Environmental Assessment

Waukegan Harbor Maintenance Dredging and Placement

US Army Corps of Engineers
Chicago District

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Chapter 1 – Purpose & Need

1.1 – National Environmental Policy Act and Related Procedures

The National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), the Council on Environmental Quality (CEQ) NEPA regulations (40 CFR Parts 1500 to 1508), and the US Army Corps of Engineers' (USACE) NEPA implementing regulations (33 CFR Part 230) require that the USACE consider the potential environmental effects of a proposed action before making a decision on the proposed action. This Environmental Assessment (EA) includes the direct, indirect, and cumulative effects of dredging clean sand from the Waukegan Outer Harbor, Approach Channel and Advance Maintenance areas along with placing the dredged material in an expanded open water area, or near shore and/or on shore beach sites. This EA provides the USACE and other decision makers with the information needed to make an informed decision about the dredging and placement activities.

1.2 – Project Locations

1.2.1 Dredging

Waukegan Harbor is an authorized Federal navigation harbor located in Waukegan, Illinois on the western shore of Lake Michigan (Figure 1). The harbor is located approximately 40 miles north of Chicago, Illinois and 10 miles south of the Illinois-Wisconsin state line. The Federal navigation channel is comprised of three main areas: Inner Harbor, Outer Harbor, and Approach Channel. There is also an area adjacent to the federal harbor known as the Advance Maintenance Area. This area is dredged to form a basin where littoral sand can be deposited before it settles in the federal channel reducing the frequency of dredging the federal channel. The harbor is used for both industrial and recreational activities.

1.2.2 Placement Locations

The locations for the placement of dredged sand are as follows (Figure 2):

Open Water Area – A current default littoral placement area approximately one mile south of Waukegan Harbor.

Illinois Beach State Park – A previously used littoral placement site located adjacent to the park that is approximately eight miles north of the harbor.

City of Waukegan – The City of Waukegan requests that sand be placed at the Waukegan Municipal Beach (201 N. Sea Horse Drive).

North Chicago – The Foss Park District in North Chicago requests that sand be placed at the Foss Beach (1901 Foss Park Avenue).

Lake Bluff – The Lake Bluff Park District requests that sand be placed at the Sunrise Beach (455 Sunrise Ave.).

Glencoe – The Glencoe Park District requests that sand be placed at Glencoe Beach (55 Hazel Ave.).

Evanston – The City of Evanston requests that sand be placed to the Lee Street Beach (1111 Lake Shore Blvd.), Greenwood Street Beach (1401 Sheridan Rd.) and Dog Beach (1631 Sheridan Rd.).

The default location for placement of dredged material is currently in the open water area just south of Waukegan Harbor. The littoral placement of sand adjacent to Illinois Beach State Park has occurred in the past, but has always been contingent on the park's funding for sand placement. The other listed municipal locations would be used if the corresponding city or village requests material to be placed at the identified beaches and have appropriate funding to support those operations. Additionally, other locations between the Wisconsin/Illinois state border and the Northern city limits of Chicago that are not listed here can be used as placement sites assuming they meet criteria identified in this EA that deems them as suitable placement locations.

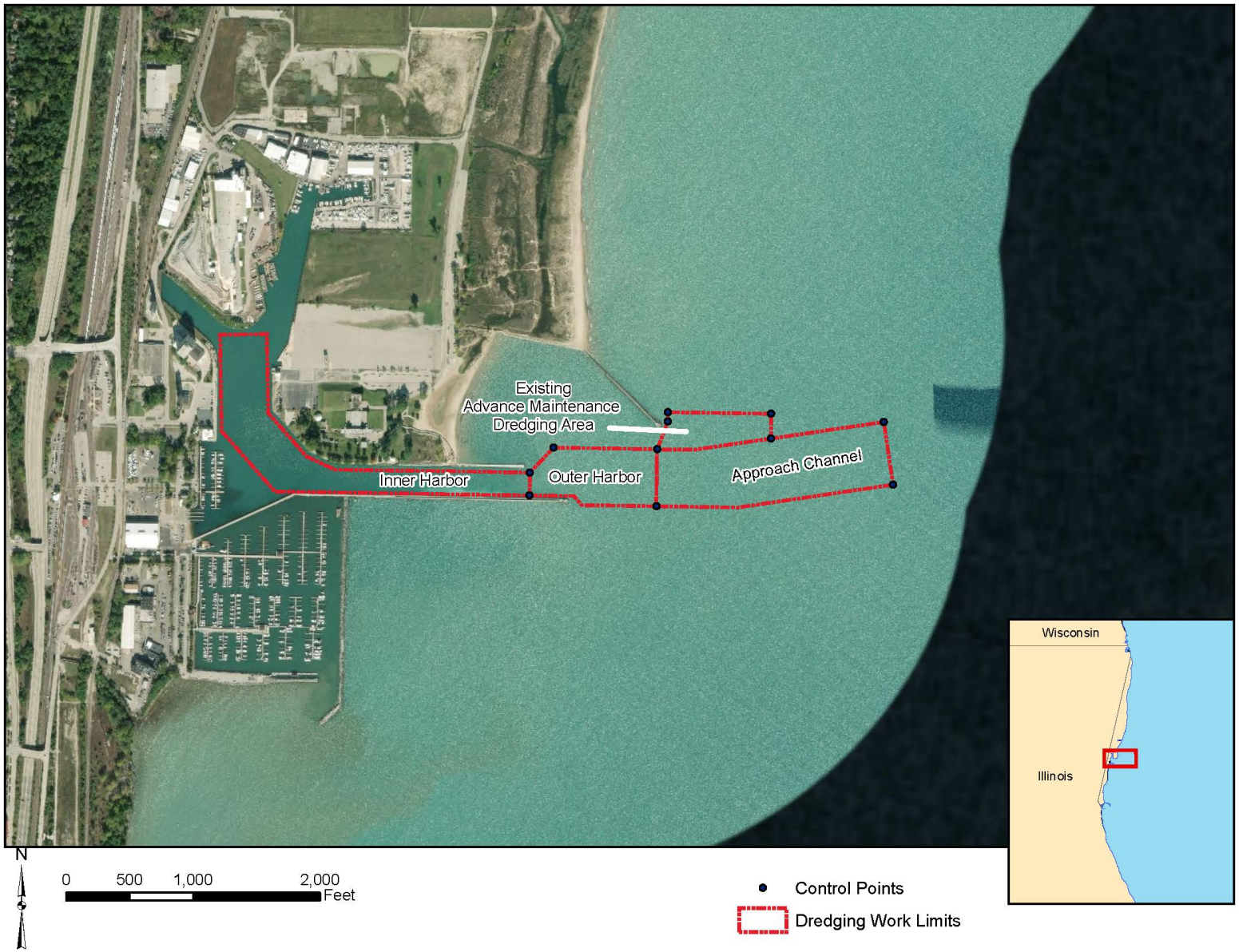

Figure 1: Vicinity Map of the Waukegan Harbor and Dredging Cells

Figure 2 – Existing open water placement area (Red Box). Identified potential placement areas (green dots) & zone of additional potential municipal beach placement areas (black bar) pending meeting placement criteria.

1.3 – Purpose & Need

The primary purpose of this federal action is to support the economic viability of the Waukegan, IL harbor.

The first need is to continue to dredge the harbor as needed to support commercial shipping and recreational boating. While USACE regularly performs routine maintenance dredging within the Approach Channel and Advance Maintenance areas, the Outer Harbor area did not receive maintenance dredging by USACE between the mid-1970s and 2015 (see section 1.6), which limited the available draft for commercial vessels utilizing the port. The failure to continue maintenance dredging within the Harbor would result in light loading the vessels and therefore increased transportation costs and could ultimately result in eventual closure of the harbor for commercial activity.

The second need is to expand the current Open Water placement area (Figure 6) to have a more broadly defined east/west boundaries to provide flexibility in locating the required depths for placement that change due to fluctuations of Lake Michigan water levels. Lake Michigan low water level years preclude the placement of material at the required minus 18 feet LWD. The Open Water placement site is needed if no other placement options are available.

The third need of this potential federal action is driven by the Illinois Department of Natural Resources' (IDNR) Coastal Management Program Illinois Sand Management Working Group. The working group includes local (Lake Bluff Park District, Foss Park District in North Chicago, Glencoe Park District, City of Evanston, City of Waukegan and other municipalities) and state (ILDNR, Illinois State Water Survey, Illinois Environmental Protection Agency) entities, with participation by the USACE as well as other stakeholders. It focuses on ways these organizations can collaborate to protect and restore Illinois' public Lake Michigan shoreline. This group has been exploring ways to leverage local resources to address Lake Michigan shoreline issues in a sustainable and cost-effective way. One way is through their efforts to build a regional sand management network to better manage and protect Illinois' public shoreline through the use of repeated mapping, nearshore wave and current measurements, and developing a vulnerability index for areas most in need of significant shoreline management. The proposed project includes dredging and sand transport for near-shore or onshore sand placement along with the possibility of installing native plantings and beach monitoring.

The physical activity and environmental impacts of dredging and some placement sites have already been assessed in previous NEPA documents and are incorporated into this EA (see 1.4). They will not be reassessed in this EA. This EA will focus on placement of the dredged sand at the proposed expanded Open Water sites and the proposed near shore and/or on shore beach sites.

1.4 – Related NEPA Documentation and Studies

- USACE, Chicago. 1975. Final Environmental Impact Statement, Waukegan Harbor, Maintenance Dredging and Disposal Areas.
- USEPA. 1989. Outboard Marine Corporation, Amended Record of Decision.
- ILEPA & CAG. 1993. Waukegan Harbor Remedial Action Plan, Stage I Report.
- IEPA and CAG. 1995. Waukegan Harbor Remedial Action Plan, Stage II Report.
- USACE Chicago. 1997. Environmental Assessment and FONSI for Waukegan Approach Channel Maintenance Dredging, Waukegan, Illinois.
- IEPA & CAG. 1999. Waukegan Harbor Remedial Action Plan, Stage III Report.

- USACE. 2006. Clean Water Act 404(b)1 Contaminant Determination Report - Waukegan Outer Harbor, Waukegan, Illinois.
- CAG. 2007. Waukegan River Watershed Management Plan.
- USEPA. 2007. Outboard Marine Corporation, Record of Decision.
- USEPA. 2009. Outboard Marine Corporation, Amended Record of Decision.
- USACE. 2014. Clean Water Act 404(b)(1) Contaminant Determination Report – Waukegan Approach Channel and Advance Maintenance Area, Waukegan, Illinois.
- USACE. 2017. Clean Water Act 404(b)(1) Contaminant Determination Report - Waukegan Outer Harbor, Waukegan, Illinois.

1.5 – Dredging History

Construction, operation and maintenance of the existing Federal navigation project at Waukegan Harbor was authorized by the River and Harbor Act of 14 June 1880 and by subsequent amendments of 1882, 1902, 1930, 1945, 1965, and 1970. The approach channel has an authorized depth of -22 feet Low Water Datum (LWD). The remainder of the harbor has an authorized depth of -18 feet LWD.

USACE has been performing maintenance dredging at Waukegan Harbor since 1889 with recent dredging operations typically occurring every year or two. Over the last 50 years, USACE has dredged approximately 2 million cyds of sediment from the harbor with an average dredging event consisting of approximately 53,000 cyds. However, between the mid-1970s and 2015 USACE has only performed routine maintenance dredging in the Approach Channel and Advanced Maintenance Area and did not dredge the Outer Harbor.

Prior to 1982, all dredged material was deposited in deep-water locations resulting in the permanent removal of millions of cubic yards of sediment from the littoral system. Since that time, Approach Channel dredged material has been placed in several near shore (Open Water) locations along the Lake Michigan shoreline. Most recently, in summer 2018 USACE dredged 48,879 cyds from the Approach Channel as part of its routine dredging operations. USACE is currently investigating additional ecosystem restoration opportunities for Waukegan Harbor dredged material as part of feasibility study being conducted under the Section 204, WRDA 1974, Beneficial Use of Dredged Material.

1.6 – Maintenance Dredging Outer Harbor

The Outer Harbor consists of the area between the North Breakwater and the Inner Harbor piers. The Outer Harbor is 1,050 feet in length with widths ranging from 180-450 feet and covers a surface area of approximately 10 acres. The Outer Harbor has an authorized project depth of -25 feet LWD, although the actual maintenance depth is -22 feet based on local needs and professional judgment. The Outer Harbor requires a deeper depth than the Inner Harbor because it is less protected from wave action and therefore subjected to greater oscillations in water levels. The deeper depth provides vessels some factor of safety against grounding. Additionally, the Waukegan Outer Harbor is designated by the U.S. Coast Guard as a Harbor of Refuge. Maintaining deeper depths is critical for providing safe refuge for commercial vessels.

USACE did not perform maintenance dredging in the Outer Harbor from the 1970's through 2015 due to two primary reasons: general concerns that the Inner Harbor PCB contamination may have spread to the

Outer Harbor and the lack of a suitable disposal facility. In the summer of 2015, however, the Outer Harbor channel was finally dredged of its backlog of material as a USEPA funded project to beneficially use the material upland as cover for one of the local Superfund site management units. After clearing out the accumulated backlog material in the Outer Harbor, the littoral material from the north now migrates into the federal channel, specifically the Outer Harbor. The sediment within the Outer Harbor now is the same clean sand coming from the north, settling over a wider area, rather than confined to the Approach Channel and the Advanced Maintenance Area.

Shoaling has begun to accumulate in the Waukegan Outer Harbor (Figure 3). This is consistent with shoaling patterns of pre-1980 when USACE maintained the outer harbor by regular dredging. In preparation for future dredging activities, the Chicago District evaluated the sediment in the newly formed shoals in 2016 (Figure 4) to determine the environmental acceptability of dredged material placement in compliance with 33 C.F.R. 335.7, the Clean Water Act 404(b)(1), and the Illinois Coastal Management Plan, to the maximum extent practicable. The sediment is considered suitable for open water placement in Lake Michigan.

This EA analyzes the proposal that any sediment dredged from the Outer Harbor would be placed in a near shore littoral zone south or north of the harbor, or placed on the beach at one of the identified locations north or south of the harbor. These placement alternatives would meet the dual intent of clearing the navigational channel and beneficially reusing the sediment within the near shore zone to prevent further coastal degradation. The Chicago District has determined this project to be consistent with the Illinois Coastal Management Program and with current practice. A concurrence of Federal Consistency is being sought from the Illinois Department of Natural Resources. Additionally, the Chicago District will seek Section 401 Water Quality Certification from ILDNR.

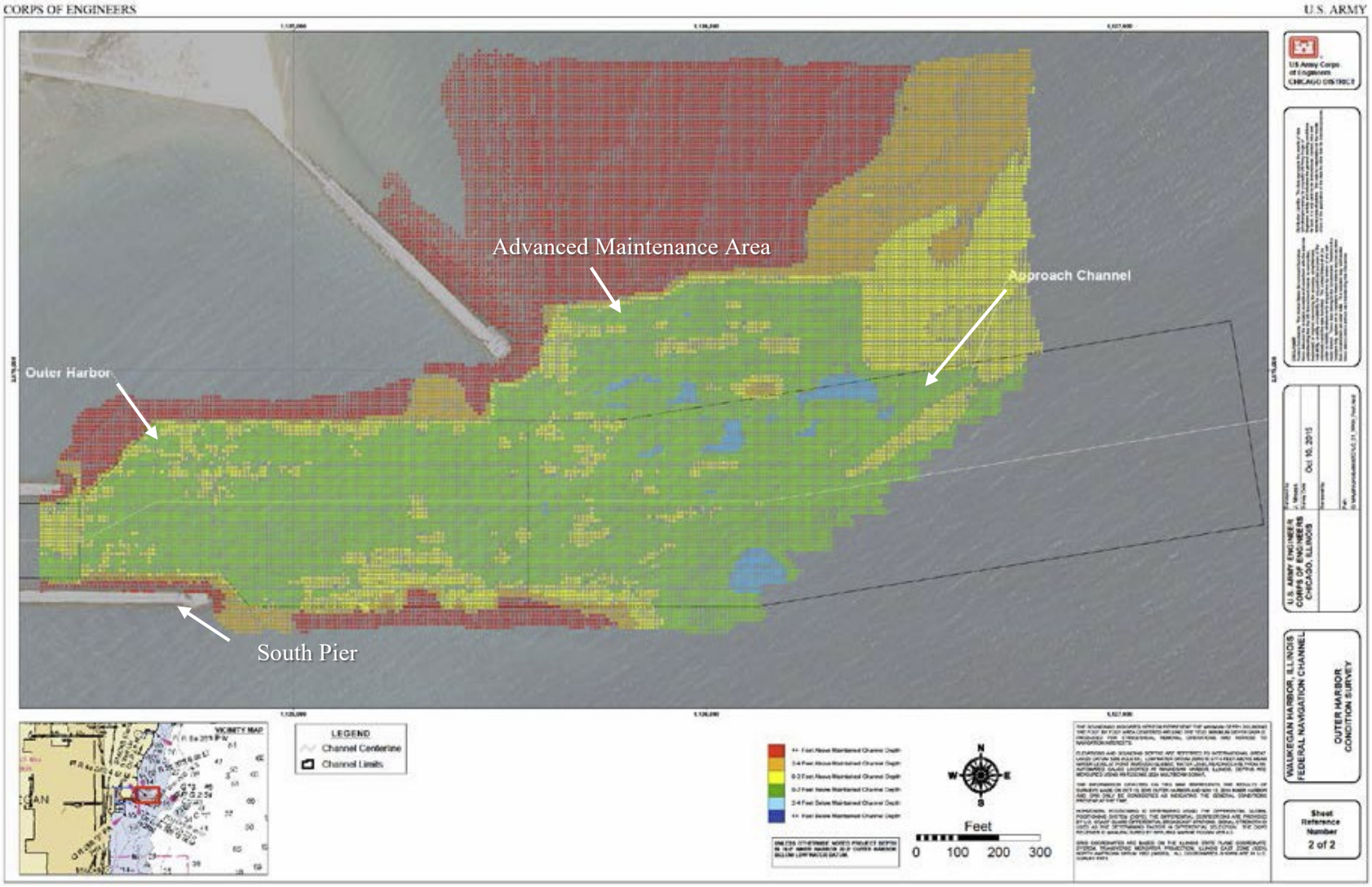

Figure 3 Outer Harbor shoaling rates (2015)

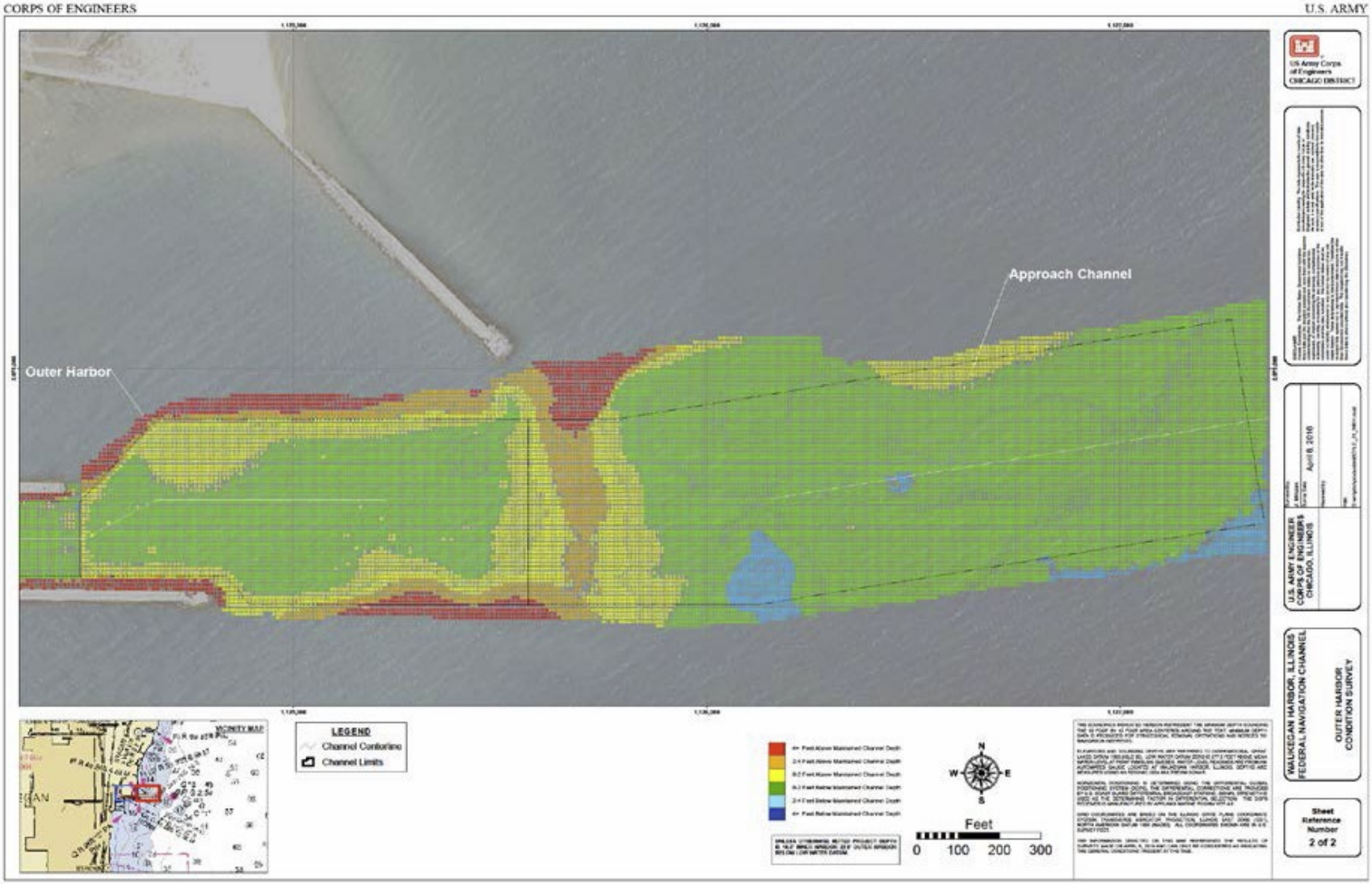

Figure 4 Outer Harbor shoaling rates (2016)

Chapter 2 – Proposed Alternatives

2.1 – No Action

Under the no action alternative, USACE would cease dredging operations in and around Waukegan Harbor. The no action alternative would not adversely impact physical resources; biological resources; or cultural, archaeological, or social resources. No action could potentially reduce employment, business and industrial activity in the area by limiting the shipping and transportation capabilities of the harbor. The impacts of this option are detailed in previous Environmental Assessments (EA) and Environmental Impact Statements (EIS) conducted for the project area in 1971, 1973 and 1975. These can be found within the library system of Northwestern University (http://libguides.northwestern.edu/c.php?g=114822&p=4475870). Additional EA's and EIS's that also evaluate the no action alternative were conducted in 1988, 1989, 1993, 1997, and 2013.

2.2 – No Deviation from Historical Activities

Under the No Deviation Alternative, USACE would dredge clean littoral sands from the Waukegan Outer Harbor and continue to dispose of them at Illinois Beach State Park (IBSP) or in the near shore Open Water placement area to the south. Consistent with the Illinois Coastal Management Plan and with current practice, it is proposed that any sediment dredged from the Outer Harbor would be placed south of the harbor in the littoral zone or, dependent on funding, north in the littoral zone along Illinois Beach State Park (Figure 5). The base plan[1] for Waukegan Outer Harbor is mechanical dredging, with near shore placement via bottom dump (split hull) scow, at the south placement area already in use for the Waukegan Approach Channel materials. This would allow commercial and recreational navigation to continue; however, there would be no sand available for municipal beach placement and the near shore area would continue to have very limited capacity during low Lake Michigan water levels.

2.3 –Beach or Near Shore Placement Alternatives

Beach/littoral nourishment involves the placement of dredged material directly onto a beach under the ordinary high water mark or into the shallow water (< five feet water depth) near the shore. Suitable dredged material is typically sand or fine sand, and may only stay on the beach for a limited time before being entrained into the littoral drift. Approximately 12% of Great Lakes dredged material is used for beach and littoral nourishment.

Near shore placement would involve the discharge of dredged material directly into Lake Michigan, into water depths less than 18' which is still considered the littoral zone (although further from shore). Discharged dredged material settles through the water column and deposits on the bottom of the lake site. The dredged material may remain in a mound at the site or disperse depending on the material's physical properties and the hydrodynamics of the site. Open water placement is used for approximately 32% of Great Lakes dredged material. Generally, sand moves out of the open water placement sites in the Great Lakes.

2.3.1 – Illinois Beach State Park with Requested ILDNR Modifications

Illinois Beach State Park (IBSP) (Figure 5) is a state park managed by the Illinois Department of Natural Resources (ILDNR) located between 5 – 8 miles north of Waukegan Harbor on Lake Michigan. IBSP is a

[1] Base Plan is an accurate operational description that defines the placement for navigational purposes. It is the least costly alternative that is consistent with sound engineering practices and meets all federal standards.

significant natural resource in the State of Illinois and the ILDNR has expressed interest in using any clean dredged material for sustainability activities. The park represents the only remaining, naturally high biological diversity shoreline reach along the Illinois portion of Lake Michigan. USACE currently has a permitted open water placement site in the nearshore littoral zone adjacent to IBSP, which is used as a placement location for Waukegan Harbor Approach Channel dredged material dependent on funding availability.

This alternative would include placing clean littoral sands (from any of the identified dredging areas) within the northern most area (Upper Placement Zone) maximizing sustainability of the rare and imperiled ecotypes within the site per letter dated 05 August 2018 (Attachment 2).

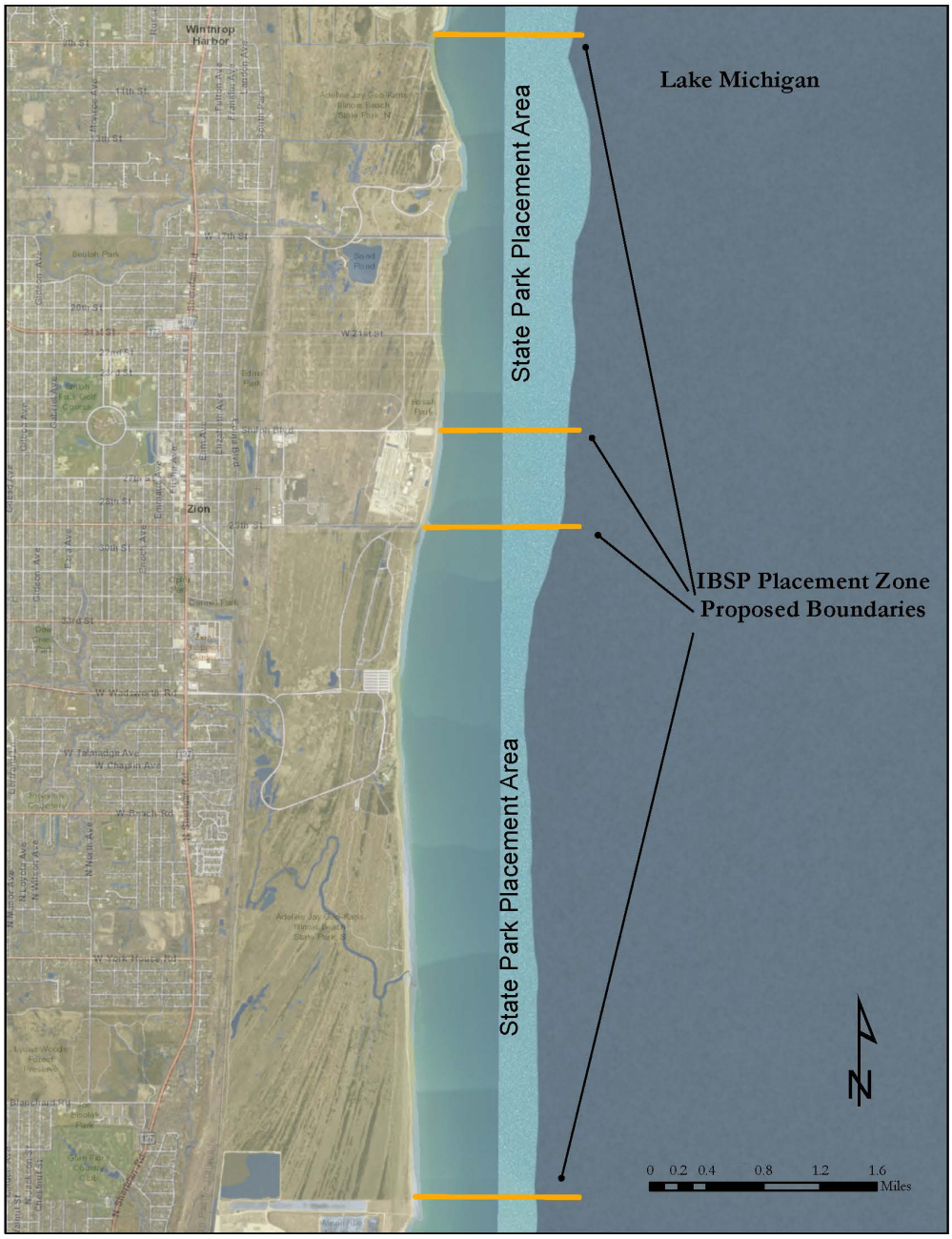

Figure 5: IBSP Littoral Sand Placement Alternative

2.3.2 – Changes to Open Water South Placement Area

The nearshore open water placement site needing spatial boundary changes is currently located one mile south of Waukegan Harbor (Figure 6). This site is used as placement location for Waukegan Harbor Approach Channel dredged material, which is suitable for open water placement. This alternative includes adjusting the definite east/west boundaries to a zone with only north and south limits, allowing for material from any of the identified dredging areas to be placed according to fluctuating water levels to meet the required minus 18-feet LWD. The south boundary has also been extended so that the north south distance is approximately 1.5 miles.

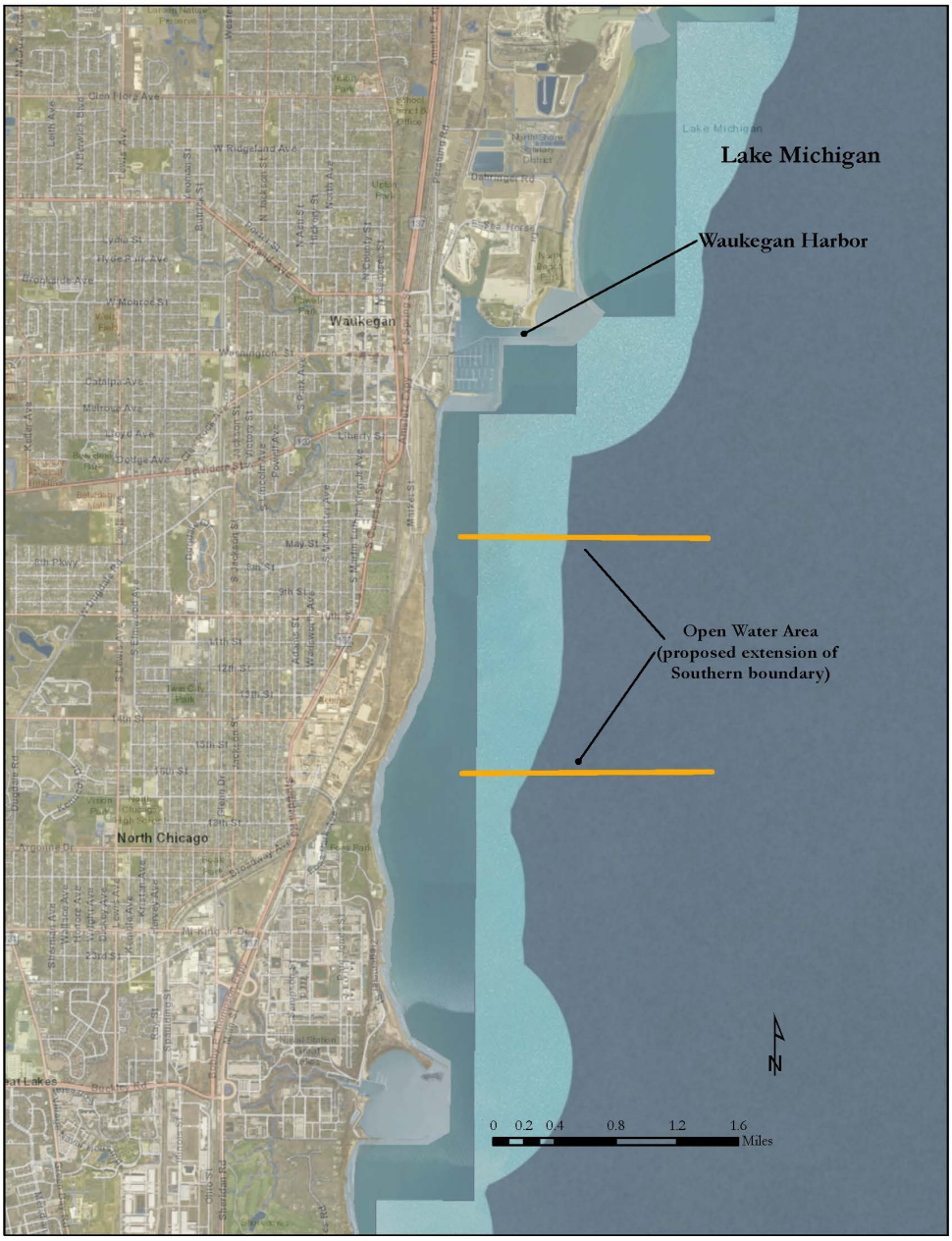

Figure 6: Proposed Change to Open Water South Placement Area, Removal of Definitive East/West Boundaries

2.3.3 –Nearby Municipal Beaches

The proposed alternative is a collaborative effort of four Illinois coastal communities –Lake Bluff Park District, Foss Park District in North Chicago, Glencoe Park District, and City of Evanston. The City of Waukegan has also requested materials for their municipal beaches. The dredged material from the Waukegan Harbor would be placed onshore, or immediately adjacent to shore (less than 5' water), providing a beneficial use of combating shoreline erosion and enhancing an estimated 54,560 square yards of public beaches, parks, and open space in these communities. Placement of this dredged material would sustain beaches that support the local economy, outdoor recreation, and key infrastructure.

Waukegan Municipal Beach – There was no specific identification of how much sand would be need to sustain the beach or specific areas within the beach to place the sand. About 1.56 acres was identified as being viable for placing sand within the beach and surf zone (Figure 7).

Foss Park Beach – The initial requested amount of sand is about 4,477 cyds. that would cover an estimated 2.27 acres (Figure 8).

Sunrise Beach – The initial requested amount of sand is about 769 cyds. that would cover about 1.08 acres of beach and surf zone (Figure 9).

Glencoe Beach – The initial requested amount of sand is about 1,500 cyds. that would cover about 1.16 acres of beach and surf zone (Figure 10).

Lee Street Beach, Greenwood Street Beach, & Dog Beach – The initial requested amount of sand is about 3,000 cyds. that would cover about 6.27 acres of beach and surf zone (Figure 11).

2.3.4 – Proposed Plan

The proposed placement plan would include a combination of the three main options listed above in section 2.3 depending on available placement material, municipal needs and funding. If there is a need for sand at the listed municipal beaches or at IBSP, the appropriate funding amounts are met, and sufficient cubic yardage of material is obtained, placement of sand can be conducted at the appropriate locations. If there is insufficient material, funding, or need for material, then the dredged material will be placed at the open water placement location just south of the harbor.

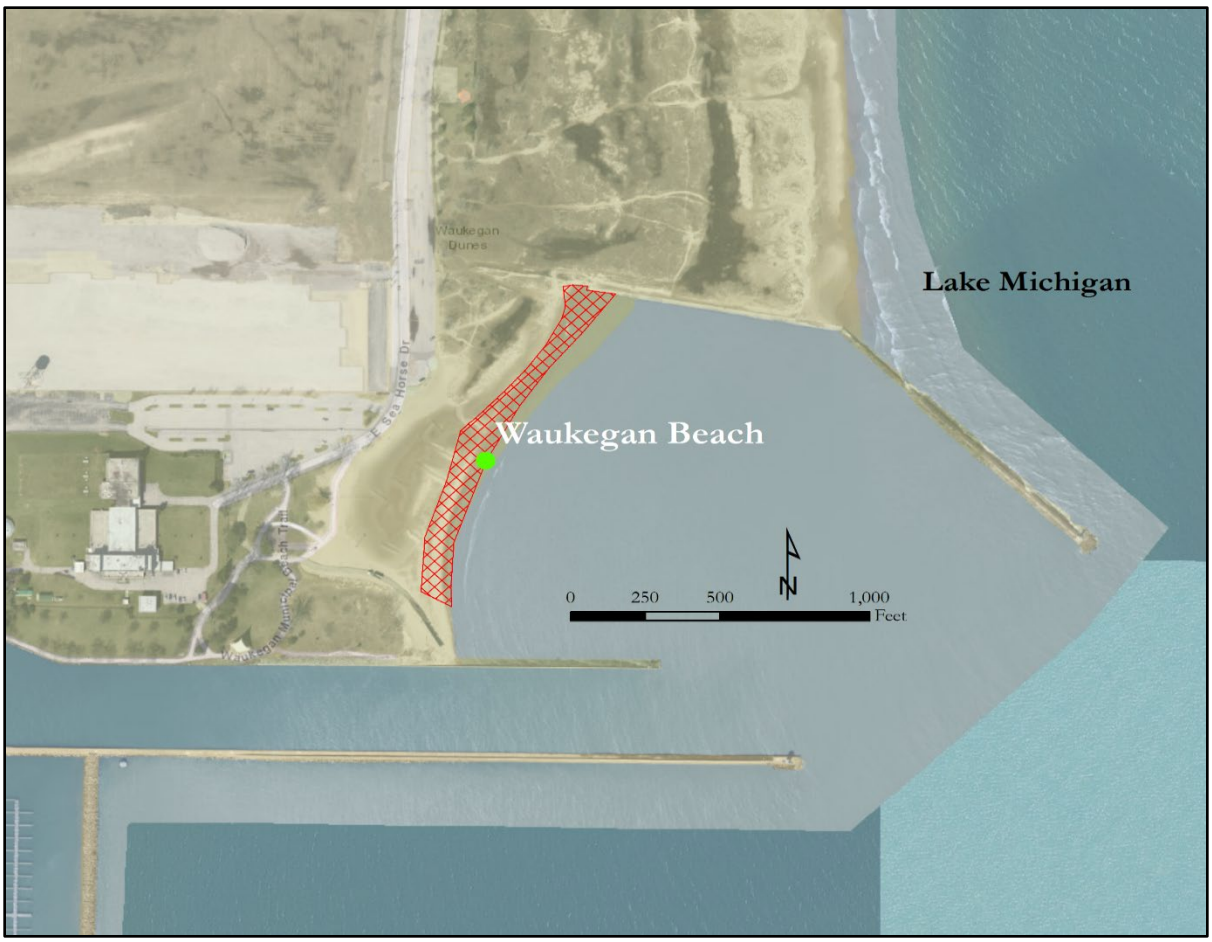

Figure 7: Waukegan Municipal Beach Sand Placement Zone

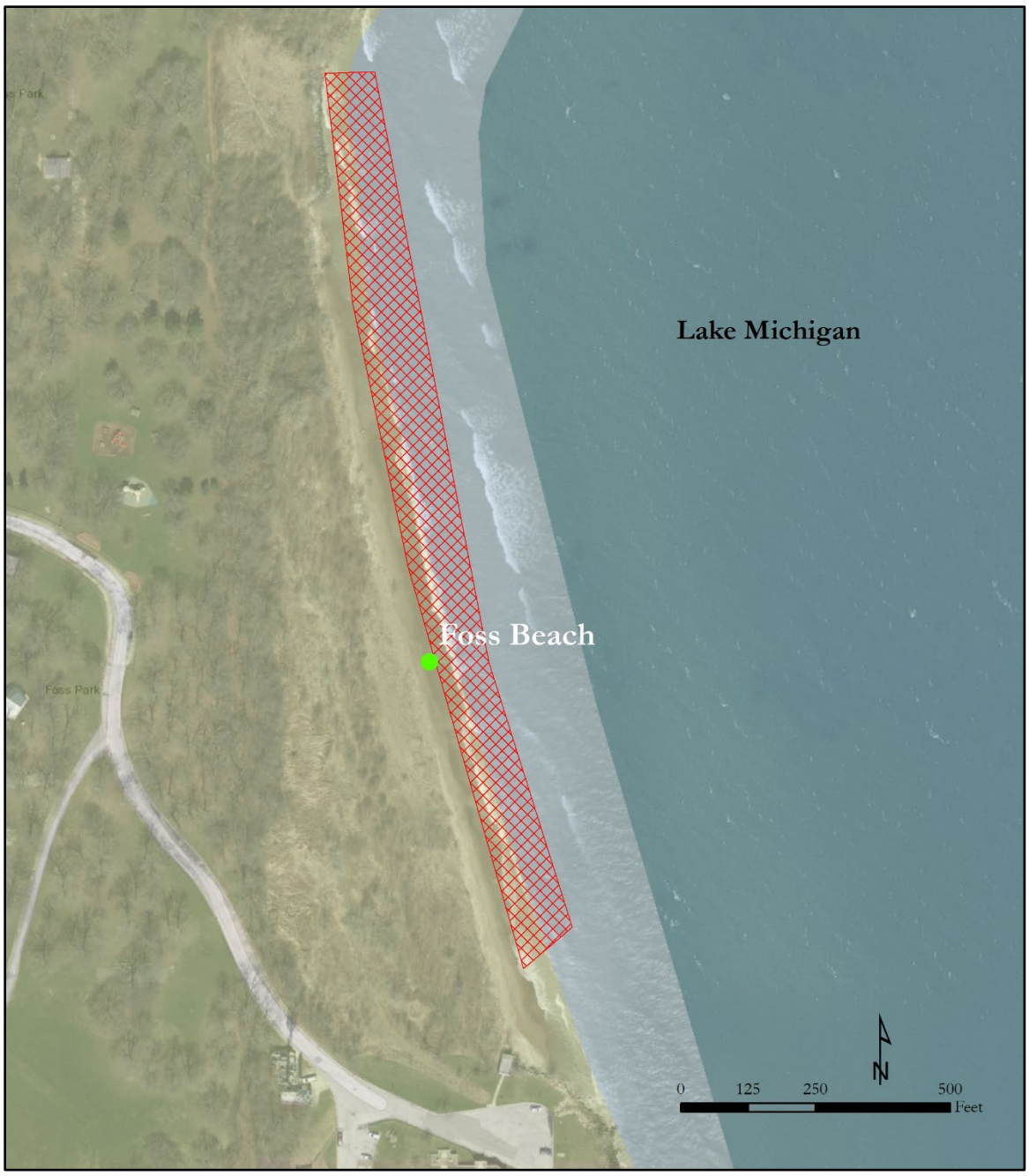

Figure 8: Foss Park Beach Sand Placement Zone

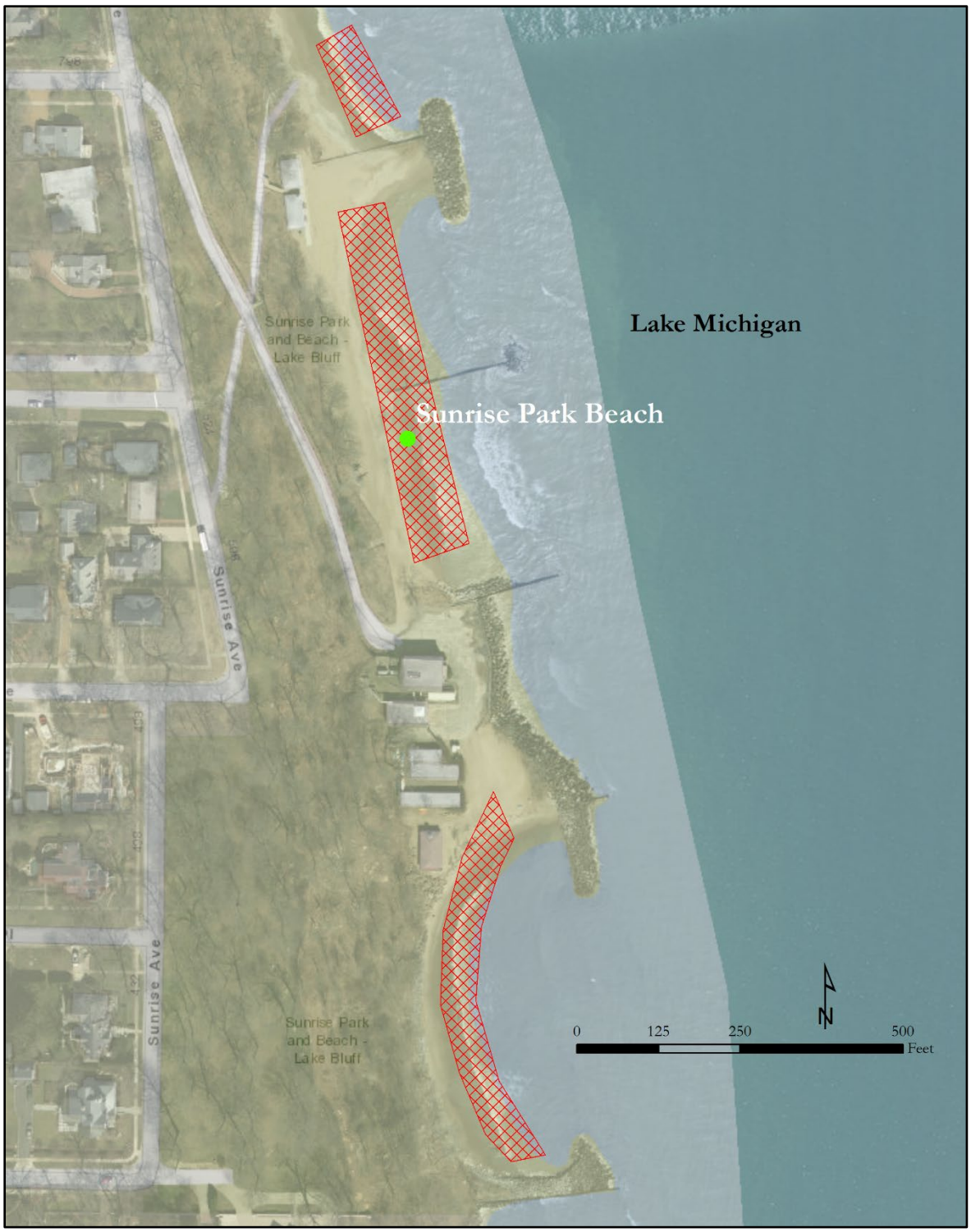

Figure 9: Sunrise Park Beach Sand Placement Zones.

Figure 10: Glencoe Beach Sand Placement Zone.

Figure 11: City of Evanston Beaches Placement Zones.

Chapter 3 – Affected Environment

This Chapter identifies those environmental, cultural and social resources that could potentially be affected by the proposed placement of littoral sands resulting from maintenance dredging at the Waukegan Outer Harbor.

3.1 – Physical Resources

3.1.1 – Geology

The study area is located within the Wheaton Morainal Country subdivision of the Great Lake Section of the Central Lowland Province physiographic division. The underlying regional bedrock is Silurian-age dolomite, most likely of the Niagaran Series (Willman 1971). This rock resulted from marine deposition when all of northeastern Illinois and much of the neighboring Great Lakes region was the floor of a tropical sea from about 440 to 410 million years ago. Where bedrock reefs are exposed off the Illinois north shore is of this type of rock.

Wadsworth Formation – This formation exists at the Foss Park beach, Sunrise Park beach and Glencoe beach. The dominant material in the Illinois coastal zone is a compact, gray, silty and clayey till of the Wadsworth Till Member. The till may contain discontinuous layers of sand and gravel mixed with sand. This till, which is ubiquitous across the coastal zone, was deposited by glacial ice during the most recent (Wisconsinan) glacial episode. The till is exposed along the coastal bluffs, as well as the material first encountered beneath most of the soils in the area. It also occurs beneath the beach sand and it occurs on the nearshore lake bottom either beneath the nearshore sand or exposed where sand cover is absent. The cohesion of the till has contributed to the near-vertical bluffs along parts of the bluff coast, in this case it is the face of the Highland Park Moraine (Willman 1971).

Analysis of the till exposed in the bluffs indicate that a typical sediment size distribution is 48 percent clay, 42 percent silt, and 10 percent sand (Chrzastowski 1995). When bluff erosion occurs, only the sand-size material ultimately remains along the beaches and nearshore. The dominant clay and silt are transported offshore for eventual deposition in deep water (Colman and Foster 1994). The grayish or milky coloration that is common along the Illinois coast following times of large waves results from the suspension of the silt and clay from erosion along the bluffs or across the lake bottom.

Dolton Member Equality Formation – This member exists directly along the coast at IBSP and at the Evanston municipal beaches. Member composition is primarily sand, but contains beds of silt, pebble sand and gravel. This member is exposed as beaches, sand ridges and spits, with thickness typically less than 10 feet, but can be up to 25 feet at some of the spits.

Zion City Moraine – This moraine exists at southern IBSP and Foss Park Beach. The youngest moraine in Illinois, the Zion City Moraine, is comprised of three small ridges in and around Zion. The Zion City Moraine is one of five Lake Border moraines that run roughly parallel to the current shoreline of Lake Michigan. The dominant material in the area is a compact, gray, silty and clayey till of the Wadsworth Till Member. This till may contain discontinuous layers of sand and gravel mixed with sand.

Zion Beach-Ridge Plain (strandplain) – Illinois Beach State Park is part of a distinct and unique coastal landform called the Zion Beach-Ridge Plain, an expanse of coastal land formed by deposition and migration of a succession of nearly parallel beach sand ridges (CDF and MWH 2008a, b). It is also called the Ravinia Sand Member.

Highland Park Moraine – This moraine exists at inland from Sunrise Park Beach and at Glencoe Beach. Along the coast between North Chicago and Winnetka, the lakeshore and the Zion City and Highland Park Moraines dead-end into Lake Michigan. These end moraines formed about 14,000 years ago just prior to glacial ice permanently receding into the Lake Michigan basin. These are the youngest end moraines in Illinois. The Highland Park Moraine encompasses the entire study area. Long-term wave erosion along this morainal unit has resulted in bluffs that form the highest and steepest landscape along the Illinois coast. Maximum bluff heights of about 90-feet occur along the southern Highland Park lakeshore.

Man Made Land – The Waukegan Municipal beach resides on an impacted geologic area, in which the natural features and materials have been mined. The resulting beach is a condition of shoreline filling, modification and structures.

3.1.2 – Northern Illinois Littoral Drift

Seasonal variations in the dominant wind direction result in variability to the waves and currents experienced along the Lake Michigan shoreline. During the majority of the year, winds blow across the lake from the southeast, resulting in a circulatory pattern moving along the Illinois shoreline in a counterclockwise direction. The resultant wave climate along this reach is relatively small. Beginning in late fall and continuing until spring, however, these trends reverse. Northerly winds drive waves towards the southern end of Lake Michigan generating a significantly larger wave climate. The dominant influence by northerly waves results in a net southward littoral drift along the entire Illinois coast. Waves from the southeast can influence a northward movement of beach and nearshore sediment of sand, gravel and cobble, however; the stronger northerly waves counteract this influence and produce a net southerly transport.

The Illinois coast was formerly a single continuous pathway for the southward transport of littoral sediment. This was part of a large-scale littoral transport cell that originated in Wisconsin near Sheboygan and terminated in eastern Indiana along the Indiana Dunes (Chrzastowski et al 1994). If no anthropogenic influences would have interfered with coastal erosion processes, and historical lake levels were maintained, in a thousand years the bluff coast would erode landward to an equilibrium position (Rovey & Borucki 1994). During this process, rates of erosion would decrease with time; however, the Illinois coast has experienced considerable reduction in the volume of littoral sediment in transport due to anthropogenic modifications. Construction of perpendicular structures such as jetties, piers and small boat harbors formed near-total barriers to littoral transport, fragmenting a continuous littoral cell into a series of cells. Coastal structures, particularly in the vicinity of Chicago have completely isolated the southern Chicago lakeshore from any littoral sediment supply from the south.

Long-term reduction in the volume of littoral sediment transport has occurred along the bluff coast. In the 1950s the USACE computed a maximum littoral transport rate along the bluff coast of 57,000-cyd/year (USACE 1953). Dredge records for sand captured at Wilmette Harbor near the south down-drift end of the bluff coast suggest that the present day bluff coast littoral transport is one third or less of what it was in the early 1950s. Only along the southern part of Illinois Beach State Park are present-day littoral transport volumes of about 80,000-cyd/year at or near what likely occurred in the natural setting. This volume of littoral transport is dependent on a sediment supply from Wisconsin sands as well as beach nourishment supplied by the State of Illinois.

3.1.2 – Sediment Quality

The most recent sediment data available for the study area are from Waukegan Harbor Approach Channel and Advance Maintenance Area and for the Waukegan Outer Harbor. A Tier 1 and Tier 2 Contaminant

Determination was completed in 2014 for the Approach Channel and Advanced Maintenance Area, and in 2017 for the Outer Harbor. Those evaluations included sediment and elutriate physical and chemical analyses for a limited list of parameters. Sediment in all areas consists of sands with low fines (generally less than 10%). The material is of good chemical quality. Elutriate testing shows low levels of nutrients are likely to be released, however these are near water quality limits without a mixing zone. With a mixing zone analysis, all water quality standards are easily met. The in-water placement of this material is not anticipated to cause detrimental water quality impacts for Lake Michigan. The Contaminant Determinations are included as attachments to the 404(b)(1) analysis.

3.1.3 – Water Quality

Lake Michigan is an extremely important resource for drinking water supply, industrial water supply, fishing, recreation, and waterborne commerce. Water intakes for the cities of Waukegan and North Chicago are situated 2,000-4,000 feet from the shoreline (far from the proposed dredge areas). Factors potentially affecting water quality in the near shore lake zone include combined sewer overflows, tributary streams, and boat harbors. Water quality of Lake Michigan in the vicinity of Waukegan is regularly monitored by the Illinois Environmental Protection Agency (IEPA). In general, the water quality of the near shore zone is good. Violations of state water quality standards are rare.

3.1.4 – Air Quality

The local air quality in Cook and Lake Counties is considered 'non-attainment' under the Clean Air Act for ozone and lead. The project is within the non-attainment zone. Once implemented, the project itself will be neutral in terms of air quality, with no features that either emit or sequester air pollutants to a large degree, including Green House Gas emissions. During the project construction, heavy equipment would cause minor, temporary air quality impacts, however all equipment will be in compliance with current air quality control requirements for diesel exhaust, fuels, and similar requirements. A general conformity analysis was not conducted due to the short and temporary nature of any air quality impacts.

3.1.5 – Hazardous, Toxic & Radioactive Wastes (HTRW)

Waukegan Approach Channel and the current advance maintenance area have been dredged nearly annually since the late 1990's. The sediment in this area is mainly coarse littoral sand, with no notable chemical impurities. The source of the sediment is littoral material from the northern near shore areas in Lake Michigan. Upland run off to the Lake is a general consideration, but no specific discharge locations that would impact Waukegan Harbor sediment to a significant degree have been located.

The study area has mixture of industrial, residential and natural uses along the shoreline. Initial development occurred more than 100 years ago, and the shoreline, including Waukegan Inner Harbor, has been impacted in some areas by historic industrial activities. Past contaminants for upland areas and the Inner Harbor have included polychlorinated biphenyls (PCBs), asbestos, or metals, all from upland sources that no longer exist. The inner harbor was previously impacted by PCBs from an industry (OMC Cor.) that discharged contaminated oil directly to the inner harbor. The inner harbor (including the entrance channel, but not the outer harbor and approach) was added to the National Priority List (NPL; aka the Superfund list) in the late 1980's. Several rounds of dredging removed most of the very heavily contaminated sediment, with confined disposal in a former private slip, upland in disposal cells at the industrial site, and in a landfill. After the initial clean up actions, fish tissue concentrations of PCBs failed to decrease at the harbor. In 2012, USEPA GLNPO and Superfund working together implemented a final clean up action which removed all sediment with a surface weighted average concentration greater than 0.2 mg/Kg PCBs. In 2014, USACE dredged the outer harbor and placed the clean but fine grained sediment upland on a portion of the superfund site, under an Economy Act agreement with the USEPA.

These two recent sediment removal actions were considered to complete all of the required management actions for the Waukegan Area of Concern (AOC), and the sediment (restriction on dredging) beneficial use impairment was removed. The AOC is currently proceeding through the final delisting process. USACE has not dredged the inner harbor since prior to the Superfund designation in the 1980s and has no current plans to do so. The Inner Harbor is not part of the sediment under consideration in this study. The Approach Channel, Advance Maintenance Area, and the Outer Harbor were never impacted by the Inner Harbor issues.

North of the harbor and adjacent to Lake Michigan, a second superfund site was identified in the late 1980s. The Johns-Manville site was used for manufacturing insulating products, and included the use and on-site disposal of asbestos containing materials. Asbestos materials are alleged to have been dumped into near shore Lake Michigan, and are suspected of having migrated southward toward Waukegan Harbor. A 2005 Illinois Attorney General investigation into the presence of asbestos in beach sand at Illinois Beach State Park included testing at Waukegan Approach Channel. Although individual fibers were found, the human health risk was identified as being acceptably low. The Outer Harbor was tested in 2006 following the same method, with similar findings. No asbestos containing materials (i.e. materials with 1% or greater asbestos content) have ever been identified in Waukegan Harbor. The Johns-Manville site is substantially remediated and closed. The risk of encountering any HTRW materials during the dredging of Waukegan Outer Harbor, Approach Channel and/or Advance Maintenance Area is considered very low.

3.2 – Ecological Resources

3.2.1 – Great Lakes Wetland Habitat

All of the sand placement sites and zones are classified as Lacustrine (lake) system wetland type, with an additional wetland type, barrier enclosed system, existing at IBSP. Hydrogeomorphic Classification for Great Lakes Coastal Wetlands by Albert et al (2005) was utilized to delineate and characterize wetlands for this EA.

<u>Lacustrine System / Open Lacustrine / Open Shoreline</u>

The beach along IBSP, the Open Water Area, and all of the municipal beaches are classified generically as an open lacustrine shoreline (Albert et al 2005). The hydrogeomorphic setting for this type is driven by wave action sculpting and moving littoral sediment (cobble/sand/clay) with hydrology provided directly by Lake Michigan water. Wetland plants cannot typically establish in this environment due to severe hydraulic forces of wave action and continually moving sediment. This wetland type is starved of organic matter in which hydrophytic plants that are able to colonize quiescent areas typically do not require organic sediment. The resultant expanse of shallow water bars, spits, beaches and small foredunes of this wetland type can serve to dampen waves and create a more stable wetland systems on the inland side, as is the case of IBSP.

<u>Barrier Enclosed System / Swale Complex / Ridge & Swale Complex</u>

The IBSP is classified generically as a barrier enclosed ridge and swale complex (Albert et al 2005). This primary type of swale complex wetland occurs between relict beach ridges, which is known as a ridge and swale complex, but is also referred to as dune and swale or strandplain. The ridge and swale complex at IBSP is composed of a series of beach ridges separated by narrow swales, in which the ridges formed in response to cyclic fluctuations in Lake Michigan water levels over the past several thousand years. The current hydrogeomorphic setting is established by the beach and foredune (open shoreline) providing barrier to the harsh wave climates and littoral Lake Michigan. Because of the barrier, there is reduced

mixing of Great Lakes waters and exclusion of coastal processes within the wetlands. The first couple of swales are typically in direct hydrologic connection to the lake; however, these ridge and swales continue for hundreds of feet inland in which other hydrologic inputs have influence. Organic soil depths are quite variable, as is the vegetation, which ranges from shrub swamp, to sedge meadow to wet savanna. These wetlands can also discharge water into the Lake, creating small streams for transient lake fishes and other aquatic organisms.

3.2.4 – Native Plant Communities

Moraine Bluffs – Unique climate and erosive-prone clay bluffs within the study area provides an interesting suite of native plants that have evolved to withstand harsh conditions. The Zion City and Highland Moraine bluff system is known to support rare northern boreal (forest) species such as paper birch (*Betula papyrifera*), buffalo berry (*Shepherdia canadensis*), and common juniper (*Juniperus communis*). The wooded areas on the bluff inhabit species such as eastern white cedar (*Thuja occidentalis*), red oak (*Quercus rubra*), hop hornbeam (*Ostrya virginiana*), ninebark (*Physocarpus opulifolius*), golden alexanders (*Zizia aurea*), white baneberry (*Actaea pachypoda*), red honeysuckle (*Lonicera dioica*), wood betony (*Pedicularis canadensis*), and common oak sedge (*Carex pensylvanica*). However, much of the bluffs along the north shore of Lake Michigan (unless ecologically restored) within the study area and adjacent habitat have become degraded from fire suppression, in turn degrading the rich herbaceous understory which has increased rates of soil erosion. Invasive species such as crown vetch (*Securigera varia*), reed canary grass (*Phalaris arundinacea*), black locust (*Robinia pseudoacacia*), common reed (*Phragmites australis*), and buckthorn (*Rhamnus* spp.) are widely established throughout the surrounding bluffs.

Beach & Foredune: Small foredune and beach areas are relatively small and narrow at sand placement sites. Typically, the wave active beach zones are known to have established populations of winged pigweed (*Cycloloma atriplicifolium*), sand grass (*Triplasis purpurea*), and the state listed seaside spurge (*Chamaesyce polygonifolia*) and sea rocket (*Cakile edentula*). More stable areas further inland, but still within active moving sand are stands of state listed, dune-forming marram grass (*Ammophila breviligulata*). The sand placement sites may currently contains narrow strips of beach impacted by invasive species such as lyme grass (*Elymus arenarius*), sweet clover (*Melilotus* spp.), crown vetch (*Securigera varia*), and a multitude of other non-native species. Less conservative, but native plants are found growing on the beach as well, including common milkweed (*Asclepias syriaca*), common evening primrose (*Oenothera biennis*), and early goldenrod (*Solidago juncea*).

3.2.5 – Macroinvertebrates

Several studies on aquatic macroinvertebrates in Southern Lake Michigan have been completed as well as a few within the Grand Calumet River and Indiana Harbor Canal. Garza and Whitman of the United States Geological Survey investigated macroinvertebrate assemblages of Southern Lake Michigan and observed macroinvertebrates from forty taxa. Approximately 81% of the observed taxa consisted of a species of segmented worm (*Chaetogaster diastrophus*) and a variety of round worms (*Nematoda* spp). Nalepa et al. also conducted surveys throughout southern Lake Michigan that encompassed areas adjacent to the City of Chicago. Their study identified three main groups of macroinvertebrates including Amphipods (Diporeia), worms (Oligochaeta), and bivalves (Sphaeriidae). Another study investigating the diet of Lake Whitefish (*Coregonus clupeaformis*) from 1985 to 2000 revealed a shift in the macroinvertebrate prey items with the establishment of the Zebra and Quagga mussels (*Dreissena polymorpha and Dreissena burgensis*). As *Dreissena* spp. filtered the water of Southern Lake Michigan it reduced the food availability to native macroinvertebrates and severely impacted populations of amphipods (*Diporeia* spp), the dominant food source for Lake Whitefish. At the turn of the century, Lake Whitefish along the southeast coast of Lake Michigan had turned to consuming Chironomidae as their

primary prey item with *Dreissena polymorpha*, *Mysis relicta* and Spaeriidae supplementing the diet. Yellow perch diets were analyzed under yet another study in southeast Lake Michigan in 1998 and 1999. These fish were found to be consuming primarily *Mysis relicta*, Chironomidae, *Gammarus* spp. and Isopoda.

3.2.6 – Fishes

In general, the surf zone fish assemblage of Lake Michigan would be the target community that occurs within the sand placement areas, with the exception of the deep portions of the Open Water Area. The shallow surf zone fish assemblage typically consists of Longnose Dace (*Rhinichthys cataractae*), Emerald Shiner (*Notropis atherinoides*), Sand Shiner (*Notropis stramineus*), and Spottail Shiner (*Notropis hudsonius*), with less frequent presence of Lake Chub (*Couesius plumbeus*), Mimic Shiner (*Notropis volucellus*), Mottled Sculpin (*Cottus bairdii*), juvenile Yellow Perch (*Perca flavescens*) and juvenile Smallmouth Bass (*Mircropterus dolomieu*). The recent increase in abundance and range by the State Threatened Banded Killifish (*Fundulus diaphanus*) has now also made this fish a typical surf zone fish. The non-native Round Goby[I] (*Neogobius melanostomus*) can also be found within this habitat zone. (I = introduced/invasive). Species presence was determined utilizing the Chicago Region Fish Database (unpublished); specimens are vouched at the INHS or the Field Museum of Natural History (FMNH).

<u>IBSP</u> – Multiple historic fish collection were made near the sand placement zones at IBSP, but none within the two specific zones. Species recorded include Alewife[I] (*Alosa pseudoharengus*), Bigmouth Shiner (*Notropis dorsalis*), Lake Chub, Emerald Shiner, Spottail Shiner, Sand Shiner, Mimic Shiner, Red Shiner (*Notropis lutrensis*), Longnose Dace, Fathead Minnow (*Pimephales promelas*), White Sucker (*Catostomus commersonii*), Rainbow Smelt (*Osmerus mordax*), Bloater Cisco (*Coregonus hoyi*), Lake Char (*Salvelinus namaycush*), Northern Pike (*Esox lucius*), Central Mudminnow (*Umbra limi*), Brook Stickleback (*Culaea inconstans*), Ninespine Stickleback (*Pungitius pungitius*), Threespine Stickleback (*Gasterosteus aculeatus*), Mottled Sculpin, Largemouth Bass (*Micropterus salmoides*), Warmouth (*Lepomis gulosus*), Yellow Perch, and Logperch (*Percina caprodes*). The different fish assemblage within the surf zone at IBSP is unique, most likely due to the presence of high quality coastal sloughs, such as Dead River and Bull Creek.

<u>Open Water Area</u> – Multiple historic fish collections were made near the Open Water Area, but none specifically within the zone itself. Potential species that would utilize the shallow areas include but are not limited to: Spottail Shiner, White Sucker, Mottled Sculpin, Rock Bass (*Ambloplites rupestris*), Pumkinseed (*Lepomis gibbosus*), Bluegill (*Lepomis macrochirus*), Smallmouth Bass (*Micropterus dolomieu*), Largemouth Bass, Yellow Perch, Coho Salmon[I] (*Oncorhynchus kisutch*), Rainbow Trout[I] (*Oncorhynchus mykiss*), Trout Perch (*Percopsis omiscomaycus*), Alewife[I], European Brown Trout[I] (*Salmo trutta*). Potential species that would utilize deep areas include but are not limited to: Lake Whitefish (*Coregonus clupeaformis*), Burbot (*Lota lota*), Lake Chub, Deepwater Sculpin (*Myoxocephalus thompsoni*), Longnose Sucker (*Catostomus catostomus*), Lake Char.

<u>Waukegan Municipal Beach</u> – Multiple historic fish collections were made at or within the vicinity of the Waukegan Municipal Beach. Species recorded from during these collections included Spottail Shiner, White Sucker, Burbot, Mottled Sculpin, Rock Bass, Pumkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, Yellow Perch, Coho Salmon[I], Rainbow Trout[I], Trout Perch, Alewife[I], and European Brown Trout[I]. In 2002, Lake Whitefish was collected by USACE biologists and vouched at the Illinois Natural History Survey (INHS).

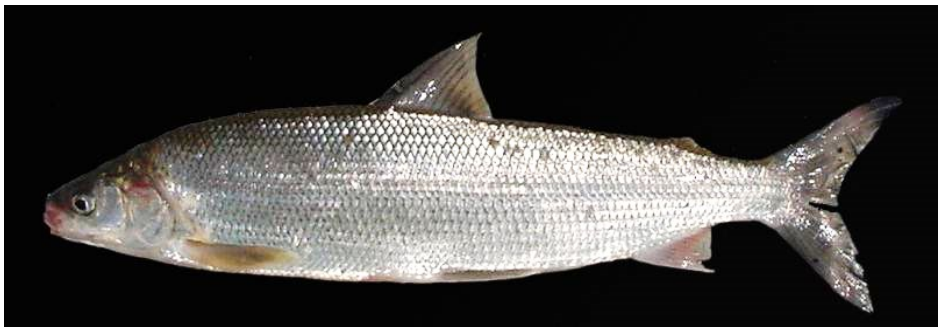

Photo 1: Lake Whitefish (*Coregonus clupeaformis*) sub-adult; Waukegan Harbor, Lake Michigan, Lake County, IL (2002).

Foss Park Beach – One historic fish collection was made at or within the vicinity of Foss Park Beach. In 1964, Alewife[I], Emerald Shiner, Spottail Shiner, Longnose Dace and Rainbow Smelt[I].

Sunrise Beach – Historic fish collections at or within the vicinity of Sunrise Beach are limited. In 1951 Lake Chub was recorded; in 1964 Alewife[I], Emerald Shiner, Spottail Shiner and Longnose Dace were recorded; 1981 Longnose Sucker and Brook Char (*Salvelinus fontinalis*) were recorded.

Glencoe Beach – There are no collections within the vicinity of Glencoe Beach; however, the closest beach to the south at Winnetka was sampled in 1998 (INHS). Species recorded from this surf zone included Sea Lamprey[I] (*Petromyzon marinus*), Golden Shiner (*Notemigonus crysoleucas*), Chinook Salmon[I] (*Oncorhynchus tshawytscha*), Trout Perch, Ninespine Stickleback, Warmouth and Black Crappie (*Pomoxis nigromaculatus*).

Lee Street Beach, Greenwood Street Beach, & Dog Beach – Multiple historic fish collections were made at and within the vicinity of these three Evanston beaches. The most interesting collection was a Spoonhead Sculpin (*Cottus ricei*) in 1939. The total list of species recorded from these beaches include Chestnut Lamprey (*Ichthyomyzon casteneus*), Alewife[I], Fathead Minnow, Emerald Shiner, Mimic Shiner, Spottail Shiner, Smallmouth Buffalo (*Ictiobus bubalus*), Burbot, Rainbow Smelt[I], Trout Perch, and Ninespine Stickleback.

3.2.7 – Amphibians & Reptiles

Reptiles and amphibians that may be present in the area include those that utilize beach habitat. These are quite limited along the coast of Lake Michigan, and may include Painted Turtle[I] (*Chrysemys picta*), Red Ear Slider (*Pseudemys scripta*), Snapping Turtle (*Chelydra serpentina*) and the Garter Snake (*Thamnophis sirtalis*). Any manmade rock structures near the beaches could support the State Threatened Mudpuppy (*Necturus maculosus*) salamander. These salamanders spend their entire life underwater, foraging rocky shoals for crayfish and other prey items. They prefer cold water and only migrate into the near shore area during the winter months.

3.2.8 – Birds

The Audubon Bird Conservation Network database for Chicago Region breeding birds was utilized to identify species richness and important bird species at the sand placement areas. Most of the beaches do not have specific point data, but the nearest data point within the vicinity was utilized.

IBSP – The site serves as important breeding habitat for many wetland dependent birds and provides critical stop-over habitat for at least 310 migratory avian species (ILDNR letter dated 05 August 2018).

Because of this concentration, IBSP has been designated an Important Bird Conservation Area by the National Audubon Society.

Open Water Area – The open water of Lake Michigan provides resting and forage habitat for many water fowl suck as Divers, Mergansers, Terns, Gulls, and Raptors.

Waukegan Municipal Beach – An estimated 14 species of bird have been observed just north of the Waukegan Municipal Beach, mostly common urbanized resident species. Some interesting birds observed include Eastern Wood-Peewee and Spotted Sandpiper.

Foss Park Beach – An estimated 30 species of bird have been observed just south of Foss Park Beach, including various species of Gulls, Terns, Plover and Sandpiper. Some interesting birds observed include Blue-Winged Teal, Forster's Tern, Short-Billed Dowitcher and Curlew Sandpiper.

Sunrise Beach – An estimated 11 species of bird have been observed at Sunrise Beach, and provides foraging or resting habitat for species such as Gulls, Cormorants, and swifts.

Glencoe Beach – This beach has very little data within the vicinity on bird observations. The closest observations to the north included Redhead Woodpecker, American White Pelican and Common Tern.

Lee Street Beach, Greenwood Street Beach, & Dog Beach – An estimated 24 species of bird have been observed at Greenwood Street Beach, mostly common urbanized resident species. Some interesting birds observed include Blue-gray Gnatcatcher, Red-eyed Vireo and Warbling Vireo.

3.2.9 – Threatened & Endangered Species

Federal

Federally-listed Threatened, Endangered, Proposed and Candidate Species were reviewed for the project area by the Chicago District. The following federally listed species and their critical habitats are identified by the USFWS as occurring within Lake County:

- Piping Plover (*Charadrius melodus*) – Endangered – Wide, open, sandy beaches with very little grass or other vegetation

- Eastern Massasauga (*Sistrurus catenatus*) – Candidate – Graminoid dominated plant communities (fens, sedge meadows, peat lands, wet prairies, open woodlands, and shrublands)

- Eastern prairie fringed orchid (*Platanthera leucophaea*) – Threatened – Mesic to wet prairies

- Hine's Emerald Dragonfly (*Somatochlora hineana*) – Endangered – Spring fed wetlands, wet meadows and marshes

- Karner Blue Butterfly (*Lycaeides Melissa samuelis*) – Endangered – Pine barrens and oak savannas on sandy soils and containing wild lupines (*Lupinus perennis*), the only known food plant of the larvae

- Mead's milkweed (*Asclepias meadii*) – Threatened – Late successional tallgrass prairie, tallgrass prairie converted to hay meadow, and glades or barrens with thin soil

- 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.

- Pitcher's Thistle – (*Cirsium pitcheri*) – Threatened – Lakeshore dunes.
- Prairie Bush Clover – (*Lespedeza leptostachya*) – Threatened – Dry to mesic prairie with gravelly soil
- Rattlesnake-master Borer Moth (*Papaipema erynigii*) – Candidate – Undisturbed prairie and woodland openings that contain their only food plant, rattlesnake-master (*Eryngium yuccifolium*)
- Rufa Red Knot (*Calidris canutus rufa*) – Threatened – Coastal Areas or large wetland complexes
- Rusty Patched Bumble Bee (*Bombu affinis*) – Endangered – Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.

All of the municipal beaches are not identified as critical habitat for federally listed species, and it is unlikely they occur there based on recreational uses and associated maintenance practices. IBSP, however, does have critical habitats and documented presence of federal species. IBSP has been designated critical habitat for the Piping Plover by the U.S. Fish and Wildlife service (50 CFR Part 17) and this species has been observed on this beach. The Rufa Red Knot would be considered due to actions that occur along coastal areas or large wetland complexes during migratory window of May 1 - September 30, which IBSP provides this type of habitat. Although it is unlikely the Karner Blue Butterfly occurs at IBSP, sandy barrens that support Lupine (*Lupinus perennis*) are present. The Rusty Patched Bumble Bee could potential utilize flowering forbs in stable fore dunes between the bluffs and active surf zone.

State of Illinois

Several state-listed plants are known to occur in the project area, including Bearberry (*Arctostaphylos uva-ursi*), Golden Sedge (*Carex aurea*), Kalm's St. John's wort (*Hypericum kalmianum*), Little Green Sedge (*Carex viridula*), Marram Grass (*Ammophila breviligulata*), Richardson's Rush (*Juncus alpinoarticulatus*), Sea Rocket (*Cakile edentula*), and Seaside Spurge (*Chamaesyce polygonifolia*) (ILDNR letter dated 07 September 2018).

Other State listed species known to occur within the greater project area that could utilize the surf zone or adjacent rock structures include the Longnose Sucker (*Catostomus catostomus*), Banded Killifish (*Fundulus diaphanus*) and the Mudpuppy (*Necturus maculosus*). The Longnose Sucker typically does not occupy the nearshore around sandy beaches, but certain may be found in these zones foraging. The Banded Killifish is becoming ubiquitous within the Chicago Area and is highly abundant along the shorelines and surf zone of Lake Michigan. The Mudpuppy is known to occupy manmade structures constructed out of dolomitic limestone riprap throughout southern Lake Michigan during the winter months.

3.2.10 – Natural Areas & Nature Preserves

Illinois Beach State Park is an ecosystem representing 14 different community types. The wetlands and associated upland prairie and savanna complex provides habitat for over 930 native plant species and 300

animal species, including 63 state-protected species. The site serves as important breeding habitat for many wetland dependent birds and provides critical stop-over habitat for at least 310 migratory avian species. Because of this concentration, IBSP has been designated an Important Bird Conservation Area by the National Audubon Society. In recognition of the importance of the overall coastal landscape, in 2015 the area was designated as a Wetland of International Importance by the Ramsar Convention on Wetlands. Of national significance, IBSP provides habitat for four federally listed species, two in particular that utilize beach and foredune habitat, the Piping Plover (*Charadrius melodus*) and the Dune's Thistle (*Cirsium pitcheri*). Much of the shoreline has been officially designated by the U.S. Fish and Wildlife Service as Critical Habitat for Piping Plover. The state-listed Blanding's (*Emydoidea blandingii*) turtle has been found to use the foredunes in which to place their nests each summer. With the continued physical loss of nearshore habitat, these species will continue to be negatively impacted and population recovery further threatened by reduced littoral sands.

Photo 2: IBSP Littoral Sand Deficiency Threatens Unique Sand-based Plant & Animal Communities

3.3 – Cultural & Social Resources

3.3.1 – Social Setting

Illinois Beach State Park (IBSP) – Is part of the Illinois state park system. It is located along 6.5 miles of the western coast of Lake Michigan in Zion, Illinois and is the only remaining beach ridge shoreline left in the state. The park itself consists of two separate areas, a north unit and south unit, and encompasses 4160 acres. Zion has a population of 24,508 (2010), 33.2% of which are under the age of 18. The median household income is $45,723 (2010) and the per capita income for the city was $17,730.

Waukegan Municipal Beach and Near Shore Area – Waukegan has a racially and ethnically diverse population of approximately 89,000 (2010) with a medium household income of $43,995 (2010) and a medium house value of $152,400 (2010).

Foss Park Beach – The beach is located in North Chicago, Illinois which is also home to the Great Lakes Naval Training Center. As of the 2010 census there were 32,574 residents in the city with a median age of 22. The median household income is $38,180 (2010) in the city and a median home value of $77,500 (2010).

Sunrise Beach – The beach is located in Lake Bluff, Illinois directly south of Naval Station Great Lakes. The village is home to 5,722 (2010) residents. The median household income for the village is $114,521 (2010) with a median home value of $507,000 (2010).

Glencoe Beach – The village of Glencoe has a population of 8,723 people (2010), 31.6% of which are under the age of 18, but a median age of 44 years old. The median household income in the village was $193,517 (2010) and median home value of $805,000 (2010).

Lee Street Beach, Greenwood Street Beach, and Dog Beach – These three beaches are located in Evanston, Illinois, a city boarding the northern edge of Chicago. As of the 2010 census, Evanston had a racially and ethnically diverse population of 74,486 people residing in the city. The median age of residents was 34.3 years old (2010) and the median household income was $60,033 (2010). The median home price in Evanston was $268,000 (2010).

3.3.2 – Archaeological & Historic Properties

The Waukegan Harbor approach channel and advanced management area are not considered to be of historical significance by the Illinois Historic Protection Agency (IHPA). Likewise the placement areas of Waukegan Beach/near shore area, Foss Park Beach, Sunrise Beach, and Glencoe Beach are not considered to be of historical significance by IHPA. The three placement options in Evanston are found within the Evanston Lakeshore Historic District as denoted by IHPA. There was no formal response provided by the State Historic Preservation Office objecting to the proposed work limits of placement sites.

A letter was received from the Miami Tribe of Oklahoma (06 August 2018) indicating no presence of Cultural Resources within the work limits.

3.3.3 – Recreation

IBSP – The 4,160-acre park offers opportunities for swimming, boating, picnicking, hiking, fishing, camping and observing nature. In addition to swimming beaches, trails and campgrounds, the Illinois Beach Resort and Conference Center has lodging facilities.

Open Water Area – Recreational activities within this zone would be boating and fishing.

Waukegan Municipal Beach –The Waukegan Municipal beach is free and open to the general public. The City of Waukegan maintains this as a public beach on the shore of Lake Michigan for swimming, sunbathing, picnicking, kiteboarding, sand soccer, and sand volleyball.

Foss Park Beach – Foss Park beach is free and open to the general public. The 32-acre park includes 3 shelters, band shell, concession stand, ball diamonds, skate park, and playground equipment.

Sunrise Beach – This Lake Bluff beach is a regulated and gated beach that requires residency to utilize the beach for free, and non-residents can purchase a pass. Recreational amenities include play equipment, two shelters with fireplaces, charcoal grills, restroom facilities, complimentary games and complimentary beach chairs.

Glencoe Beach – This Glencoe Park District beach is a regulated beach that requires residency and non-residents to purchase a pass. Recreational amenities include paddleboard, kayak and sailboat rentals, Paul & Ada Safran Sprayground for children, shaded trellis & sun shelters for picnics and parties, sand chairs, cabanas, and umbrella rentals, volleyball courts and complimentary volleyball rentals, beach cafe with lakefront dining options, and scheduled complimentary beach cart service. Many of these amenities require fee for usage.

Lee Street Beach, Greenwood Street Beach, & Dog Beach – The City of Evanston's beaches require residents and non-residents to purchase a pass. Low income families can apply for assistance with proof of burden. This beach is typically a swimming and sun bathing beach, with opportunities to purchase tube rides on Lake Michigan.

Chapter 4 – Effects Determination

The effects determination provided in this document only pertain to those sites already identified in this assessment. If new sites become available and are to be considered for placement of dredged material, said sites will be required to meet criteria outlined below. Coordination will also be required between all interested parties and agencies.

There are two sets of criteria for any beach placement operation that would be conducted: the sediment to be dredged and the location at which it will be placed. The sediment criteria include the following list:

- Material from the authorized navigational maintenance areas of the Waukegan Approach Channel, Waukegan Outer Harbor and/or Advance Maintenance area.
- Fines less than 20%; predominately sandy material, of suitable chemical quality.

The placement location must meet the following criteria:

- Either within the near-shore littoral zone, defined as less than 18' of water depth, or upland on an existing beach area.
- The placement location must not have endangered species or historically or culturally significant resources that would be impacted by the sediment placement. Endangered Species Act and National Historical Preservation Act compliance must be verified before a new placement site may be used.
- For in-water placement, the location must not block tributary drainage, marina entrances, dock faces, or other existing natural or manmade features.
- For upland placement, the beach area must be an existing sandy beach recognized by the state, county and/or municipal government and designated as a beach in land use. The beach may be for recreational use or for habitat use, as long as the placement of sand does not destroy any resources.
- Sediment may be placed mechanically or hydraulically, using appropriate mechanic or hydraulic marine or land based equipment; the selected approach will minimize cost and impacts to the beach and beach users.
- For any placement site, all appropriate permitting, including but not limited to Clean Water Act permitting, must be obtained prior to any placement action.

Several specific locations have been identified as potential placement sites, including Illinois Beach State Park (northern and southern units), Foss Park, near shore area south of Waukegan Harbor, Waukegan Beach, Sunrise Park Beach, Glencoe Beach, and City of Evanston beaches (Dog Beach, Greenwood St. Beach, Lee St. Beach). These locations have been investigated as part of this assessment and have been determined to meet the criteria above for placement locations. Additional coastal locations between the northern City of Chicago boundary and the Illinois/Wisconsin state line may also be used as placement sites if the above criteria are met, sediment of suitable quality is available, and funding and logistics allow along with compliance with the National Environmental Policy Act. Placement may including any combination of near shore littoral placement and upland beach placement (above or below the ordinary high water mark).

4.1 – Physical Resources

4.1.1 – Geology

All of the proposed alternatives would have upland placement of sand or placement of sand into the littoral drift system, which would support sediment transport and efforts to slow down coastal erosion of

coastal glacial features and till/outwash materials; however be it minor and short term. It is anticipated that all of the alternatives would have no adverse effects to geologic resources.

4.1.2 – Littoral Drift Processes

All of the proposed alternatives that place sand into the littoral drift system would support increasing sediment transport quantities and efforts to slow down coastal erosion; however be it minor and short term comparatively to the greater natural littoral drift system. It is anticipated that all of the littoral drift system alternatives would have no adverse effects to littoral drift resources.

4.1.3 – Sediment Quality

The sediment quality at Waukegan Harbor would not be impacted by the dredging and sediment placement activities. It is anticipated that any dredged areas would re-shoal within a year. The sediment quality at the placement locations would not be impacted by the placement of Waukegan Harbor materials; the sediment along the entire Illinois coastal zone consists of similar sands as the placement materials. The proposed work would only increase the mass of sediment at discrete locations, but would not impact sediment quality nor would the placement change the well-established sediment migration patterns that exist along the coast.

4.1.4 – Water Quality

The proposed plans that place sand into the littoral drift system would have temporary and localized impacts on Lake Michigan at the dredging and particularly at the sediment placement location, due to the mixing of the sediment the water and the release of water entrained in the sediment to the water column. Main impacts would be turbidity (cloudiness) caused by the suspension of fines, and potentially nutrients due to the release of soluble nitrogen and phosphorus compounds from the sediment matrix. Both of these conditions would be temporary, and any released materials would be quickly mixed within the water column and diluted to levels below impact. No long term impacts are identified. The proposed upland placement alternatives would have minimal short term impacts to the Lake Michigan water.

4.1.5 – Air Quality

The local air quality in Cook and Lake Counties is considered ‘non-attainment’ under the Clean Air Act for ozone and lead. The proposed project is within the non-attainment zone. Due to the small scale and short duration of these projects, the main sources of emissions would be vehicle emissions and dust associated with the construction activities. The project does not include any stationary sources of air emissions, and a General Conformity Analysis was not completed. The temporary mobile source emissions from this project is *de minimis* in terms of the National Ambient Air Quality Standards and the State Implementation Plan. The project is not expected to be a significant source of Green House Gas emissions. All construction vehicles will comply with federal vehicle emission standards. USACE and its Contractors comply with all Federal vehicle emissions requirements. USACE follows EM 385-1-1 for worker health and safety, and requires all construction activities to be completed in compliance with Federal health and safety requirements.

4.1.6 – Hazardous, Toxic & Radioactive Wastes (HTRW)

The sediment in the Waukegan Approach Channel, Outer Harbor and Advance Maintenance Area is mainly coarse littoral sand, with no notable chemical impurities. The source of the sediment is littoral material from the northern near shore areas in Lake Michigan.

Past contaminants for upland areas and the Inner Harbor (but not the Outer Harbor and Approach Channel/Advance Maintenance Area) have included polychlorinated biphenyls (PCBs), asbestos, or metals, all from upland sources that no longer exist. In 2014, USACE dredged the Outer Harbor and placed the clean but fine grained sediment upland on a portion of the superfund site, under an economy act agreement with the USEPA. All of the required management actions for the Waukegan Area of Concern (AOC) are considered complete and the AOC is currently proceeding through the final delisting process.

A 2005 Illinois Attorney General investigation into the presence of asbestos in beach sand at Illinois Beach State Park included testing at Waukegan Approach Channel. Although individual fibers were found, the human health risk was identified as being acceptably low. The Outer Harbor was tested in 2006 following the same method, with similar findings. No asbestos containing materials (i.e. materials with 1% or greater asbestos content) have ever been identified in Waukegan Harbor. The potential source site is substantially remediated and closed. The risk of encountering any HTRW materials during the dredging of Waukegan Outer Harbor, Approach Channel and/or Advance Maintenance Area is considered very low.

4.2 – Ecological Resources

4.2.1 – Great Lakes Wetland Habitat

All of the lacustrine and coastal wetland areas characterized for sand placement require transport of glacial deposition sands, till and outwash to sustain their hydrogeomorphic setting and associated hydrologies. All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. It is anticipated that all of the alternatives would have no adverse effects to Great Lakes wetlands of Lacustrine Open Shoreline and Barrier Enclosed Ridge and Swale Complex. The No Action alternative of not placing sand at IBSP misses the opportunity to contribute to offsetting shoreline erosion effects. Adverse effects to the ridge and swale complex would occur should the beach and foredune barrier be eroded or ruptured due to lack of littoral drift sands passing through this coastal reach.

4.2.2 – Native Plant Communities

All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. These zones are naturally barren, with minimal to no plant life due to wave action and continually moving substrates (Albert 2005). The only plant typically found in the beach zone is the State Threatened Sea Rocket, which is an annual that reproduces by seed and maintains persistence in this manner. Additionally, the municipal beaches that practice beach-combing would also contribute to maintaining plant free beach zones. It is anticipated that all of the alternatives would have no adverse effects to bluff, dune or beach plant communities.

4.2.3 – Macroinvertebrates

All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. These zones are naturally barren with continually shifting sands and substrates. Due to these conditions, macroinvertebrate diversity is low, and those taxa that live in the conditions are adapted to sands and gravels continually been entrained and deposited by waves (Albert 2005). It is anticipated that all of the alternatives would have no adverse effects to littoral macroinvertebrate communities.

4.2.4 – Fishes

All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. These zones are naturally barren with continually shifting sands and substrates, which provides spawning and foraging conditions for surf zone fishes. Although surf zone fishes have adapted to continually moving substrates, large piles of sand that would sit in the surf zone for durations longer than a day or two could impact fish eggs embedded in the shifting sands and gravels. To avoid minor effects to surf zone fish spawning and recruitment, it is recommend no sand be placed in the surf zone between 01 March and 01 July. Considering this stipulation, it is anticipated that all of the alternatives would have no adverse effects to surf zone or littoral fish communities.

4.2.5 – Amphibians & Reptiles

All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. These zones are naturally barren with continually shifting sands and substrates. Due to these conditions, amphibian and reptile diversity is absent to low. It is anticipated that all of the alternatives would have no adverse effects to amphibian or reptile communities.

4.2.6 – Birds

All of the alternatives would place sand onto open beach or into the surf zone, which are the natural zones for littoral sands to continue through the drift process. These zones are naturally barren with continually shifting sands and substrates, where birds to do not nest. However, due to these conditions, certain species of birds have adapted to feeding on macroinvertebrates in these areas, such as certain Sandpiper and Plover species. Also, wading birds and diving duck species likely hunt for fish in the surf zone. Due to sand placement beneficially supporting littoral drift properties, it is anticipated that all of the alternatives would have no adverse effects to resident or migratory bird communities.

4.2.7 – Threatened & Endangered Species

<u>Federally Listed Species</u>

The USFWS recommends consideration of potential beneficial or adverse impacts to listed species for each potential sand placement area. In particular, the EA should evaluate the potential benefits of selecting the "Optional Placement Area," at the northern section of IBSP and south of Winthrop Harbor, to the Piping Plover, the Pitcher's Thistle, and the Rufa Red Knot.

The USACE concurs that placing sand in the littoral zone of the IBSP most northern area, termed "Optional Placement Area", would provide the most benefits to federally listed species that are known to occur and utilize Illinois north shore coastal habitats. The <u>Piping Plover</u> would benefit by allowing the beach at IBSP to maintain critical habitat size so that the potential for nesting can be sustained. Adverse effects to Piping Plover could occur during sand placement and associated disruptive activities that could drive birds from the beach. This potential adverse effect can be avoided by adhering to recommended USFWS "no work" windows during breeding season. Adverse effects to Piping Plover would occur if sand was not continually placed at IBSP since beaches would be expected to reduce in size significantly or disappear altogether. The Pitcher's Thistle scenario at IBSP would be the same as the Piping Plover, but with a lesser degree of concern since this plant species can occur on the beaches even if they do get reduced in size, but only to a point, since this plant prefers more stable areas near the foredune as opposed to the active wave beach and surf zones. Since placement of material will occur at the shore and in the

littoral zone, away from the preferred forefune habitat, any Pitcher's Thistle present on the beach should be unaffected. The Rufa Red Knot has been identified as potentially susceptible to actions that occur along coastal areas or large wetland complexes during migratory window of May 1 - September 30. The beach and foredune at IBSP are not only critical habitat for this species, but the Barrier Enclosed Ridge and Swale Complex is critical as well. This species would benefit by allowing the beach at IBSP to maintain critical habitat size so that the barrier Ridge & Swale Complex can be sustained. Adverse effects to Rufa Red Knot could occur during sand placement and associated disruptive activities that could drive birds from the beach. This potential affect can be avoided by adhering to the recommended USFWS "no work" during migratory window of May 1 - September 30. Adverse effects to Rufa Red Knot would occur if sand was not continually placed at IBSP since beaches would be expected to reduce in size significantly or disappear altogether and allow the Ridge & Swale Complex to become compromised by changes in hydrology and being exposed to direct coastal wave forces. A letter dated July 26, 2019 was received from the USFWS indicating no objection to the project.

Photo 3: Pitcher's Thistle Restoration at 63rd Street Beach (USACE/Chicago Park District)

Illinois State Listed Species

The only two listed species of concern for the proposed activities under this EA would be for the state Threatened Sea Rocket and the Banded Killifish. Placing large piles of sand within the identified beach and surf zones could impair spawning and recruiting of Banded Killifish or could smother existing Sea Rocket. Based on the recommended no sand placement window for fishes (01 March – 01 July), the Banded Killifish would be protected. This window would also give time for Sea Rocket to sprout, so if it were desired for municipalities to perform survey and mark this species for avoidance, it could be accomplished and not delay sand placement activities.

Photo 4: Sea Rocket Growing in Active Beach and Fluvial Zone at McCormick Ravine, Ft. Sheridan, IL.

4.3 – Cultural & Social Resources

4.3.1 – Social Properties

It is anticipated that the preferred plans would have no effects to Archaeological or Historic Properties.

4.3.2 – Land Use History

Waukegan Harbor was constructed in the 1850s and the USACE has conducted dredging operations in the area on and off since 1889. The harbor has been used for both industrial and recreational purposes since its construction. In 1981 the inner harbor was listed as a Superfund Site and has undergone extensive remediation and is in the final process of being delisted as a Superfund site.

4.3.3 – Recreation

The beach placement areas are all public, municipal beaches that see a variety of activities during the appropriate time of year. Placement of dredged material on or near these beaches is expected to provide sand nourishment and replenish sand that has been lost through the littoral drift process. The near shore placement area is expected to also provide sediment through the drift process to areas to the south. The dredging activity is expected to allow for deeper draft navigation into and out of Waukegan Harbor for both industrial and recreational marine traffic.

4.3.4 – Archaeological & Historic Properties

The Waukegan Harbor approach channel and advanced management area are not considered to be of historical significance by the Illinois Historic Protection Agency (IHPA). Likewise the placement areas of Waukegan Beach/near shore area, Foss Park Beach, Sunrise Beach, and Glencoe Beach are not considered to be of historical significance by IHPA. The three placement options in Evanston are found within the Evanston Lakeshore Historic District as denoted by IHPA. There was no formal response provided by the State Historic Preservation Office objecting to the proposed work limits of placement sites.

A letter was received from the Miami Tribe of Oklahoma (06 August 2018) indicating no presence of Cultural Resources within the work limits.

4.3.3 – 17 Points of Environmental Quality

The 17 points are defined in Section 122 of the Rivers, Harbors and Flood Control Act of 1970 (P.L. 91-611). Effects to these points are discussed as follows:

Noise – Temporary increases in noise from sand off-loading machinery would be noticeable by beach goers, but would not extend beyond the park boundaries since sand off-loading operations would be water based.

Displacement of People – The proposed sand placement will not displace any people.

Aesthetic Values – The proposed sand placement could have minor short term impacts during placement but after placement could enhance the visual aesthetics of the municipal beaches.

Community Cohesion – The proposed sand placement would not disrupt community cohesion.

Desirable Community Growth – The proposed sand placement would not affect community growth.

Desirable Regional Growth – The proposed sand placement would not affect regional growth.

Tax Revenues – The proposed sand placement could potentially save municipal tax payers money.

Property Values – The proposed sand placement would not affect property values.

Public Facilities – The proposed sand placement would help maintain public and semi-public facilities.

Public Services – The proposed sand placement would allow public services to continue, including recreation, public safety and economic driven activities.

Employment – The proposed sand placement would provide short term beneficial impacts during construction activities.

Business and Industrial Activity – The proposed sand placement would support local businesses and industries that support beach and water recreation.

Displacement of Farms – Since there are no farms within the study area none will be displaced.

Man-made Resources – The proposed sand placement would not adversely affect man-made resources.

Natural Resources – The proposed sand placement would support sustaining existing natural resources of the study area, especially at IBSP.

Air Quality – Any of the alternative plans would be *de minimis* in terms of CAA compliance. Temporary vehicle emission impacts would meet current federal regulations. Greenhouse gas emissions are expected to be negligible.

Water Quality – The proposed dredging and sediment placement would have temporary, localized impacts on water quality during sediment placement activities, particularly in the form of turbidity. Because of the coarse nature and limited fines associated with the sediment, any impacts would be temporary. Lake Michigan as a whole would experience negligible short term impacts from the project, and would experience beneficial long term impacts from improved shoreline stability.

4.5 - Cumulative Effects

Consideration of cumulative effects requires a broader perspective than examining just the direct and indirect effects of a proposed action. It requires that reasonably foreseeable future impacts be assessed in the context of past and present effects to important resources. Often it requires consideration of a larger geographic area than just the immediate "project" area. One of the most important aspects of cumulative effects assessment is that it requires consideration of how actions by others (including those actions completely unrelated to the proposed action) have and will affect the same resources. In assessing cumulative effects, the key determinant of importance or significance is whether the incremental effect of the proposed action will alter the sustainability of resources when added to other present and reasonably foreseeable future actions. Cumulative environmental effects for the proposed littoral sand placement areas on the Illinois north shore of Lake Michigan were assessed in accordance with guidance provided by the Council on Environmental Quality (CEQ) and the U.S. Environmental Protection Agency (USEPA 315-R-99-002).

4.5.1 - Scope of Cumulative Effects Analysis

Through this environmental assessment, the cumulative effects issues and assessment goals are established, the spatial and temporal boundaries are determined, and the reasonably foreseeable future actions are identified. Cumulative effects are assessed to determine if the sustainability of any of the resources is adversely affected with the goal of determining the incremental impact to key resources that would occur should the proposed work be implemented. The spatial boundary being considered is normally in the general area of the proposed activity; however, the area may be expanded on a case-by-case basis if some particular resource condition necessitates broadening the boundary. The analysis will only include the immediate area since the proposed activity is a highly localized repair to an existing man made structure.

Three temporal boundaries were considered:

- Past – Pre-1830s because this is the approximate time that the Lake Michigan shoreline and littoral drift started being modified for development
- Present – 2019 when the decision is being made on sand placement.
- Future – 2069, the year used for determining repair life (~50 years)

Projecting the reasonably foreseeable future actions can be difficult. The proposed action, sand placement along Illinois' north shore of Lake Michigan, is reasonably foreseeable; however, the actions by others

that may affect the same resources are not as clear. Projections of those actions must rely on judgment as to what are reasonable based on existing trends and where available, projections from qualified sources. Reasonably foreseeable does not include unfounded or speculative projections. Some future projections were taken from watershed and specific studies generated for the general project area. In this case, reasonably foreseeable future actions include:

- Continued reduction in erosion from littoral sand inputs and/or shoreline armoring
- Continued reduction and attenuation of littoral sands from north shore structures
- Continued use of dredged littoral sands to supplement actively erosive shoreline reaches
- Continued maintenance and nourishment of sandy bathing beaches

4.5.2 - Cumulative Effects on Resources

The proposed sand placement areas are beneficial impacts, but considered to be localized compared to the whole southern Lake Michigan littoral drift system. Generally, the removal of sand from one spot within the littoral system and placing it in another spot is quite negligible and the effects are short term when considering the quantities and ceaseless movement of littoral sands in the system. The physical and ecological/biological impacts associated with littoral drift processes were started to the Illinois' north shore over 100 years ago with the development and build-out of the southern Lake Michigan shoreline. The proposed sand placement will temporarily abate minor shoreline erosion and potentially result in a cumulative economic and social effect by reducing local costs for sand placement and allowing the funding to be utilized for other municipal/public resources. Implementation of any of the alternatives would not result in a significant cumulative environmental effect since the greater littoral drift system and waves driven by thunderstorms far outweigh any of the minor and short term affects resulting from sand placement.

<u>Clean Air Act</u>
The local air quality in Cook County and Lake County is considered 'non-attainment' under the Clean Air Act for ozone, and lead. The project is within the non-attainment zone. Due to the small scale and short duration of this project, the main sources of emissions would be vehicle emissions and dust associated with the construction activities. The project does not include any stationary sources of air emissions, and a General Conformity Analysis was not completed. The temporary mobile source emissions from this project are *de minimis* in terms of the National Ambient Air Quality Standards and the State Implementation Plan. The project is not expected to be a significant source of Green House Gas emissions. All construction vehicles will comply with federal vehicle emission standards. USACE and its Contractors comply with all Federal vehicle emissions requirements. USACE follows EM 385-1-1 for worker health and safety, and requires all construction activities to be completed in compliance with Federal health and safety requirements.

Chapter 5 – Conclusions & Compliance

5.1 – Compliance with Environmental Statutes

The proposed sand placement alternatives are in compliance with appropriate statutes, executive orders, memoranda and USACE regulations including the Natural Historic Preservation Act of 1966; the Endangered Species Act of 1973; the Fish and Wildlife Coordination Act; EO 12898 (environmental justice); EO 11990 (protection of wetlands); EO 11988 (floodplain management); and the Rivers and Harbors Act of 1899. The potential project is in compliance with the Clean Air Act; the Clean Water Act, and the National Environmental Policy Act of 1969. There were no adverse environmental effects identified which cannot be avoided should the proposal be implemented [40 C.F.R. 1502.16; NEPA Section 102(2)(C)(ii)]. The proposed work does not have local and short-term effects to uses of the environment or Lake Michigan's coastal zone [40 C.F.R. 1502.16; NEPA Section 102(2)(C)(iv)]. There have been no irreversible and irretrievable commitments of resources identified resulting from the proposed action should it be implemented [40 C.F.R. 1502.16; NEPA Section 102(2)(C)(v)].

5.1.1 – Environmental Justice

EO 12898 (Environmental Justice) requires that, to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands. Per Executive Order 12898 (Environmental Justice), the USEPA Environmental Justice website has been consulted (6 August 2012) and indicates that the project is not within an Environmental Justice area and therefore the project will not have an adverse effect on any low-income or minority populations.

5.1.2 – Clean Air Act

Waukegan and the proposed placement locations are within non-attainment areas for ozone. Due to the small scale, short duration and nature of the dredging project, it is assumed that the project is de minimis with regard to ozone and ozone precursors. Although a General Conformity analysis was not conducted, other Chicago area projects that are much larger in scale and earthwork have emissions well below the level of significance under the Clean Air Act and based on those experiences it is assumed that the proposed project is de minimis for air impacts.

5.1.3 – Section 401 / 404 of the Clean Water Act

The proposed project would include dredging and placing the dredged sediment within or near the littoral zone, with direct return of water. Based on elutriate testing, water quality impacts associated with the placement are expected to be localized and temporary, and to be fully consistent with USACE guidance. Further discussion of the proposed action can be found in the Section 404(b)(1) Contaminant Determination. USACE will comply with the Illinois Coastal Zone Management requirements.

5.1.4 – USFWS Coordination

Coordination with the USFWS commenced with a project scoping letter dated 12 July 2017. Coordination under the Fish & Wildlife Coordination Act (FWCA) of the considered alternatives was initiated under

the authority of, and in accordance with, the provisions of the National Environmental Policy Act of 1969 (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.), the Fish and Wildlife Coordination Act of 1956 (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) via a letter dated 13 August 2018. The Service requested that the USACE evaluate the potential benefits of selecting the "Optional Placement Area," at the northern section of IBSP and south of Winthrop Harbor, to the Piping Plover, the Pitcher's Thistle, and the Rufa Red Knot. This EA provides the analysis in Section 4.2.7 and concurs with the Service that the most beneficial sand placement area for fish and wildlife benefits would be at the northern most zone at IBSP. The USFWS sent a letter indicating no objection to this project in a letter dated July 26, 2019.

5.1.5 – State of Illinois Natural Resources Coordination

Coordination with the ILDNR commenced with a project scoping letter dated 12 July 2017.

The ILDNR provided a response on 07 September 2018. The letter indicates the need to consider the impacts of State Listed species on public lands, which is presented in Section 4.2.7. It was also indicated that state-listed plant species belong to the landowner and their fate resides with the landowner's conservation decisions. When feasible, the ILDNR recommends listed plants be identified and relocated out of the disturbance area, but within the same habitat area, when conditions are appropriate.

The Office of Water Resources did not provide response to the scoping letter; however, they were copied on the ILDNR's Impact Assessment Section's letter. USACE is applying for a Federal Consistency Determination under the Illinois Coastal Zone Program. This EA was provided to the ILDNR with a letter identifying that "The proposed activity complies with Illinois' approved coastal management program and will be conducted in a manner consistent with such policies."

5.1.6 – State of Illinois Historic Preservation Act

Coordination with the Illinois Historic Preservation Agency (IHPA) commenced with a project scoping letter dated 12 July 2018. IHPA did not provide response to the scoping letter. Based on the location and nature of the proposed sand placement alternatives, it is anticipated that "no historic properties effected". IHPA is anticipated to concur in response to this EA.

5.1.7 – EO 13112 Invasive Species

This Executive Order calls for actions "to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause..." This EO utilizes the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C.§ 4321 et seq.), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C.§ 4701 et seq.), Lacey Act, as amended (18 U.S.C.§ 42), , , Plant Protection Act of 2000 (P.L. 106-224, Title IV), Endangered Species Act of 1973, as amended (16 U.S.C.§ 1531 et seq.), and other pertinent statutes. Completed in 2001, the National Invasive Species Management Plan, served as a comprehensive "blueprint" for federal action on invasive species, as well as NISC's primary coordination tool. The 2008 Plan identified prevention as the first line of defense, and calls for preventing the introduction and establishment of invasive species to reduce their impact on the environment, the economy, and health of the United States. Executive Order (EO) 13112 also includes specific duties for federal agencies in regard to invasive or nuisance aquatic species. Excerpts from the Order relating to federal agencies are contained in the following paragraphs:

> (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,

(1) identify such actions;

(2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and

Any native planting work associated with the federal action of sand placement would be in compliance via removing non-native ornamental landscaping plants and replacing with native coastal bluff, dune and beach species known to be beneficial to migratory birds and pollinators.

5.1.8 – EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds

Federal agencies shall restore or enhance the habitat of migratory birds and prevent or abate pollution or detrimental alteration of the environment for migratory birds. This project lies within a significant portion of the Mississippi Flyway along the western shoreline of Lake Michigan that particularly favors both ecological and economically valuable species including neo-tropic migrants and waterfowl. The sand placement work would be in compliance by restoring and preserving existing Lacustrine Open Shoreline and Barrier Enclosed Ridge and Swale Complex wetlands. In addition, removing non-native ornamental landscaping plants and replacing with native species known to be beneficial to migratory birds and pollinators.

5.2 – Areas of Known and Expected Controversy

Waukegan Harbor has a history of industrial pollution that resulted in it being listed as a Superfund site in 1981 by USEPA and independently named as one of 43 Areas of Concern on the Great Lakes by the International Joint Commission, USEPA and IEPA. The Outboard Marine Corporation (OMC) site was on the western shore of Lake Michigan and was formerly used from 1948 – 2000 as a boat motor manufacturing plant. The site's various parcels historically included a wood-treating plant (railroad ties), a coal gasification plant and a coke oven gas plant facility. During OMC operations, the site was a source of contamination entering the harbor, specifically PCBs and trichloroethene (TCE). Cleanup activities, primarily dredging the PCB-contaminated sediment and removal of contaminated upland soils, began in the early 1990s at the approximately 100-acre site. The cleanup had progressed to the point that in 2014 the dredging equipment was removed from the site and the upland confinement facility was capped. A full timeline of activities is listed on the US EPA website and as of 2019 the sources of contamination have been addressed and remediated. The state of Illinois continues to monitor PCB levels in fish tissue annually (USEPA 2019). During the Superfund remediation process, the outer harbor, approach channel, and advance maintenance area were tested for PCBs and were determined not to be present. The test results showed that the PCB contamination within the inner harbor had not moved out of the inner harbor (USACE 2017). Although the USEPA has removed the PCB contaminated sediment, the Chicago District has no plans to dredge the inner harbor at this time.

USACE sampling of the Waukegan Harbor sediments it proposes to dredge indicates no detectable levels of PCBs. The reason for this is largely that the source of the dredged material is sand being transported along the Lake Michigan shoreline rather than coming from the inner harbor. However, USACE is aware

that a portion of the surrounding population remains concerned over the possibility of contamination being entrained in dredged material from its operation and maintenance of the federal navigation channel in the outer harbor, approach channel, and advanced maintenance area.

Additionally historic asbestos contamination near the site is another cause of lingering concern among a portion of the surrounding population. The Johns-Manville site is a 150-acre asbestos disposal area in Waukegan, Illinois. About 3 million cubic yards of product and wastewater sludge were disposed of at the site. Johns-Manville ceased operations at the site in the summer of 1998. EPA's cleanup of this site consisted of consolidating waste into the Industrial Canal, Pumping Lagoon, and Black Ditch areas and placing clean soil with vegetation over the waste disposal areas; placing sand and gravel on all site roadways; institutional controls; and periodic sampling of air, soil cover and groundwater to ensure the cleanup continues to protect people and the environment. (USEPA 2019).

The Illinois Department of Public Health (IDPH) in 2000 published a Public Health assessment of Illinois Beach State Park (IBSP) and concluded there were no public health hazards present (IL Department of Health 2000). IBSP is north of the Waukegan Harbor and the sand that erodes from there migrates southward along the coastline before shoaling within the approach channel of the Waukegan Harbor. At the request of the Illinois Attorney General, the Center for Excellence in Environmental Health at the University of Illinois at Chicago (UIC) School of Public Health evaluated the levels of asbestos at IBSP in 2005. They determined that the sand did contain statistically elevated levels of asbestos as compared to the background beach levels. However the levels of asbestos were below the risk level established by the USEPA. The U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) in 2007 also conducted a study of the area to test for asbestos. The level of asbestos released into the air due to various activities was evaluated in the ATSDR study. The study showed no significantly elevated levels of asbestos that would pose a human health risk being present due to these activities. It was also hypothesized that the asbestos that was detected likely does not come from debris washing up on shore (ATSDR 2007).

The Chicago District also conducted testing in areas around Waukegan Harbor. The Advanced Maintenance Area and Approach Channel were tested between 1997 and 2012 for asbestos and it was determined that there were no detectable levels of asbestos in the dredged material at that time (USACE 2013). The 2005 UIC study also included an analysis of asbestos at Waukegan Approach Channel and asbestos was not found to present a human health risk. Testing of the Outer Harbor by the Chicago District in 2006 reached similar conclusions.

Although the Chicago District is aware that there is some concern from members of the public related to the potential for contamination in dredged material from Waukegan Harbor, sampling conducted by USACE, as well as other independent parties, has repeatedly shown that PCBs and asbestos in the sediment are not human health issues. The Chicago District will continue to sample in accordance with its permits and the Great Lakes Testing Manual and make results of the sampling available for public consumption.

5.3 – Finding of No Significant Impact (FONSI)

This Environmental Assessment was completed for the discussed alternatives in this EA if there is a desire by the State and Federal partnership to implement the beneficial reuse of the sand. The Environmental Assessment has found that there would be no long term, significant effects resulting from implementation of any of the alternatives since sand inputs for the Illinois north shore littoral drift system is critical at this point in history. A 53-day Agency and Public Review period was held from June 28, 2019 to August 20, 2019. All pertinent comments received have been incorporated into the document or answers have been provided in a Frequently Asked Questions Document available is Appendix 4. The

Final Environmental Assessment document and supporting appendices will be placed on the Chicago District's Civil Works webpage for maximum distribution. The FONSI has been posted along with this EA and 404(b)(1) analysis.

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