Kenosha Harbor Dredging
and
Kenosha Dunes Nourishment Project

Kenosha County, Wisconsin

Environmental Assessment
Appendix 1 - Section 404(b)(1) Analysis

U.S. Army Corps of Engineers
Chicago District

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I. Project Description

A. Locations

Kenosha Harbor is an authorized Federal navigation harbor located in Kenosha, Wisconsin on the western shore of Lake Michigan (**Error! Reference source not found.**). The harbor is located approximately 30 miles south of Milwaukee and 45 miles north of Chicago. The harbor supports mainly recreational navigation; and also serves as a harbor of refuge. The harbor is comprised of six main areas: the lake approach channel, an approach channel, the entrance channel, an inner basin, a northern channel extension, and a recreational boat harbor (not a part of the federal project). The harbor is used primarily for recreational purposes, but can function as a harbor of refuge.

Approximately two miles south of the harbor within the Chiwaukee Prairie State Natural Area are the Kenosha Dunes located partially within Kenosha, WI and partially in Pleasant Prairie, WI. The shore and nearshore areas of the dunes are the proposed locations for placement of the dredged material.

B. General Description

The goal of the current action is to conduct maintenance dredging at the Harbor, and it is proposed that any sediment dredged could be placed onshore in addition to the existing near shore placement.

USACE has not performed maintenance dredging of the Kenosha Harbor since 2014. However, the city of Kenosha performed dredging in 2019 with placement of material at an approved shoreline site along 1st Street in Kenosha.

C. Authority and Purpose

The existing Federal navigation project at Kenosha Harbor was authorized by the River and Harbor Act of 1899 and by subsequent amendments in 1907, 1935, 1950, 1962, and 1970. The lake approach channel is authorized to be -27 feet (LWD), the approach channel is -26 feet (LWD), the entrance channel and inner basin are -25 feet (LWD), and the northwesterly channel extension to 50th street is -21 feet (LWD).

USACE had performed dredging annually between 1957 and 1969. The harbor was not dredged again until 1976 and was subsequently dredged in 1977, 1980, 1982, 1984 (twice), 1986, 1999 and 2014. The city of Kenosha performed dredging in 2019. Note that “purpose and need” are also discussed in the main EA document.

D. General Description of Dredged or Fill Material

(1) General Characteristics of Material

Sediment grab samples were collected in Kenosha Harbor, three were from the entrance channel and one from the approach channel. These samples were taken in May 2020 and no new potential sources of contamination are known at this time. Materials present in the entrance channel and approach channel contain clean sand, free of fines, and contaminants. (See Appendix 2 of the EA for additional details on the quality of the sediment.)

(2) Quantity of Material

At the current rate, Kenosha harbor is dredged only intermittently on an as needed basis. Individual

dredge years may have significantly more or less dredging based on funding or special considerations (large storm events, low or high water levels, etc).The current estimate is between 20,000 and 60,000 cubic yards to be dredged from the Approach and Entrance channels. This will not fully remove the backlog of shoaled sediment and future dredging projects may be planned.

(3) Source of Material

The littoral drift pattern in the vicinity of Kenosha Harbor is predominately from north to south. The dredged areas act as sediment traps, where the littoral sediment settles, thus significantly reducing the amount of littoral sediment migrating south of the Harbor.

E. Description of the Proposed Placement Site(s)

(1) Location

The proposed primary beach placement site is the Kenosha Dunes. The dredged material from Kenosha Harbor Approach Channel and Entrance Channel could be placed onshore, or placed along the shore to build up the eroded shoreline. Placement is dependent on the quantity needed for shoreline protection, and is limited to the available dredging volume or less.

Material dredged from the channels could also be placed at a secondary site along 1st Street on shore or in the near shore area depending on the volume available.

(2) Size

Kenosha Dunes – Located in the City of Kenosha and the Village of Pleasant Prairie, WI. The initial placement site is approximately 1,300 feet long and is state owned. There is potential that this site could be expanded to 2,240 feet as necessary and if sufficient quantities of sediment are available.

The total quantity of annual dredging is dependent on shoaling patterns and funding, therefore in any given dredging year not all placement areas may be used. Over the life of the project some placement areas may be reused, or not used at all.

(3) Type of Site

The identified placement sites are beaches adjacent to Lake Michigan. Placement would be between the toe of the eroded bank onshore and the nearshore zone (-8-foot LWD).

(4) Type of Habitat

The natural habitat at these beaches before their development was most likely an open lacustrine shoreline with barrier enclosed ridge and swale complex. The beaches were likely sculpted by wave action that caused the movement and drift of littoral sand from east to west along the coastline. Wetlands exist at various distances and connectedness to the lake and as a result the organic soil depth and vegetation are quite variable. This natural condition can be seen fairly well at the Kenosha Dunes, but along much of the adjacent shoreline the condition no longer exists due to development of the area. The natural littoral drift cycle has also been disrupted by construction of in water structures that block or severely reduce the north to south sediment flow.

(5) Timing and Duration of Discharge

Dredging at Kenosha Harbor is dependent upon shoaling rates and appropriations. Historically through 1986, the harbor was dredged every year or two in spring, summer or early fall depending on weather conditions. After 1986, the harbor was dredged by the USACE in 1999 and 2014 and by the City of Kenosha in 2019. The length of each individual dredging event various, but typically lasts approximately one to two months depending on dredging volume, equipment used, weather, and other factors.

F. Description of Placement Method

Material to be placed in the beach and nearshore zone is transported via bottom dump scow, mechanical crane, or hydraulic dredge (pipeline). Once the scow is in place, the bottom doors open and material is dropped down. Alternatively, a crane could be used to place small loads into the water or on-shore. Material can also be placed in the nearshore zone or on the beach hydraulically. Material to be placed onshore or near shore (shallow water) is hydraulically pumped as a slurry onto the beach, either from a scow or pumped directly from the dredging location.

II. Factual Determinations

A. Physical Substrate Determinations

(1) Substrate Elevation and Slope

The Approach Channel has an authorized depth of -26 feet Low Water Datum (LWD), and the Entrance Channel has an authorized depth of -25 feet LWD. The Approach Channel and Entrance Channel are generally maintained at this depth. Material will be placed between the toe of the eroded bank and the nearshore area (-8-foot LWD).

(2) Sediment Type

The sediment to be dredged is predominantly the result of littoral transport of Lake Michigan sand from areas north of Kenosha Harbor. (See Appendix 2 of the EA for additional sediment information.) The sediment in the potential placement areas is primarily of the same type.

(3) Dredged/Fill Material Movement

Littoral transport is the movement of sediments in the near shore zone by waves and current. Littoral transport travels parallel to the coast in a predominantly north to south direction along the coast of Wisconsin and Illinois down to the southern end of Lake Michigan. Material placed in the littoral zone either moves onto the beach or provides wave energy attenuation from the placement location. Material placed on the beach widens the existing beach for the same goal of wave energy attenuation. Material placed in either type of location will eventually rejoin the overall east to west littoral transport.

(4) Physical Effects on Benthos

Existing periphyton, epibenthic plankton, and benthic macroinvertebrate organisms that currently reside in the substrate of the area to be dredged or placement area(s) would be removed or disturbed when the dredged materials are removed from the water, placed back into the water, or placed on/near beaches. The existing sediment within the dredging area will need to be removed to allow for an adequate navigation depth. After this material is removed it will be transported to a predetermined deposition site as listed above and placed upon the existing sediment in the area. Organisms that typically reside in

high wave energy environments near shorelines are generally tolerant of turbid waters and adapted to elevated suspended solids concentrations. As a result, the periphyton, epibenthic plankton, and macroinvertebrate organisms would quickly repopulate, grow, and recolonize on/in the benthos after operations have ended.

(5) Other Effects

There would be no other significant substrate impacts.

(6) Actions Taken to Minimize Impacts

For near shore placement a bottom dump scow minimizes resuspension by going into shallow water before opening, or careful hydraulic placement of the sediment low in the water column can reduce resuspension of sediment. For onshore placement the slurry is pumped into a temporary settling basin, which allows the solids to settle out and clear water to return to the lake. Regardless of the placement method or location, the material to be dredged has a very low fine content and turbidity is expected to be relatively low during placement. As a precaution, dredging and material placement shall be conducted in a manner to minimize re-suspension of sediment. This would be achieved through the use of best management practices (BMPs) including careful dredging and placement methods, dredging and placement during favorable weather conditions that minimize turbulence and transport of materials, sequential filling at the placement site (no random broadcasting of material), and other methods as necessary to limit sediment re-suspension and transport beyond the immediate work areas.

B. Water Circulation, Fluctuation and Salinity Determinations

(1) Water

a) *Salinity*

Lake Michigan is a freshwater lake. The proposed work is not expected to increase or decrease the salinity of the water and will not add salts to the system.

b) *Water Chemistry*

No water chemistry data are available for Lake Michigan. Sediment dredging and placement are expected to cause localized turbidity effects, but no significant long term or detrimental changes to water chemistry in Lake Michigan due to the small scale of the operation compared to the size of the lake.

c) *Clarity and Color*

Since the dredged material has a low percentage of fines, it is unlikely to cause any considerable long-term effects on, or changes to the water clarity or color. Short-term, minor, and localized changes to the water clarity and color are expected due to temporary increases in the concentration of suspended solids and turbidity during work. As a precaution, dredging and material placement shall be conducted in a manner to minimize re-suspension of sediment. This would be achieved through the use of best management practices (BMPs) including careful dredging and placement methods, dredging and placement during favorable weather conditions that minimize turbulence and transport of materials, sequential filling at the placement site (no random broadcasting of material), and other methods as necessary to limit sediment re-

suspension and transport beyond the immediate work areas.

d) *Odor and Taste*

The dredged materials are not anticipated to cause any considerable long-term effects on, or changes to, the odor or taste of the water. As mentioned above, the placement may cause short-term, minor, and localized increases of suspended solids and turbidity. These changes might be associated with slight changes to odors or tastes in the water for organisms in the vicinity of the work area, but any potential changes are expected to be temporary and limited to the work area. The dredging and placement activities will not affect any public water intakes.

e) *Dissolved Gas Levels*

The dredged materials are not anticipated to cause any considerable long-term effects on, or changes to, the dissolved gas levels in the water. As mentioned above, the placement will likely cause short-term, minor, and localized increases of suspended solids concentrations and turbidity. These increases in the work area may have an effect on the dissolved gas and nutrient levels in the water column, which could adversely impact some of the aquatic plants and organisms near the site. In particular, increases of suspended solids and turbidity could slightly reduce the amount of dissolved oxygen in the water column, and this is because the biological and chemical content of the suspended solids might react with some of the dissolved oxygen. However, the aquatic plants and organisms that have adapted to the dynamic, high wave energy environments near the shoreline are generally tolerant of the turbid waters that occur during storm events, so most of the aquatic plants and organisms should be able to withstand the short-term and minor changes in dissolved gas and nutrient levels. In addition, the clean sand with low fines content is expected to have a low sediment oxygen demand. Changes to the dissolved gas levels in the water should be temporary and confined to the work area.

f) *Nutrients*

The dredged materials are not anticipated to cause any considerable long-term effects on, or changes to, the nutrient levels in the water. The work may cause temporary, minor, and localized changes to the suspended solids, turbidity, and nutrient levels. These changes could adversely impact some of the aquatic plants and organisms in the vicinity of the work area, but the aquatic plants and organisms along the shoreline should be tolerant of the turbid waters that occur during storm events and should quickly recover.

g) *Eutrophication*

Eutrophication is commonly caused when water is subjected to prolonged and elevated nutrient levels, particularly nitrogen and phosphorus. The dredging and placement is expected to cause short-term, minor, and localized changes to the suspended solids, turbidity, and nutrient levels, but the nutrient levels should return to Lake Michigan background concentrations shortly after the materials have been placed and the suspended particles have settled from the water column. The changes to suspended solids, turbidity, and nutrient levels are temporary and confined to the work area.

h) *Others as Appropriate*

There would be no other significant water impacts.

(2) Current Patterns and Circulation, Current Flow and Water Circulation

The proposed project will place dredged material in the near shore or on the beach. Kenosha Harbor and the proposed placement area are all part of the same dynamic littoral system of Lake Michigan. Lake Michigan is an enormous lake, and the dredging and placement areas are comparatively small; any placed material will rejoin the overall littoral system after placement. The proposed project will not have a significant adverse effect on the current patterns, flow, direction, velocity, stratification or hydrologic regime of Lake Michigan.

(3) Normal Water Level Fluctuations

Lake Michigan is an extremely large lake that has a huge surface area and contains an immense volume of water. According to the Great Lakes Atlas (Government of Canada and USEPA 1995), Lake Michigan has a water surface area of 22,300 square miles (57,800 square kilometers) and a volume of 1,180 cubic miles (4,920 cubic kilometers). It can take multiple months, seasons, or even years of persistently wet/dry conditions to cause an impact to the water levels of the Great Lakes (USACE 2013). The USACE, Detroit District, tracks the water levels in each of the Great Lakes, and the primary factors that determine water level changes are precipitation falling on the lake surface, runoff draining to the lake, evaporation from the lake surface, diversions into or out of the lake, and connecting channel inflows and outflows (USACE 2013). The very small volumes of material that would be moved for this project are insignificant in terms of water level impacts to the lake.

(4) Salinity Gradients

Lake Michigan is a fresh water lake, so the effect of the Project on salinity gradients is not applicable.

(5) Actions That Will Be Taken to Minimize Impacts

Onshore and near shore placement could take place either mechanically or hydraulically. For mechanical placement, material would be hauled to the site via barge and placed in the project area via mechanical offloading or bottom dump scow. For hydraulic placement the slurry is pumped into a temporary settling basin, which allows the solids to settle out and clear water to return to the lake. The sediment being handled has a very low fines content. No additional special measures would be taken to minimize temporary impacts.

C. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Placement Site

The sediment to be dredged has a low fine content (see Appendix 2 to the EA). It is expected that there could be turbidity (suspended sediment) at the locations of dredging and placement, however since the content of silt and clay is low, the impacts are expected to be minor and localized. Turbidity controls in the form of best management practices will be used to minimize turbidity.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column

a) *Light Penetration*

The activities are expected to cause minor, temporary, and localized increases of suspended solids and turbidity that will likely cause a temporary decrease in the clarity of the water and reduce the

penetration of light through the water column. These minor increases are anticipated to be low relative to the increased levels of suspended solids and turbidity that typically result from storm events and adverse weather conditions. The project is therefore not expected to cause any long-term adverse impacts.

b) *Dissolved Oxygen*

Minor, temporary, and localized increases of suspended solids and turbidity might cause a slight reduction in the level of dissolved oxygen in the water. This reduction may be due to the biological and chemical content of the suspended solids, which could react with the dissolved oxygen and slightly lower concentrations in the water column.

c) *Toxic Metals and Organics*

Sediment in the Kenosha entrance channel and approach channel was sampled in May 2020. The samples were analyzed for conventional parameters (nutrients, organic carbon, oil and grease), metals, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). The results were compared to past sediment data from 2013 and 2018, collected in support of the previous two dredging events. Metal, PAH, and PCB concentrations were all low. Trace levels of these compounds were found, consistent with past sampling events and with the urban nature of the harbor. The contaminant concentrations for all parameters are sufficiently low that no environmental impacts are anticipated from the use of the sediment to augment eroded areas of the shoreline at Kenosha Dunes. Refer to Appendix 2 of the EA for additional details.

d) *Pathogens*

The optional areas for dredged material placement are beaches and the adjacent shallows. Pathogens, particularly disease-causing bacteria and other germs, are a major concern for beaches along urbanized areas of Lake Michigan's coastline. Several municipalities routinely test the water for pathogenic bacteria such as *Escherichia coli* (*E. coli*) during the swimming and recreational boating season. Although *E. coli* is not harmful itself and is naturally occurring in the environment, the bacteria is a potential indicator of sewage contamination and the possible presence of human pathogens (bacteria, protozoa, and viruses) (Whitman and Nevers 2003).

It has been shown that beach sand can act as a source of bacterial input into coastal waters (Stanford University 2007). Bacteria that is present in dry sand can be released into waterways when submerged in water such as during storm surges or high water levels. One potential source of beach contamination would be excrement from waterfowl that utilize the beach, or an adjacent area (parking lot, lawns, etc.) were rainwater can flow over and onto the beach. Sediment in Kenosha Harbor was not tested for *E. coli* or other bacteria. It is possible that the sediment to be dredged contains some level of pathogens, but because the harbor is separated from the beaches and the sediment originates in littoral transport, concentrations are expected to be low.

e) *Aesthetics*

The proposed project is not anticipated to cause any long term effects on, or changes to, the aesthetics of the water at the project site. There will likely be some temporary and minor increases of suspended solids and turbidity in the work area, and these increases are commonly associated with short-term and slight decreases of water clarity and/or changes to the color of the water. Nevertheless, these adverse aesthetic impacts should be short-term and minor, and the water is expected to return to a normal clarity and color as the suspended particles settle from the water column. In addition, the visual presence of

barges, vessels, backhoes, and other construction equipment in the water or on the beach may generate noise and cause temporary and minor adverse impacts to the aesthetic beauty of the placement sites.

f) *Others as Appropriate*

The proposed project is not expected to have any other adverse effects on the chemical and physical properties of the water column.

(3) Effects on Biota

a) *Primary Production, Photosynthesis*

As discussed above in the discussion of light penetration, primary production generally refers to the fixation of solar energy by phytoplankton for an aquatic ecosystem. The dredging and placement of material will likely cause some minor, temporary, and localized increases of suspended solids and turbidity, but the effects are anticipated to be low relative to the increased levels of suspended solids that typically result from storm events and adverse weather conditions. The aquatic ecosystem in the area is likely comprised of aquatic organisms that typically reside in near shore dynamic, high wave energy environments, so they should be tolerant of turbid waters and adapted to elevated suspended solids concentrations and turbidity. The project is not expected to cause any significant or long-term adverse impacts to primary production or photosynthesis for the biota.

b) *Suspension/Filter Feeders*

The dredging and placement of material will cause some minor, temporary, and localized increases of suspended solids and turbidity, which could benefit suspension/filter feeders. The effects are anticipated to be low relative to the increased levels of suspended solids and turbidity that typically result from storm events and adverse weather conditions, and the project is not expected to have any long-term effects on suspension/filter feeders.

c) *Sight Feeders*

Persistently high turbidity levels can cause adverse impacts to sight-dependent species because the reduction in clarity can hinder the feeding ability of these species, and thereby limit their growth and increase their susceptibility to disease. The dredging and placement of material is expected to cause minor, temporary, and localized increases of suspended solids and turbidity, but, as mentioned previously, the effects are anticipated to be low relative to the increased levels of suspended solids and turbidity that typically result from storm events and adverse weather conditions. Although there may be minor, temporary, and localized impacts, the project is not expected to have any persistent, long-term, and adverse effects on sight feeders.

d) *Others as Appropriate*

During the spring the Wisconsin DNR stocks fish in Kenosha Harbor. The dredge equipment will not block the channel in such a way to inhibit fish movement into or out of the harbor during or after stocking activities.

(4) Actions Taken to Minimize Impacts

The proposed actions that will be taken to minimize the adverse impacts are the same actions discussed earlier. Although there may be minor and temporary adverse impacts within the local work

area, these actions should minimize any broader effects outside the immediate vicinity of the work area.

D. Contaminant Determinations

The most recent Contaminant Determination for Kenosha Harbor was completed in 2020. The sediment was evaluated for hydraulic or mechanical dredging. It concluded that the sediment within the Approach Channel and Entrance Channel is suitable for unrestricted use, including placement upland for coastal protection or within the littoral zone. See Appendix 2 to the Environmental Assessment.

E. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton

Plankton are pelagic, which means they live within the water column itself, as opposed to benthic organisms that live along the bottom (Water Encyclopedia 2016). Plankton generally drift along with the water currents and/or float on or near the water surface, as opposed to nekton, which are active swimmers that can propel themselves through water currents. Plankton are typically divided into phytoplankton, which includes photosynthesizing species like algae that derive energy from sunlight, water, and carbon dioxide, and zooplankton, which consume food in order to derive energy. Although most planktonic species are small and often microscopic, there are large plankton organisms that are still considered to be plankton because they drift with the water current.

Researchers have found that Lake Michigan has experienced substantial and complex changes to the food-web structure since the 1980s (Vanderploeg et al. 2012, Makarewicz et al. 1998, and Scavia et al. 1988). The paper by Vanderploeg et al. (2012) lists the following changes: (1) a decrease in phosphorus loading, (2) increased control of planktivorous alewife (*Alosa pseudoharengus*) by the introduction of Pacific salmon, (3) the invasion of the visual-feeding spined predatory cladoceran *Bythotrephes longimanus* in the mid-1980s from northern Europe, (4) invasion by a host of Ponto-Caspian species, including zebra (*Dreissena polymorphia*) and quagga mussels (*Dreissena rostiformis bugensis*) during the 1990s, and (5) loss of the spring phytoplankton bloom in 2007 and 2008 likely caused by intense filtering during winter and spring by quagga mussels following their massive population expansion into deep water starting in 2004.

The many changes, invasive or non-native species, and complex interactions that have occurred in Lake Michigan makes it difficult to assess and/or quantify the effects on different species and the food-web (Vanderploeg et al. 2012). The proposed dredging and placement project will cause some minor, temporary, and localized impacts to some phytoplankton and zooplankton. There are approximately 50+ species of plankton present in the Great Lakes with an estimated average biomass of several milligrams per cubic meter (Vanderploeg et al 2012; INHS 2019; NOAA 1993). Due to the nature of these organisms and large scale of Lake Michigan in comparison to the project site, the impacted populations of plankton in the vicinity should recover quickly, and no considerable long-term effects on plankton communities are anticipated.

(2) Effects on Benthos

Benthos refers to the organisms (plants and animals) that inhabit the bottom of a sea, stream or lake. For the current project, the benthos includes organisms that live on, in, or near the bottom of Lake Michigan. The removal of the dredged sediment material, as well as the placement of the material in open water near shore areas will cause some minor destruction and temporary adverse effects on the

existing benthos in the local work area. However, benthic communities that are established near the shoreline are generally tolerant and adapted to dynamic, high wave and energy environments. As such, the disturbed areas are likely to be recolonized quickly be the same species, and no long term effects or modifications to species diversity or dynamics is anticipated.

(3) Effects on Nekton

Nekton refers to the aquatic life (organisms) that can swim freely and are generally independent of the water currents (Water Encyclopedia 2016). The work activities are expected to cause minor auditory disturbances to nekton in the vicinity of the work area, and some aquatic organisms that are slow or unable to move away quickly enough could be injured or killed during the removal of dredged material or when the material is placed back into the water along or on the shore. However, compared to the tremendous size of Lake Michigan and its extensive shoreline, the work area is small. There might be some minor, temporary, and localized adverse impacts, but the proposed dredging and placement project is not anticipated to degrade or have any permanent or noticeable effects on the nekton or nekton habitat in Lake Michigan.

(4) Effects on Aquatic Food Web

When discussing the effects on plankton, it was previously noted that Lake Michigan experienced substantial and complex changes to the food web since the 1980s (Vanderploeg et al. 2012, Makarewicz et al. 1998, and Scavia et al. 1988). Although it is likely that proposed dredging and placement of material might cause effects on some food web organisms in the vicinity, particularly sedentary organisms along the bottom, the project sites are small compared to the extremely large size of Lake Michigan, and the food web organisms near the shoreline should be tolerant and adapted to dynamic, high wave and energy environments. The food web organisms should repopulate and become reestablished shortly after the project is completed, so any adverse impacts to the aquatic food web are expected to be minor, temporary, and localized. The dredging within the Kenosha Harbor project area and near or on shore placement activities are not expected to have any permanent or considerable long-term effects on the food web structure.

(5) Effects on Special Aquatic Sites

a) *Sanctuaries and Refuges*
There are no sanctuaries or refuges in the vicinity, so this topic is not applicable.

b) *Wetlands*
Brinson (1993) defines wetlands as the following:

> "Those areas that are inundated or saturated at a frequency to support, and which normally do support, plants adapted to saturated and/or inundated conditions. They normally include swamps, bogs, marshes, and peatlands."

The project site is in open freshwater lake habitat and moderately trafficked public beach. Wetland plants are unlikely to be established in the placement area due to the severe hydraulic forces of wave action and continually moving sediment. Given the unfavorable conditions for wetland plants this topic does not seem to be applicable.

c) *Mud Flats*
There are no mud flats in the vicinity of the site, so this topic is not applicable.

d) *Vegetated Shallows*
No vegetated shallows are in the vicinity of the site, so this topic is not applicable.

e) *Coral Reefs*
There are no coral reefs in freshwater environments, so this topic is not applicable.

f) *Riffle and Pool Complexes*
There are no riffle and pool complexes in the vicinity of the site, so this topic is not applicable.

(6) Threatened and Endangered Species

The USFWS Information for Planning and Consultation (IPaC) website was consulted for occurrence of federally threatened or endangered species within the project area. The following federally listed species and their critical habitats are identified by the USFWS as occurring within Kenosha County in the vicinity of the project:

- Northern Long Eared Bat (*Myotis septentrionalis*) – Threatened – Hibernates in caves and mines – swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods.

- Rufa Red Knot (*Calidris canutus rufa*) – Threatened – Coastal areas or large wetland complexes.

- Whooping Crane (*Grus americana*) – Experimental Population, non-essential – Migrates, winters, and forages in a variety of wetland habitats including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. Nest sites are typically located in shallow diatom ponds that contain bulrush.

- Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) – Threatened – Occurs in mesic prairies to wetlands such as sedge meadows, marsh, edges, and bogs.

It was determined that the project activities would have no effect on the northern long-eared bat, whooping crane, and eastern prairie fringed orchid as the activities are planned to take place along the eroding shoreline away from coastal wetlands, prairies, and woodlands, the preferred habitats for these species. The Rufa Red Knot has the potential to be encountered on the beach along the placement area. The Red Knot does not nest in this area, and would solely be using the beach for foraging and resting activities. Any project activities would likely cause the birds to vacate the area to another suitable habitat further along the coast. Therefore, the proposed placement of dredged material along Kenosha Dunes has the potential to affect, but not likely to adversely affect (NLAA) the Rufa Red Knot. This NLAA determination was provided to USFWS on June 3, 2020 for their review and was concurred with by USFWS on July 20, 2020.

(7) Actions Taken to Minimize Impacts

The proposed actions that will be taken to minimize the adverse impacts to the aquatic ecosystem and organisms are the same actions discussed earlier. There is the potential to include a pre-placement survey of the potential placement area(s) to ensure that any threatened or endangered species are not impacted, and to adjust the dredging/placement schedule to avoid critical life cycle stages if needed. Although there may be minor and temporary adverse impacts to the aquatic ecosystem and organisms within the local work area, these actions should minimize any broader effects on the aquatic ecosystem and organisms outside the immediate vicinity of the work area.

F. Proposed Disposal Site Determinations

(1) Mixing Zone Determination

A mixing zone determination was not completed as part of the evaluation of Approach Channel and Entrance Channel material. The sediment has a low fine content and low nutrient content. High concentrations of soluble contaminants at the dredging or placement sites are considered unlikely. It is expected that the dynamic and dispersive nature of Lake Michigan would mitigate any potential negative short-term impacts associated with sediment placement.

(2) Determination of Compliance with Applicable Water Quality Standards

None of the proposed materials are expected to be a source of toxic or persistent contamination, and the materials are not anticipated to cause any considerable long-term effects on, or changes to, the water chemistry or quality. Minor, short-term, and localized adverse impacts may occur within the immediate work area due to increases in the concentration of suspended solids and turbidity that are associated with the dredging activities. In general, the activities are expected to comply with the applicable water quality standards and no violations are anticipated. It is expected that the State will issue a Chapter 30 permit for conducting this work.

(3) Potential Effects on Human Use Characteristic

a) *Municipal and Private Water Supply*

A water intake for the City of Kenosha is located north of the harbor, and off-shore in Lake Michigan. The proposed dredging and placement activities are not located near the intake, and are not expected to impact the intake or local water quality.

b) *Recreational and Commercial Fisheries*

The dredging and placement activities that occur during the project will not have any effects on the operations of commercial fisheries because there are no commercial fisheries in the near shore vicinity of Kenosha Harbor or the Kenosha Dunes. There may be very minor, temporary, and localized disruptions for recreational fishing in the immediate vicinity of the project due to the implementation of restrictions around the site to ensure public safety and secure the construction site and equipment.

c) *Water Related Recreation*

It is likely that boat access to Kenosha Harbor will be impacted during dredging operations, since vessels will need to avoid the dredging operation. These restrictions could potentially result in some minor, temporary, and localized inconveniences related to harbor accessibility for commercial or recreational boat users in the immediate vicinity of the project either entering/exiting the harbor or in open water areas of the lake. However, the dredging operations are expected to be completed within a reasonably short duration, and the working area around the work barge(s) is expected to be small in relation to the harbor entrance channel and the near shore area of the lake. Additionally, there will likely be an impact to terrestrial access to the shoreline of Kenosha Dunes during placement of dredged material. These restrictions will also potentially result in some minor, temporary, and localized inconveniences to the public accessing the park, but should be short in duration.

d) *Aesthetics*

The proposed dredging operations will maintain the navigable channel depth and reduce sediment levels in the area of Kenosha Harbor. Placement of the dredged material on beaches or in near shore open water areas will provide needed nourishment to shoreline areas that are experiencing erosion from the natural process of littoral drift.

During operations, it is likely that the aesthetics of the local area will occasionally be affected by the additional noise and operations of the vessels and heavy equipment while dredging is conducted. This may include the visual presence of barges, vessels, backhoes, and other construction equipment in the water or on the beach. Since the placement areas are at or near to public beaches, the activities may adversely impact the noise and visual aesthetics for these recreational areas. The active dredging and placement of sediment will likely cause short-term and temporary increases in the suspended solids and turbidity of the immediate area. These increases could reduce the aesthetic quality of the water by causing minor and temporary impacts to the clarity or color of the water in the local area. In general, the aesthetic effects are expected to be minor and temporary and should only impact those people and organisms in the immediate vicinity.

e) *Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves*

Kenosha Harbor is flanked by the Simmons Island Park to the north and HarborPark to the south. Simmons Island Park is a public park managed by the City of Kenosha. Activities include recreational activities such as a baseball diamond, bike trail, beach, boardwalk, and boat launch. HarborPark is the former dredged material disposal site for the harbor and has since been turned into a neighborhood and green space. HarborPark is 69 acres and includes two public museums, festival space, fishing locations, and a lakeside promenade. The dredging and placement activities will not directly impact any of these park and recreational areas.

The Kenosha Dunes are located within the Chiwaukee Prairie Natural Area, a 485-acre prairie managed by the Wisconsin Department of Natural Resources. The prairie and dunes are open to the public and offer walking/hiking trails, over 400 species of plants, and over 70 species of birds. Chiwaukee Prairie is recognized as a National Natural Landmark by the National Park Service and was designated as a State Natural Area in 1967. The shoreline has been subject to drastic erosion due to higher than average lake levels and as such the dunes behind the beach have begun to erode, impacting the plant communities in the area. Placement activities will not negatively impact the dunes, but instead will augment the shoreline and provide protection against continued coastal erosion. The project is not anticipated to cause any permanent or long-term effects to the parks or lakefront, but as discussed above, there could be minor and temporary effects on the aesthetics of the local area.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

The Section 404(b)(1) Guidelines indicate that cumulative effects are the effects attributable to the collective effect of numerous individual dredged or fill material placement events. Although the impact from one particular, individual dredged or fill material placement event may only cause a minor effect on the aquatic ecosystem, numerous individual dredged or fill material placement events could cause a more substantial effect on the aquatic ecosystem.

The Kenosha Dunes Shoreline Nourishment Project is a product of the periodic dredging of Kenosha Harbor maintenance project. The dredging operations have historically sporadically occurred depending on sedimentation rates. If sedimentation was allowed to continually occur in the Approach Channel and Entrance Channel the natural littoral drift of sand along the coast will deposit material in the area. This

deposition at the harbor will limit the amount that is deposited further south along the coast, effectively eliminating the replenishment process and increasing the near shore erosion rate along the shoreline south of the harbor. Placement of sand from the harbor along the eroded shoreline to the south will return sand to the system and continue its movement along the coast, effectively maintaining the process of littoral drift and reducing the impact of erosion on those beaches.

There will likely be impacts to the aquatic community in the immediate area around dredging operations and around placement area(s). However, these disturbances are expected to be small, localized, and temporary. Given this and the overall size of the near shore area of Lake Michigan the aquatic ecosystem should quickly recover from the minor effects, and no long-term permanent, or cumulative effects are anticipated.

H. Determination of Secondary Effects on the Aquatic Ecosystem

According to the Section 404(b)(1) Guidelines, secondary effects are the effects associated with the placement of dredged or fill material, but they are not a direct result from the placement of dredged or fill material. For example, secondary effects may include the effects from activities to be conducted on fast land that was created by the placement of dredged or fill material.

Shoreline placement of material may increase the beach width. The additional beach potentially created would be similar to the previously existing beach and to beaches further north and south of the placement area. Activities on the increased beach are not expected to cause any secondary effects on the aquatic ecosystem.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation

No adaptation of the Section 404(b)(1) guidelines was made for this evaluation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

The “no action” alternative would be to cease dredging operations in and around Kenosha Harbor. This alternative is unacceptable since the Federal Government has determined that there is an economic benefit to the navigational maintenance activities and Congress has authorized and funded the actions. Additionally, there would be no sand made available for potential beach nourishment at the placement area. Dredging of the harbor allows commercial and recreational navigation to continue and the additional beach placement areas allow for sustaining additional beaches and beneficially using the clean sediment.

C. Compliance with Applicable State Water Quality Standards

Based on the sediment quality, it is anticipated that no state water quality standards would be exceeded during the proposed dredging and placement activities. Additionally, the dynamic and dispersive nature of Lake Michigan would mitigate any potential negative impacts associated with placement. Only short-term and localized impacts are likely to occur during placement.

D. Compliance with Clean Water, Endangered Species, National Historic Preservation and Marine Sanctuaries Acts

The project is expected to be in compliance with applicable Toxic Effluent Standards under Section 307 of the Clean Water Act; with the Endangered Species Act of 1973; with the National Historic Preservation Act of 1966; and with the Marine Protection, Research, and Sanctuaries Act of 1972 (not applicable because the proposed project is in Lake Michigan, and the Great Lakes are fresh water lakes that are not included in the Act).

E. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects

The proposed fill activity is not expected to have any significant, long-term adverse impacts on recreational, aesthetic, and economic values; or on human health or welfare including municipal and private water supplies, recreational and commercial fisheries, plankton, fish, shellfish, wildlife communities (including community diversity, productivity, and stability), or special aquatic sites.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

It was indicated previously that the work activities may cause minor auditory disturbances to nekton in the vicinity of the work area, and some aquatic organisms that are slow or unable to move away quickly enough could be injured or killed during sediment removal or when the material is placed back into the water. However, these impacts are not considered to be significant because, compared to the tremendous size of Lake Michigan, the work area is small. There might be some minor, temporary, and localized adverse impacts, but the proposed Project is not anticipated to degrade or have any permanent or noticeable effects on the nekton or nekton habitat in Lake Michigan.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability

Lake Michigan is enormous in comparison to the size of the project site, and no long-term adverse effects are expected on aquatic ecosystem diversity, productivity, or stability. Furthermore, it should be noted that the elevated levels of suspended solids would be expected to settle or dissipate within a relatively short time period, and the minor and temporary increases of suspended solids concentrations produced by dredging operations, as well as the placement operations, are expected to be considerably lower than the increased turbidity that would typically result from adverse weather conditions that produce high waves and strong currents.

F. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

In order to prevent adverse aquatic ecosystem impacts during placement, material to be placed in the near shore area is transported via bottom dump scow, sealed scow, or pipeline. Once a bottom dump scow is in place, the bottom doors open and material is dropped directly down, minimizing resuspension. Alternatively, material could be placed in water or on shore in discrete aliquots using a crane and bucket. Material to be placed onshore can be hydraulically pumped as a slurry into a temporary settling basin, which allows the solids to settle out and clear water to return to the lake, or could be pumped directly into the shallow water along the shore to build up the eroded coast. Best management practices will be used to minimize resuspension of solids during dredging and placement activities.

G. On the Basis of the Guidelines, the Proposed Placement Sites for the Discharge of Fill Material is:

Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize adverse effects on the aquatic ecosystem.

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V. Figures

Figure 1: Kenosha Harbor authorized areas and associated depths.

Figure 2: Kenosha Harbor dredge material placement area. Shows 2021 placement area and potential future placement area extent.