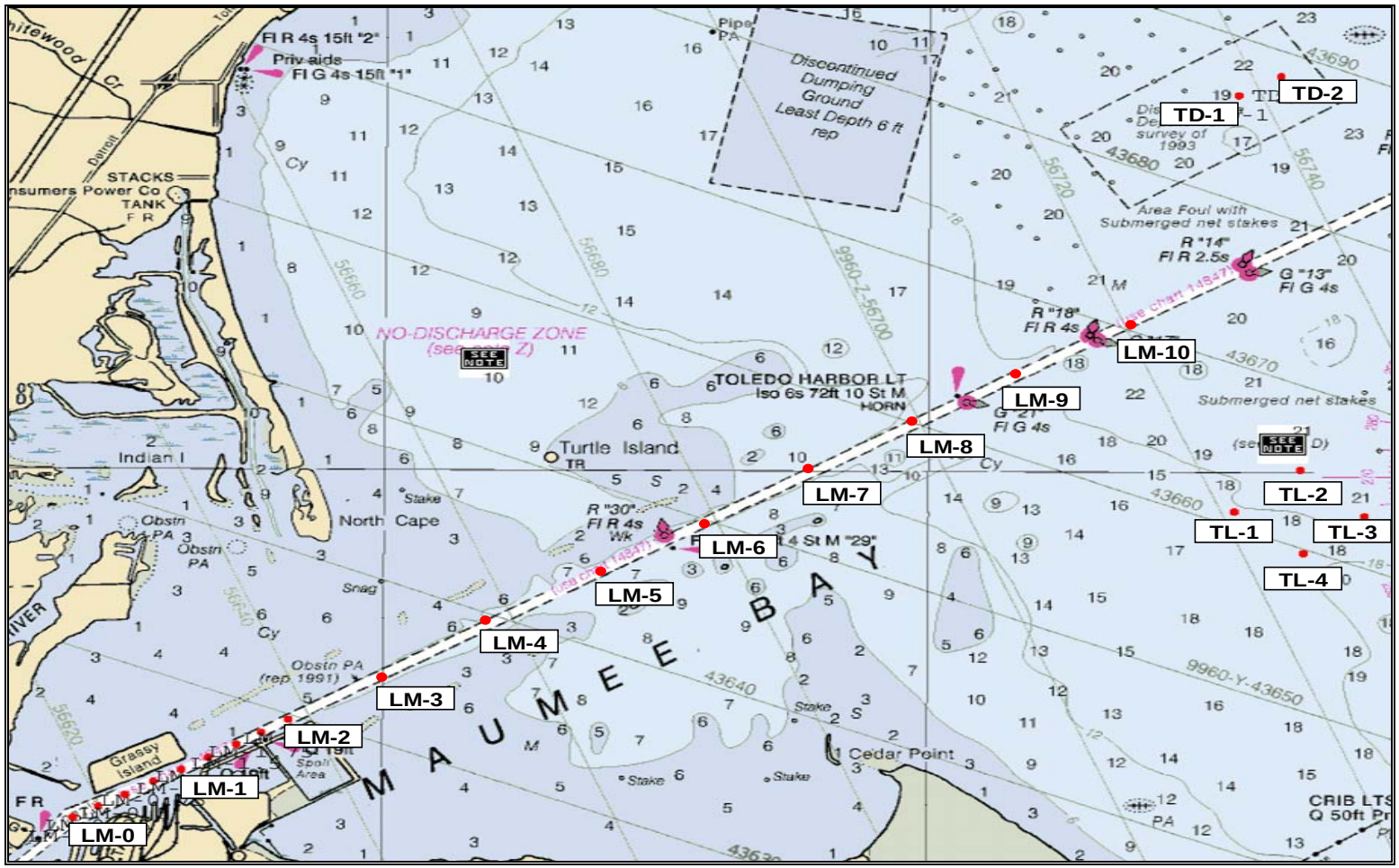

Figure 3: Toledo Harbor 2004 sediment sampling sites in Lake Approach Channel, and open-lake reference and placement areas.

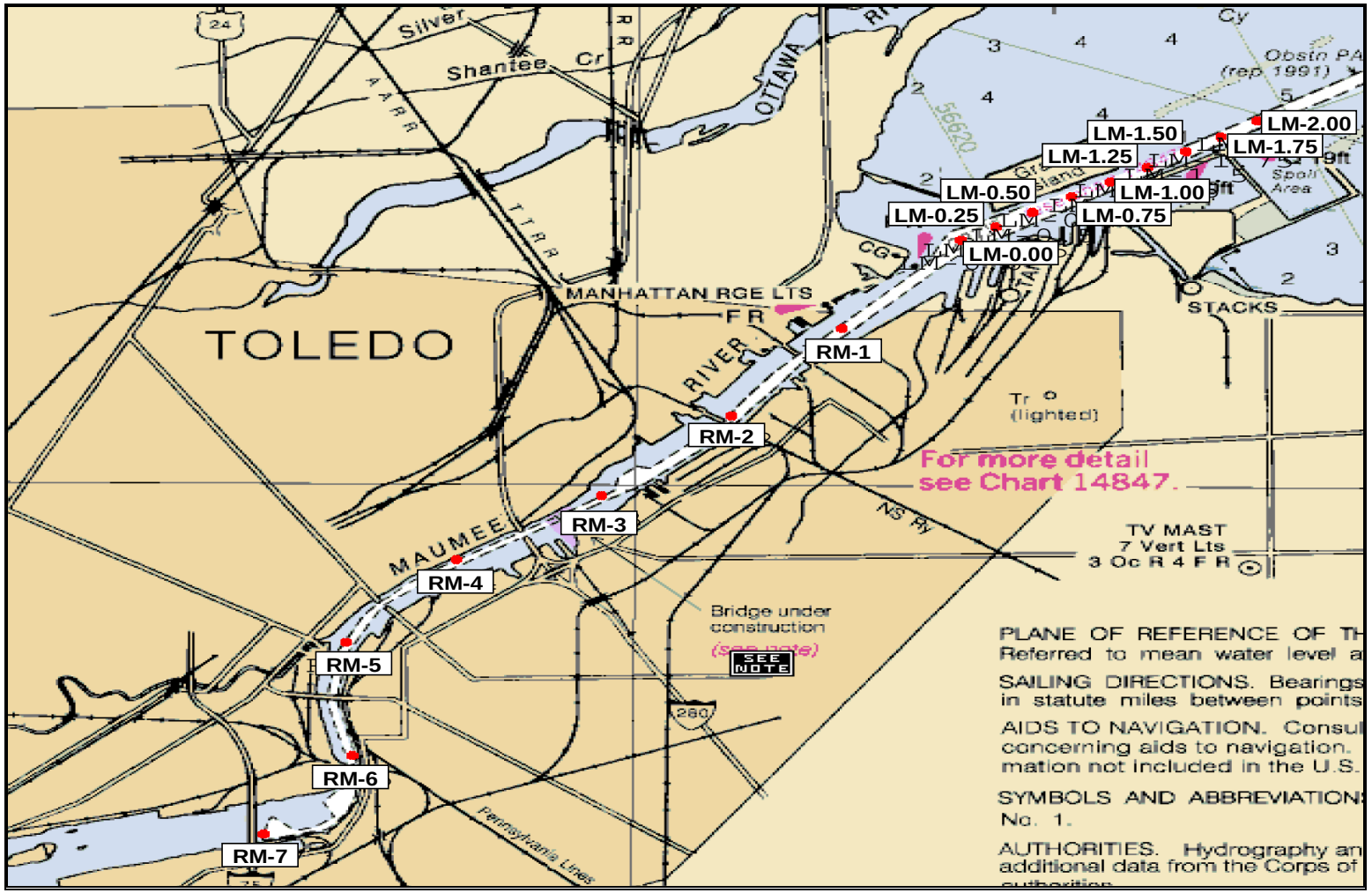

FIGURE 4: Toledo Harbor sediment 2006 sampling sites in Maumee River Channel and Upper Lake Approach Channel.

Table 1. Particle size distribution of Toledo Harbor Lake Approach Channel sediments (from EEI 2004).

	Harbor Sediments										
	Sampling Sites										
Particle Size (%)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10
Gravel	0	0	0	0	0	0	0	0	0	0	0
Sand	2.3	5.6	20.6	1.1	0.7	1.2	4.1	31.8	2.2	18.70	31.2
Silt	43.8	41.3	38.4	53.3	52.6	50.7	46.8	22.5	62	44.6	36.9
Clay	53.9	53.1	41	45.6	46.7	48.1	49.1	45.7	35.8	36.7	31.9

	Open Lake Area Sediments							
	Reference Sites				Placement Sites			
Particle Size (%)	TL-1	TL-2	TL-3	TL-4	TD-1	TD-2	TD-3	TD-4
Gravel	0	0	0	0	0	0	0	0
Sand	18.4	5.9	15.4	62	2	4.3	5.6	1.6
Silt	47	57.6	49.1	14.5	49.9	56.5	59.6	68.8
Clay	34.6	36.5	35.5	23.5	48.1	39.2	34.8	29.6

Table 2 . Particle size distribution of Toledo Harbor Upper Lake Approach Channel and River Channel sediments (from EEI 2006).

	Harbor Sediments																Open Lake Area Sediments					
	Sampling Sites																Reference Sites				Placement Sites	
Particle Size (%)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7	TL-1	TL-2	TL-3	TL-4	TD-1(06)	TD-2(06)
Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand	5.8	13.4	1.4	1.1	2.8	4.1	2.4	2.2	1.2	13.9	8.8	48.5	14.4	3.2	16.4	27.1	27.5	4	41.6	5.4	21.5	2.9
Silt	46	44.4	48	52.1	44.8	54.5	42.6	45.6	55.7	34.7	44.8	21.7	36.1	48.8	43.7	35.4	41.7	61	28.1	70.8	33.9	45.4
Clay	48.2	42.2	50.6	46.8	52.3	41.4	55	52.2	43.1	51.4	46.4	29.8	49.5	48	39.9	37.5	30.8	35	30.3	23.8	44.6	51.7

Table 3. Inorganic Standard Elutriate Test results on Toledo Harbor Lake Approach Channel sediments (from EEI 2004).

	Harbor Sediments										
	Sampling Sites										
Metals (mg/L)	**LM-0**	**LM-1**	**LM-2**	**LM-3**	**LM-4**	**LM-5**	**LM-6**	**LM-7**	**LM-8**	**LM-9**	**LM-10**
Aluminum	31.4	26.1	83.3	3.57	1.72	7.31	36.9	40.5	18.3	24.4	18
Antimony	0.0003U*	0.0003U	0.0004	0.0003U	0.0003U	0.0003U	0.0003U	0.0004	0.0003U	0.0004	0.0004
Arsenic	0.023	0.011	0.023	0.014	0.021	0.021	0.014	0.02	0.01	0.008	0.007
Barium	0.23	0.188	0.552	0.06	0.052	0.07	0.235	0.269	0.143	0.172	0.132
Beryllium	0.001	0.001	0.003	0.0002	0.00008U	0.0003	0.001	0.002	0.001	0.001	0.001
Cadmium	0.001	0.005	0.002	0.0002	0.0001	0.0002	0.001	0.001	0.0004	0.001	0.001
Calcium	45.2	32	31.5	44.1	54.9	35.7	29.6	30.4	27.5	23.1	23
Chromium	0.039	0.033	0.118	0.005	0.002	0.009	0.044	0.053	0.025	0.039	0.031
Cobalt	0.012	0.009	0.027	0.002	0.001	0.003	0.011	0.013	0.006	0.008	0.006
Copper	0.032	0.026	0.083	0.009	0.005	0.011	0.034	0.041	0.022	0.028	0.024
Iron	32.1	24.3	73.6	4.29	2.16	7.8	32.3	38	18.3	21.2	16.6
Lead	0.022	0.019	0.071	0.004	0.002	0.007	0.028	0.035	0.018	0.025	0.022
Magnesium	16.8	12.5	21.2	11.3	15.4	10.1	11.7	12.8	8.9	8.61	7.38
Manganese	1.07	0.731	0.891	1.04	1.41	1	0.723	1.03	0.761	0.406	0.393
Mercury	0.0002	0.0002	0.0003	0.0002	0.0001	0.0003	0.0002	0.0002	0.0002	0.0001	0.0001
Nickel	0.04	0.033	0.101	0.008	0.009	0.014	0.043	0.05	0.025	0.033	0.026
Potassium	10.3	8.52	18.9	4.73	3.79	3.87	9.62	11.2	6.59	7.96	6.45
Selenium	0.002	0.001U	0.002	0.001U	0.002	0.001U	0.001	0.001	0.001U	0.001U	0.001
Silver	0.0002	0.0002	0.001	0.0001	0.00004	0.0001	0.0002	0.0003	0.0002	0.0003	0.0002
Sodium	7.45	7.51	5.19	7.74	7.65	7.26	5.85	5.56	5.49	4.63	4
Thallium	0.001	0.001	0.002	0.0001	0.00005	0.0001	0.001	0.001	0.0003	0.0004	0.0003
Vanadium	0.061	0.047	0.148	0.01	0.006	0.017	0.068	0.082	0.036	0.044	0.033
Zinc	0.144	0.111	0.377	0.019	0.009	0.032	0.154	0.18	0.082	0.117	0.086

Misc (mg/L)	**LM-0**	**LM-1**	**LM-2**	**LM-3**	**LM-4**	**LM-5**	**LM-6**	**LM-7**	**LM-8**	**LM-9**	**LM-10**
Ammonia	10.1	4.33	2.99	6.85	2.96	2.17	1.76	1.58	1.45	0.573	0.765
Cyanide	0.00237J**	0.00279J	0.00227J	0.00227J	0.00601	0.00176J	0.00172U	0.00172U	0.00203J	0.00172U	0.00172U
Phosphorus	0.582	1.72	0.653	0.621	0.485	1.23	1.17	1.05	0.757	0.752	0.669
Oil & Grease	2.26U	1.53U	1.44U	1.83U	1.88U	1.51U	1.53U	1.55U	2.62J	1.46U	1.53U

*Not detected at or above the specified minimum detection limit.

**Estimated value between the minimum detection limit and reporting limit.

Table 4. Polycyclic Aromatic Hydrocarbon (PAH) Standard Elutriate Test results on Toledo Harbor Lake Approach Channel sediments (from EEI 2004).

	Harbor Sediments										
	Sampling Sites										
PAHs (µg/L)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10
1-Methylnaphalene	0.500U*	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
2-Methylnaphthalene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Acenaphthene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Acenaphthylene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Anthracene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Benzo(a)Antracene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Benzo(a)Pyrene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Benzo(b)Flouranthene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Benzo(ghi)Perylene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Benzo(k)Floranthene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Chrysene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Dibenzo(a,h)Anthracene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Fluoranthene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Fluorene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Indeno(1,2,3-cd)Pyrene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Naphthalene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Phenanthrene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U
Pyrene	0.500U	0.500U	0.500U	0.500U	0.590U	0.570U	0.500U	0.500U	0.570U	0.500U	0.500U

*Not detected at or above the specified minimum detection limit.

Table 5. Polychlorinated Biphenyl (PCB) Standard Elutriate Test results on Toledo Harbor Lake Approach Channel sediments (from EEI 2004).

	Harbor Sediments										
	Sampling Sites										
PCBs (µg/L)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10
PCB-1016	0.100U*	0.100U	0.100U	0.100U	0.250U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1221	0.100U	0.100U	0.100U	0.100U	0.417U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1232	0.100U	0.100U	0.100U	0.100U	0.250U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1242	0.100U	0.100U	0.100U	0.100U	0.300U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1248	0.100U	0.100U	0.100U	0.100U	0.250U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1254	0.100U	0.100U	0.100U	0.100U	0.250U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U
PCB-1260	0.100U	0.100U	0.100U	0.100U	0.250U	0.100U	0.100U	0.100U	0.100U	0.100U	0.100U

*Not detected at or above the specified minimum detection limit.

Table 6. Pesticide Standard Elutriate Test results on Toledo Harbor Lake Approach Channel sediments (from EEI 2004).

	Harbor Sediments										
	Sampling Sites										
Pesticides (µg/L)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10
4,4-DDD	0.400U*	0.400U	0.400U	0.400U	0.0400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
4,4-DDE	0.400U	0.400U	0.400U	0.400U	0.0191J**	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
4,4-DDT	0.158J	0.400U	0.400U	0.400U	0.0177J	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Aldrin	0.200U	0.200U	0.200U	0.200U	0.0200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Alpha-BHC	0.200U	0.200U	0.200U	0.200U	0.0200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Beta-BHC	0.200U	0.200U	0.200U	0.200U	0.0200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Delta-BHC	0.200U	0.200U	0.200U	0.200U	0.0200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Chlordane	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U	2.50U
Dieldrin	0.400U	0.400U	0.400U	0.400U	0.4	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Endosulfan I	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Endosulfan II	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Endosulfan Sulfate	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Endrin	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Endrin Aldehyde	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Endrin Ketone	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U	0.400U
Gamma-BHC	0.200U	0.200U	0.200U	0.200U	0.0200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Heptachlor	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Heptachlor Epoxide	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U
Methoxychlor	2.00U	2.00U	2.00U	2.00U	0.200U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U
Toxaphene	10.0U	10.0U	10.0U	10.0U	1.00U	10.0U	10.0U	10.0U	10.0U	10.0U	10.0U

*Not detected at or above the minimum detection limit.

**Estimated value between the minimum detection limit and reporting limit.

Table 7. Inorganic Standard Elutriate Test results on Toledo Harbor Upper Lake Approach and River Channel sediments (from EEI 2006).

	Harbor Sediments															
	Sampling Site															
Metals (µg/L)	**LM-2**	**LM-1.75**	**LM-1.5**	**LM-1.25**	**LM-1.0**	**LM-0.75**	**LM-0.5**	**LM-0.25**	**LM-0**	**RM-1**	**RM-2**	**RM-3**	**RM-4**	**RM-5**	**RM-6**	**RM-7**
Aluminum	20.8J*	65.9J	15.9J	19.6J	26.3J	106J	64.2J	49.6J	79.9J	78.4J	114	68	116	15.8J	93.6	60.6
Antimony	0.880U**	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U	0.880U
Arsenic	8.88J	7.08J	7.44J	18.4J	6.12J	7.12J	4.32J	7.56J	2.8J	3.64J	8.76J	3.2J	6.44J	5.44J	9.88J	5J
Barium	184J	164J	179J	183J	178J	201	682	225	142J	299	470	186J	244	179J	303	194J
Beryllium	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U
Cadmium	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U	0.240U
Calcium	51200	43400	49700	57800	46200	44200	41600	46100	38000	40500	35700	35900	37400	51600	39000	42700
Chromium	0.520U	0.520U	0.520U	0.520U	0.520U	0.520U	0.88J	0.520U	0.520U	0.64J	1.00J	0.520U	0.520U	0.520U	0.76J	0.6J
Cobalt	0.32J	0.200U	0.28J	0.200U	0.200U	0.36J	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.200U	0.76J	0.200U	0.200U
Copper	1.08J	0.960U	0.960U	1.96J	1.6J	0.960U	1.72J	0.960U	7.96J	2.48J	1.64J	0.960U	0.960U	0.960U	5.92J	0.960U
Iron	39.5J	33.6J	17.7J	49.4J	58.7J	48.6J	46.6J	10.7J	86.4J	315J	55.6J	35J	49.6J	38.4J	81.8J	39.9J
Lead	1.56U	1.56U	1.56U	1.56U	2.08J	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U	1.56U
Magnesium	15900	11300	15500	17800	13300	10900	9480	11000	10800	10000	9990	9460	10300	14000	11400	11300
Manganese	1780	848	2070	2260	1630	755	382	800	531	394	453	543	524	1230	782	515
Mercury	0.47	1.7	0.32	0.29	0.24	0.13J	0.11J	0.23	2.5	0.10U	0.68	0.12J	0.27	0.12J	0.11J	0.22
Nickel	3.96J	2.28J	4.48J	5.84J	3.88J	12.5	2.76J	3.6J	2.56J	2.16J	3.76J	1.6J	1.84J	15.4	1.32J	2.28J
Potassium	4560	5110	4790	4500	4530	6890	6730	6010	5400	5980	5110	4990	5400	6860	5360	5320
Selenium	5.48J	3.96J	4.76J	6.8J	4.84J	3.52J	2.6J	4.08J	3.00J	2.28J	3.48J	2.64J	2.68J	5.08J	2.48J	3.24J
Silver	0.6J	0.24	0.16J	0.16U	0.16U	0.28J	0.32J	0.16U	0.16U	0.16U	0.28J	0.16U	0.36J	0.64J	0.16U	0.16U
Sodium	12000	11500	11900	12300	10900	11800	19500	13400	13200	13700	10000	11500	12300	10000	13100	11200
Thallium	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U	2.00U
Vanadium	3.56J	2.84J	3.04J	3.88J	2.36J	2.68J	4.64J	2.88J	2.80J	3.28J	3.48J	2.88J	3.04J	2.12J	2.96J	2.8J
Zinc	41J	50.1J	40.6J	47.5J	187	58.7J	34.5J	49.4J	26.8J	51.2J	30.8J	40J	46.8J	51.4J	46.2J	39.8J

Misc (mg/L)	**LM-2**	**LM-1.75**	**LM-1.5**	**LM-1.25**	**LM-1.0**	**LM-0.75**	**LM-0.5**	**LM-0.25**	**LM-0**	**RM-1**	**RM-2**	**RM-3**	**RM-4**	**RM-5**	**RM-6**	**RM-7**
Cyanide	0.0032	0.0029J	0.0029J	0.0026J	0.0029J	0.0029J	0.0032J	0.0046J	0.0038J	0.0055J	0.0063J	0.0026	0.0026J	0.0026J	0.0026J	0.0026J
Ammonia	1.93	1.93	2.45	3.5	4.55	7	7.35	2.8	1.75	4.55	2.45	2.28	4.55	4.55	4.38	4.38
Phosphorus	0.08	0.11	0.068	0.13	0.055	0.058	0.09	0.09	0.1	0.069	0.064	0.06	0.083	0.036	0.069	0.069
Nitrogen	2.1	4.4	0.28U	2.6	4.7	9.8	8.1	5.3	3.2	7.2	4.2	3.3	6.7	4.9	5.1	5.1
Oil & Grease	1.3	0.85U	0.85U	5	0.85U	0.85U	0.96J	0.85U	0.85U	1.3J	0.85U	1	1.7J	5	5	0.85U

*Estimated value between the minimum detection limit and reporting limit.
**Not detected at or above the specified minimum detection limit.

Table 8. PAH Standard Elutriate Test results on Toledo Harbor Upper Lake Approach and River Channel sediments (from EEI 2006).

	Harbor Sediments															
	Sampling Site															
PAH (µg/L)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7
2-Methylnaphthalene	0.050U*	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U
1-Methylnaphthalene	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.24
Acenaphthene	0.036U	0.036U	0.036U	0.036U	0.036U	0.036U	0.036U	0.036U	0.036U	0.036U	1	0.036U	0.091	0.036U	0.087	0.14
Acenaphthylene	0.035U	0.035U	0.035U	0.035U	0.035U	0.035U	0.035U	0.035U	0.035U	0.035U	0.1	0.035U	0.035U	0.035U	0.035U	0.16
Anthracene	0.064U	0.064U	0.064U	0.064U	0.064U	0.064U	0.064U	0.064U	0.064U	0.064U	0.27	0.064U	0.064U	0.064U	0.064U	0.064U
Benzo(a)Anthracene	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.51	0.031U	0.037	0.031U	0.031U	0.031U
Benzo(a)Pyrene	0.054U	0.054U	0.054U	0.054U	0.054U	0.054U	0.054U	0.054U	0.054U	0.054U	0.25	0.054U	0.054U	0.054U	0.054U	0.054U
Benzo(b)Flouranthene	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.23	0.039U	0.039U	0.039U	0.039U	0.039U
Benzo(ghi)Perylene	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.1	0.044U	0.044U	0.044U	0.044U	0.044U
Benzo(k)Fluoranthene	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.16	0.050U	0.050U	0.050U	0.050U	0.050U
Chrysene	0.030U	0.030U	0.030U	0.030U	0.030U	0.030U	0.030U	0.030U	0.030U	0.030U	0.44	0.030U	0.046	0.030U	0.030U	0.030U
Dibenz(a,h)Anthracene	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.039U	0.046	0.039U	0.039U	0.039U	0.039U	0.039U
Fluoranthene	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	0.044U	1.4	0.044U	0.17	0.044U	0.076	0.044U
Fluorene	0.057U	0.057U	0.057U	0.057U	0.057U	0.057U	0.057U	0.057U	0.057U	0.057U	0.74	0.057U	0.057U	0.057U	0.062	0.062
Indeno(1,2,3-cd)Pyrene	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.078	0.031U	0.031U	0.031U	0.031U	0.031U
Naphthalene	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.086	0.031U	0.031U	0.031U	0.1	0.17
Phenanthrene	0.048U	0.048U	0.048U	0.048U	0.048U	0.048U	0.048U	0.048U	0.048U	0.048U	0.58	0.048U	0.1	0.048U	0.14	0.048U
Pyrene	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	0.031U	1.2	0.031U	0.16	0.031U	0.057	0.031U

*Not detected at or above the specified minimum detection limit.

Table 9. PCB Standard Elutriate Test results on Toledo Harbor Upper Lake Approach and River Channel sediments (from EEI 2006).

	Harbor Sediments															
	Sampling Site															
PCB (µg/L)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7
PCB-1016	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U	0.18U
PCB-1221	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U	0.20U
PCB-1232	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U	0.15U
PCB-1242	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U
PCB-1248	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U	0.21U
PCB-1254	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	2.6	0.17U	0.59	0.17U	0.17U	0.17U
PCB-1260	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U	0.17U

*Not detected at or above the minimum detection limit.

Table 10. Pesticide Standard Elutriate Test results on Toledo Harbor Upper Lake Approach and River Channel sediments (from EEI 2006).

	Harbor Sediments															
	Sampling Site															
Pesticide (µg/L)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7
4,4-DDD	0.00370U*	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U	0.00370U
4,4-DDE	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U	0.00350U
4,4-DDT	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U	0.00490U
Aldrin	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U	0.00260U
Alpha-BHC	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U	0.0101U
Beta-BHC	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U	0.00230U
Delta-BHC	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U	0.00200U
Chlordane	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U	0.00180U
Dieldrin	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U	0.00430U
Endosulfan I	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U	0.00240U
Endosulfan II	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U
Endosulfan Sulfate	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U	0.00700U
Endrin	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U	0.00460U
Endrin Aldehyde	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U	0.00860U
Endrin Ketone	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U	0.00450U
Gamma-BHC	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U	0.00160U
Heptachlor	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U	0.00290U
Heptachlor Epoxide	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U	0.00280U
Methoxychlor	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U	0.0288U
Toxaphene	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U	0.423U

*Not detected at or above the specified minimum detection limit.

Table 11. Bulk inorganic analyses on Toledo Harbor Lake Approach Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2004).

	Harbor Sediments											Open Lake Area Sediments							
	Sampling Sites											Reference Sites				Placement Sites			
Metals (mg/kg)	**LM-0**	**LM-1**	**LM-2**	**LM-3**	**LM-4**	**LM-5**	**LM-6**	**LM-7**	**LM-8**	**LM-9**	**LM-10**	**TL-1**	**TL-2**	**TL-3**	**TL-4**	**TD-1**	**TD-2**	**TD-3**	**TD-4**
Aluminum	**23800**	15300	16400	**25300**	**23800**	**27800**	22800	15300	21400	14800	16600	2230	7980	12200	8170	17200	23200	20500	18500
Antimony	<0.135*	<0.134	<0.103	<0.15	**<0.154**	<0.141	<0.127	<0.098	<0.134	<0.109	<0.11	<0.097	<0.124	<0.098	<0.089	<0.142	<0.126	<0.128	<0.134
Arsenic	**7.67**	4.92	5.93	**7.4**	**7.62**	**8.28**	6.7	4.97	**7.28**	5.24	6.86	0.951	2.87	6.04	2.63	6.14	7.15	6.22	5.91
Barium	**132**	84.5	106	**129**	**130**	**144**	116	77.1	111	76.5	81.6	12.2	44.2	74.1	80.9	99	121	113	95.7
Beryllium	**0.984**	0.646	0.672	**1.05**	**0.998**	**1.12**	0.881	0.656	**0.952**	0.68	0.767	0.118	0.372	0.6	0.367	0.858	0.925	0.85	0.854
Cadmium	1.09	0.796	1.62	1.07	1.23	1.21	1.1	0.798	1.27	1.31	1.54	0.271	0.825	2.01	0.711	1.85	1.21	1.14	1.73
Calcium	29400	18300	27700	**31400**	**32000**	**31300**	25600	26400	26000	25100	27400	3180	13800	29500	18100	18900	29800	27800	24700
Chromium	30.4	21.6	27	31.2	33.3	36.3	30.2	22.2	33.8	28	32	5.06	18.8	32.1	15.2	45.2	29.7	27.3	36.5
Cobalt	**10.4**	6.51	7.45	**10.5**	**10.4**	**11.3**	9.47	7.08	**10.2**	7.77	8.43	0.943	4.49	7.38	3.93	9.69	9.71	9.1	9.28
Copper	30.1	19.1	27	29.8	31.1	32.8	27.8	19.9	30.9	26.4	30.3	4.35	15.5	30.5	11.1	36.8	28.9	27	33.7
Iron	**30900**	19600	21200	**31100**	**30800**	**34200**	28000	20500	**29400**	22100	25100	2570	12500	21000	11700	26100	28200	26000	26300
Lead	21.5	15.5	23.2	21.4	24.3	26.3	21.5	16.1	27	25.2	31.2	4.59	17.5	34	12	40.7	22.5	20.4	33
Magnesium	9830	6580	8600	**11200**	**12300**	**12700**	10400	8660	10900	10300	11000	1120	6800	8980	3850	11700	11300	9840	11700
Manganese	**471**	326	349	**514**	**554**	**563**	425	374	**519**	384	**462**	50.3	246	371	157	446	442	418	407
Mercury	0.087	0.106	0.121	0.108	0.131	0.133	0.109	0.115	0.188	0.259	0.306	0.235	0.339	0.306	0.117	0.385	0.096	0.1	0.308
Nickel	32.6	21.7	27.7	33.3	34.4	37.8	31	23.5	34.6	27.6	30.7	3.78	16.7	27.7	14.9	38.5	31.5	29	34.7
Potassium	**4360**	3090	2760	**4800**	**4780**	**5200**	**4350**	3050	4110	2870	3140	564	1670	2470	1750	4030	4240	3770	3560
Selenium	0.466	0.561	<0.267	<0.389	0.615	<0.367	0.604	<0.254	<0.349	<0.284	0.771	<0.252	0.451	0.703	<0.231	0.589	1.72	0.395	0.378
Silver	0.289	0.187	0.354	0.25	0.246	0.272	0.232	0.181	0.31	0.3	0.356	0.063	0.201	0.371	0.122	0.518	0.258	0.22	0.375
Sodium	183	149	134	189	209	200	160	129	155	121	121	43.8	98.4	131	863	178	129	124	129
Thallium	**0.552**	0.385	0.404	**0.554**	**0.543**	0.6	0.505	0.343	0.481	0.346	0.378	0.147	0.366	0.409	0.201	0.441	0.523	0.482	0.438
Vanadium	**45.2**	31	30.4	**47.3**	**48.4**	**53.3**	44.2	29.7	41.5	29	31.2	4.16	17.9	26.8	18.3	37.8	44.6	40.5	36.5
Zinc	119	79.8	100	119	118	133	112	75.7	120	102	114	14.9	62.9	106	50.8	151	113	105	131

Misc (mg/kg)	**LM-0**	**LM-1**	**LM-2**	**LM-3**	**LM-4**	**LM-5**	**LM-6**	**LM-7**	**LM-8**	**LM-9**	**LM-10**	**TL-1**	**TL-2**	**TL-3**	**TL-4**	**TD-1**	**TD-2**	**TD-3**	**TD-4**
TOC	26800	28400	33900	35500	35100	33300	30000	34500	30100	33400	38900	28500	27800	30300	20200	22300	25300	27300	21000
Cyanide	0.566	0.352	0.25	0.95	0.31	0.354	<(-0.724)	0.284	0.433	0.16	0.18	0.213	0.268	1.12	0.215	0.252	0.324	0.275	0.661
Ammonia	**422**	**210**	183	**244**	**203**	175	142	108	175	70.5	69.4	116	74.3	124	69.8	108	176	196	112
Phosphorus	497	581	593	**949**	552	546	444	383	599	328	458	571	580	585	457	836	691	639	619
Nitrogen	**2920**	2670	1870	**3230**	2830	2830	2120	1320	2740	1540	1820	1670	2330	1770	1270	2880	2280	2430	2360
Oil & Grease	1220	1060	938	559	530	<321	878	880	815	717	974	1010	636	1030	417	1790	916	1630	1290

*Not detected at or above the specified minimum detection limit.

Table 12. Bulk inorganic analyses on Toledo Harbor Upper Lake Approach Channel and River Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2006).

	Harbor Sediments																Open Lake Area Sediments					
	Sampling Sites																Reference Sites				Placement Sites	
Metals (mg/kg)	**LM-2**	**LM-1.75**	**LM-1.5**	**LM-1.25**	**LM-1.0**	**LM-0.75**	**LM-0.5**	**LM-0.25**	**LM-0**	**RM-1**	**RM-2**	**RM-3**	**RM-4**	**RM-5**	**RM-6**	**RM-7**	**TL-1**	**TL-2**	**TL-3**	**TL-4**	**TD-1(06)**	**TD-2(06)**
Aluminum	**19400**	15600	**22400**	**18300**	**17700**	15500	**18500**	**18600**	**19000**	11800	17500	**22400**	**18000**	**18000**	**18200**	**23200**	9410	13000	10900	12800	14800	17700
Antimony	**<1.15***	<0.686	**<1.29**	**<0.971**	<0.745	**<0.992**	<0.714	**<0.826**	**<0.871**	<0.600	**<0.873**	<0.705	<0.562	**<72.5**	<0.776	**<0.837**	<0.391	<0.699	<0.455	<0.626	<0.798	<0.509
Arsenic	**10.4**	6.88	**10.8**	**9.07**	**8.12**	6.53	6.43	5.77	**7.88**	4.29	**10.6**	**10.8**	**9.04**	**7.62**	**7.23**	**14**	6.44	6.98	3.92	4.95	5.64	7.11
Barium	**149**	118	**162**	**139**	**141**	**167**	**142**	**146**	**153**	96.5	**169**	**163**	**147**	**140**	**144**	**171**	81.3	97.8	82.4	100	107	123
Beryllium	**1.07J****	0.87	**1.19J**	**1.04J**	**1.02**	0.943J	**1.11**	**1.05**	**1.08**	0.703J	**1.06**	**1.22**	**1.01**	0.995	0.984	**1.31**	0.639	0.87	0.689	0.824	0.817J	1
Cadmium	0.168J	0.268J	<0.188	0.166J	<0.109	<0.145	<0.105	<0.121	<0.127	<0.0879	**2.71**	0.275J	**1.49**	0.159J	0.114J	0.367J	1.14	0.665J	0.278J	0.458J	0.681J	0.546J
Calcium	43000	35900	36200	33000	35300	**51400**	36000	39100	**44000**	26400	38900	**81400**	39900	**46200**	**43700**	**69900**	39900	30100	38300	28700	43100	31800
Chromium	32.7	26.3	37.4	31.7	28.1	24.2	28.5	29.5	31.1	21	**83.8**	38	38.5	27	27.4	**42.2**	30.8	36.6	27.5	33.1	39	36.5
Cobalt	**12.9**	10.1	**14.4**	**12.2**	10.1	9.26	11	10	10.4	6.85	9.8	**15.1**	11.2	10.7	10.9	**15.7**	7.13	8.99	7	8.26	10.6	11.9
Copper	**56.3**	43.9	**57.2**	49.2	46.6	49.7	47.1	48.1	**51.1**	32.7	**84.6**	**77.9**	**57.9**	47.9	46.9	**60.7**	49.7	50	34.3	45	46.5	49.8
Iron	**31600**	25300	**35200**	**30300**	**30200**	27100	**30100**	**30600**	**31800**	19900	**33700**	**36400**	28300	27400	28000	**37100**	25300	27700	21500	25600	25400	29400
Lead	21.7	15.8	21.9	20.3	19.1	17.5	16.7	19.4	21.2	13.4	**61.6**	26.8	**47.3**	17.4	15.4	21.5	30.7	33.7	22.7	30.3	28.7	25.3
Magnesium	11800	10600	12100	10500	10300	11700	10500	9950	10700	7350	9790	**22600**	10700	10200	10300	**19000**	11700	14400	7980	12900	11000	12400
Manganese	**834**	487	**913**	**795**	**671**	567	510	546	**614**	320	570	**790**	527	523	493	**629**	436	562	365	493	523	584
Mercury	0.081J	0.068J	0.044J	0.079J	0.057J	0.065J	0.076J	0.095J	0.088J	0.11J	**0.4**	0.049J	0.12J	0.066J	0.046J	0.049J	0.21	0.36	0.21J	0.32	0.22J	0.17J
Nickel	37.2	29.9	**41.9**	36.6	36.6	**38**	35.2	36.3	**37.8**	23.1	**49.1**	**40.9**	36.7	30.6	30.7	**41.5**	25.6	37.7	29.8	35.3	36.5	37.7
Potassium	**3640**	2770	**4190**	**3200**	**3080**	2880	**3210**	**3270**	**3440**	2110	2940	**4060**	**3050**	**3340**	**3330**	**4240**	1600	2270	1920	2180	2730	2980
Selenium	**<1.63**	<0.97	**<1.82**	**<1.37**	<1.05	**<1.40**	<1.01	**<1.17**	**<1.23**	<0.849	**<1.24**	<0.997	<0.794	<1.03	<1.1	**<1.18**	<0.553	<0.987	<0.644	<0.885	<1.13	<0.719
Silver	<0.28	<0.167	<0.314	<0.237	0.182J	0.266J	0.348J	<0.202	0.225J	0.293J	**1.77**	<0.172	**0.562**	<0.177	<0.189	0.265J	0.419J	0.478J	0.244J	0.336J	0.214J	0.26J
Sodium	**<102**	<60.9	**<114**	<86.2	<66.1	<88.1	<63.4	<73.4	<77.3	<53.3	<77.4	<62.6	<49.9	<64.4	<68.9	<74.3	<24.7	<62.1	<40.4	<55.6	90.3J	<45.1
Thallium	1.35J	1.14J	1.51J	1.02J	**3.27J**	**3.24J**	**2.96J**	**3.95J**	**3.95J**	1.52J	**3.58J**	2.58J	1.68J	1.54J	2.22J	**3.37J**	2.75	2.47J	2.82	2.92J	0.992J	1.66
Vanadium	**39.2**	31.4	**43.9**	**35.3**	33.3	31.4	33.1	33.9	**35.3**	21.4	33.7	**42.9**	33.8	34	33.9	**45.9**	22	28	23.3	27.1	29.7	34.6
Zinc	147	120	**160**	138	130	**148**	131	136	144	97.5	**245**	**169**	**171**	133	128	**171**	116	139	105	126	148	147

Misc (mg/kg)	**LM-2**	**LM-1.75**	**LM-1.5**	**LM-1.25**	**LM-1.0**	**LM-0.75**	**LM-0.5**	**LM-0.25**	**LM-0**	**RM-1**	**RM-2**	**RM-3**	**RM-4**	**RM-5**	**RM-6**	**RM-7**	**TL-1**	**TL-2**	**TL-3**	**TL-4**	**TD-1**	**TD-2**
TOC	**67000**	**46000**	**61000**	**69000**	**71000**	**62000**	**52000**	**68000**	**69000**	**54000**	**77000**	17000	**46000**	**62000**	**41000**	29000	25000	14000	26000	34000	34000	36000
Cyanide	0.07U	0.06U	**0.076J**	**0.090J**	0.068J	**0.08U**	0.06U	**0.072J**	0.08U	0.06U	**0.65**	0.04U	0.05U	0.06U	**0.07J**	0.05U	0.05U	0.07U	0.06U	0.06J	0.07U	0.13J
Ammonia	52	57	27	53	**340**	65	**460**	**300**	76	**360**	55	43	56	37	16	49	90	63	87	93	22	24
Phosphorus	**780**	574	**762**	**732**	**713**	**728**	**659**	**670**	**826**	**724**	**638**	479	**1010**	**701**	600	497	453	603	537	606	577	556
Nitrogen	**1300**	750	760	**1300**	930	**1100**	600	**1100**	890	**1200**	1000	840	770	**1400**	520	730	350	310	850	1100	1600	780
Oil & Grease	**709**	308	<232	528	<212	435	420	<200	509	261	**1140**	<133	489	569	250	49	598	319	229	<160	<171	<160

*Not detected at or above the specified minimum detection limit.
**Estimated value between the minimum detection limit and reporting limit.

Table 13. Bulk Polychlorinated Biphenyl (PCB) analyses on Toledo Harbor Lake Approach Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2004).

	Harbor Sediments											Open Lake Area Sediments							
	Sampling Sites											Reference Sites				Placement Sites			
PCBs (µg/kg)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10	TL-1	TL-2	TL-3	TL-4	TD-1	TD-2	TD-3	TD-4
PCB-1016	<8.69*	**<27.3**	<2.13	<3.01	<3.12	<6.94	<8.15	<2.01	2.76	<2.19	<2.21	<6.5	<2.49	<6.6	<6.2	<9.7	<8.6	<8.3	<8.4
PCB-1221	**<24.5**	**<76.9**	<6	<8.49	<8.79	**<19.6**	**<23**	<5.66	7.78	<6.17	<6.24	<6.5	<7.02	<6.6	<6.2	<9.7	<8.6	<8.3	<8.4
PCB-1232	**<14.5**	**<45.4**	<3.54	<5.02	<5.2	**<11.6**	**<13.6**	<3.34	<4.6	<3.65	<3.69	<6.5	<4.15	<6.6	<6.2	<9.7	<8.6	<8.3	<8.4
PCB-1242	<14.5	<45.4	7.8	14.2	18.3	**143**	<13.6	13	14.4	14.9	34.1	43	49.9	61	14	35	24	30	24
PCB-1248	<8.69	**<27.3**	<2.13	<3.01	<3.12	<6.94	<8.15	<2.01	<2.76	<2.19	<2.21	<6.5	<2.49	<6.6	<6.2	<9.7	<8.6	<8.3	<8.4
PCB-1254	17.8	**182**	3.8	5.2	5.8	31.4	<4.07	4.8	5.4	7	13.6	65	26.7	77	11	26	8.8	25	10
PCB-1260	<8.69	**40.6**	<2.13	<3.01	<3.12	<6.94	<8.15	<2.01	<2.76	2.5	5.5	19	11.3	16	6.7	15	6.7	15	4.2
TOTAL PCBs	17.8	**223**	11.6	19.4	24.1	**174**	ND	17.8	30.3	24.4	53.2	127	87.9	154	31.7	76	39.5	70	38.2

*Not detected at or above the specified minimum detection limit.

Table 14. Bulk Polychlorinated Biphenyl (PCBs) analyses on Toledo Harbor Upper Lake Approach Channel and River Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placemenent area (from EEI 2006).

	Harbor Sediments																Open Lake Area Sediments					
	Sampling Sites																Reference Sites				Placement Sites	
PCBs (µg/kg)	**LM-2**	**LM-1.75**	**LM-1.5**	**LM-1.25**	**LM-1.0**	**LM-0.75**	**LM-0.5**	**LM-0.25**	**LM-0**	**RM-1**	**RM-2**	**RM-3**	**RM-4**	**RM-5**	**RM-6**	**RM-7**	**TL-1**	**TL-2**	**TL-3**	**TL-4**	**TD-1(06)**	**TD-2(06)**
PCB-1016	**<11***	**<8.9**	**<12**	**<11**	**<11**	**<9.3**	**<9.1**	**<10**	**<11**	**<9.6**	**<9.8**	<6.9	<8.3	**<9.8**	**<9.3**	<7.6	<6.3	<8.1	<7.9	<8.4	<8.9	<8.3
PCB-1221	**<10**	**<8.2**	**<11**	**<10**	**<10**	**<8.6**	**<8.4**	**<9.6**	**<10**	**<8.9**	**<9.1**	<6.4	<7.7	**<9.1**	**<8.6**	<7.1	<5.9	<7.5	<7.3	<7.7	<8.2	<7.7
PCB-1232	**<10**	**<8**	**<11**	**<9.9**	**<9.9**	**<8.4**	**<8.2**	**<9.3**	**<10**	**<8.6**	**<8.8**	<6.2	<7.5	**<8.8**	**<8.4**	<6.9	<5.7	<7.3	<7.1	<7.5	<8	<7.5
PCB-1242	**<11**	**<8.8**	**<12**	**<11**	**<11**	**<9.2**	**<9**	**<10**	**<11**	**<9.4**	**<9.7**	<6.8	<8.2	**<9.7**	**<9.2**	<7.5	<6.2	<8	<7.8	<8.2	<8.8	<8.2
PCB-1248	**<11**	**<8.4**	**<11**	**<10**	**<10**	**<8.8**	**<8.6**	**<9.8**	**<11**	**<9**	**<9.3**	<6.5	<7.8	**<9.2**	**<8.8**	<7.2	<6	<7.6	<7.5	<7.8	<8.4	<7.8
PCB-1254	**<11**	**<9**	**<12**	**<11**	**<11**	**<9.5**	**<9.2**	**<11**	**<11**	**<9.7**	**<10**	<7	<8.4	**<10**	**<9.5**	<7.7	<6.4	<8.2	<8	<8.4	<9	<8.4
PCB-1260	**<13**	**<10**	**<14**	**<12**	**<12**	**<11**	**<10**	**<12**	**<13**	**<11**	**<11**	<7.8	<9.4	**<11**	**<11**	<8.6	<7.1	<9.2	<9	<9.4	<10	<9.4
TOTAL PCBs	77	61.3	83	74.9	74.9	64.8	62.5	71.7	77	66.2	67.7	47.6	57.3	67.6	64.8	52.6	43.6	55.9	54.6	57.4	61.3	57.3

*Not detected at or above the specified minimum detection limit.

Table 15. Bulk Polycyclic Aromatic Hydrocarbon (PAH) analyses on Toledo Harbor Lake Approach Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2004).

	Harbor Sediments											Open Lake Area Sediments							
	Sampling Sites											Reference Sites				Placement Sites			
PAHs (µg/kg)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10	TL-1	TL-2	TL-3	TL-4	TD-1	TD-2	TD-3	TD-4
2-Methylnaphthalene	<4.18*	<4.16	<3.24	**<4.59**	**<4.76**	<4.33	<3.91	<3.06	<4.21	<3.34	<3.37	<3.03	<3.8	<3.06	<2.77	<4.34	<3.99	<3.94	<4.12
1-Methylnaphthalene	60.1	50.1	<3.68	37	**66.9**	57.7	58.3	<3.47	46.3	**72.8**	54.7	<3.43	66.7	<3.47	20.4	47.2	44.2	36.3	44.5
Acenaphthene	<18.7	<18.6	<14.5	<20.5	<21.2	<19.3	<17.5	<13.7	<18.8	<14.9	<15.1	23.6	<17	39.3	<12.4	<19.4	<17.8	<17.6	<18.4
Acenaphthylene	**27.7**	<2.07	<1.61	<2.29	<2.37	<2.16	<1.95	<1.52	**7.01**	<1.66	<1.68	<1.51	3.58	<1.52	<1.38	<2.16	<1.99	14.2	4.15
Anthracene	26.7	21.6	51	<12.8	25.1	22.1	19	11.1	22.6	33.2	20.7	73.5	29	142	<7.73	20.4	45.1	20.2	24.3
Benz(a)Antracene	114	97.7	161	72.3	120	129	122	54.6	97.6	139	96.5	245	126	355	30.1	87.8	124	117	89.1
Benzo(a)Pyrene	116	85.6	161	74.8	100	106	104	53.9	104	127	107	207	149	330	33.3	120	125	110	102
Benzo(b)Flouranthene	162	114	186	106	144	142	137	69.5	120	152	109	285	155	391	38.6	136	170	138	117
Benzo(ghi)Perylene	97.4	72.7	103	70	98.7	87.7	83.7	43.7	67.9	81.3	66.1	128	80.7	194	27	79	86.4	75	69.3
Benzo(k)Floranthene	<1.8	<1.79	<1.4	**<1.98**	**<2.05**	**<1.87**	<1.69	<1.32	<1.81	<1.44	<1.45	<1.3	<1.64	<1.32	<1.2	<1.87	<1.72	<1.7	<1.78
Chrysene	125	97.4	136	67.8	101	114	113	48.5	90.1	107	79.6	191	90.7	288	25.4	77.2	120	112	70.3
Dibenz(a,h)Anthracene	11.1	8.58	31.4	14.2	<3.34	9.45	<2.74	9.66	20	20.2	15.2	39.6	21.4	59.2	5.93	3.04	11.1	32.1	<2.89
Fluoranthene	243	167	265	165	206	198	191	94.1	146	187	120	313	165	510	43.1	147	257	193	143
Fluorene	31.1	<17.2	<13.5	<19.1	<19.7	<18	<16.2	<12.7	<17.5	<13.9	<14	<12.6	<15.8	134	<11.5	<18	<16.5	<16.4	<17.1
Indeno(1,2,3-cd)Pyrene	<2.47	<2.45	<1.91	**<2.71**	**<2.81**	**<2.56**	<2.31	<1.81	<2.48	<1.97	<1.99	<1.79	<2.24	<1.8	<1.64	<2.56	<2.35	<2.33	<2.43
Naphthalene	38.3	38.6	<1.93	<2.73	<2.82	<2.57	<2.32	<1.82	<2.5	28.9	<2	173	<2.26	173	<1.64	28.8	<2.37	<2.34	24.7
Phenanthrene	128	94.7	186	76.9	90.8	91.9	88.8	49.6	75.6	103	68.8	174	85.7	409	21.4	70.9	125	94.7	72.3
Pyrene	226	190	377	159	194	198	198	117	173	241	163	447	197	665	55.1	175	246	197	171
Total PAHs	1433.6	1084.3	1699.2	909.7	1205.6	1206.6	1163.4	591.06	1017.4	1329.6	940.19	2323.4	1212.5	3700.7	340.59	1040.7	1400.5	1183.8	978.37

*Not detected at or above the specified minimum detection limit.

Table 16. Bulk Polycyclic Aromatic Hydrocarbon (PAH) analyses on Toledo Harbor Upper Lake Approach Channel and River Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2006).

	Harbor Sediments																Open Lake Area Sediments					
	Sampling Sites																Reference Sites				Placement Sites	
PAHs (µg/kg)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7	TL-1	TL-2	TL-3	TL-4	TD-1(06)	TD-2(06)
2-Methylnaphthalene	3.8J*	3.1J	<2.8**	<2.6	7.7J	2.5J	<2.1	2.6J	4.2J	<2.3	**46**	<1.6	<2	<2.3	**6.2J**	<1.8	5.9J	2.1J	<1.9	2.1J	<2.1	<2
1-Methylnaphthalene	7.4J	6.1J	3.6J	3.3J	17J	4.3J	<2.1	4.7J	8.6J	<2.3	**120**	<1.6	2.1J	2.4J	13J	<1.8	15	4J	1.9J	3.9J	<2.1	<2
Acenaphthene	<2.4	2.9J	<2.6	<2.4	<2.4	3.1J	<2	<2.2	3.2J	<2.1	**340**	<1.5	5J	<2.1	**13J**	<1.6	8.8J	<1.7	<1.7	<1.8	<1.9	<1.8
Acenaphthylene	3J	4J	<2.6	<2.4	3.9J	3.4J	<2	<2.2	5.2J	2.4J	**190**	<1.5	2.6J	<2.1	4.6J	<1.6	27	5.4J	<1.7	4J	2.6J	<1.8
Anthracene	5.1J	6.2J	<4	<3.6	3.9J	14J	<3	<3.4	5.8J	<3.2	**500**	<2.3	4.7J	<3.2	13J	<2.5	25	4.1J	<2.6	3J	<2.9	<2.7
Benz(a)Antracene	11J	19	<3.6	7.1J	12J	20	5.5J	6.4J	16J	6.2J	**700**	<2	9.9J	10J	34	2.4J	72	13J	3.5J	9.2J	4.6J	2.5J
Benzo(a)Pyrene	11J	17	<6.3	6.6J	13J	18	6.4J	6.7J	16J	5.7J	**550**	<3.6	8.2J	11J	19	<4	63	14J	<4.1	9.8J	5.3J	<4.3
Benzo(b)Flouranthene	9J	15J	<6.1	5.7J	13J	17	6.8J	6.8J	15J	5.2J	**400**	<3.5	7.6J	10J	20	<3.8	42	10J	<4	7.7J	<4.5	<4.2
Benzo(ghi)Perylene	7.7J	12J	<3.4	5.1J	11J	13J	5.8J	6.2J	12J	3.8J	**280**	<1.9	5.6J	9.2J	11J	<2.1	38	8.9J	3.2J	6.8J	4.1J	<2.3
Benzo(k)Floranthene	9.1J	15J	<5.7	6.3J	12J	17	5.5J	6.5J	11J	5.4J	**440**	<3.3	7.7J	11J	19	<3.6	46	12J	<3.7	8J	4.6J	<3.9
Chrysene	14J	24	<5.7	8.2J	20	31	8.7J	9.9J	20J	8.7J	**730**	<3.3	11J	14J	40	<3.6	80	16	5.3J	11J	6.1J	<3.9
Dibenz(a,h)Anthracene	3.4J	4.6J	<3	<2.7	4.2J	4.9J	2.4J	<2.5	5.3	<2.3	**120**	<1.7	2.3J	3.5J	4.4J	<1.9	19	3.7J	<1.9	2.9J	<2.2	<2
Fluoranthene	29	35	9.7J	13J	32	49	16J	20	39	19	**1400**	7.7J	31	30	88	8.2J	96	25	7.8J	15	9J	6.5J
Fluorene	<4.1	6J	<4.3	<3.9	<3.9	5.6J	<3.3	<3.7	5.8J	<3.4	**590**	<2.5	5.5J	<3.5	17J	<2.7	24	3.1J	<2.9	<3	<3.2	<3
Indeno(1,2,3-cd)Pyrene	7.3J	11J	<3	5J	10J	12J	4.7J	5.3J	11J	3.7J	**290**	<1.7	5.3J	8.8J	11J	1.9J	37	8.6J	2.7J	6.5	3.7J	<2
Naphthalene	20J	11J	3.7J	4J	15J	9.4J	5.4J	8.2J	13J	7.3J	**500**	<1.7	3.5J	2.9J	15J	<1.9	77	18J	3.6J	14J	3.9J	2.8J
Phenanthrene	15J	20	4.7J	5.1J	12J	25	6.4J	9.2J	19J	8.7J	**1400**	4.2J	15	12J	**67**	3.3J	38	9.8J	3.5J	6.7J	3.9J	3.3J
Pyrene	24	27	7.9J	10J	26	35	11J	15J	31	13J	**1000**	5.4J	21	21	53	5.4J	90	20	6.9J	13J	7.2J	4.7J
Total PAHs	186.3	238.9	82.7	97	219	284.2	99.1	121.5	241.1	104.7	**9596**	51	150	159	448.2	54.1	803.7	179.4	62.9	128.4	73.9	55.7

*Estimated value between the minimum detection limit and reporting limit
**Not detected at or above the specified minimum detection limit

Table 17. Bulk pesticide analyses on Toledo Harbor Lake Approach Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2004).

	Harbor Sediments											Open Lake Area Sediments							
	Sampling Sites											Reference Sites				Placement Sites			
Pesticides (µg/kg)	LM-0	LM-1	LM-2	LM-3	LM-4	LM-5	LM-6	LM-7	LM-8	LM-9	LM-10	TL-1	TL-2	TL-3	TL-4	TD-1	TD-2	TD-3	TD-4
4,4-DDD	<5.76*	<2.86	<2.23	<6.33	<3.27	<2.98	<2.69	<2.11	<5.79	<2.3	<2.32	<8.33	<5.23	<4.21	<3.82	<5.97	<5.49	<5.43	<5.68
4,4-DDE	<4.94	<2.45	7.55	<5.42	<2.81	<2.56	<2.31	<1.81	<4.97	<1.97	<1.99	35.5	<4.48	14.8	<3.27	<5.12	<4.71	<4.66	<4.87
4,4-DDT	<10.4	<5.18	<4.04	<11.4	<5.92	<5.4	14.2	<3.81	<10.5	<4.16	<4.2	<15.1	<9.46	<7.62	<6.91	<10.8	<9.94	<9.83	<10.3
Aldrin	<4.71	<2.34	<1.83	<5.17	<2.68	<2.44	<2.2	<1.72	<4.74	<1.88	<1.9	<6.81	<4.27	<3.44	<3.12	<4.88	<4.49	<4.44	<4.64
Alpha-BHC	<3.17	<1.57	<1.23	<3.48	<1.8	<1.64	<1.48	<1.16	<3.19	<1.26	<1.28	<4.58	<2.88	<2.32	<2.1	<3.28	<3.02	<2.99	<3.12
Beta-BHC	<2.6	<1.29	<1.01	<2.86	<1.48	<1.35	<1.22	<0.951	<2.62	<1.04	<1.05	<3.76	<2.36	<1.9	<1.72	<2.7	<2.48	<2.45	<2.56
Chlordane	182	<90.6	<70.7	<200	<104	<94.5	<85.3	<66.7	<183	<72.8	<73.5	<264	<166	<133	<121	<189	<174	<172	<180
Delta-BHC	<2.9	<1.29	<1.01	<2.89	<1.48	<1.35	<1.22	<0.954	<2.65	<1.04	<1.05	<3.79	<2.39	<1.9	<1.72	<2.7	<2.48	<2.45	<2.56
Dieldrin	<4.71	<2.34	<1.83	<5.17	<2.68	<2.44	<2.2	<1.72	<4.74	<1.88	<1.9	<6.81	<4.27	<3.44	<3.12	<4.88	<4.49	<4.44	<4.64
Endosulfan 1	<2.2	<1.09	<0.853	<2.41	<1.25	<1.14	<1.03	<0.804	<2.21	<0.878	<0.887	<3.18	<2	<1.61	<1.46	<2.28	<2.1	<2.07	<2.17
Endosulfan 2	<4.24	<2.11	<1.64	<4.66	<2.41	<2.2	<1.98	<1.55	<4.27	<1.69	<1.71	<6.14	<3.85	<3.1	<2.81	<4.4	<4.05	<4	<4.18
Endrosulfan Sulfate	<5.03	<2.5	<1.95	<5.52	<2.86	<2.6	<2.35	<1.84	<5.06	<2.01	<2.03	<7.28	<4.57	<3.68	<3.33	<5.21	<4.8	<4.74	<4.96
Endrin	<5.53	<2.75	<2.14	<6.07	<3.14	<2.87	<2.59	<2.02	<5.56	<2.21	<2.23	<8	<5.02	<4.04	<3.67	<5.74	<5.27	<5.22	<5.45
Endrin Aldehyde	<5.53	<2.75	<2.14	<6.07	<3.14	<2.87	<2.59	<2.02	<5.56	<2.21	<2.23	<8	<5.02	<4.04	<3.67	<5.74	<5.27	<5.22	<5.45
Endrin Ketone	<5.94	<2.95	<2.3	<6.53	<3.38	<3.08	<2.78	<2.17	<5.98	<2.37	<2.4	<8.6	<5.4	<4.34	<3.94	<6.16	<5.67	<5.6	<5.86
Gamma-BHC	<2.28	<1.13	<0.884	<2.51	<1.3	<1.18	<1.07	<0.834	<2.29	<0.91	<0.92	<3.3	<2.07	<1.67	<1.51	<2.37	<2.18	<2.15	<2.25
Heptachlor	<2.91	<1.44	<1.13	<3.19	<1.65	<1.51	<1.36	<1.06	<2.92	<1.16	<1.17	<4.21	<2.64	<2.13	<1.93	<3.01	<2.77	<2.74	<2.87
Heptachlor Epoxide	<2.46	<1.22	<0.955	<2.71	<1.4	<1.28	<1.15	<0.901	<2.48	<0.983	<0.993	<3.56	<2.24	<1.8	<1.63	<2.55	<2.35	<2.32	<2.43
Methoxychlor	<36.8	<18.3	<14.3	<40.4	<20.9	<19	<17.2	<13.4	<37	<14.7	<14.8	<53.2	<33.4	<26.9	<24.4	<38.1	<35	<34.7	<36.2
Toxaphene	<343	<170	<133	<377	<195	<178	<160	<125	<345	<137	<138	<496	<311	<251	<227	<356	<327	<323	<338

*Not detected at or above the specified minimum detection limit.

Table 18. Bulk pesticide analyses on Toledo Harbor Lake Approach and River Channel sediments. Boldface/shaded values indicate a concentration that is greater in comparison to the open-lake reference and/or placement area (from EEI 2006).

	Harbor Sediments																Open Lake Area Sediments					
	Sampling Sites																Reference Sites				Placement Sites	
Pesticides (µg/kg)	LM-2	LM-1.75	LM-1.5	LM-1.25	LM-1.0	LM-0.75	LM-0.5	LM-0.25	LM-0	RM-1	RM-2	RM-3	RM-4	RM-5	RM-6	RM-7	TL-1	TL-2	TL-3	TL-4	TD-1(06)	TD-2(06)
4,4-DDD	<0.555*	<0.436	<0.591	<0.539	<0.537	<0.458	<0.447	<0.509	<0.554	<0.470	<0.482	<0.339	<0.470	<0.482	<0.458	<0.374	1.41	<0.398	<0.389	<0.407	<0.437	<0.407
4,4-DDE	<0.549	<0.431	<0.584	<0.533	<0.531	<0.453	<0.442	<0.504	<0.548	<0.465	<0.477	<0.336	<0.403	<0.477	<0.453	<0.370	1.95	<0.394	<0.385	<0.403	<0.432	<0.402
4,4-DDT	<0.897	<0.705	<0.955	<0.871	<0.868	<0.741	<0.722	<0.823	<0.896	<0.760	<0.780	<0.549	<0.659	<0.779	<0.740	<0.605	4.02	<0.643	<0.629	<0.659	<0.706	<0.657
Aldrin	<0.317	<0.249	<0.338	<0.308	<0.307	<0.262	<0.255	<0.291	<0.317	<0.269	<0.276	<0.194	<0.233	<0.276	<0.262	<0.214	1.53	<0.227	<0.222	<0.233	<0.249	<0.232
Alpha-BHC	**<0.264**	**<0.207**	**<0.281**	**<0.256**	**<0.255**	**<0.218**	**<0.212**	**<0.242**	**<0.263**	**<0.223**	**<0.229**	<0.161	<0.193	**<0.229**	**<0.217**	<0.178	<0.147	<0.189	<0.185	<0.193	<0.207	<0.193
Beta-BHC	**<0.523**	<0.411	**<0.557**	**<0.508**	**<0.506**	**<0.432**	**<0.421**	**<0.480**	**<0.523**	**<0.443**	**<0.455**	<0.320	<0.384	**<0.455**	**<0.432**	<0.353	<0.293	<0.375	<0.367	<0.384	<0.412	<0.384
Chlordane	**<14.1**	<11	**<15**	**<13.6**	**<13.6**	**<11.6**	**<11.3**	**<12.9**	**<14.0**	**<11.9**	**<12.2**	<8.6	<10.3	**<12.2**	**<11.6**	<9.48	<7.87	<10.1	<9.87	<10.3	<11.1	<10.3
Delta-BHC	**<0.585**	<0.460	**<0.623**	**<0.568**	**<0.566**	**<0.484**	**<0.471**	**<0.537**	**<0.585**	**<0.496**	**<0.509**	<0.358	<0.430	**<0.509**	**<0.483**	<0.395	<0.327	<0.420	<0.411	<0.430	<0.461	<0.429
Dieldrin	**<0.507**	<0.398	**<0.540**	**<0.492**	**<0.491**	**<0.419**	**<0.408**	**<0.465**	**<0.507**	**<0.429**	**<0.441**	<0.310	<0.372	**<0.441**	**<0.418**	<0.342	<0.284	<0.364	<0.356	<0.372	<0.399	<0.372
Endosulfan I	**<0.411**	**<0.323**	**<0.438**	**<0.399**	**<0.398**	**<0.340**	**<0.331**	**<0.377**	**<0.411**	**<0.348**	**<0.358**	<0.251	<0.302	**<0.357**	**<0.339**	<0.277	<0.230	<0.295	<0.288	<0.302	<0.323	<0.301
Endosulfan II	**<0.513**	<0.403	**<0.546**	**<0.498**	**<0.497**	**<0.424**	**<0.413**	**<0.471**	**<0.513**	**<0.435**	**<0.446**	<0.314	<0.377	**<0.446**	**<0.423**	<0.346	<0.287	<0.368	<0.360	<0.377	<0.404	<0.376
Endosulfan Sulfate	**<0.670**	**<0.527**	**<0.714**	**<0.651**	**<0.649**	**<0.554**	**<0.540**	**<0.615**	**<0.670**	**<0.568**	**<0.583**	<0.410	<0.492	**<0.583**	**<0.553**	<0.452	<0.375	<0.481	<0.470	<0.492	<0.527	<0.491
Endrin	**<0.508**	<0.399	**<0.541**	**<0.493**	**<0.492**	**<0.420**	**<0.409**	**<0.467**	**<0.508**	**<0.430**	**<0.442**	<0.311	<0.373	**<0.442**	**<0.419**	<0.343	<0.284	<0.365	<0.357	<0.373	<0.400	<0.372
Endrin Aldehyde	**<0.702**	**<0.552**	**<0.747**	**<0.682**	**<0.679**	**<0.580**	**<0.565**	**<0.645**	**<0.701**	**<0.595**	**<0.611**	<0.429	<0.516	**<0.610**	**<0.579**	<0.474	<0.393	<0.504	<0.493	<0.516	<0.552	<0.515
Endrin Ketone	**<0.569**	**<0.447**	**<0.605**	**<0.552**	**<0.550**	**<0.470**	**<0.458**	**<0.522**	**<0.568**	**<0.482**	**<0.495**	<0.348	<0.418	**<0.494**	**<0.469**	<0.384	<0.318	<0.408	<0.399	<0.418	<0.447	<0.417
Gamma-BHC	**<0.281**	**<0.221**	**<0.299**	**<0.273**	**<0.272**	**<0.232**	**<0.226**	**<0.258**	**<0.281**	**<0.238**	**<0.244**	<0.172	<0.206	**<0.244**	**<0.232**	<0.190	<0.157	<0.202	<0.197	<0.206	<0.221	<0.206
Heptachlor	**<0.580**	<0.456	**<0.618**	**<0.563**	**<0.561**	**<0.479**	**<0.467**	**<0.533**	**<0.580**	**<0.491**	**<0.505**	<0.355	<0.426	**<0.505**	**<0.479**	<0.391	<0.325	<0.416	<0.407	<0.426	<0.457	<0.425
Heptachlor Epoxide	**<0.280**	<0.220	**<0.299**	**<0.272**	**<0.271**	**<0.232**	**<0.226**	**<0.257**	**<0.280**	**<0.238**	**<0.244**	<0.171	<0.206	**<0.244**	**<0.231**	<0.189	<0.157	<0.201	<0.197	<0.206	<0.221	<0.206
Methoxychlor	**<3.42**	**<2.69**	**<3.64**	**<3.32**	**<3.31**	**<2.82**	**<2.75**	**<3.14**	**<3.41**	**<2.89**	**<2.97**	<2.09	<2.51	**<2.97**	**<2.82**	<2.30	<1.91	<2.45	<2.40	<2.51	<2.69	<2.50
Toxaphene	**<42.7**	<33.5	**<45.4**	**<41.4**	**<41.3**	**<35.3**	**<34.4**	**<39.2**	**<42.6**	**<35.2**	**<37.1**	<26.1	<31.3	**<37.1**	**<35.2**	<28.8	<23.9	<30.6	<29.9	<31.3	<33.6	<31.3

*Not detected at or above the specified minimum detection limit.

Table 19. Results of water column elutriate bioassays on Toledo Harbor Upper Lake Approach Channel sediments (from USAERDC 2007). Boldface/shaded values indicate statistically reduced survival relative to 0% treatment.

		Test Species			
		Pimephales promelas		*Ceriodaphnia dubia*	
Sample Site	Treatment	Survival (%)	LC50	Survival (%)	LC50
Performance Control (Dechlorinated tap)	NA	96±9	NA	92±11	NA
LRM-1	0%	86±11		84±26	
	10%	76±11		#	
	50%	76±9		88±18	
	100%	**54±17***	>100%	96±9	>100%
LRM-1 Toxicity Reduction Evaluation	100% (Zeolite)	83±13†			
	100% (EDTA)	41±17	NA	NA	
LRM-2	0%	86±11		84±26	
	10%	98±5		100±0	
	50%	82±11		96±9	
	100%	**66±15***	>100%	96±9	>100%

* Statistically reduced survival compared to site water (0% treatment)
† Statistically increased survival in the zeolite-treated 100% elutriate compared to untreated 100% elutriate
# Treatment lost due to laboratory error
>100% = LC50 could not be calculated due to insufficient mortality in test concentrations

State of Ohio Environmental Protection Agency

OhioEPA

STREET ADDRESS:

Lazarus Government Center
50 West Town Street, Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:

P.O. Box 1049
Columbus, Ohio 43216-1049

August 20, 2007

Mr. Tod Smith
Environmental Analysis Section
US Army Corps of Engineers, Buffalo
1776 Niagara St
Buffalo, NY 14207

FAX 716-879-4310

Re: Complete 401 Water Quality Certification Application

Dear Applicant/Agent:

On July 1, 2005, Ohio's new state budget bill was enacted. As a part of that budget bill, portions of the Ohio Revised Code (ORC) pertaining to 401 Water Quality Certifications (WQC) were revised. The specific section of code is ORC 6111.30 and the requirements of this section are effective September 29, 2005.

Among other things, ORC 6111.30 specifies ten items that must be submitted for a WQC application package to be complete. This section of ORC also requires the Ohio EPA to review that application within 15 business days of submission and to notify the applicant whether the application is considered complete, or not. This letter constitutes that notification required under ORC 6111.30 (B).

The following application was reviewed by DSW;

Project Name	Authorized Agent	County	Received	SWIMS ID
Toledo Harbor Dredging 2008-2011	Tod Smith	Lucas	08/07/2007	073192

The application cited above is considered **COMPLETE** since it contains all of the items required under ORC 6111.30 (A). Ohio EPA reserves the right to request additional information in order to conduct its **technical** review of the project that is the subject of this application as authorized in OAC Section 3745-32-04 (A) and 3745-32-05 (D).

ORC 6111.30 also requires that the applicant for a WQC be responsible for issuing a public notice regarding that application. Guidance for preparing that public notice is available at: http://www.epa.state.oh.us/dsw/401/401guidance_1.pdf.

You should prepare your public notice as follows:

[X] Information contained in the application indicates that a public hearing is mandatory pursuant to Ohio Administrative Code (OAC) 3745-1-05. The public notice should be prepared announcing the receipt of the application by Ohio EPA and that a Public Hearing will be held regarding this project. As indicated in the above referenced guidance, you must obtain the date and location information for this hearing from our Public Interest Center (614-644-2160). Please send an electronic copy of the public notice to Patti.smith@epa.state.oh.us for review and approval prior to submitting it for public noticing.

This letter has been faxed to you or the agent identified in your application in order to speed the processing of your application. Please fill in and date the fax confirmation included below and send it to Ohio EPA via return fax. The number to use is (614) 644-2745. Failure to provide this confirmation may create unnecessary delays in the review process. Thank you for your cooperation.

The reviewer assigned to this project is Rahel Babb. She can be reached at 419-373-3027.

If you have any questions regarding the information that has been presented, please contact me at (614) 644-2148.

Sincerely,

Laura Fay, Application Coordinator
401/Wetlands Section

cc: Darla Peele, Ohio EPA Public Interest Center, (via email)
Rahel Babb Reviewer (via email)
Patti Smith, Permit Processing (via email)
Marty Wargo, US Army Corps, Buffalo District (via email)

FAX CONFIRMATION: please fax all pages to (614) 644-2745

Printed Name _____ Date _____

Signature _____

Printed on Recycled Paper

Date of Public Notice: August 31, 2007 Lucas County

PUBLIC NOTICE

NOTICE OF RECEIPT OF 401 APPLICATION AND PUBLIC HEARING

Public notice is hereby given that the Ohio Environmental Protection Agency (Ohio EPA) Division of Surface Water (DSW) has received an application for, and has begun to consider whether to issue or deny, a Clean Water Act Section 401 water quality certification to conduct annual maintenance dredging and associated placement of dredged material from the Toledo Harbor Federal navigation channels into either the open-lake or a confined disposal facility (CDF). The application was submitted by the U.S. Army Corps of Engineers, Buffalo District, 1776 Niagara Street, Buffalo, New York 14207-3199. The project is located in the Lake Erie Approach and Maumee River Federal navigation channels, and at the open-lake placement and confined disposal facilities of Toledo Harbor, City of Toledo, Lucas County, Ohio. The Ohio EPA ID Number for this project is 073192.

As required by the Antidegradation Rule, rule 3745-1-05 of the Ohio Administrative Code (OAC), three alternatives have been submitted for the project. The applicant's proposed preferred alternative, if approved, would involve annual dredging of up to 1,350,000 cubic yards of sediment annually, open lake dispose 1,250,000 cubic yards annually and place 100,000 cubic yards annually in a confined disposal facility. The applicant's proposed minimal degradation alternative, if approved, would involve annual dredging of up to 1,000,000 cubic yards of sediment annually, open-lake disposal of up to 900,000 cubic yards annually and place up to 100,000 cubic yards annually in a confined disposal facility. The applicant's proposed non-degradation alternative, if approved, would have no direct impacts on waters of the state.

Discharges from the activity, if approved, would result in degradation to, or lowering of, the water quality of Lake Erie. Ohio EPA will review the application, and decide whether to grant or deny the application, in accordance with OAC Chapters 3745-1 and 3745-32. In accordance with OAC rule 3745-1-05, an antidegradation review of the application will be conducted before deciding whether to allow a lowering of water quality. All three proposed alternatives will be considered during the review process. No exclusions or waivers, as outlined by OAC rule 3745-1-05, apply or may be granted.

Starting August 31, 2007 copies of the application and technical support information may be inspected at Ohio EPA-DSW, Lazarus Government Center, 50 West Town Street, Suite 700, Columbus, Ohio, by first calling (614) 644-2001. Copies of the application and technical support information can be made available upon request at Ohio EPA District Offices by calling the same number.

Ohio EPA will hold a public information session and public hearing relative to issues of lower water quality on October 23, 2007 at 6:30 p.m. at the City of Toledo Council Chambers, Suite 2100, One Government Center, Toledo, OH 43604. The public hearing will end when all interested parties have had an opportunity to provide testimony related to the project.

All interested persons are entitled to attend or be represented and give written or oral comments on the proposed project. The purpose of the hearing is to obtain additional information that will be considered by Ohio EPA prior to any further action on the application.

Ohio EPA will continue to accept written comments on the application through the close of business on October 30, 2007. Comments received after this date may not be considered as part of the official record of the hearing. Anyone may submit written comments or requests to be placed on a mailing list for information by writing to: Ohio EPA-DSW, Attention: Permits Processing Unit, P.O. Box 1049, Columbus, Ohio 43216-1049.

Ohio Environmental Protection Agency
Division of Surface Water
Response to Comments

Project: Toledo Harbor Dredging
Ohio EPA ID #: 073192

Agency Contacts for this Project

Division Contact: Rahel Babb, Division of Surface Water, 419-373-3027, rahel.babb@epa.state.oh.us
Public Involvement Coordinator: Darla Peelle, 614-644-2160, darla.peelle@epa.state.oh.us

Ohio EPA held a public hearing and/or comment period on October 23, 2008, regarding a Clean Water Act Section 401 water quality certification for U.S. Army Corps of Engineers' project to dredge Toledo Harbor as proposed in an application received by Ohio EPA on August 20, 2007. This document summarizes the comments and questions received at the public hearing and/or during the associated comment period, which ended on November 21, 2007.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. For example, concerns about zoning issues are addressed at the local level. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format.

Ohio EPA received numerous comments regarding this application for this water quality certification. Comments were received from various federal, state, and local regulatory agencies; national, state, and local environmental groups; and, citizens of the State of Ohio.

Several comments were similar in nature; and, therefore, will be addressed as one single response per those comments.

Comment 1: **2005 Memorandum of Agreement**

Response 1: In July 2005, the U.S. Army Corps of Engineers, Buffalo District (Corps), Ohio Environmental Protection Agency (Ohio EPA), and Ohio Department of Natural Resources (ODNR) entered into a Memorandum of Agreement (MOA) that would require all involved parties to work together towards the development and implementation of habitat restoration units (HRUs) through the utilization of suitable materials dredged from the Toledo Harbor Lake Approach Channel (Lake Miles 2-19). The MOA also required that the Corps seek other opportunities for the beneficial reuse of dredged material and alternate upland placement locations.

Since 2005, issues regarding funding and recent analytical results of dredged material have made compliance with the MOA unachievable, as it is written. Regarding funding, the MOA states that the majority of funding will be federal, with a 25 percent non-federal component provided only during the construction phase. However, changes in federal requirements regarding cost sharing now require that state agencies provide cost share for all phases of the beneficial reuse project development except for the reconnaissance phase, which has been completed.

Additionally, the MOA was written to address sediment dredged from the Lake Approach Channel (Lake Miles 2-19). However, recent analytical data submitted by the Corps shows that the sediment that the Corps dredges from the Maumee River (River Miles 0-7) meets open lake water quality disposal criteria in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual (September 1998) except at River Mile 2. Since the Corps cannot use federally regulated confined disposal facilities to dispose of dredged material that that would not be considered to be contaminated in accordance with the abovementioned manual, this material will have to be considered in beneficial reuse exploration.

Ohio EPA expects the Corps to continue its work with stakeholders to solve the problem of the need for open lake disposal through the development and implementation of beneficial reuse options for the dredged material, as per the MOA, so that the need for open lake disposal of dredged material from Toledo Harbor is reduced.

Comment 2: **Declining Lake Levels**

Response 2: Lake Erie water levels change on short-term (daily and seasonally) and on long-term scales (over years and decades). Long-term declines in water levels can come from a variety of sources such as water withdrawals, diversions, modifications to connecting channels or global climate change. Water levels have been documented to fluctuate about 6 ft. over a long term cycle. Precipitation patterns also play a large role in lake levels.

Ohio EPA believes that it is imperative that alternatives for the long-term management of dredged material be developed and implemented as soon as is practical. Ohio EPA has already taken steps to ensure that open lake disposal is severely limited by 2011; however, prior to that date, it is expected that beneficial reuses of dredged material will be continue to be explored so that reductions in the need for open lake disposal can be implemented before and in preparation of that date.

Comment 3: **Environmental Impact Statement**

Response 3: Ohio EPA does not have the authority under our current regulations to require a full environmental impact statement. Through the water quality certification process and anti-degradation review, Ohio EPA evaluates the direct and indirect impacts that the applied for project could have on water quality, and weighs the impacts of the fill activities to the social and economic justification for the activity.

Comment 4: **Island 18**

Response 4: In August 2007, a weir located at the combined disposal facility (CDF), known as Island 18, breached and water associated with dredged material that had recently been placed in the CDF was released into the environment. The material was dredged from an area of the Maumee River that, according to recent sampling, met open lake disposal water quality standards. However, since the Corps was not authorized to dispose of this material in the open lake, it was placed in the CDF. Sampling of water and sediment associated with the dredged material after the breach confirmed that the material did not pose a significant risk to the environment.

In their recent 401 application for open lake disposal of dredged material, the Corps proposed the use of Island 18 as a containment site for dredged material that does not meet open lake disposal water quality standards per the Great Lake Dredged Material Testing and Evaluation Manual. The Corps is

currently conducting an investigative study as to the cause of the breach. Since this study was not available at the time of the submittal of the 401 water quality certification application, Ohio EPA does not feel that dredged material should be placed in this location until such time that the Corps effectively demonstrates to Ohio EPA that the berms and weir structures associated with Island 18 are structurally capable of withstanding the increased capacity.

Comment 5: **Mitigative Techniques**

Response 5: Rule 3745-1-05 of the Ohio Administrative Code requires that the applicant provide a "Mitigative technique alternative" designed to offset all or part of the lowering of water quality, preferably within the same watershed. Best management practices are acceptable as mitigative techniques. In addition to the mitigative techniques proposed by the Corps in their application, Ohio EPA will also require, as a mitigative technique in this 401 water quality certification, that contaminated sediments from River Mile 2 be placed into a confined disposal facility; and, that open lake disposal be restricted to the northeast half of the open lake disposal site (the deepest part of the open lake disposal area).

Comment 6: **National Pollutant Discharge Elimination System (NPDES)**

Response 6: In order to prevent redundancy in permitting, the return water associated with dredged material is regulated under Section 401 of the Clean Water Act, not Section 402 (NPDES). Like the NPDES permit, Ohio EPA could set effluent limits in the 401 water quality certification; however, we do not feel this is necessary at this time.

Comment 7: **Open Lake Disposal Location**

Response 7: In the most recent Section 401 water quality certification application, the Corps has proposed to open lake dispose the sediments from the federal navigation channels in the open lake disposal site located approximately 3.5 miles northwest of the channel at the latitude/longitude of 41 46'10" and 83 15'39". This area has been used for dredged material disposal since 1989.

Per the National Oceanic and Atmospheric Agency (NOAA) navigation charts, the open lake disposal site depth is typical of the western basin depths at approximately 6.1 meters (20 feet). The Corps provided information from their latest soundings on

the area showing that the depths range from 16 to 22 feet low water datum.

Placement of the dredged material in the central basin of Lake Erie would increase the dredging cycle time, which is the time it takes to dredge, dispose of the material and return to the dredge site again. Open lake disposal in the central basin at a depth of 40 feet would require hauling the dredged material an additional 45 miles out, and 45 miles back. The Corps has provided estimates that this would increase the cost from $3 to about $15 per cubic yard. Assuming that the Corps open lake disposes 550,000 cubic yards, this would increase open lake disposal costs at a minimum by $5,500,000 per dredging operation

Comment 8: **Quality of Dredged Sediment & Open Lake Disposal**

Response 8: Analytical data submitted by the Corps shows that the sediment that they dredge in Toledo Harbor meets open lake water quality disposal criteria in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual (September 1998), except at River Mile 2 (sediment from River Mile 2 will be placed in a combined disposal facility). Since the Corps cannot use federally regulated confined disposal facilities to dispose of dredged material that that would not be considered to be contaminated in accordance with the abovementioned manual, they are required to manage the material by the most cost effective, technically feasible and legal means possible. In this case, the Corps has identified open lake disposal as the only viable means to meet this criteria. Ohio EPA feels that further effort must be made by the Corps to identify upland disposal options for dredged material.

From Ohio EPA's perspective, we believe that there are alternatives to open lake disposal. This was our concern during the last certification review and it remains the same today.

Several comments were submitted regarding the effects of turbidity plumes and nutrients on the aquatic environment, and the public water in-take structures for the Cities of Toledo and Oregon. These comments are addressed as follows:

Comment 9: **Phosphorous & Algae Blooms**

Response 9: Concerns have been raised regarding a species of blue-green algae in the western basin of Lake Erie, *Lyngbya wollei*. *Lyngbya wollei* is found in the southern United States and its growth appears to be a direct result of dissolved, reactive

phosphorous. Comments suggested that the practice of open lake disposal is responsible for the proliferation of the algae.

At this time, little scientific information exists to determine the complicated biological processes that encourage the spread of *Lyngbya wollei*.

Some theories as to the changing relationships between external phosphorus loading and algal growth in the lake may be a consequence of increasing release of phosphorus from bottom sediments, mediated by zebra and/or quagga mussels. Others have suggested that phosphorus loading from unmonitored tributaries may be larger than estimated. Most recently, it has been suggested that increased dissolved phosphorus loading from nonpoint sources may be involved.

Additionally, there is some evidence that *Lyngbya wollei* has been in the lake system already for decades, and Ohio EPA is not sure why it exploded so suddenly in Maumee Bay. There are reports that it is in Put-in-Bay harbor and at several areas in Lake Ontario.

There is also a difference between the issues of impairments related to *Microcystis* and those related to *Lyngbya*. We know that *Microcystis* produces a toxin that could impact drinking water sources. We don't know what toxin might be associated with this particular species of *Lyngbya* or if it causes a threat to human or ecosystem health. To further complicate the matter, questions have been raised recently as to whether this species is actually *Lyngbya wollei* or something else. Different species could present different levels of impact/risk. While it does appear that increased dissolved phosphorus loading is causing the *Microcystis* blooms, we can't say the same for the *Lyngbya*. The appearance of *Microcystis* blooms pretty much follows the timing of the increased dissolved phosphorus loads, dating back to 1995. However, there does not appear to be a new condition that supports the sudden growth of *Lyngbya* in Maumee Bay in 2006.

In order to investigate this issue further, Ohio EPA has formed a Phosphorus Task Force to more formally review the phosphorus loading data from Ohio tributaries to Lake Erie; to consider possible relationships between trends in dissolved reactive phosphorus loading and in-lake conditions; to determine possible causes for increased soluble phosphorus loading; and, to evaluate possible management options for reducing soluble phosphorus loading.

More information regarding the Phosphorous Task Force can be found on Ohio EPA's Web site at:

http://www.epa.state.oh.us/dsw/cafo/PTaskForce/PTaskForceWorkgroup.html

Comment 10: Toledo and Oregon Water Intakes

Response 10: The drinking water intakes nearest the project area serve the Cities of Toledo (one intake) and Oregon (two intakes). These intakes are located in Lake Erie more than 10 miles east of the mouth of the Maumee River. Both intakes are located beyond the normal flow of the Maumee River as well as that of the Detroit River to the north. At its closest, the project area is more than five miles northwest of the intakes for the City of Oregon and the open lake disposal facility six miles north of the City of Toledo's intake.

Per Ohio EPA's Division of Surface Water's (DSW) request, the Agency's Division of Drinking and Ground Water (DDAGW) reviewed the water quality certification application submitted by the Corps for the proposed Toledo Harbor maintenance dredging for potential adverse impacts to public water supplies. Based on that review, Ohio EPA has determined that the proposed dredging project should not impact the intakes for the cities of Toledo and Oregon or water quality.

DDAGW further commented that the Corps is aware of the location of Toledo's and Oregon's intakes, and routinely notifies the public water systems when dredging operations will occur near the intake so turbidity levels can be closely monitored. This is a condition of the current 401 water quality certification, and will remain a condition in any subsequent certifications.

Ohio EPA also will continue to require that best management practices be implemented to reduce turbidity during dredging and open lake disposal. These include limiting the amount of material that can be open lake disposed at this time; prohibiting placement during storm events; and, restricting placement to the deepest part of the open lake disposal area.

Also worth noting is that in 2005, the Corps studied turbidity plumes related to the placement of Toledo Harbor dredged material at the existing open lake disposal area, and documented their findings in a draft report titled, "Suspended Sediment Plumes Resulting from Bucket Dredging Operations in Maumee Bay, Lake Erie." This document is still under review by the Corps and has not been issued final. Ohio EPA has not

been provided with a copy of this report; therefore, the conclusion of the study, as presented in a summary to Ohio EPA, was not taken into consideration when reviewing this 401 water quality certification.

Comment 11: Walleye

Response 11: Per the Ohio Department of Natural Resources, walleye spawning in the Maumee River generally initiates in late March and extends through late April, with peak spawning generally occurring in early April. On the reef complex, spawning generally initiates in early April and extends through mid May, with peak spawning generally occurring around the third week of April. Egg incubation can range generally from seven to 28 days, depending on the water temperature. In Lake Erie, egg incubation times typically range from seven to 15 days. Per Ohio Department of Natural Resources, researchers also have conducted egg sampling in the Maumee Bay and found late-stage walleye eggs on May 5, suggesting walleye that are spawning in the bay spawn between those in the rivers and on the reefs.

The data available to Ohio EPA indicate that open lake disposal does not significantly increase the susceptibility of walleye spawning to impacts from sedimentation. This is primarily due to the presence of considerable existing sediment on the floor of the Western Basin.

Basically, walleye eggs and spawning efforts are susceptible to impacts from sediment, but the sediment disposed in the western basin does not create conditions significantly worse than those that already exist. Heavy wind and associated wave action are the principal agents by which sedimentation conditions are created that may impact walleye spawning efforts.

In a paper titled, "Assessment of Potential Impacts of bucket Dredging Plumes on Walleye Spawning Habitat in Maumee Bay, Ohio," the Corps presented information that suggests that dredging activities have little or no effect on walleye spawning activities within the vicinity of the federal navigation channel. This report, however, does not document any effects on walleye as a result of open lake disposal activities. In the 401 water quality certification application, the Corps requested that in-water work restrictions be waived within the Lake Approach Channel (LM2 to LM19), and used this study as the basis for the waiver. Based on comments that Ohio EPA received from the United States Fish and Wildlife Service, the in-water work

restriction from March 15 through June 30 shall remain in effect unless specific permission to work outside of that window is granted by the Ohio Department of Natural Resources, Division of Wildlife.

On a final note, population estimates conducted by the Lake Erie Committee (LEC) of the Great Lakes Fishery Commission, indicate that walleye populations increased between 2000 and 2005, with the population rated as "high quality" in 2005. The high quality walleye population of 2005 is attributed to improved management techniques, increased food availability and improved reproductive success in 2003.

Comment 12: **Benthic Macroinvertebrates**

Response 12: Per a study by Dr. Kenneth Krieger (Heidelberg College, 2000) on the assessment of the macroinvertebrate community in and around the open lake disposal area, 22 samples collected in May 1999, showed that "the kinds and relative numbers of macroinvertebrates were indicative of mesotrophic lake conditions and were probably representative of the conditions found throughout the western basin of Lake Erie." Ohio EPA is not aware of any new studies that contradict this report.

Comment 13: **Sediment Management & Beneficial Reuse**

Response 13: Ultimately, what matters most in the above issues, is the reduction of sediment and nutrients that are introduced into the western basin, and appropriate management of the sediment after it has entered the waterway.

The reduction of nonpoint sources of pollution (e.g., agricultural practices, residential applications of fertilizers, construction activities, etc.) is an Ohio EPA priority. Programs such as Ohio's Lake Erie Protection and Restoration Plan, and the recently formed Phosphorous Task Force are in place to achieve this goal. The state of Ohio has committed $33.7 million to the Lake Erie Conservation Reserve Enhancement Program and the Ohio Lake Buffer Program to reduce sediment and nutrient runoff in the upper Maumee Watershed. Federal commitment to this program raises it to $200 million during a 10-year period. Additionally, there are other major federal, state and local programmatic commitments to sediment reduction in the Maumee watershed area.

U.S. EPA and the state of Ohio have construction and storm water regulations in place to reduce sediment loadings to the watershed. Urban areas have been required to develop a

program to reduce urban runoff and all construction that disturbs more than one acre is required to file for a storm water permit. Ohio uses all of these tools to reduce sediment loading.

To manage sediment after it enters the waterway, Ohio EPA believes that beneficial reuse of dredged material is necessary to minimize and eventually eliminate the need to place dredged material from Toledo Harbor into the existing open lake disposal location in Lake Erie's western basin. To this end, renewable uses of dredged material have been and are being pursued. Ohio EPA continues to meet with the Corps, Ohio Department of Natural Resources and other stakeholders to examine beneficial reuse options for dredged material from Toledo Harbor, and to monitor the progress being made towards the development and implementation of those efforts. Some examples of beneficial reuse options that are under consideration include:

- Landscaping
- Topsoil creation and enhancement
- Road construction
- Land creation and reclamation (e.g., strip mines, brownfields)
- Habitat creation and restoration (i.e., habitat restoration units)

Habitat Restoration Units (HRU) have been of particular interest to all involved parties since they would have a positive influence on water quality and provide much needed wildlife habitat in the western basin.

More information regarding the beneficial reuse of dredged material can be found in "Waste to Resource: Beneficial Use of Great Lakes Dredged Material (Great Lakes Commission, August 2001), available on-line at http://www.glc.org/dredging/publications/benuse.pdf.

Comment 14: **Are there any plans to expand existing combined disposal facilities and/or construct new combined disposal facilities for dredged material in Maumee Bay?**

Response 14: Ohio EPA is unaware of any plans to expand existing combined disposal facilities or to construct new combined disposal facilities in Maumee Bay. If such a proposal is made, the application will be subject to the same public participation requirements as this application for open lake disposal.

State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

Certified Mail

May 15, 2008

Mr. Tod Smith
Environmental Analysis Section
U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, New York 14207

Re: Lucas County /City of Toledo
Grant of Section 401 Certification (MODIFIED Minimum Degradation Alternative)
ACOE Public Notice dated August 8, 2007
Ohio EPA ID No. 073192

Ladies and Gentlemen:

Pursuant to Section 401 of the Federal Water Pollution Control Act, Public Law 95-217, the director of Ohio Environmental Protection Agency hereby certifies that the above-referenced project will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act.

This authorization is specifically limited to a Section 401 Water Quality Certification with respect to water pollution and does not relieve the applicant of further Certifications or Permits as may be necessary under the law. I have determined that a lowering of water quality in the Maumee River, Toledo Harbor (04100009) and Lake Erie (04120200) watersheds as authorized by this Section 401 Water Quality Certification are necessary. I have made this determination based upon the consideration of all public comments, including the technical, social, and economic considerations concerning this application and its impact on waters of the state.

I have also determined that long term open lake disposal of dredged material in the Western Basin of Lake Erie is not an environmentally acceptable long-term alternative. Therefore, I will be proposing a regulatory change that would restrict open lake disposal of dredged material from Toledo Harbor in the Western Basin of Lake Erie, effective January 1, 2011.

I. ON-SITE WATER RESOURCES AND IMPACTS

A. Site Setting

The Toledo Harbor Federal Navigation Channel is comprised of the lower seven miles of the Maumee River and 19 miles of the Lake Approach Channel within Maumee Bay and the Western Basin of Lake Erie.

HUC- Maumee River (04100009) and Lake Erie Drainage (04120200)

Designations: Maumee River: Warmwater Habitat
Lake Erie: Exceptional Warmwater Habitat

Maumee River Miles: RM 0 to RM 7

Watershed Impairment Status and Causes of Impairment: Per the Ohio Integrated Report Appendix E.2 Watershed Assessment Unit (WAU) Summaries, the high magnitude causes of impairment are Siltation and Direct Habitat Alterations. The high magnitude sources of impairment are Channelization – Development, Habitat Modifications other than Hydromodification and Stream Bank Destabilization - Development.

B. Streams

Perennial (P) stream impacts include the dredging of seven miles of the Maumee River to maintain a 400-foot wide, 27-foot deep draft federal navigation channel.

Stream ID	Type E, I, or P	Total Length on Site (lf)	Total Length Impacted (lf)	Impact Type	% Avoided
Maumee River RM 0 to RM 7	P	36,960	36,960	Dredging	0.00%
Totals		36,960	36,960		0.00%

C. Lake Erie

Impacts to Lake Erie include the dredging of nineteen miles of the Lake Approach Channel in the Western Basin of Lake Erie to maintain a 500-foot wide, 28-foot deep draft federal navigation channel; and filling approximately one square mile of Western Basin habitat, via open lake disposal of sediment.

Lake ID	Designation	Impact	Total Acreage on Site	Acreage Impacted	% Avoided

Western Basin LM 0 to LM 19	EWH	Dredging	810,211	1,151.5	99.86%
Western Basin at LM 11	EWH	Disposal	1,280	640	50.00%
Totals			811,491	1,791.5	99.78%

II. GENERAL CONDITIONS

A. This authorization is valid from the date of this certification through the 2009 dredging season during which time, the USACE shall continue to work with the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, Ohio Environmental Protection Agency, the Ohio Department of Natural Resources, and other appropriate parties to develop feasible beneficial reuse alternatives for dredged material associated with Toledo Harbor.

B. This 401 prohibits the placement of dredged material into the open lake provided that there is a cost effective upland disposal option.

C. Open lake disposal of dredged material, if necessary, shall be restricted to the northeast half of the open lake disposal site. No more than 300,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2008. No more than 900,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2009.

D. This 401 does not authorize the placement of dredged material into the combined disposal facility known as Island 18 until such time the applicant effectively demonstrates to Ohio EPA that the weir structures and containment berm of Island 18 are structurally sound and capable of withstanding additional capacity.

E. This authorization is subject to disposal of dredged material at River Mile 2 into a confined disposal facility.

F. Within the limits of its authorities and the funding available for this purpose, the USACE, Buffalo District will participate and cooperate with the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, Ohio Environmental Protection Agency, the Ohio Department of Natural Resources, and other appropriate parties in the investigation and evaluation of the feasibility of establishing fish habitat restoration areas within the limits of the Lower Maumee River; and, beneficial reuse alternatives for dredged material. A report of the activities related to this condition must be submitted to Ohio EPA, Division of Surface Water, annually.

G. The 2003 401 Water Quality certification required USACE, Buffalo District, to modify the near-term sediment management plan prior to submission of its next 401 application to dredge Toledo Harbor. For this requirement, "near-term" was defined as from the present to 2013. No modification of the near-term sediment management plan was submitted prior to submission of the application submitted September 29, 2003.

H. The dredging work shall take place during low flow conditions in order to minimize adverse impacts to water quality away from the project site.

I. Dredging operation shall not take place within 3000 feet up-current of municipal or industrial water supply intakes.

J. Prior to commencement of dredging operations, dredge operators must notify area water users, municipal and industrial, whose water quality may be affected by the dredge's turbidity plume and its associated contaminants.

K. Steps must be employed throughout the course of this project to avoid the creation of unnecessary turbidity which may degrade water quality or adversely affect aquatic life outside of the project.

L. No in-water work shall occur between March 15 and June 30 in order to ensure that fish spawning activities are not disturbed unless specific written approval has been granted in advance from the Ohio Department of Natural Resources and/or the United States Department of Interior – Fish and Wildlife Service.

M. Prior to commencement of dredging operations, the USACE shall contact Mr. Mark Shieldcastle with the Ohio Department of Natural Resources, Division of Wildlife, (419) 898-0960, regarding a bald eagle nest that exists near the western side of the Maumee River mouth. USACE shall follow any restrictions recommended by the Ohio Department of Natural Resources and/or the United States Department of Interior – Fish and Wildlife Service regarding the potential affects of the dredging activities on bald eagle nest(s) in this location or any other locations within the project area.

N. No dredging or disposal shall occur during storm events (i.e., winds > 30 knots or waves > 3 feet).

O. Representatives from Ohio EPA will be allowed to inspect the authorized activity at any time to insure that it is being or has been accomplished in accordance with the terms and conditions of this water quality certification.

P. In the event that there is a conflict between the 401 water quality certification application and the conditions within this 401 water quality certification, the

condition shall prevail unless Ohio EPA agrees, in writing, that the certification application or other provision prevails.

Q. The applicant shall provide electronic maps of the dredge and disposal areas to the Ohio EPA 401 section within 30 days of the date of this certification. JPEG, TIFF, PDF or BMP files are acceptable. When sending the electronic files, include the Ohio EPA ID Number and the Army Corps of Engineers Number (if applicable). If possible, these electronic maps shall be GIS shape files or Geodatabase files. If this is not possible, the electronic maps shall be in another electronic format readable in GIS (GIF, TIF, etc). The electronic files shall be sent to the following e-mail address: Mike.Smith@epa.state.oh.us If the files are too large to send by e-mail, a disk containing the electronic files shall be mailed to the following address: Mike Smith, Ohio EPA, Division of Surface Water, PO Box 1049, Columbus, OH 43216-1049.

III. MITIGATIVE TECHNIQUE

A. Contaminated sediments from River Mile 2 shall be removed from the aquatic environment and placed in Confined Disposal Facility # 3.

B. Limiting the amount of material that needs to be disposed of in the open lake and restricting such disposal, if necessary, to the northeast half of the open lake disposal site.

IV. NOTIFICATIONS TO OHIO EPA

All notifications, correspondence, and reports regarding this Section 401 Water Quality Certification shall reference the following information:

Applicant: U.S. Army Corps of Engineers, Buffalo District
Project: Toledo Harbor Dredging 2008 - 2011
Ohio EPA ID#: 073192

and shall be sent to:

Ohio Environmental Protection Agency
Division of Surface Water, 401 Unit
Lazarus Government Center
50 West Town Street
P.O. Box 1049
Columbus, Ohio 43216-1049

You are hereby notified that this action of the director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within 30 days after notice of the director's action. The appeal must be accompanied by a filing fee of $70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the director within three days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

Sincerely,

Chris Korleski
Director

cc: Scott Pickard, U.S. Army Corps of Engineers, Buffalo District
Kevin Pierard, U.S. EPA, Region 5
Mary Knapp, U.S. Fish & Wildlife Service
Brian Mitch, ODNR, Division of Real Estate & Land Management
Shannon Nabors, Ohio EPA Northwest District Office Chief
Julie Letterhos, Ohio EPA, Central Office, Lake Erie Unit
Dave Snyder, Ohio Historical Preservation Office
Rahel Babb, Ohio EPA, DSW (419) 373-3029
401 file

State of Ohio Environmental Protection Agency

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Columbus, OH 43216-1049

Certified Mail

July 31, 2008

Mr. Tod Smith
Environmental Analysis Section
U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, New York 14207

Re: Lucas County /City of Toledo
Modification of Section 401Certification (Minimal Degradation Alternative)
ACOE Public Notice dated August 8, 2007
Ohio EPA ID No. 073192

Ladies and Gentlemen:

The 401 Water Quality Certification for this project was issued on May 15, 2008. This modification replaces one prior condition. The prior condition to be replaced is as follows:

II. GENERAL CONDITIONS

C. Open lake disposal of dredged material, if necessary, shall be restricted to the northeast half of the open lake disposal site. No more than 300,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2008. No more than 900,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2009.

The replacement condition is as follows:

II. GENERAL CONDITIONS

C. Open lake disposal of dredged material, if necessary, shall be restricted to the northeast half of the open lake disposal site. No more than 360,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2008. No more than 840,000 cubic yards of dredged material may be disposed of in the open lake during calendar year 2009.

You are hereby notified that this action of the director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within 30 days after notice of the director's action. The appeal must be accompanied by a filing fee of $70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the director within three days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

Sincerely,

Chris Korleski
Director

cc: Scott Pickard, U.S. Army Corps of Engineers, Buffalo District
Kevin Pierard, U.S. EPA, Region 5
Mary Knapp, U.S. Fish & Wildlife Service
Brian Mitch, ODNR, Division of Real Estate & Land Management
Shannon Nabors, Ohio EPA Northwest District Office Chief
Julie Letterhos, Ohio EPA, Central Office, Lake Erie Unit
Dave Snyder, Ohio Historical Preservation Office
Rahel Babb, Ohio EPA, DSW

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

TOLEDO HARBOR
LUCAS COUNTY, OHIO

APPENDIX EA-C: COASTAL MANAGEMENT PROGRAM FEDERAL CONSISTENCY DETERMINATION

STATE OF OHIO COASTAL MANAGEMENT PROGRAM
CONSISTENCY DETERMINATION

PROJECT NAME: Maumee River and Toledo Outer Harbor
TYPE OF PROJECT: Operations & Maintenance
(Dredging and Dredged Material Placement)
COUNTY: Lucas

1. PROJECT DESCRIPTION

1.1 Toledo Harbor is located on the northwest shore of Lake Erie approximately 100 miles west of Cleveland, Ohio and 60 miles south of Detroit, Michigan. (Figure 1). The Federal channels and structures are maintained by the U.S. Army Corps of Engineers, Buffalo District in support of commercial and recreational transportation at the deep-draft harbor.

1.2 The U.S. Army Corps of Engineers (USACE), Buffalo District, anticipates the need to dredge and place (open-lake, beneficial use, CDF, as appropriate/possible) material excavated from the Federal navigation channels of the Toledo Harbor project (Figures 1 through 5), in order to maintain sufficient depth/width for deep-draft commercial vessels. Included in the project are the Outer Harbor Channel (nineteen mile Lake Approach Channel) and Inner Harbor Channel (seven mile Maumee River Channel). The attached Figures (Figures 4 and 5) show the authorized limits and depths of the Federally maintained channels. Up to one additional foot of material may be removed to insure the minimum depth.

1.3 The open-lake placement area is located just north of the lake navigation channel about 12 miles northeast of Toledo Harbor in Lake Erie. Confined disposal facility (CDF) 3 – Cell 2 is located just southeast of the lake navigation channel and mouth of the river in Lake Erie. Island 18 CDF is located just north of the lake navigation channel and northeast of the mouth of the river in Lake Erie. Reference Figures 3, 4, and 5.

1.4 There are several beneficial use of dredged material studies and projects being pursued which are in various phases of study and implementation. The Port Authority has been pursuing opportunities for use of the material as fill and/or manufactured soil. There are also several environmental restoration or habitat restoration unit (HRU) and landscaping projects being pursued, however, limited availability of resources has delayed progress on these projects. Also, market demand, project costs and cost shares, processing/handling and transportation costs, and project/site acquisition and assessment/ evaluation requirements limit these options. To date, beneficial use of large quantities of dredged material has not evolved; but, is still being pursued, as possible. Reference Figure 6.

1.5 Dredging will be performed in a manner that minimizes potential negative impacts to fisheries. Dredging in the Lake Approach Channel, landward of Lake Mile 2, and River Channel will be conducted between 1 July and 15 March to avoid any significant adverse impacts on local fishery resources and activities. This work period is consistent with ODNR's "Statewide In-Water Work Restrictions" for Maumee River. In the Lake Approach Channel lakeward of Lake Mile 2, no environmental window is proposed. An investigation in Maumee Bay completed in 2007 using

walleye as an evaluation species demonstrated that dredging-related plumes in the Lake Approach Channel did not migrate outside the channel or encroach on any potential spawning habitat. This study was performed by the U.S. Army Engineer Research and Development Center (ERDC) under the Great Lakes Dredging Team, and coordinated with ODNR. Activities may be postponed during severe storm events.

1.6 Sediments will be removed from the channel bottom by a mechanical or hydraulic dredge and placed into hoppers aboard ship or scow for transport to the placement areas. The method of excavation will be determined by the Contractor performing the maintenance dredging. In previous years, hopper, pipeline (hydraulic) and clamshell bucket (mechanical) dredges have been used to complete the required work.

1.7 USACE - Buffalo District regularly collects sediment samples from the Federal navigation channels and analyzes sediment and water quality in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual (USEPA/USACE, 1998). In 2004, sediment samples were taken from the Lake Approach Channel (Lake Mile 0 through Lake Mile 10), the open-lake reference area, and the open-lake placement area. In 2006, sediment samples were taken from Lake Approach Channel (Lake Mile 0 through Lake Mile 2), the River Channel, the open-lake reference area, and the open-lake placement area. These were subject to physical, chemical, and biological analysis. The material to be dredged consists primarily of silts and clays and some fine sand. Current analysis has shown all sediment in the Federal navigation channels, except at River Mile 2, to be suitable for unconfined open-lake placement. Accordingly, it is proposed that those sediments be placed at the northeastern-most portion of the harbor open-lake placement area or possibly utilized as a component of a beneficial use project. Sediments dredged from River Mile 2 would be placed into CDF 3 – Cell 2 and/or Island 18 CDF.

1.8 The proposed project quantities (annually) over the next several years would include up to:

CDF Placement:	Open Lake Placement (or possibly utilized as a component of a beneficial use project)	Total:
100,000 CY	1,250,000 CY	1,350,000 CY

Total volume includes an estimate of annual dredging requirements (approximately 850,000 cubic yards) and the removal of shoals that were not dredged in previous years due to lack of resources or an approved dredged material placement area. The amount dredged annually also assumes the availability of Federal funds.

1.9 Dredged material for open-lake placement would likely be transported to the open-lake placement area in bottom dump scows or hopper dredges. After arrival at the placement area, the vessel would come to a near-stop/stop, its bottom gates would be opened, and the dredged material would be allowed to settle to the bottom. Dredging and placement in the lake would not be performed during severe Lake Erie storm events.

1.10 Dredged material would be transported to the CDF area and transferred mechanically or

hydraulically. Measures would be incorporated to avoid transfer spillage. The method of transfer will be determined by the Contractor performing the maintenance dredging. Placement will be controlled by the transfer method and located a significant distant from the CDF overflow discharge weirs to allow for maximum water column settling within the CDF.

1.11 The CDFs have weir discharge structures that are used periodically, particularly when CDF fill material reaches above lake level. Return water from the CDF is a carrier water regulated as a Section 404 discharge under the Clean Water Act. Previous studies have demonstrated that particulate settling to 100 parts per million (ppm) or better prior to weir discharge reasonably meets water quality discharge regulations. Weir discharge structures essentially consist of drop structures with sluice board discharge control features. Particulates are allowed to settle (contaminants are primarily adsorbed to sediment) from ponded slurry and water is discharge via removal of sluice boards.

2. EVALUATION

2.1 The USACE-Buffalo District has analyzed the proposed action with respect to the 41 management policies presented in Chapter 5 of the April 2007 State of Ohio Coastal Management Program and Final Environmental Impact Statement. The following seven policy statements have been determined to be applicable to the proposed action:

2.1.1 ***Policy 6 - Water Quality.*** *It is the policy of the State of Ohio to maintain and improve the quality of the State's coastal waters for the purpose of protecting the public health and welfare and to enable the use of such waters for public water supply, industrial and agricultural needs, and propagation of fish, aquatic life and wildlife by:*

I. Assuring attainment of State water quality standards and other water quality related requirements (O.A.C. 3745-1) through:

a. controlling discharges into waters of the State by requiring permits to construct facilities and by establishing and enforcing effluent limitations under the National Pollutant Discharge Elimination System (NPDES Section 4O2 CWA, O.R.C 6611.03;

b. administering a permit system to control injection well drilling in compliance with the SDWA and CWA (O.R.C. 6lll.043 and 6lll.044);

c. regulating discharge of dredge or fill material into surface waters including wetlands in accordance with Section 401 of the CWA (O.R.C. 66111.03);

d. establishing uniform regulations regarding solid waste disposal sites and facilities (O.R.C. 3734.02 and 3734.05);

e. prohibiting the sale or distribution for sale of phosphorus-containing household laundry detergents in the Lake Erie Basin (O.R.C. 6111.10);

f. preparing a State water quality management plan to assess technical needs for pollution control and institutional mechanisms to enforce controls (O.R.C. 6111.41 and 6111.42); and

g. administering a State revolving loan fund program to provide financial assistance for publicly owned wastewater treatment facilities (O.R.C. 6111.03 and 6121.03).

II. Coordinating, through the Lake Erie Commission, State and local policies and programs pertaining to Lake Erie water quality; reviewing, and making recommendations concerning, the development and implementation of policies, programs and issues for Iong-term, comprehensive protection of Lake Erie water resources and water quality that are consistent with the Great Lakes Water Quality Agreement and Great Lakes Toxic Substances Control Agreement (O.R.C.1506.23).
III. Using the Lake Erie Protection Fund (LEPF) to establish a firm scientific base for implementing a basin-wide system of water quality management for Lake Erie and its tributaries; supporting research to improve the scientific knowledge on which Lake Erie aquatic resource protection policies are based (O.R.C.1506.23).

Compliance Statement. Sediments will be removed from the channel bottom by a mechanical or hydraulic dredge and placed into hoppers aboard ship or scow for transport to the placement areas. The method of excavation will be determined by the Contractor performing the maintenance dredging. In previous years, hopper, pipeline (hydraulic) and clamshell bucket (mechanical) dredges have been used to complete the required work.

As discussed previously, based on recent summary analysis (2007) of sediment samples from the project sample areas, sediments in the Maumee River Federal navigation channels (except at River Mile 2) and Lake Approach Federal navigation channels are similar in character to those present in the reference Lake Erie environment. Accordingly, it is proposed that those sediments be placed at the center of the northeastern-most portion of the harbor open-lake placement area or possibly utilized as a component of a beneficial use project. Sediments dredged from River Mile 2 would be placed into CDF 3 – Cell 2 and/or Island 18 CDF.

Construction contractors would be required to comply with the Corps of Engineers Civil Works Construction Specification pertaining to "Environmental Protection" implementing practical measures to be applied during construction and operations to protect significant water and associated land environmental resources (i.e. noise, turbidity, etc.)

During the course of the dredging and placement operation, varying degrees of contaminated bottom sediments would be re-suspended in the water column. The generation of turbidity and reduced dissolved oxygen in the water column would be the primary effects associated with the placement activities. These impacts should be minor, temporary, and localized. A more detailed evaluation entitled “Evaluation of Toledo Harbor Federal Navigation Channel Sediments with Respect to their Suitability for Open-Lake Placement” including elutriate tables has been prepared and coordinated with OEPA. Section 401 water quality certification has been requested from the Ohio Environmental Protection Agency.

2.1.2 ***Policy 10 - Area of Concern Remedial Action Plans.*** *It is policy of the State of Ohio to coordinate the development and implementation of remedial action plans for Ohio’s four Lake Erie Basin areas of concern as identified in the International Joint Commission’s (IJC) Reports on Great Lakes Water Quality.*

Compliance Statement. The Toledo Metropolitan Area Council of Governments (TMACOG) continues to pursue phases of the Maumee River Area of Concern Remedial Action Plan (RAP) with support from the Ohio Environmental Protection Agency (OEPA) and USEPA.

With the proposed project, contaminated sediments would be removed from the Federal navigation channels and contained in a CDF, which would serve to improve sediment/water quality in the harbor and reduce their availability to aquatic life and other wildlife.

2.1.3 ***Policy 17 -Dredging and Dredged Material Disposal.*** *It is the policy of the State of Ohio to provide for the dredging of harbors, river channels and other waterways and to protect the water quality, public right to navigation, recreation and natural resources associated with these waters in the disposal of the dredged material by:*

a. regulating, through the Ohio Environmental Protection Agency Water Quality Certification,the discharge or disposal of dredged material (O.R.C. 6111.03(p) and O.A.C. 3745-1);

b. requiring a lease for State-administrated submerged lands through the Department of Natural Resources before initiating the confined disposal of dredged material in the waters or on lands underlying the waters of Lake Erie (O.R.C. 1506.11);

c. regulating commercial dredging of mineral resources (O.R.C. 1505.07 and O.R.C. 1505.99); and

d. coordinating interdisciplinary reviews of dredging project's at Ohio' s Lake Erie ports and providing technical and funding assistance to help select and implement environmentally sound dredging and dredged sediment management practices.

Compliance Statement. The purpose of the project is to maintain sufficient water depths for commercial and recreational navigation.

The proposed project quantities (annually) over the next several years would include up to:

CDF Placement:	Open Lake Placement (or possibly utilized as a component of a beneficial use project)	Total:
100,000 CY	1,250,000 CY	1,350,000 CY

Total volume includes an estimate of annual dredging requirements (approximately 850,000 cubic yards) and the removal of shoals that were not dredged in previous years due to lack of resources or an approved dredged material placement site. The amount dredged annually also assumes the availability of Federal funds. Reference Figures 3, 4, and 5.

Reference previous Item 2.1.1 also.

2.1.4 ***Policy 26 - Preservation of Cultural Resources.*** *It is the policy of the State of Ohio to provide for the preservation of cultural resources to ensure that the knowledge of Ohio's history and pre-history is made available to the public and is not willfully or unnecessarily destroyed or lost, by:*

a. protection of cultural resources on or eligible for State and National Registers of Historic Places (O.R.C. 149.51 through 149.55;

b. regulating recovery of submerged abandoned property through permits (O.R.C. 1506.32); and

c. establishing and enforcing Lake Erie submerged lands preserves (O.R.C. 1506.31).

Compliance Statement. There are no registered historic properties or properties listed as being eligible for inclusion in the National Register of Historic Places that will be affected by this project. Since the dredge and placement operations would be restricted to those areas which have been historically impacted by these activities, the likelihood of encountering unknown cultural resources is low. In the event that unrecorded historic or archaeological remains are encountered during the course of the dredging operations, the SHPO will be duly notified and appropriate measures will be taken to preserve their integrity.

2.1.5 ***Policy 27 - Fisheries Management*** *It is the policy of the State of Ohio to assure the continual enjoyment of the benefits received from the fisheries of lake Erie and to maintain and improve these fisheries by:*

a. regulating the taking of fish (O.R.C. 1531.08 and O.R.C. 1501.31);

b. prosecuting persons responsible for stream litter and for water pollution resulting in fish kills (O.R.C. 1531.29 and 1531.02);

c. protecting fish habitat through Ohio EPA's Section 401 water ouality certification authority (O.R.C. 6611.03(O) and 6111.03(P) and O.A.C. 3745-1 and 3745-32);

d. considering the protection of fish habitat through the review of Slate and Federal permit applications;

e. establishing State wildlife areas for fish and wildlife habitat (O.R.C. 1531.06);

f. surveying fish populations and trends and conducting other fishery research studies;

g. providing access to the fishery; and

h. providing technical and general information about the Lake Erie fisheries.

Compliance Statement. Some minor disturbance to the local fish population would be unavoidable. The generation of turbidity and reduced dissolved oxygen in the water column would be the primary effects associated with the dredging and placement activities. These impacts would be temporary and localized. Fish would tend to avoid the project area during the actual dredging and placement operations, but would return quickly after the activities cease.

Dredging will be performed in a manner that minimizes potential negative impacts to fisheries. Dredging in the Lake Approach Channel, landward of Lake Mile 2, and River Channel will be conducted between 1 July and 15 March to avoid any significant adverse impacts on local fishery resources and activities. This work period is consistent with ODNR's "Statewide In-Water Work Restrictions" for Maumee River. In the Lake Approach Channel lakeward of Lake Mile 2, no environmental window is proposed. An investigation in Maumee Bay completed in 2007 using walleye as an evaluation species demonstrated that dredging-related plumes in the Lake Approach Channel did not migrate outside the channel or encroach on any potential spawning habitat. This study was performed by the U.S. Army Engineer Research and Development Center (ERDC) under the Great Lakes Dredging Team, and coordinated with ODNR. Activities may be postponed during severe storm events. Reference "Assessment of Potential Impacts of Bucket Dredging Plumes on Walleye Spawning Habitat in Maumee Bay, Ohio; Kevin Reine, Douglas Clarke, Charles Dickerson, and Scott Pickard; May 2007".

Reference previous Item 2.1.1 also.

2.1.6 ***Policy 29 - Wildlife Management*** *It is the policy of the State of Ohio to provide for the management of wildlife in the coastal area to assure the continued enjoyment of benefits received from wildlife by:*

a. protecting all wildlife including nongame and endangered species (O.RR.C. 1531.02, 1531.08 and 1531.25);

b. regulating the taking of wildlife (O.R.C. Chapter 1533 and O.A.C. 1501.31)

c. establishing State wildlife areas and providing recreation opportunities;

d. providing food, cover and habitat for wildlife; and

e. providing nongame wildlife research and education funding.

Compliance Statement. *A*vian species such as gulls would likely be attracted to the dredging and placement areas while foraging, although no adverse impacts to them are anticipated. Disturbance by dredging and placement activities would result in the smothering and mortality of benthic micoinvertibrates and the temporary avoidance of the area by fish species. Following dredging and placement activities, the benthic communities are expected to re-colonize the impacted areas and any displaced wildlife would return. The dredging of the sediments at River Mile 2 would remove the contaminated sediments (i.e. unsuitable for unconfined open-lake placement) from the channel and contain them within the harbor CDFs. This may enable the ecosystem to achieve a higher diversity, or at least health, of aquatic species in the area.

Although some waterfowl, gulls, and shorebirds utilize the CDFs as resting and foraging areas, use of the CDFs by other wildlife is likely limited relative to similar habitats on the mainland. Based on available data, the USACE has determined that the proposed work will not have a substantial adverse impact on any species proposed or designated by the U.S. Fish and Wildlife Service or ODNR as threatened or endangered, nor will it affect the critical habitat of any such species.

2.1.8. ***Policy 33 - Visual and Aesthetic Quality****. It is the policy of the State of Ohio to protect the visual and aesthetic amenities of Lake Erie and its shoreline to enhance the recreational, economic, cultural and environmental values inherently associated with the coastal area by:*

a. Prohibiting the dumping of litter and refuse into or along the waters of Lake Erie and its tributaries, and maintaining law enforcement activities to apprehend violators (O.R.C. 1531.29 and 3767.32);

b. enforcing State water quality standards (O.R.C.Chapter 6111, O.A.C. 3745-1-04); and

c. preserving aesthetic resource areas of Statewide significance through the nature preserve,wildlife area, park development and historic preservation programs.

Compliance Statement. The presence of dredging equipment and the short-term impacts on water quality may temporarily detract from the aesthetic quality of the project area. Water clarity in the area of the dredging and placement activities may be unavoidably degraded at times for up to several hundred feet downstream or drift in the river or bay due to dredging and placement activities. A brownish/grey plume may be noticeable.

Dredged material placement at the CDFs would present an initial slurry within the CDF. Particulates would essentially settle out following placement, and CDF weir discharges (if present) would not present a significantly noticeable visual impact.

3. CONCLUSION

In accordance with Coastal Zone Management Regulations 15 CFR, Part 930.34(a), the U.S. Army Corps of Engineers has determined that the proposed dredging and placement operations required to maintain the Federal channel at the mouth of the Maumee River would be undertaken in a manner which is consistent to the maximum extent practicable with the State of Ohio Coastal Management Program.

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

OFFICE OF COASTAL MANAGEMENT
105 WEST SHORELINE DRIVE
SANDUSKY, OHIO 44870
(419) 626-7980
FAX (419) 626-7983

October 4, 2007

Martin P. Wargo, Chief
Environmental Analysis Section
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207-3199

CONDITIONAL CONCURRENCE

RE: Consistency determination for 2008-2011 Toledo Harbor maintenance dredging

Dear Mr. Wargo:

This letter regards the above referenced consistency determination received by the Ohio Department of Natural Resources (ODNR) on August 9, 2007. This consistency determination relates to the proposed dredging of up to 1,350,000 cubic yards of material annually from Toledo Harbor.

The Coastal Zone Management Act and its corresponding Federal Regulations provide that any federal agency activity affecting any coastal use or resource of a state's designated coastal zone must be conducted in a manner consistent to the maximum extent practicable with the enforceable policies of that state's approved coastal management program. ODNR is the designated state agency under the Ohio Coastal Management Program. As such, ODNR is responsible for concurring with or objecting to Federal agency consistency determinations.

This letter is to inform you that ODNR concurs with this consistency determination, on the condition that a *Section 401 Water Quality Certification* is obtained from the Ohio Environmental Protection Agency for this proposed activity. This condition is necessary to insure consistency with Policies #6 (Water Quality), #17 (Dredging and Dredged Material Disposal), #27 (Fisheries Management), and #33 (Visual and Aesthetic Quality) of the Ohio Coastal Management Program.

If you need additional information or have any questions regarding this consistency review, please contact me at (419) 626-7980.

Sincerely,

Steve Holland, M.P.A.
Federal Consistency Coordinator

c: Tod Smith, U.S. Army Corps of Engineers
John Watkins, ODNR Office of Coastal Management
Brian Mitch, ODNR Office of Environmental Policy

OPERATIONS AND MAINTENANCE
DREDGING AND PLACEMENT OF DREDGED MATERIAL

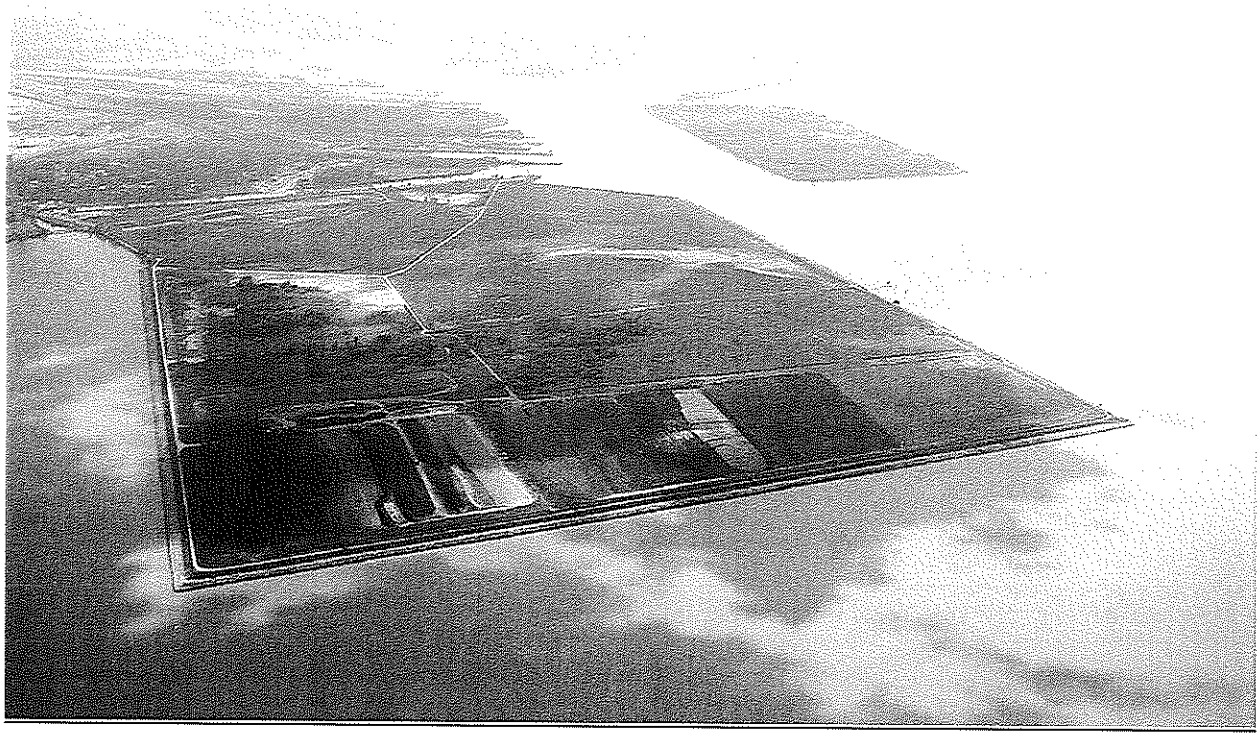
TOLEDO HARBOR
LUCAS COUNTY, OHIO

APPENDIX EA-D: CORRESPONDENCE

U.S. Army Corps of Engineers
Buffalo District

TOLEDO HARBOR
OPERATIONS AND MAINTENANCE (DREDGING)
LUCAS COUNTY, OHIO

SCOPING INFORMATION PACKET



August 2007

Table of Contents

1. INTRODUCTION

The U.S. Army Corps of Engineers, Buffalo District (USACE) is developing a dredged material management strategy for the next several years for maintaining the Federal navigation channels at Toledo Harbor. This strategy will be developed and implemented in accordance with all applicable environmental compliance requirements.

The scope of this project is essentially limited to the change in dredging of Federal navigation channels at Toledo Harbor and the associated placement of dredged material at the designated open-lake and existing confined disposal facilities (CDFs).

2. PROJECT SCOPING

The purpose of this document is to provide initial project information to interested agencies, organizations, and individuals and to provide opportunity for their input on the development and assessment of the proposed project.

Comments relative to this project information will be accepted 30 days from the date of this packet and should be sent to:

Address: U.S. Army Corps of Engineers
Buffalo District
ATTN: Tod Smith
1776 Niagara Street
Buffalo, NY 14207-3199

Point of Contact: Tod D. Smith
Community (Environmental) Planner
Environmental Analysis Section

Telephone: 716-879-4175
Fax: 716-879-4310
E-mail: tod.d.smith@usace.army.mil

3. PROJECT AUTHORITY

The existing Federal navigation project at Toledo Harbor, including its operation and maintenance, was authorized by the River and Harbor Acts of 1899, 1910, 1950, 1955, 1954, 1958 and 1960.

4. PROJECT LOCATION & SETTING

Location. Toledo Harbor is located in the city of Toledo in Lucas County, Ohio and is situated on the southwestern shore of Lake Erie at the mouth of the Maumee River (Figures 1 through 5). The harbor is located approximately 90 miles west of Cleveland, Ohio and 50 miles south of Detroit, Michigan. The Maumee River watershed drains an area of about 4.2 million acres in Michigan, Indiana, and Ohio. The river is the largest tributary to the Great Lakes with an average discharge of about 4,800 cubic feet per second. The watershed is relatively flat and consists primarily of farmlands. The

watershed's land cover which includes 3.3 million acres of cropland, 50,000 acres of pasture, 100,000 acres of farmsteads, and 300,000 acres of forest land accounts for the river's high sediment load.

The Maumee River empties into Maumee Bay, a water body formed by two lakeward spits - North Cape which extends south from Michigan and Little Cedar Point which extends northwest from Ohio. The Maumee River, Ottawa River, and several smaller streams enter the shallow bay on the west. The Lake, Bay, and River provide diverse fish and wildlife resources. The shallow depths of Lake Erie's Western Basin (including Maumee Bay) magnify its substantial significance relative to water and sediment quality, aquatic habitat, and associated environmental concerns.

Harbor Maintenance - Toledo Harbor is an important domestic and international port along the Great Lakes and St. Lawrence Seaway System and is one of the most active ports on Lake Erie and the Great Lakes. Toledo's location at the hub of a major North American market has made it a key player in Midwestern commerce and, since the opening of the St. Lawrence Seaway, a factor in global commerce as well. Primarily a transshipment point, its domestic waterborne commerce consists primarily of the shipment of coal and petroleum products to lake ports of the United States and Canada, and the receipt of iron ore from the Lake Superior region. Other commodities include: steel products, stone, gravel and sand, grain, and various general cargo. Railroads and trucks provide the transportation linkage between the harbor facilities and the interior and manufacturing localities. Figure 4 depicts development and waterfront industries along Maumee Bay and Toledo Harbor and the lower Maumee River.

Toledo Harbor consists of a 19-mile lake and bay approach channel and a 7-mile river channel including two turning basins (Figures 3, 4, and 5). It also includes a maintained sailing course between the Maumee Bay Channel and East Outer Channel of the Detroit River.

The Maumee River watershed is very large (approximately 4.2 million acres) and sediment loading into the harbor channels is significant. The shallowness of Maumee Bay compounds the situation and contributes to substantial shoaling at the harbor. Consequently, substantial amounts of sediment must be dredged periodically from the harbor channels and suitable placement areas are essential in order to maintain commercial navigation in this harbor.

Historically, approximately 900,000 cubic yards (cy) of material has been dredged from Toledo Harbor on an average annual basis. In past years, sediments dredged from the river channel and portions of the bay channel (approximately 350,000 cy) have been found to be unsuitable for unconfined open-lake placement and have been placed in various CDFs. Material dredged from the lake channel (approximately 550,000 cy) has been placed at open-lake placement sites. Existing CDFs include Grassy Island (Island 18) (approximately 132 acres) located just northeast of the mouth of the river, and those located just southeast of the mouth of the river (Cell 1 – approximately 242 acres; Cell 2 – approximately 155 acres; Cell 3 – approximately 90 acres). The open-lake placement sites (approximately two square miles each) are located just north of the lake channel, about 12 miles northeast of Toledo Harbor (Figures 3, 4, and 5).

Toledo Harbor Dredged Material Management Context. The USACE, Buffalo District and other harbor interests continually work to develop harbor dredged material management measures which are assessed and evaluated from engineering, economic, environmental and social perspectives; and, in accordance with associated laws and regulations. Subsequently, Toledo Harbor dredged material

management is pursued within the context of associated developed strategies and measures. Current overall developed strategies and measures being pursued generally include consideration of:

- Watershed Best Management Practices
- Dredging and Open-Lake and CDF Placement
  (with reference to the Great Lakes Dredged Material Testing and Evaluation Manual)
- Maximizing Use of Existing CDFs
- Beneficial Use of Dredged Material, as possible

Development of these strategies and measures are documented in a number of progressive existing and on-going planning and environmental documentations. Note PROJECT REFERENCES at the end of this scoping information packet. Associated planning/NEPA documentation may be viewed on the USACE Buffalo District web site www.lrb.usace.army.mil (Toledo Harbor).

In brief, ongoing initiatives with respect to Toledo Harbor dredged material management measures include:

- Maumee River Watershed Best Management Practices. The U.S. Department of Agriculture – Natural Resources Conservation Service is pursuing best management practices (no till/ conservation till farming, farm sedimentation collection ponds/wetlands, buffer strips, optimized pesticide application), as possible. They are also further assessing the erosion and sedimentation problems in each component watershed in this regard as part of the Western Lake Erie Basin Study.

- Dredging and Open-Lake and CDF Placement. The placement of dredged material from the harbor will continue to be initially determined in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual. The sediment sampling and analyses program for the harbor is discussed further in section 7 of this Scoping Information Packet.

- Maximizing Use of Existing CDFs. The USACE, Buffalo District and the Toledo – Lucas County Port Authority will maximize the use of existing facilities (including Island 18) through the use of consolidation measures (e.g. improved drainage), vertical expansion through the construction of interior berms, and provision for the beneficial use of dredged material.

- Beneficial Use of Dredged Material. There are several beneficial use of dredged material studies and projects being pursued which are in various phases of study and implementation. The Port Authority has been pursuing opportunities for use of the material as fill and/or manufactured soil. There are also several environmental restoration or habitat restoration unit (HRU) projects and landscaping projects being pursued, however, limited availability of resources has delayed progress on these projects. Also, market demand, project costs and cost shares, processing/handling and transportation costs, and project/site acquisition and assessment/evaluation requirements limit these options. To date, beneficial use of large quantities of dredged material has not evolved; but, is still being pursued, as possible. Reference Figure 6.

5. PROBLEMS, NEEDS, AND OBJECTIVES

The U.S. Army Corps of Engineers (USACE), Buffalo District, needs to dredge and place (open-lake, beneficial use, CDF, as appropriate/possible) material excavated from the Federal navigation channels of the Toledo Harbor project (Figures 1 through 5), in order to maintain sufficient depth/width for deep-draft commercial vessels. The objective in maintaining the Federal navigation channels in Toledo Harbor is to provide sufficient depth and safe navigation for deep-draft commercial vessels and to sustain associated economic benefits and community/social well-being. Dredged material from the harbor must be managed in the least cost, environmentally sound manner. Alternative dredged material management plans must best meet this objective and must be technically and economically feasible, environmentally sound, and socially acceptable.

For a number of years the USACE - Buffalo District has not been able to complete maintenance dredging at Toledo Harbor to the extent desired. Only a portion of the total volume of material suitable for open-lake placement has actually been dredged. As a result, more than 2,700,000 cubic yards of shoal material has remained in place in the lake channel. Navigation and associated safety concerns have been raised.

Federal funding may become available over the next few years to address the backlog of dredging needs to remove the substantial accumulation of sediments from the harbor.

6. PROPOSED PROJECT

USACE - Buffalo District is responsible for maintenance dredging of the Federal navigation channels at Toledo Harbor. Currently, dredging is conducted from River Mile 0 at the mouth of the Maumee River upstream to River Mile 7 at the upper most navigation channel limit, and from Lake Mile 0 at the mouth of the Maumee River lakeward to Lake Mile 19. The attached Figures (Figures 4 and 5) show the authorized limits and depths of the Federally maintained channels. Up to one additional foot of material may be removed to insure the minimum depth.

USACE - Buffalo District regularly collects sediment samples from the Federal navigation channels and analyzes sediment quality in accordance with the Great Lakes Dredged Material Testing and Evaluation Manual (USEPA/USACE, 1998). In 2004, sediment samples were taken from the Lake Approach Channel (Lake Mile 0 through Lake Mile 10), the open-lake reference area, and the open-lake placement area. In 2006, sediment samples were taken from Lake Approach Channel (Lake Mile 0 through Lake Mile 2), the River Channel, the open-lake reference area, and the open-lake placement area. These were subject to physical, chemical, and biological analysis. The material to be dredged consists primarily of silts and clays and some fine sand. Current analysis has shown all sediment in the Federal navigation channels, except at River Mile 2, to be suitable for unconfined open-lake placement. Accordingly, it is proposed that those sediments be placed at the northeastern-most portion of the harbor open-lake placement site or possibly utilized as a component of a beneficial use project. Sediments dredged from River Mile 2 would be placed into CDF 3 – Cell 2 and/or Island 18 CDF.

The proposed project quantities (annually) over the next several years would include up to:

CDF Placement	Open Lake Placement (or possibly utilized as a component of a beneficial use project)	Total
100,000 CY	1,250,000 CY	1,350,000 CY

Total volume includes an estimate of annual dredging requirements (approximately 850,000 cubic yards) and the removal of shoals that were not dredged in previous years due to lack of resources or an approved dredged material placement site. The amount dredged annually also assumes the availability of Federal funds.

Construction contractors would be required to comply with the Corps of Engineers Civil Works Construction Specification pertaining to "Environmental Protection" implementing practical measures to be applied during operations to protect significant water and associated land environmental resources (i.e. noise, turbidity, containment, etc.)

Dredging and associated placement of dredged material will be performed in a manner that minimizes potential negative impacts to fisheries. Dredging in the Lake Approach Channel, landward of Lake Mile 2, and River Channel will be conducted between 1 July and 15 March to avoid any significant adverse impacts on local fishery resources and activities. This work period is consistent with ODNR's "Statewide In-Water Work Restrictions" for Maumee River. In the Lake Approach Channel lakeward of Lake Mile 2, no environmental window is proposed.

Barges would place material at an up-drift location at the open-lake placement site and would come to a near stop or stop at the placement area. Activities may be postponed during severe storm events. Particulates and adsorbed contaminants would be essentially settled from ponded water prior to any occasional CDF overflow weir discharge.

7. ALTERNATIVE PLANS

In addition to on-going overall dredged material management strategies and measures (Section 4), the following options are more immediate and specific considered alternatives to the associated proposed plan:

- **No Action (Without Project Conditions)** - A No Action (Without Project Conditions) alternative is always considered and serves as a baseline for comparison for other alternatives. With this alternative, Federal channel dredging would not be conducted or would be significantly limited. Navigation channels would eventually shoal in and most commercial harbor operations would no longer be economically viable.

- **Reduced Dredging Scenario** – Under this plan, USACE – Buffalo District would dredge the Federal navigation channels to narrower/shallower limits than authorized. The project

quantities (annually) over the next four years would include up to:

CDF Placement	Open Lake Placement (or possibly utilized as a component of a beneficial use project)	Total Up to:
100,000 CY	900,000 CY	1,000,000 CY

Total volume includes an estimate of annual dredging requirements (approximately 850,000 cubic yards) and the removal of some shoals that were not dredged in previous years due to lack of resources or an approved dredged material placement site.

This scenario would not fully resolve navigation problems and needs at Toledo Harbor or fully address the harbor's dredging backlog. This scenario is also contingent on availability of future Federal funds.

8. ASSESSMENT/EVALUATION

The project will be evaluated for engineering and economic feasibility, environmental and social acceptability, and it's responsiveness in meeting the project planning objectives. Evaluation will include assessment of various public interest factors (listed below) and trade-off evaluation. It will also document compliance with environmental protection statutes, Executive Orders, etc., as applicable. Coordination and compliance items are discussed in the next section.

Engineering
Feasibility
Practicality

Economics
Benefits
Federal Cost
NonFederal Cost
Total Cost
Net Benefits
Benefits (AA)
Costs (AA)
B/C

Environmental Physical/*Natural Resources
Geography
*Air Quality
Geology
*Water Quality
Aquatics
Benthos
Aquatic Vegetation

Fisheries
Wetlands
Flood Plain
Terrestrial
Wildlife
Threatened and Endangered

Environmental Community/Social (*Man-Made) Resources
Demographics
Water and Land Use and Developments
**Community and Regional Growth
*Displacement of People
*Displacement of Farms
*Business and Industry
*Labor Force, Employment, and Income
**Public Facilities and Services
Recreational Resources
**Property Value and Tax Revenue
**Noise and Aesthetics
Health and Safety
*Community Cohesion

Environmental Cultural Resources
Archeological
Historical

** Analysis mandated under Section 122 of the River and Harbor and Flood Control Act of 1970.*

The environmental effects of the dredging and placement operation are historically documented in the ***Final Environmental Impact Statement, Operation and Maintenance, Toledo Harbor, Ohio (1976); Section 404 (b) (1) Evaluation, Operation and Maintenance, Toledo Harbor, Ohio (1984); Environmental Assessment (including Section 404(b)(1) Evaluation), Operation and Maintenance, Toledo Harbor, Ohio (1989); Final Environmental Impact Statement, CDF Cell 2, Toledo Harbor, Ohio (1990); Environmental Assessment (including Section 404(b)(1) Evaluation), Island 18, Toledo Harbor, Ohio (1990); Environmental Assessment, LTMP Interim Plan, Toledo Harbor, Ohio (1995); Environmental Assessment, LTMP, Toledo Harbor, Ohio (2002); Environmental Assessment, Island 18, Toledo Harbor, Ohio (2002); and pending Environmental Assessment (including Section 404(b)(1) Evaluation), Operations and Maintenance, Toledo Harbor, Ohio (2007)***. These documents, and supplemental documentation, are filed with the USEPA. Copies are also made available for examination at the Buffalo District office or web site www.lrb.usace.army.mil.

Generally, past and more recent studies have shown only minor short-term adverse physical/natural environmental impacts pertaining to operations and maintenance dredging and placement projects and substantial sustaining community/social and regional beneficial impacts. Cultural resource items were addressed via previous studies.

9. COORDINATION AND COMPLIANCE

The project is being coordinated in accordance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the NEPA of 1969" (40 CFR 1500-1508) and Engineer Regulation 200-2-2 (Procedures for Implementing NEPA). This Scoping Information Packet has been coordinated with Federal, State, and interested organizations and individuals. Its purpose is to provide initial project information and to provide opportunity for agencies and the public to provide their input on the development, assessment/evaluation, and implementation of the proposed project.

The proposed project will be implemented in compliance with the following environmental protection statutes, Executive Orders, etc., as applicable.

In accordance with the Clean Water Act, public notice is being made (Section 404) and associated hearings will be conducted, as necessary, relative to the Clean Water Act Sections 404 and 401.

An Environmental Assessment will be prepared and coordinated for 30 days for review and comments. If no comments that would alter findings are received within the 30-day review period, and/or after addressing such comments, findings will be signed and filed with the official project documentation.

Compliance with Environmental Protection Statutes, Executive Orders, etc.:

National Environmental Policy Act (NEPA). In accordance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the NEPA of 1969" (40 CFR 1500-1508) and Engineer Regulation 200-2-2 (Procedures for Implementing NEPA), the USACE, Buffalo District will assess and coordinate the potential environmental impacts of the project. Assuming this analysis concludes that the proposed project is not a major Federal action significantly affecting the quality of the human environment, USACE-Buffalo District will complete an Environmental Assessment (EA) and circulate it for a 30-day public review. If no substantial objections are received during this official review period, the District Commander will sign a Finding of No Significant Impact (FONSI) and it will be included as part of the official project documentation.

National Historic Preservation Act. Under Section 106 of this Act, this Scoping Information Packet also initiates consultation with the National Park Service, State Historic Preservation Office (Ohio Historical Society), historic preservation organizations and others likely to have knowledge of, or concern with, historic properties that may be present within the area of potential effect. It is not expected that there will be a concern in this regard since the project is an operations and maintenance project and impact areas have been previously addressed.

Clean Water Act. Since the proposed project involves the placement of dredged material into waters of the United States, the project will be evaluated in accordance with the Section 404(b)(1) guidelines. A Section 404(a) Public Notice is being issued and any party that may be significantly impacted by the project will be afforded the opportunity to comment and/or request a public hearing. Under Section 401 of the Act, USACE - Buffalo District will request certification from the OEPA that the proposed project is in compliance with established effluent limitations and water quality standards.

Fish and Wildlife Coordination Act and Endangered Species Act. Compliance with these acts will be accomplished through coordination and consultation with the U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR). USFWS and ODNR are requested to provide their comments and recommendations for consideration in the EA. Their input will include resource information, impact assessment, threatened and endangered species information, and any recommendations relative to the project.

Coastal Zone Management Act. USACE - Buffalo District will evaluate the proposed project with respect to the 41 management policies of the Ohio Coastal Management Program and assure that the proposed project is consistent with them to the maximum extent practicable. The USACE, Buffalo District has prepared a Federal Consistency Determination that will be coordinated with the Ohio Department of Natural Resources for their concurrence.

Other Coordination Requirements. In addition to the aforementioned Federal statutes, the proposed project must also comply with other applicable or relevant and appropriate Federal laws. Table 1 presents a comprehensive list of environmental protection statutes, executive orders, etc. Therefore, an additional intent of this Scoping Information Packet is to disseminate pertinent project information to meet the applicable coordination/consultation requirements required under their provisions.

Table 1 - Federal Environmental Protection Laws, Executive Orders, Regulations, Policies

Public Laws

(a) American Folk Life Preservation Act, P.L. 94-201; 20 U.S.C. 2101, et seq.
(b) Anatropous Fish Conservation Act, P.L. 89-304; 16 U.S.C. 757, et seq.
(c) Antiquities Act of 1906, P.L. 59-209; 16 U.S.C. 431, et seq.
(d) Archaeological and Historic Preservation Act, P.L. 93-291; 16 U.S.C. 469, et seq. (Also known as the Reservoir Salvage Act of 1960, as amended; P.L. 93-291, as amended; the Moss-Bennett Act; and the Preservation of Historic and Archaeological Data Act of 1974.)
(e) Bald Eagle Act; 16 U.S.C. 668.
(f) Clean Air Act, as amended; P.L. 91-604; 42 U.S.C. 1857h-7, et seq.
(g) Clean Water Act, P.L. 92-500; 33 U.S.C. 1251, et seq. (Also known as the Federal Water Pollution Control Act; and P.L. 92-500, as amended.)
(h) Coastal Barrier Resources Act of 1982, 16 U.S.C. § 3501 et seq.; 12 U.S.C. § 1441 et seq.
(i) Coastal Zone Management Act of 1972, as amended, P.L. 92-583; 16 U.S.C. 1451, et seq.
(j) Endangered Species Act of 1973, as amended, P.L. 93-205; 16 U.S.C. 1531, et seq.
(k) Estuary Protection Act, P.L. 90-454; 16 U.S.C. 1221, et seq.
(l) Federal Environmental Pesticide Control Act, P.L. 92-516; 7 U.S.C. 136.
(m) Federal Water Project Recreation Act, as amended, P.L. 89-72; 16 U.S.C. 460-1(12), et seq.
(n) Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624; 16 U.S.C. 661, et seq.
(o) Historic Sites Act of 1935, as amended, P.L. 74-292; 16 U.S.C. 461, et seq.
(p) Land and Water Conservation Fund Act, P.L. 88-578; 16 U.S.C. 460/-460/-11, et seq.
(q) Migratory Bird Conservation Act of 1928; 16 U.S.C. 715.
(r) Migratory Bird Treaty Act of 1918; 16 U.S.C. 703, et seq.
(s) National Environmental Policy Act of 1969, as amended, P.L. 91-190; 42 U.S.C. 4321, et seq.
(t) National Historic Preservation Act of 1966, as amended, P.L. 89-655; 16 U.S.C. 470a, et seq.
(u) Native American Religious Freedom Act, P.L. 95-341; 42 U.S.C. 1996, et seq.
(v) Resource Conservation and Recovery Act of 1976, P.L. 94-580; 7 U.S.C. 1010, et seq.
(w) River and Harbor Act of 1899, 33 U.S.C. 403, et seq. (Also known as the Refuse Act of 1899.)
(x) Submerged Lands Act of 1953, P.L. 82-3167; 43 U.S.C. 1301, et seq.
(y) Surface Mining and Reclamation Act of 1977, P.L. 95-89; 30 U.S.C. 1201, et seq.
(z) Toxic Substances Control Act, P.L. 94-469; 15 U.S.C. 2601, et seq.
(aa) Watershed Protection and Flood Prevention Act, as amended, P.L. 83-566; 16 U.S.C. 1001, et seq.
(bb) Wild and Scenic Rivers Act, as amended, P.L. 90-542; 16 U.S.C. 1271, et seq.

Executive Orders

(a) Executive Order 11593, Protection and Enhancement of the Cultural Environment. May 13, 1979 (36 FR 8921; May 15, 1971).
(b) Executive Order 11988, Floodplain Management. May 24, 1977 (42 FR 26951; May 25, 1977).
(c) Executive Order 11990, Protection of Wetlands. May 24, 1977 (42 FR 26961; May 25, 1977).
(d) Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order, 11991, May 24, 1977.
(e) Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978.
(f) Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982.
(g) Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 3, 1993.
(h) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994.
(i) Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001.

Other Federal Policies

(a) Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act.
(b) Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the National Inventory.
(c) Migratory Bird Treaties and other international agreements listed in the Endangered Species Act of 1973, as amended, Section 2(a)(4)

PROJECT REFERENCES

The environmental effects of the dredging operation are historically sequentially documented in: the Final Environmental Impact Statement, Operation and Maintenance, Toledo Harbor, Ohio (1976); Section 404 (b) (1) Evaluation, Operation and Maintenance, Toledo Harbor, Ohio (1984); Environmental Assessment (including Section 404(b)(1) Evaluation), Operation and Maintenance, Toledo Harbor, Ohio (1989); Final Environmental Impact Statement, CDF Cell 2, Toledo Harbor, Ohio (1990); Environmental Assessment (including Section 404(b)(1) Evaluation), Island 18, Toledo Harbor, Ohio (1990); Environmental Assessment, Dredged Material Management Interim Plan, Toledo Harbor, Ohio (1995); Environmental Assessment, Dredged Material Management, Toledo Harbor, Ohio (2002); Environmental Assessment, Island 18, Toledo Harbor, Ohio (2002); and pending Environmental Assessment (including Section 404(b)(1) Evaluation), Operations and Maintenance, Toledo Harbor, Ohio (2007) . These documents, and supplemental documentation, are filed with the USEPA. Associated documentation may be viewed on the USACE Buffalo District web site www.lrb.usace.army.mil (Toledo Harbor).

U.S. Environmental Protection Agency/U.S. Army Corps of Engineers, 1998; Great Lakes Dredged Material Testing and Evaluation Manual

Heidelberg College, 2003. "Assessment of Macroinvertebrate Community In and Around an Open-Lake Disposal Area, Western Basin of Lake Erie"

Engineering and Environment, Inc., 2003/2004; Toledo Harbor, Ohio; Sediment Sampling for Chemical and Physical Analyses; for the USACE, Buffalo District

Engineering and Environment, Inc. 2006/2007; Toledo Harbor, Ohio; Sediment Sampling for Chemical and Physical Analyses; for the USACE, Buffalo District.

USACE, Engineer Research and Development Center (ERDC), December 2006; Toledo Harbor, Ohio; Elutriate Testing (Toxicity) Using Toledo Harbor Sediments; for the USACE, Buffalo District.

Reine (Kevin), Clarke (Douglas), Dickerson (Charles), and Pickard (Scott), May 2007; "Assessment of Potential Impacts of Bucket Dredging Plumes on Walleye Spawning Habitat in Maumee Bay, Ohio."

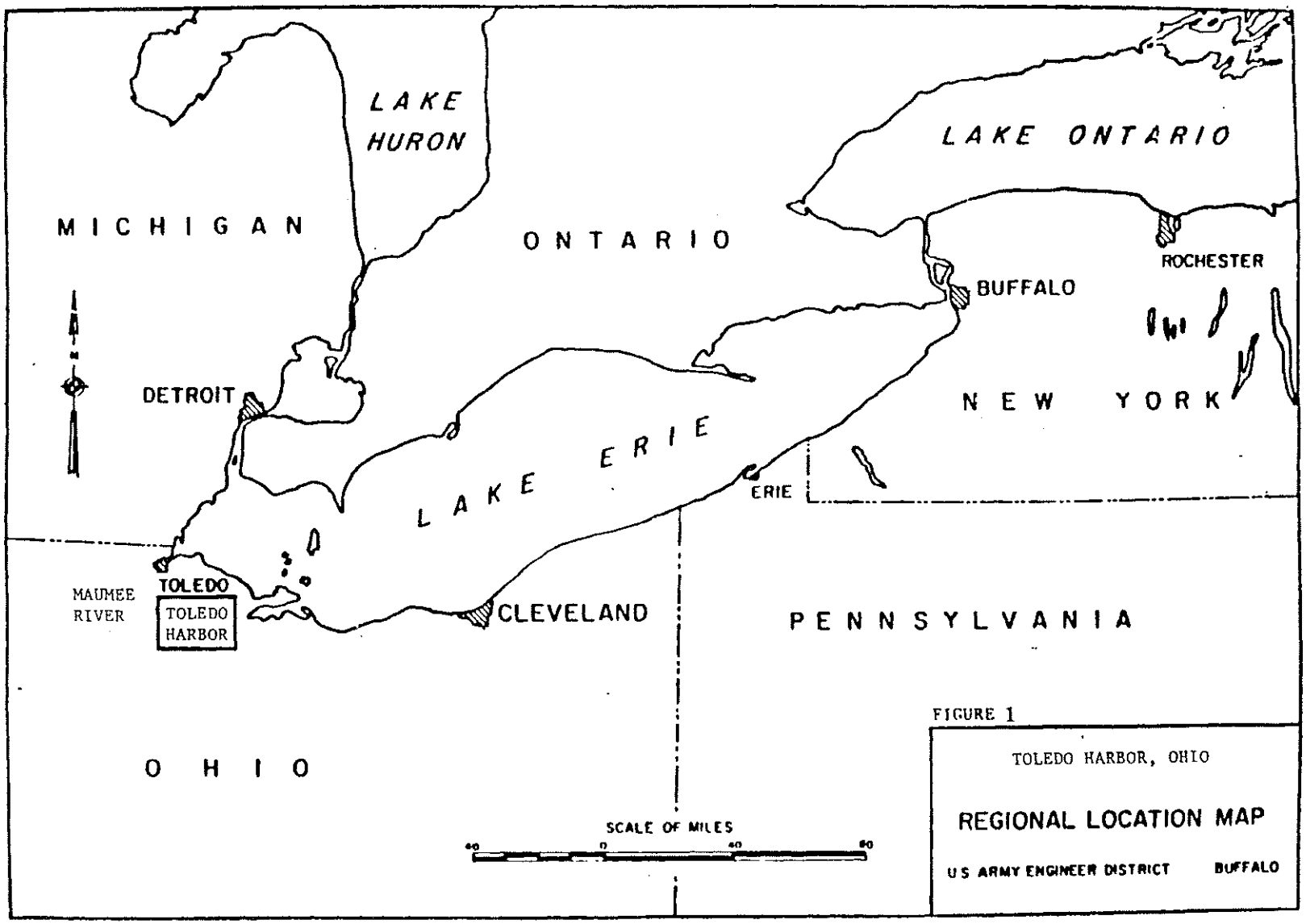


FIGURE 1

TOLEDO HARBOR, OHIO

REGIONAL LOCATION MAP

US ARMY ENGINEER DISTRICT BUFFALO

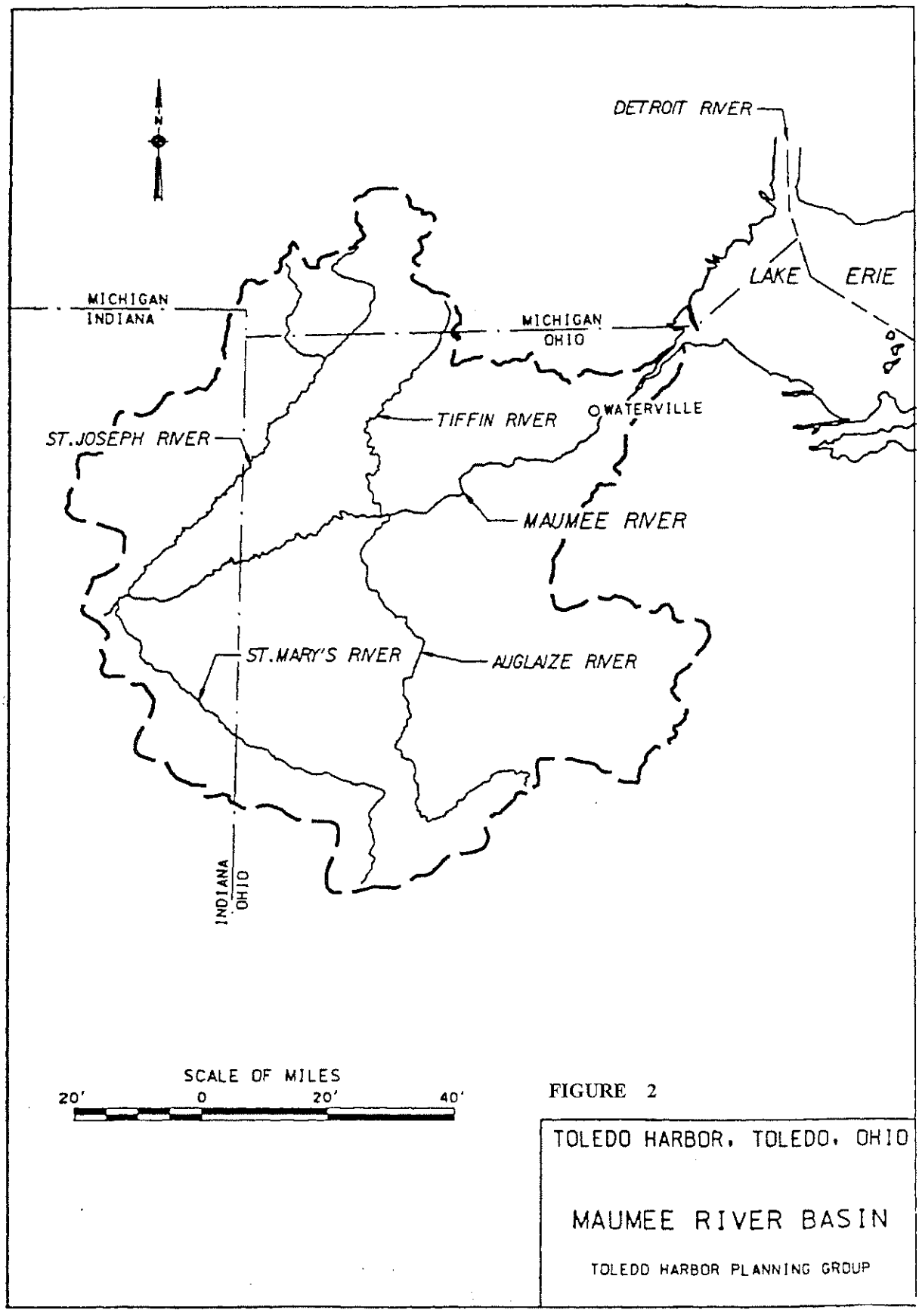


FIGURE 2

TOLEDO HARBOR, TOLEDO, OHIO

MAUMEE RIVER BASIN

TOLEDO HARBOR PLANNING GROUP

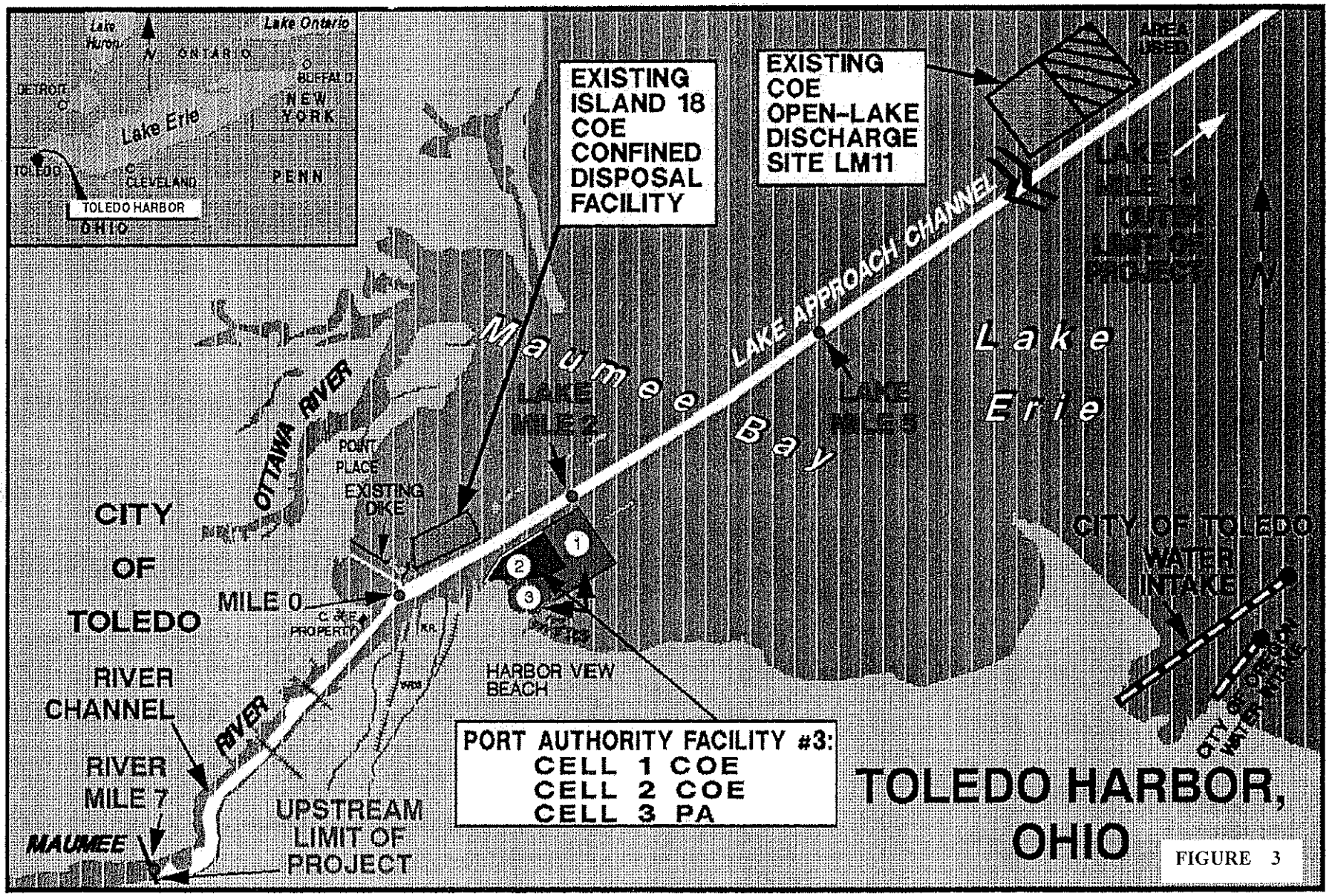

Lake Huron
Lake Ontario
ONTARIO
BUFFALO
NEW YORK
DETROIT
Lake Erie
TOLEDO
CLEVELAND
PENN
TOLEDO HARBOR
OHIO
EXISTING ISLAND 18 COE CONFINED DISPOSAL FACILITY
EXISTING COE OPEN-LAKE DISCHARGE SITE LM11
AREA USED
LAKE APPROACH CHANNEL
Maumee Bay
Lake Erie
LAKE MILE 2
LAKE MILE 3
OTTAWA RIVER
POINT PLACE
EXISTING DIKE
CITY OF TOLEDO
MILE 0
C.O.E. PROPERTY
HARBOR VEW BEACH
CITY OF TOLEDO WATER INTAKE
RIVER CHANNEL
RIVER MILE 7
MAUMEE RIVER
UPSTREAM LIMIT OF PROJECT
PORT AUTHORITY FACILITY #3:
CELL 1 COE
CELL 2 COE
CELL 3 PA
TOLEDO HARBOR, OHIO

FIGURE 3

CORPS OF ENGINEERS

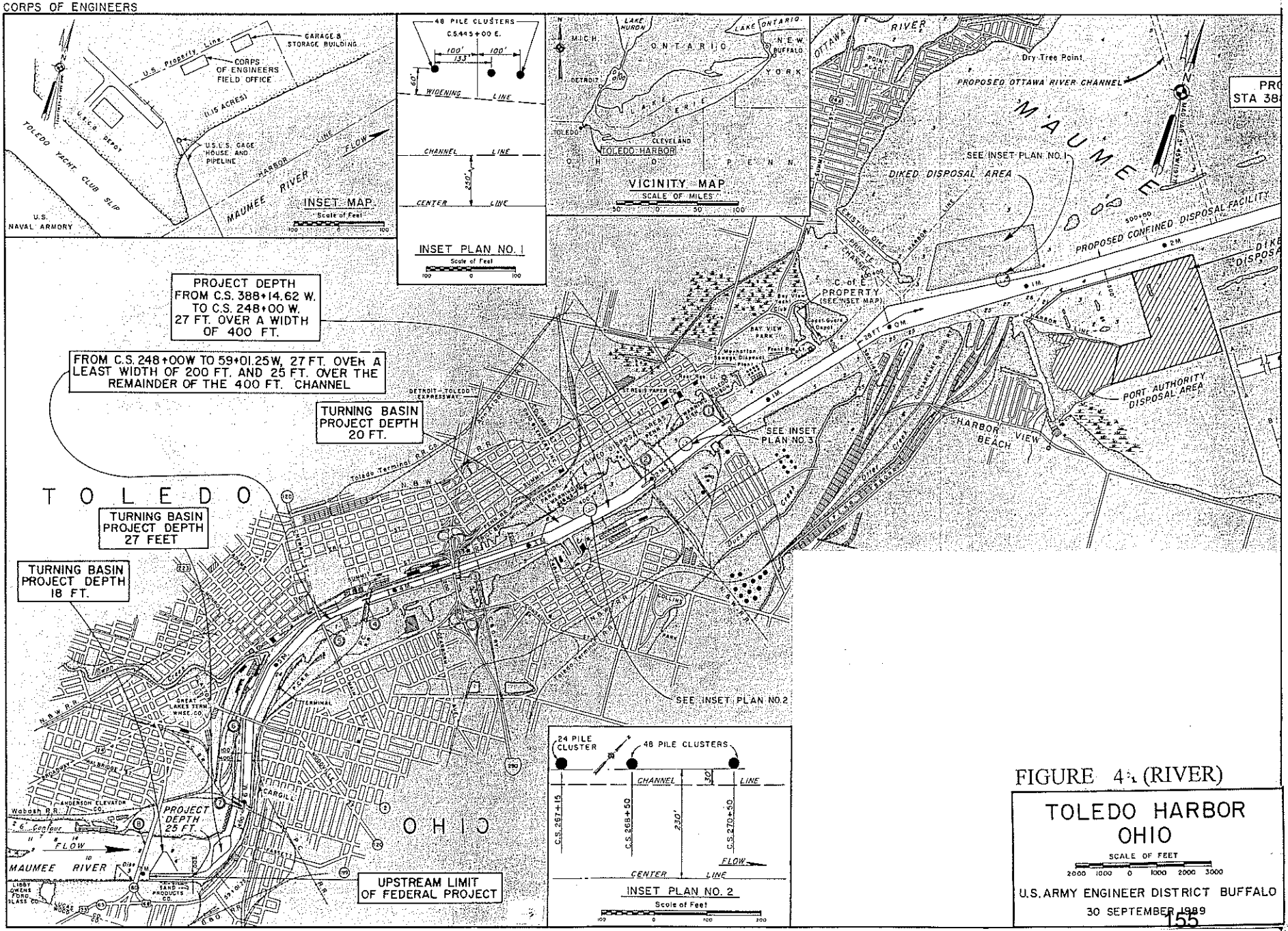
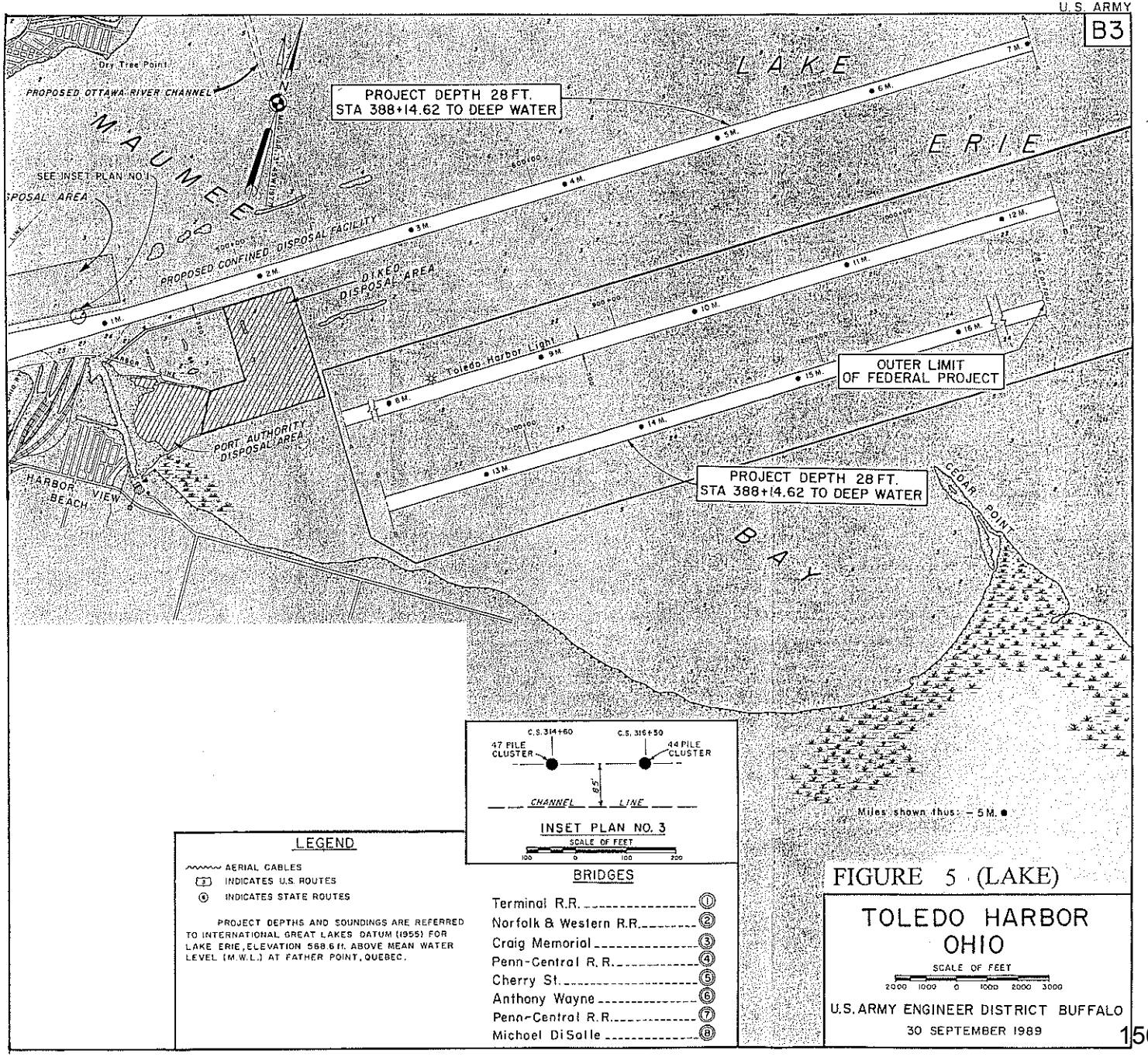


FIGURE 4 (RIVER)

TOLEDO HARBOR
OHIO

SCALE OF FEET
2000 1000 0 1000 2000 3000

U.S. ARMY ENGINEER DISTRICT BUFFALO
30 SEPTEMBER 1989



LEGEND

AERIAL CABLES
(2) INDICATES U.S. ROUTES
(6) INDICATES STATE ROUTES

PROJECT DEPTHS AND SOUNDINGS ARE REFERRED TO INTERNATIONAL GREAT LAKES DATUM (1955) FOR LAKE ERIE, ELEVATION 568.6 ft. ABOVE MEAN WATER LEVEL (M.W.L.) AT FATHER POINT, QUEBEC.

BRIDGES

Terminal R.R.	①
Norfolk & Western R.R.	②
Craig Memorial	③
Penn-Central R.R.	④
Cherry St.	⑤
Anthony Wayne	⑥
Penn-Central R.R.	⑦
Michael DiSalle	⑧

FIGURE 5 (LAKE)

TOLEDO HARBOR
OHIO

SCALE OF FEET
2000 1000 0 1000 2000 3000

U.S. ARMY ENGINEER DISTRICT BUFFALO
30 SEPTEMBER 1989

LOCATION OF POTENTIAL HRUs

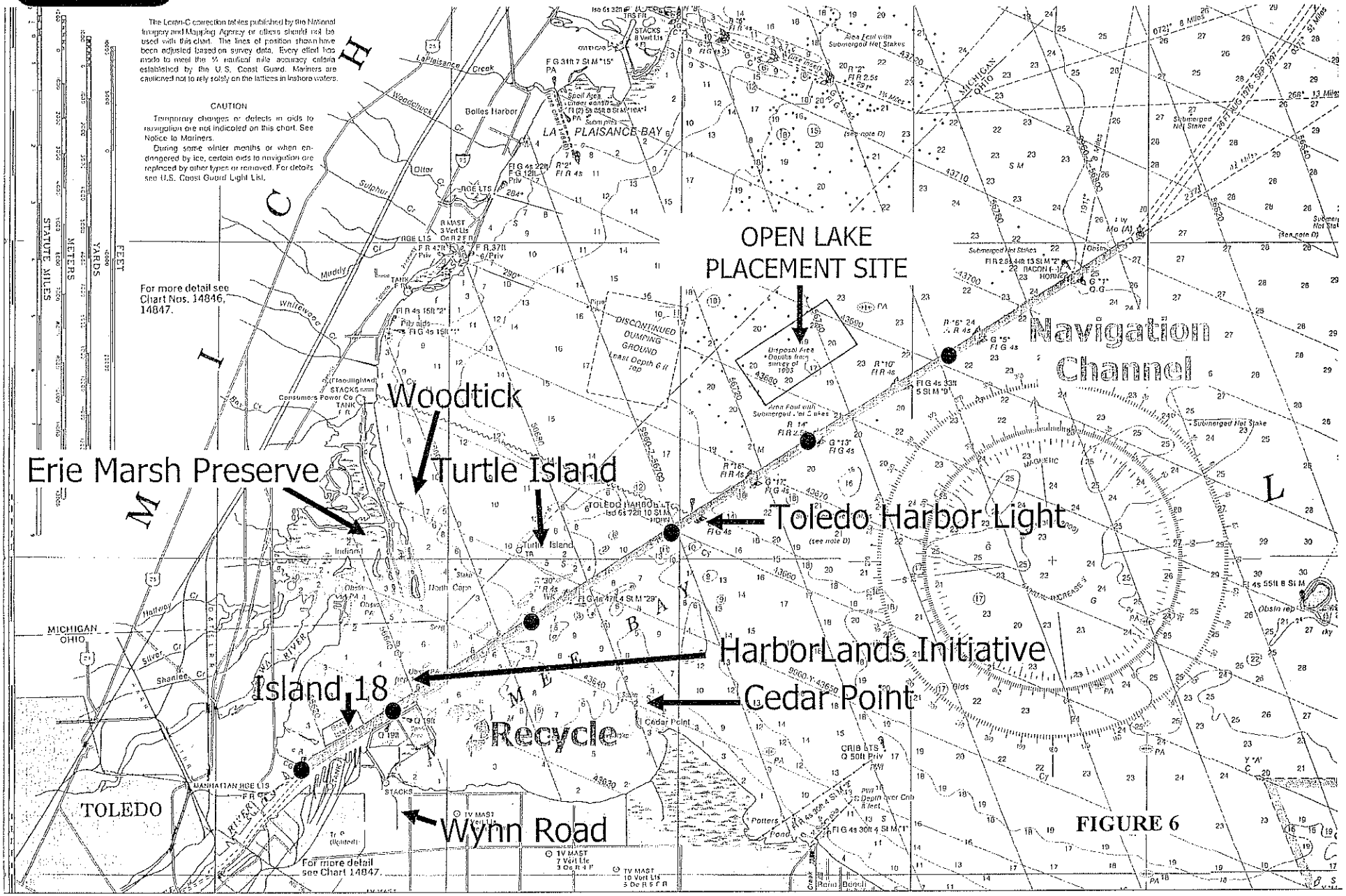


FIGURE 6

September 4, 2007

Tod D. Smith
Environmental Analysis Section
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207 – 3199

Re. Toledo Harbor, Lucas County, Ohio – Operations and Maintenance Dredging

Dear Mr: Smith:

This is a request for a public hearing and meeting for the Section 404 of the Clean Water Act permit that includes increasing the amount sediments open lake dumped from the Toledo Shipping Channel in the Western Basin of Lake Erie. The sediments come from dredging approximately one million cubic yards annually from the Maumee River and Bay, the most continuously dredged channel in the Great Lakes. For years Ohio E.P.A. has required the Corps to phase out the practice of open lake dumping. Instead, the public notice asks to increase the amount of sediments that are open lake disposed. The Public Notice states that "Assessment of the impacts of the placement of dredged material applying the guidelines for Specification of Disposal Sites for Dredged or Fill Material in 40 CFR 230 indicates that the proposed actions would not cause unacceptable disruption to the water quality uses of the effected aquatic ecosystem".

The dredging and disposal of over one million cubic yards annually is conducted in the shallowest, warmest, most biologically productive waters of the Great Lakes. The Toledo Shipping Channel/Harbor studies which are sited to support the request for increased open lake dumping are: A 1976 Environmental Impact Statement and 1984, 1989, 1990, 1995, 2002 and now 2007 Environmental Assessment. Factors in these waters that were used to support an Environmental Assessment rather than an Environmental Impact Statement have now changed. For the past decade water levels in this area have dropped and dissolved phosphorous levels are increasing. In 2007 a new form of algae, Lyngbya Wollei, appeared along the shores of Maumee Bay and Western Lake Erie and is growing. The algae piles up on rocks and then weeds sprout up. It is filling small privately owned marinas. The algae is clogging boat motors and decreasing recreational uses of the waters – the impacts on aquatic life are unknown. The problem is phosphorous – there is too much.

Does the dredging and the resuspension of sediments in the open lake impact nutrient levels and/or aquatic life? Is the statement by the corps that the "proposed actions would not cause unacceptable disruption to the water quality uses of the effected aquatic system" accurate? These and other questions on the impacts of open lake disposal of dredge materials in the warmest, shallowest, most biologically productive waters in the Great Lakes require a public meeting and hearing that is hereby requested by those listed below. The contact for this request is Sandy Bihn, Western Lake Erie Waterkeeper, 419-691-3788, email sandylakeerie@aol.com.

Sincerely,

Sandy Bihn
Executive Director/Waterkeeper
Western Lake Erie Association
6565 Bayshore Rd.
Oregon, Ohio 43618

Anthony Szilagye
Conservation Chair
Ohio Sierra Club
P.O. Box 9105
Toledo, Ohio 43697-9105

Amy Gomberg
Environment Ohio
203 E. Broad
Columbus, Ohio 43215

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

REPLY TO
ATTENTION OF

Environmental Analysis Section 28 SEP 2007

SUBJECT: Toledo Harbor, Lucas County, Ohio - Operations and Maintenance (Dredging) - Request for Clean Water Act - Section 404(a) Public Notice - Public Hearing

Ms. Sandy Bihn
Executive Director/Waterkeeper
Western Lake Erie Association
6565 Bayshore Road
Oregon, Ohio 43618

Dear Ms. Bihn:

Reference is made to your September 4, 2007 request for a public hearing for the proposed Operation and Maintenance Dredging of Toledo Harbor, Lucas County, Ohio. As a reason for a public hearing, you indicated that there are many questions on the impacts of open lake placement of dredged material on aquatic life in Lake Erie.

The primary reason for holding a public hearing is to obtain information that is not otherwise available, and which is necessary to properly evaluate the impacts of a proposed project to ensure balanced decision making and full consideration of water quality impacts in accordance with the Clean Water Act. Of note, this evaluation has, and will continue, to be coordinated with and include consideration of comments from applicable state and Federal resource agencies. I have considered your request, which does not indicate that any new information would be uncovered during a public hearing, and have concluded that there would be no benefit to holding a public hearing. For this reason, I am denying your request.

Please note, however, that the U.S. Army Corps of Engineers, Buffalo District, has applied for a Clean Water Act Section 401 State Water Quality Certification for this project. The State will be conducting a public hearing for this application on October 23, 2007 at 6:30pm at the City of Toledo Council Chambers, One Government Center. The subject application includes a detailed analysis of sediment samples and associated sediment and water quality impacts that may address many of your questions. This information will also be included in a draft environmental assessment that will be available for public comment in the near future.

Thank you for your interest and input relative to this proposed project.

Environmental Analysis Section

SUBJECT: Toledo Harbor, Lucas County, Ohio - Operations and Maintenance (Dredging) - Request for Clean Water Act - Section 404(a) Public Notice - Public Hearing

If you have any additional information that you believe would be pertinent to our evaluation or you have any questions regarding this matter, please contact Mr. Tod D. Smith of my Environmental Analysis Section who may be reached at 716-879-4175 (FAX 716-879-4357), by writing to the following address: U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199, or by e-mail at tod.d.smith@usace.army.mil.

Sincerely,

David J. Conboy, P.E.
Chief, Technical Services Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127

(614) 469-6923/FAX (614) 469-6919
September 11, 2007

Mr. Tod Smith
Buffalo District, Corps of Engineers
Environmental Analysis Section
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Mr. Smith:

The U. S. Fish and Wildlife Service has completed reviewing the Scoping Information Packet and Public Notice dated August 8, 2007, for the Operation and Maintenance Dredging of the Toledo Harbor, Lucas County, Ohio. The proposed dredging includes the 19-mile Lake Approach Channel, the 7-mile River Channel, and two turning basins. Historically, approximately 900,000 cubic yards (cy) of material has been dredged from Toledo Harbor annually. The proposed dredging for the next several years would remove approximately 1,350,000 cy of material, as it would include areas that have not been dredged in several years and hence, sediment has shoaled deeply here.

Samples of sediment from the proposed dredged areas have been subject to physical, chemical, and biological analysis. The material to be dredged consists primarily of silts and clays and some fine sand. Current analysis has shown all sediment in the Federal navigation channels, except at River Mile 2, to be suitable for unconfined open-lake placement. The Corps proposes to dispose of dredged material from River Mile 2 at the existing CDF 3-Cell 2 and/or the Island 18 CDF. All remaining dredged material is proposed to be disposed at the northeastern-most portion of the harbor's open-lake placement site or possibly utilized as a component of a beneficial use project.

Dredging operations in the Lake Approach Channel landward of Lake Mile 2 and River Channel will be conducted between July 1 and March 15 to avoid any significant adverse impacts on local fisheries. In the Lake Approach Channel lakeward of Lake Mile 2, no environmental window is proposed.

The Service has several comments on the project, as proposed. First, we question why no environmental window is proposed for activities lakeward of Lake Mile 2. This has not been the case in previous years. Additionally, Maumee Bay is known to be a significant fish spawning and nursery area, so it seems that an environmental window would be beneficial here. In general, we recommend no work occur between March 15 and June 30 in order to protect fish spawning activities.

Secondly, regarding the proposed disposal of dredged material, we do not object to the disposal of up to 100,000 cy of dredged material from River Mile 2 within an existing CDF. We request that no additional materials be placed into the Island 18 CDF until the recent breach is fully repaired. We have some

concerns regarding the proposed open-lake disposal of up to 1,250,000 cy of material into the open lake area. While this material has relatively low levels of contaminants, it is likely that residual contaminants remain in the sediment, and that by open-lake disposing of them, they are being redistributed into the food chain. Additionally, Maumee Bay is so shallow that it is likely that some of this sediment will wash back into the navigation channel, necessitating additional dredging at a later time. Finally, the turbidity created by open-lake disposal decreases water quality, even if only temporarily. Because of these factors, the Service prefers the phasing out of open-lake disposal. We strongly support researching potential beneficial uses of dredged material (for example, habitat restoration units) so that eventually the need for open-lake disposal can be eliminated. Furthermore, we strongly support efforts to prevent sediment from entering the watershed, such as installation of riparian buffers, no-till farming, and wetland restoration.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the Indiana bat, Karner blue butterfly, eastern prairie fringed orchid, piping plover, eastern massasauga, and rayed bean, Federally listed endangered, threatened, or candidate species. Due to the project type, location, and onsite habitat, none of these species would be expected within the project area, and no impacts to these species are expected. This precludes the need for further action on this project as required by the 1973 Endangered Species Act, as amended.

BALD EAGLE COMMENTS: The project area lies within the range of the **bald eagle** (*Haliaeetus leucocephalus)*. The bald eagle was removed from the Federal list of endangered and threatened species in July 2007 due to recovery. This species continues to be afforded protection by the Eagle Protection Act, Migratory Bird Protection Act, and the State of Ohio. A bald eagle nest exists on property near the western side of the Maumee River mouth. We recommend that you contact Mr. Mark Shieldcastle, with the Ohio Department of Natural Resources, Division of Wildlife, (419) 898-0960, to determine if the project will affect any eagles that may be nesting at this location. If the nest is active, we may recommend that work within ½ mile of the site be restricted from mid-January through July to allow pre-nesting activities, incubation, and raising of the young.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

We appreciate this opportunity to provide the above comments. If you have questions, or if we may be of further assistance in this matter, please contact Megan Seymour at extension 16 in this office.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH
ODNR, Division of Real Estate & Land Management, Columbus, OH
Ohio EPA, 401/Wetlands Section, Attn: Randy Bournique, Columbus, OH
US EPA, Office of Environmental Review, Chicago, IL
Mr. Steve Holland, ODNR, Office of Coastal Management, 105 W. Shoreline Dr., Sandusky, OH 44870

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 12 2007

REPLY TO THE ATTENTION OF:

B-19J

Tod D. Smith
Environmental Analysis Section
Department of the Army
U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, NY 14207-3199

Re: Toledo Harbor Operations and Maintenance Dredging, Lucas County, Ohio

Dear Mr. Smith:

The U.S. Environmental Protection Agency Region 5 (U.S. EPA) has reviewed the Scoping Information Packet for the above-mentioned project. Recommendations contained in this letter are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The proposed project involves placement of dredged material at either an existing open-lake placement site in Lake Erie, or a harbor dredged material confined disposal facility (CDF), or utilization of dredged material as a component of a beneficial use project. Based on the public scoping information, we offer the following points to assist in the preparation of an Environmental Assessment (EA).

Characteristics of Dredged Materials

- Two rounds of sediment sampling and evaluation were mentioned in the scoping packet (2004 and 2006), each covering somewhat differing areas of the channel. The EA should address whether the proposed maintenance strategy will include plans for dredged material sampling and testing plans in compliance with the "Great Lakes Dredged Material Testing and Evaluation Manual." Is the existing data sufficient to evaluate all options for dredged material management (e.g., representativeness, quality, regulatory requirements, etc.)?

- The EA should provide additional information concerning development of proposed annual quantities of dredged material to be removed, including:
  - Data which provides the basis for the proposed annual quantities; and
  - How lower lake levels, in the context of global climate change, might affect proposed annual dredging schedules/quantities.

- The EA should clarify the time period to be covered by the dredged material management strategy, particularly the time period when full maintenance dredging is planned to be initiated.

- Scoping information indicates that maintenance dredging has not been completed at Toledo Harbor. The EA should discuss what obstacles were encountered and, if those obstacles remain, how the proposed project will overcome these obstacles.

Indirect Impacts

- The EA should discuss whether proposed annual dredging quantities include the potential/actual increase of acreage being placed into corn production (for the production of ethanol) with anticipated resultant increases in erosion/sedimentation in the watershed. We understand the Corps and the Great Lakes Commission have a joint project underway to develop a white paper on such impacts to the Great Lakes transportation system.

Beneficial Use and Long-Term Management of Dredged Material

- The EA should contain information regarding current and future capacity for each of the confined disposal options. Limitations regarding continued use of the open water disposal site should be discussed (e.g., whether there is a potential need for increased confined disposal in the future).

- Given the limited disposal capacity over the longer term and historical issues regarding Lake Erie water quality due to impacts resulting from open water disposal, the EA should explore all beneficial use options, including those which may employ a marketable end product. The Region 5 Center of Excellence for Sustainable Residuals Management is exploring opportunities and funding sources to develop a tool which would provide information about dredged materials in a GIS-type system with features that would provide necessary information to enable efficient remediation at a minimum cost as well as assist in developing uses for remediated sediments. If you would like to obtain additional information regarding this effort, please contact Mr. Ash Sajjad in our offices at (312) 886-6112.

  Additionally, the EA should discuss the applicability of a feasibility study under the authority of the Water Resources Development Act Section 204 (beneficial use of dredged material) to assess the feasibility of creating wildlife habitat restoration units in Lake Erie.

We appreciate the opportunity to provide recommendations for the forthcoming NEPA analysis for this project. Please send three copies of future NEPA documents pertaining to this project as they become available. Should you have any questions, please do not hesitate to contact me or Kathleen Kowal of my staff at (312) 353-5206 or via e-mail at kowal.kathleen@epa.gov.

Sincerely,

Kenneth A. Westlake, Supervisor
NEPA Implementation
Office of Enforcement and Compliance Assurance

Smith, Tod D LRB

From: Mitch, Brian [Brian.Mitch@dnr.state.oh.us]
Sent: Thursday, September 27, 2007 8:06 AM
To: Smith, Tod D LRB
Subject: 07-0207; Toledo Harbor 2008-2011 Maintenance Dredging
Attachments: oledata.mso; 07-0207.jpg

ODNR COMMENTS TO Mr. Tod D. Smith, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York, 14207-3199.

Location: The project is located within the Federal Navigation channels in Toledo Harbor, City of Toledo, Lucas County, Ohio and is situated on southwestern shore of Lake Erie at the mouth of the Maumee River.

Project: The project involves scheduled 2008-2011 maintenance dredging of Toledo Harbor. The USACE is developing a dredged material management strategy for the next several years. The project involves placement of the dredged material at either the existing open-lake placement area in Lake Erie (or possibly used as a component of a beneficial use project) or a harbor dredged material confined disposal facility.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Rare and Endangered Species: The ODNR, Division of Natural Areas and Preserves, Natural Heritage Database contains the following records within the project area and vicinity. The data listed below is shown on the attached map.
Oregon Quad
1. *Percina copelandi* - Channel Darter, threatened
2. *Haliaeetus leucocephalus* - Bald Eagle, state endangered, federal threatened
3. *Percina copelandi* - Channel Darter, threatened
4. *Percina copelandi* - Channel Darter, threatened
5. *Percina copelandi* - Channel Darter, threatened
6. *Sterna hirundo* - Common Tern, endangered

Fish and Wildlife: The ODNR, Division of Wildlife (DOW) has the following comments. In Enclosure 4 the applicant references "Assessment of Potential Impacts of Bucket Dredging Plumes on Walleye Spawning Habitat in Maumee Bay, Ohio; Kevin Reine, Douglas Clarke, Charles Dickerson, and Scott Pickard; May 2007." The DOW recommends the U.S. Army Corps of Engineers submit a copy of these study results to the DOW, Stream Conservation and Environmental Assessment Unit for review. The DOW questions why no environmental window is proposed for activities lakeward of Lake Mile 2. This has not been the case in the previous years. Additionally, Maumee Bay is known to be a significant fish spawning and nursery area, so an environmental window would be beneficial here. Unless it can be definitively demonstrated that this project will have no negative impacts, the DOW recommends no in-water work from March 15 to June 30.

Coastal Management: The ODNR, Office of Costal Management has the following comments. The proposed project cannot proceed until a Federal Consistency concurrence is issued by ODNR. Based on the information provided, a Federal Consistency concurrence, conditional concurrence, or objection will be issued by October 9, 2007.

Geological Survey: The ODNR, Division of Geological Survey has the following comments. The application states that "the material to be dredged consists primarily of silts and clays and some fine sand". If an area with >60% sand/gravel is encountered, this sediment (except from RM 2), should be placed in the littoral system.

Administration: Regarding the proposed disposal of dredged material, we do not object to the disposal of up to 100,000cy of dredged material from River Miles 2 within an existing CDF. We request that no additional materials be placed into the Island 18 CDF until the recent breach is fully repaired. We have serious concerns regarding the proposed open-lake disposal of up to 1,250,000 cy of material into the open lake area. Both sediments and associated contaminants are detrimental to Lake Erie. It is likely that open lake disposal will redistribute the contaminants back into the food chain. Additionally, Maumee Bay is so shallow that it is likely that some of this sediment will wash back into the navigation channel, necessitating additional dredging at a later time. Finally, the turbidity created by open-lake disposal decreases water quality. Because of these factors, ODNR recommends the phasing out of open-lake disposal. We strongly support researching potential beneficial uses of dredged material so that the need for open-lake disposal can be eliminated. Furthermore, we strongly support efforts to prevent sediment from entering the watershed, such as installation of riparian buffers, no-till farming, and wetland restoration.

ODNR appreciates the opportunity to provide these comments. Please contact Brian Mitch at (614) 265-6378 or Vicki Deisner at (614 265-6873 if you have questions about these comments or need additional information.

Brian Mitch, Environmental Review Manager
Vicki Deisner, Environmental Policy Coordinator
Ohio Department of Natural Resources
Environmental Services Section
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Columbus, Ohio 43229-6693
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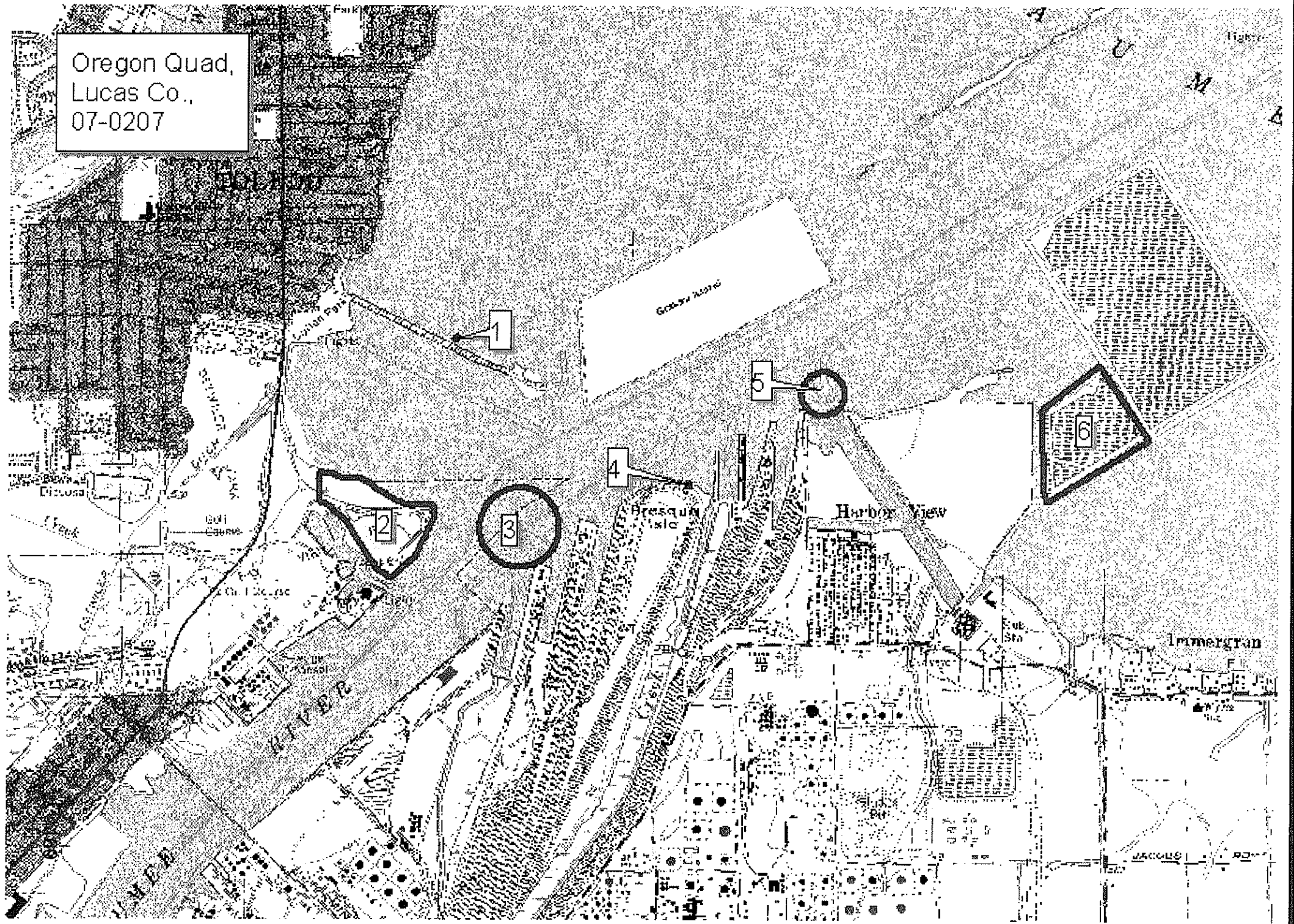
Oregon Quad,
Lucas Co.,
07-0207
1
2
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Harbor View
Bresqua Isle
Irmengran