

# CLEAN WATER ACT SECTION 404(b)(1) EVALUATION

## WOLF TRAP ALTERNATE OPEN WATER PLACEMENT SITE NORTHERN EXTENSION VIRGINIA WATERS OF THE CHESAPEAKE BAY JULY 2019

Prepared by the U.S. Army Corps of Engineers, Baltimore District

### **I. PROJECT DESCRIPTION**

#### **A. LOCATION**

The proposed Wolf Trap Alternate Open Water Placement Site Northern Extension (WTAPSNE) is an extension of the existing Wolf Trap Alternate Open Water Placement Site (WTAPS), and is located in the lower Chesapeake Bay between the Piankatank River and Mobjack Bay, approximately five miles east of Mathews County, Virginia.

#### **Coordinates for WTAPSNE in Degrees, Minutes, Seconds**

Latitude	Longitude
76°09'56.72962"W	37°26'26"N
76°10'45.17785"W	37°21'48.49069"N
76°08'41.58373"W	37°26'26"N
76°09'30.11100"W	37°21'48.48148"N

#### **B. GENERAL DESCRIPTION**

The proposed action would establish an extension of WTAPS to the north, increasing the size of the placement site by approximately 3,900 acres. WTAPSNE would serve as an open water placement site for dredged material primarily from the York Spit Channel, but may also be used as a placement site for other dredging projects in the lower Chesapeake Bay pending evaluation. WTAPSNE has been recommended by agencies of the Commonwealth of Virginia as an alternative to the currently-used WTAPS due to the potential for a high abundance of female blue crabs to overwinter in the southern portion of WTAPS. Blue crab winter dredge survey data collected by the Virginia Institute of Marine Science (VIMS) between 2009 and 2016 indicate that WTAPSNE provides less suitable habitat for overwintering female blue crabs than WTAPS. The proposed action does not include any changes to or consideration of the ongoing maintenance dredging activities or any other actions beyond the establishment of the placement site extension itself.

Approximately 2.6 million cubic yards (mcy) of dredged material from maintenance of the York Spit Channel would be placed into quadrant 1 of cell NE-6 in WTAPSNE during the initial placement event that is expected to begin in late fall of 2019. After initial placement into WTAPSNE, it is anticipated that approximately 1.5 mcy of dredged material from the York Spit Channel would be placed into the site approximately every 4 years, or until

another alternate placement site or method is identified, approved, and implemented. Each dredging cycle and the associated placement activities (mobilization to demobilization of the dredging operation) lasts for approximately 4½ months. Open water placement activities would occur 24 hours per day and seven days a week during any maintenance dredging period. Placement into WTAPSNE would not occur during the dredge closure period for sea turtles, from September 1 through November 14.

In FY 2020, the U.S Army Corps of Engineers, Baltimore District (USACE) plans to begin a comprehensive evaluation of alternatives to WTAPS through a Dredged Material Management Plan for the portion of the Baltimore Harbor and Channels Navigation Project located in Virginia.

### C. AUTHORITY AND PURPOSE

USACE is responsible for maintaining the Baltimore Harbor and Channels 50-Foot Navigation Project (50-Foot Project) to allow large, deep-draft commercial shipping vessels to safely navigate the Chesapeake Bay to and from Baltimore Harbor. The 50-Foot Project was authorized in Section 101 of the River and Harbor Act of 1970 and provides for a 50-foot-deep main shipping channel that extends from the Virginia Capes to Fort McHenry in Baltimore Harbor, Maryland, and a series of branch channels that provides access to various public and private terminals serving the Port of Baltimore.

The purpose of the proposed action is to provide a cost-effective, environmentally-acceptable placement site for dredged material in response to a recommendation by agencies of the Commonwealth of Virginia, to minimize impacts to overwintering female blue crabs. The proposed action is needed to provide a safe, reliable, and efficient channel to maintain waterborne commerce to and from the Port of Baltimore.

### D. GENERAL DESCRIPTION OF THE DISCHARGE MATERIAL

(1) **General Characteristics of the Material** - Sediments that would be dredged from the northern part of York Spit Channel are predominantly comprised of silt and clays (79.5 percent) and are most similar to the sediments at WTAPS (78.4 percent silt/clay). Sediments from the southern part of the York Spit Channel are predominately comprised of sand (81.9 percent).

(2) **Quantity of Material (cubic yards)** - Approximately 2.6 mcy of dredged material from maintenance of the York Spit Channel would be placed into WTAPSNE during the initial placement event that is expected to occur in the fall of 2019. After initial placement into WTAPSNE, it is anticipated that approximately 1.5 mcy of dredged material from the York Spit Channel would be placed into the site approximately every 4 years. Based on previous maintenance dredging actions for the York Spit Channel, it is expected that dredging would generate roughly 15,000 cubic yards (cy) of material per day. However, the volume and frequency of dredged material placement events during maintenance dredging is a function of the rate of dredging production, the number of hopper vessels in use, and their size,

speed and capacity. The thickness of the material that would be deposited in one cycle would range from 2 inches to 2 feet (ft) thick.

(3) **Source of Material** - York Spit Channel Maintenance Material

#### E. DESCRIPTION OF THE PROPOSED DISCHARGE SITE

(1) **Location** - Lower Chesapeake Bay between the Piankatank River and Mobjack Bay, approximately five miles east of Mathews County, Virginia. See coordinates in Section I(A) above.

(2) **Size (acres)** - 3,900

(3) **Type of Site (confined, unconfined, open water)** – open water

(4) **Type of habitat** - A flat, relatively featureless plain in the center of Chesapeake Bay with no submerged aquatic vegetation or shellfish beds. A deep channel runs lengthwise through the site.

(5) **Timing and Duration of Discharge** - The initial placement event is expected to occur in late fall of 2019. After initial placement, it is anticipated that dredged material will be placed into the site every 4 years, or until another alternate placement site or method is identified, approved, and implemented. Each dredging cycle and associated placement activity (mobilization to demobilization of the dredging operation) lasts for approximately 4½ months. Open water placement activities would occur 24 hours per day and seven days a week during any maintenance dredging period. Placement into WTAPSNE would not occur during the dredge closure period for sea turtles, from September 1 through November 14.

#### F. DESCRIPTION OF DISPOSAL METHOD

Dredged material would be placed into WTAPSNE using a hopper dredge. Dredged material would be dropped to the bottom of WTAPSNE through openings in the bottom of the hull. Upon placement, dredged material will partition into a main cloud, which will descend vertically. The main cloud would descend to the bottom at a high velocity, leaving behind a turbidity cloud.

Hopper dredge capacity is expected to range from 3,600 to 8,600 cy depending on the dredging contractor used. Depending on the size and types of vessels used, this would require the placement of 2 to 5 loads of dredged material at WTAPSNE per day during maintenance dredging periods.

## **II. FACTUAL DETERMINATIONS**

### **A. PHYSICAL SUBSTRATE DETERMINATIONS**

(1) **Substrate Elevation and Slope** - Water depths in WTAPSNE range from 23 ft to 55 ft mean lower low water (MLLW), with an average depth of 36 ft MLLW. A deep trough that reaches -55 feet MLLW runs lengthwise through the site.

(2) **Sediment Type** - WTAPSNE consists of two bottom types as defined by Wright et al., 1987: bay-stem plains and bay-stem channels. The beds of bay-stem plains and bay-stem channels are soft and consist of fine sediments. No sediment testing has been conducted by USACE in WTAPSNE. However, sediments found in WTAPS are expected to be similar to sediments found in WTAPSNE. Sediments in WTAPS are composed of very fine/fine sand and silts consistently throughout the entire site.

(3) **Dredged/Fill Material movement** – Upon placement, dredged material will partition into a main cloud, which will descend vertically. The main cloud would descend to the bottom at a high velocity, leaving behind a turbidity cloud. The thickness of the dredged material that would be deposited during one maintenance dredge cycle into WTAPSNE would range from 2 inches to 2 ft thick. The proposed action area is susceptible to wave-induced velocities that may cause sediments to become resuspended in the water column. The site is relatively shallow, with an average depth of 36 ft, and the area can experience wind speeds of 35 miles per hour or greater. The combination of water depth and high wind speeds may cause wave-induced velocities that could resuspend deposited materials. However, this generally occurs less than 48 hours per year. Material eroded out of this placement site would be expected to move northward in the Bay or locally to deeper parts of the Bay floor.

(4) **Physical Effects on Benthos (burial, changes in sediment type)** – The benthic community in WTAPSNE is characterized by opportunistic and equilibrium species that are adapted to and tolerant of bottom-disturbing events such as major storms. The existing community is also probably exposed to episodic oxygen stress and hypoxia, at least during some summers. Bottom-dump placement of dredged material typically produces mounded deposits on the Bay bottom, and the thickness of such mounds and the force of impacting sediment will be lethal to benthic organisms within the footprint of the deposit.

It is expected that the benthic community would recolonize within approximately one season, or at most 1.5 years (Schaffner, 2010). It is expected that the project would have minimal effect on the benthic communities. Many organisms would be able to burrow back to the surface, and recolonization would occur due to immigration from adjacent and nearby locations.

During the anticipated life of the project, successive dredged material placement events will raise the average bottom elevation within the project area from the current average of -36 feet MLLW, up to a maximum of -30 feet MLLW. The actual magnitude of this change over time would be subject to rates of sedimentation within the York Spit Channel, as well

as prevailing currents, major storms and other factors which affect the movement of sediments in the area. The relative change in depth would be greatest within the deep “trough” portion of WTAPSNE. The cumulative effects of this bathymetric change are not expected to constitute a substantially adverse effect on benthic communities. These depth changes may cause minor changes in the relative abundances of benthic taxa, but are not expected to fundamentally alter the benthic community type. Given that the deepest waters in the general vicinity of the project area are subject to seasonal hypoxia, it is possible that decreasing these depths, particularly within the trough, may reduce the frequency and severity of summer oxygen stress experienced by benthic organisms in those areas. The estimated decrease in average depths is based on current bathymetry and expected rates of dredging, and does not consider relative sea level changes. Recent climate models predict a relative rise in sea levels within the region which, regardless of magnitude, would have the effect at least partially offsetting the changes in depth caused by the project.

Short-term project effects to blue crabs would consist primarily of direct mortality, by burial or asphyxiation, of overwintering female crabs, when these crabs are present within the dredged material placement area. Cold temperatures reduce the crabs’ locomotor ability, and would make overwintering females susceptible to mortality by burial, especially in overburden thicknesses greater than 10cm.

When assessing the significance of this effect, however, it must be remembered that the WTAPSNE site is believed to support fewer overwintering female crabs than the currently-used WTAPS site. As previously discussed, a deep muddy channel runs through the center of WTAPSNE. According to the Dredge Disposal Effects on Blue Crab Report provided by VIMS, crab density will almost always be low in muddy habitats. It is likely that within the deeper, muddy channel, crab density will almost always be low due to the muddy habitat, which is usually avoided as an overwintering habitat by blue crabs (Lipcius and Knick, 2016).

(5) Actions Taken to Minimize Impacts – Attempting to flatten or spread out dredged material not appropriate.

## **B. WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS**

### **(1) Water Quality**

- (a) Salinity – Surface salinities vary from 10 to 24 parts per thousand (ppt), with an average of 17.9 ppt. Bottom salinities vary from 14 to 28 ppt, with an average of 22.2 ppt. No change in salinity expected.
- (b) Water Chemistry - No change in water chemistry is expected.
- (c) Clarity – Temporary change in water clarity expected during placement activities due to an increase in turbidity. No long-term change expected.
- (d) Color – Temporary change in water color expected during placement activities due to an increase in turbidity. No long-term change expected.
- (e) Odor – No change expected.
- (f) Taste – Not applicable.

(g) Dissolved Oxygen Levels – In WTAPSNE, bottom dissolved oxygen levels reach hypoxic levels near 4 milligrams/liter (mg/l) during the summer months while the surface dissolved oxygen remains above hypoxic levels at 6 mg/l during the summer months. During the winter months, both the surface and the bottom dissolved oxygen levels remain above hypoxic levels with a typical range of 8 to 12 mg/l at the bottom and a range of 10 to 12 mg/l at the surface. Minor temporary localized change in dissolved oxygen expected near depositional sites in warm water months. Negligible DO effects at other times of year.

(h) Nutrients – Minor and temporary mobilization of nutrients (nitrogen and phosphorus) would occur during placement activities and subsequent movement of placed material by currents.

(i) Eutrophication – Not expected to occur.

(j) Temperature – Fluctuates widely throughout the year. Temperatures in WTAPSNE range from 4°C in February to 25°C in July. No change in temperature expected.

## **(2) Current Patterns and Circulation**

(a) Current Patterns and Flow – Currents are generally slow and scattered across the site. A trough runs lengthwise through the site, but there is no defined channel that carries water through the site. No change in current patterns or circulation expected.

(b) Velocity - Currents within the bay are generally slow, primarily less than 1.6 ft/second. Minor changes in current velocity where placed materials forms local flow obstacles. Gradually reworking and flattening of mounds by currents would reduce this.

(c) Stratification – Strong seasonal stratification. During warm water months salty/cool oceanic water at bottom, fresher/warmer estuarine/riverine water at top, although then with some occasional mixing from strong winds. No changes in stratification are expected.

(d) Hydrologic Regime – WTAPSNE influenced by both river flow toward the Atlantic Ocean and the Atlantic Ocean flowing into the bay with the tides. No change expected to the hydrologic regime.

**(3) Normal Water Level Fluctuations** – Semi-diurnal lunar tide with a tidal range of 0.66 ft to 2.95 ft. The mean tidal range in the bay is approximately 2.6 ft. No change in water levels expected.

**(4) Salinity Gradients** - Varies from season to season and year to year depending largely on the amount of freshwater flowing into the Chesapeake Bay. Surface salinities vary from 10 to 24 parts per thousand (ppt), with an average of 17.9 ppt. Bottom salinities vary from 14 to 28 ppt, with an average of 22.2 ppt. No change in salinity expected.

**(5) Actions that will be taken to Minimize Impacts** – No actions will be taken to minimize impacts to water quality. Water quality impacts during open water placement activities are expected to be temporary, minimal and similar to conditions of past placement events in WTAPS. The project vicinity has historically been used for the placement of

dredged material since the 1950's. No measurable changes in temperature, salinity, oxygen content or other chemical characteristics are expected. Suspended particles are expected to settle out within a short time, with no long-term measurable effects on water quality. Placement during winter would serve to mitigate impacts by inducing less potential impact to DO than during warm water months because of reduced biological/chemical oxygen demand.

#### C. SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

**(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site** - Open water placement activities are expected to create some degree of turbidity in excess of ambient conditions up to 6,500 ft from the discharge location. During placement activities, suspended sediment levels can be as high as 500 mg/l within 250 feet of the discharge location, decreasing to background levels (i.e., 15 to 100 mg/l depending on location and sea conditions) within 1,000 to 6,500 feet of the discharge location.

#### **(2) Effects on Chemical and Physical Properties of the Water Column**

(a) Light Penetration – Temporary effects due to turbidity during placement activities. No long-term changes expected.

(b) Dissolved Oxygen - Bottom dissolved oxygen levels reach hypoxic levels below 4 milligrams/liter (mg/l) during the summer months while the surface dissolved oxygen remains healthier levels at 6 mg/l during the summer months. During the winter months, both the surface and the bottom dissolved oxygen levels are higher with a typical range of 8 to 12 mg/l at the bottom and a range of 10 to 12 mg/l at the surface. No change in DO expected.

(c) Toxic Metals and Organics - Metals of concern and polycyclic aromatic hydrocarbons (PAHs) in the sediments dredged from the York Spit Channel occur at low levels, and would likely settle out onto the bottom remaining adsorbed to sediment and not be released into the water column.

(d) Pathogens – No change expected.

(e) Aesthetics – A temporary and minor reduction in aesthetic value is expected to occur during placement activities from turbidity. No long-term effects expected.

(f) Temperature - Fluctuates widely throughout the year. Temperatures range from 4°C in February to 25°C in July. No change in temperature expected.

**(3) Actions taken to Minimize Impacts** - Total suspended solids (TSS) concentrations near the center of the plume created by the placement of dredged material have been observed to reach near background levels in 35 to 45 minutes. Furthermore, the high flushing rate (due to the water exchange and tidal fluctuations) of the Chesapeake Bay is anticipated to cause turbidity plumes to be quickly dispersed, with no long-term measurable impacts to water quality.

#### D. CONTAMINANT DETERMINATIONS

No hazardous waste, brownfields, voluntary remediation programs, or federal Superfund sites are located in or adjacent to WTAPSNE. Dredged material from the York Spit

Channel placed into WTAPSNE would not be toxic to marine life. Metals of concern and PAHs occur at low levels, and would likely settle out onto the bottom remaining adsorbed to sediment and would not be released into the water column.

#### E. AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

(1) **Effects on Plankton and Nekton** – Negligible impacts. Demersal nekton destroyed in areas of rapid thick placement. Populations would recover.

(2) **Primary Production, Photosynthesis** - Any turbidity generated during placement activities may reduce photosynthesis within the limit of disturbance area. No long-term effects expected.

(3) **Effects on Benthos** - This benthic community in WTAPSNE is characterized by opportunistic and equilibrium species that are adapted to and tolerant of bottom-disturbing events such as major storms and flows. The existing community is also probably exposed to episodic oxygen stress and hypoxia, at least during some summers. Bottom-dump placement of dredged material typically produces mounded deposits on the Bay bottom, and the thickness of such mounds and the force of impacting sediment will be lethal to benthic organisms within the footprint of the deposit. It is expected that the dredged material placement locations would return to pre-placement conditions following the project activities, with an approximation that the benthic community would become recolonized within 1.5 years. Placement activities would occur in accordance with the anticipated York Spit Channel maintenance schedule, or as necessary as a result of shoaling from storm events and other environmental factors. The benthic community would have an opportunity to fully recover following each dredged material placement event and prior to the subsequent such event.

(4) **Effects on Aquatic Food Web** – No change expected.

#### **(5) Effects on Special Aquatic Sites**

(a) Sanctuaries and Refuges – WTAPSNE is located in a blue crab sanctuary designated by the Commonwealth of Virginia. The sanctuary, generally located in water more than 35 feet deep, is closed to crabbing from June 1 through Sept. 15 each year, a time frame that corresponds with the crab's spawning season. WTAPSNE is believed to support significantly fewer overwintering female crabs than the currently-used WTAPS site, and thus the project would constitute, overall, a net reduction of the effect to blue crabs.

(b) Wetlands – Not applicable.

(c) Mud Flats – Not applicable.

(d) Vegetated Shallows – Not applicable.

(e) Coral Reefs – Not applicable.

(f) Riffle and Pool Complexes – Not applicable.

(6) **Threatened and Endangered Species** - Effects from the continued placement in WTAPS on threatened and endangered species was assessed in the 2018 National Marine

Fisheries Service (NMFS) Biological Opinion (BO) (F/NER/2018/14816). Activities covered under this BO included the construction and maintenance of the Chesapeake Bay Entrance channels and use of the associated dredged material placement sites. In the BO, NMFS concluded that these activities may adversely affect, but are not likely to jeopardize the continued existence of any distinct population segment (DPS) of Atlantic sturgeon, Kemp's ridley or green sea turtles or the Northwest Atlantic DPS of loggerhead sea turtles, and is not likely to adversely affect leatherback sea turtles, hawksbill sea turtles, shortnose sturgeon, fin whales, sei whales, blue whale, sperm whales, and North Atlantic right whales. The BO acknowledged a certain number of incidental take of listed species over the life of the project (50 years). The BO also included reasonable and prudent measures designed to minimize and monitor the impact of incidental take that might otherwise result from the activities including a time-of-year (TOY) restriction for dredging. To minimize adverse impacts to sea turtles, dredging in the York Spit Channel does not occur from September 1 through November 14 in accordance with the BO. USACE, in coordination with the NMFS, determined that the effects on listed species from placement of dredged material in WTAPSNE are similar to the effects considered in the 2018 NMFS BO. Therefore, USACE determined that re-initiation with NMFS was not warranted. Coordination with NMFS is currently ongoing.

(7) **Other Wildlife** - Short-term project effects to blue crabs would consist primarily of direct mortality, by burial or asphyxiation, of overwintering female crabs, when these crabs are present within the dredged material placement area. Turbidity would result in suspended particulates within the water column and may temporarily degrade ambient water quality for nutrients, dissolved oxygen content, and other constituents. Turbidity may also clog the gills of fishes and invertebrates within the turbidity plume. Anoxic dredged materials may also contain chemically-reduced sediments which, at least in some circumstances, produce significant chemical oxygen demand within ambient waters at the site of disposal. In practice, however, this effect is generally mitigated by the entrainment of oxygen-rich surficial waters during overboard placement and by tidal mixing. Cold temperatures reduce the crabs' locomotor ability, and would make overwintering females susceptible to mortality by burial, especially in overburden thicknesses greater than 10cm. When assessing the significance of this effect, however, it must be remembered that the WTAPSNE is believed to support significantly fewer overwintering female crabs than the currently-used WTAPS site, and thus the project would constitute, overall, a net reduction of the effect to blue crabs.

#### (8) **Actions to Minimize Impacts –**

##### **Blue Crabs**

Available data indicate that WTAPS, particularly the southern portion, supports a significant fraction of the population of overwintering female blue crabs within the lower Chesapeake Bay. By proceeding with the proposed action (WTAPSNE), adverse effects to these overwintering female crabs would be greatly reduced, relative to continued placement only in WTAPS. Although blue crab is not managed under the Magnuson-Stevens Act, minimizing impacts to blue crabs mitigates Essential Fish Habitat impacts for

those managed fish species evaluated in this document for which blue crab is an important prey item.

Placement of dredged material into WTAPS while female crabs are not overwintering (generally from early April to mid-November) is not feasible due to higher costs to dredge in the summer and potential adverse impacts to sea turtles. A hopper dredge is the preferred dredge method because it is more cost efficient and generally performs better than other dredge types in rough sea conditions. A hopper dredge removes material from the bottom of the channel in thin layers with hydraulic pressure. Sea turtles are generally present in the lower Chesapeake Bay from April through November. Sea turtles are vulnerable to entrainment in the draghead of the hopper dredge when they are likely to be feeding or resting on the bay bottom. Measures can be taken to minimize adverse impacts to sea turtles including the use of a mechanical dredge instead of a hopper dredge. Mechanical dredging entails removing material by scooping it from the channel bottom using an open bucket or clamshell and then placing it on a barge. It is unlikely that sea turtles would be captured in the mechanical dredge, presumably because they are able to avoid the dredge bucket. However, it is more cost effective to use a hopper dredge than a mechanical dredge. Therefore, because a hopper dredge is more cost effective and to minimize adverse impacts to sea turtles that may be entrained in a hopper dredge, dredging and placement is conducted in the winter months.

### **Sea Turtles**

To avoid/minimize adverse effects to Endangered Species Act (ESA)-listed sea turtles, USACE has implemented a TOY restriction from September 1 through November 14, of any year, on the dredging of the York Spit Channel. Therefore, dredged material placement would not occur in WTAPSNE during this period. Furthermore, USACE generally seeks to perform this work in the winter and early spring, subject to availability of dredging contractors. This TOY would also help to avoid and minimize effects to sandbar shark habitat area of particular concern used for pupping and nursery activities (occurring from May 1 to October 30).

### **Benthic Organisms**

Bottom-dump placement of dredged material typically produces mounded deposits on the bay bottom, and the thickness of such mounds and the force of impacting sediment will be lethal to benthic organisms within the footprint of the deposit. USACE considered requiring the contractor to smooth the deposits out to a roughly uniform thickness, but reworking the sediments in this way would be extremely costly, time consuming and likely ineffective. It would extend the duration of project disturbance, increase vessel traffic and emissions, and exacerbate turbidity. Moreover, distributing the sediments after placement would merely spread adverse effects over a much larger greater area. While it might result in somewhat-reduced mortality within the deposit footprint, it would greatly increase mortality and sub-lethal stress on benthic communities over a much larger area, and would result in delayed post-disturbance recovery and greater temporal loss of functions. If deposited “mounds” are left in place, natural tidal currents will gradually redistribute sediments, but this process would occur at a rate similar to that of natural sediment movements within the area, to which native benthic communities can acclimate with

minimal risk of harm. For these reasons, USACE believes that spreading deposited material is not a viable measure to reduce project impacts, and would likely increase adverse effects to the benthic community.

#### F. PROPOSED DISPOSAL SITE DETERMINATIONS

(1) **Mixing Zone Determination** – Open water placement activities are expected to create some degree of turbidity in excess of ambient conditions up to 6,500 ft from the discharge location. During placement activities, suspended sediment levels can be as high as 500 mg/l within 250 feet of the discharge location, decreasing to background levels (i.e., 15 to 100 mg/l depending on location and sea conditions) within 1,000 to 6,500 feet of the discharge location.

(2) **Determination of Compliance with Applicable Water Quality Standards** – On October 30, 2013, the Commonwealth of Virginia issued a Virginia Water Protection Permit (13-0593) and a Section 401 Water Quality Certification for maintenance dredging of the York Spit Channel and for placement of dredged material into WTAPS. The permit and WQC expires on October 29, 2028. A 401 WQC for WTAPSNE will be obtained from VADEQ prior to placement activities in WTAPSNE.

#### (3) **Potential Effects on Human Use Characteristic**

(a) Municipal and Private water Supply – Not applicable.

(b) Recreational and Commercial Fisheries - Recreational and commercial fishing vessels would not be able to access the waters of WTAPSNE during placement activities. Fish may temporarily leave the area during placement activities. However, impacts to recreational and commercial fisheries will be minor and temporary and the public will be able to access the area shortly after placement activities occur.

(c) Water Related Recreation – The public would not be able to access the area for water-related recreational activities during placement activities. The public will be able to access the area shortly after placement activities occur.

(d) Aesthetics - Temporary presence of a hopper dredge would occur. However, the proposed vessel presence is characteristic of the area and is consistent with vessel activity during dredging projects for the Baltimore Harbor and Channels project.

(e) Parks, Nation and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves – Not applicable.

#### G. DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Historical use of open water placement sites within the lower Chesapeake Bay has been necessary to accommodate large volumes of dredged material from the Baltimore Harbor and Channels Project. The project vicinity has historically been used for the placement of dredged material since the early 1960s. The proposed action would not create new or additional impacts, relative to the No-Action Alternative. The volumes, frequency, and

acreage impacted by placement activities during any given dredging cycle of the York Spit Channel would not change. It would merely expand the allowable placement area, to enable dredged material to be placed in the northern extension area, and thereby mitigate adverse impacts on overwintering female blue crabs that currently occurs under the No-Action Alternative. Therefore, no adverse cumulative impacts are anticipated as a result of the proposed action.

There are efforts underway by many entities to improve water quality in the Chesapeake Bay through a Total Maximum Daily Load (TMDL). Positive trends in Bay water quality would not be impacted by placement activities.

#### **H. DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM**

Secondary effects to aquatic organisms are expected to occur to aquatic organisms due to the placement of dredged material in WTAPSNE. However, these impacts would be minor and temporary. No long-term secondary effects from the proposed project are expected.

### **III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH RESTRICTIONS ON DISCHARGE**

a. Adaptation of the Section 404(b) (1) Guidelines to this Evaluation – No adaptations of the guidelines were made relative to the evaluation.

b. Evaluation of Availability of practicable Alternatives to the Proposed Discharge Site Which would have Less Adverse impact on the Aquatic Ecosystem - In addition to a “no action” plan (continued placement into WTAPS), eight alternatives were evaluated (see table below). The alternatives included an extension of WTAPS, upland placement at the Craney Island Confined Disposal Facility, ocean placement in the Norfolk Ocean Open Water Site, and beneficial reuse of dredged material including beach nourishment at Virginia Beach, Willoughby Spit/Ocean View, and Buckroe Beach, shoreline restoration in the Virginia portion of the Delmarva Peninsula in the general vicinity of Cherrystone Inlet, large island restoration at New Point Comfort Island, artificial island creation in Tangier Sound, and deferred maintenance dredging of the York Spit Channel.

Alternative	Evaluation Criteria (Relative to the No-Action Alternative)			
	Environmental	Feasibility	Risk	Cost
1 – No Action	n/a	n/a	n/a	\$55M
2 – Northern Extension of Existing WTAPS	Preferable; reduces the likelihood of adverse impacts to blue crabs; minor increase in emissions, other factors similar	Feasible	Minimal; uses established equipment and methods	\$77M
3 – Use of Craney Island CDF	Preferable; would eliminate in-water placement; minor increase in vessel emissions	Currently infeasible; Craney Is. cannot legally accept material from outside Norfolk Harbor; feasible if law changed	Excessive; legislative authorization highly uncertain, use of the facility may not be permissible given USN fleet operations	\$104M
4 – Norfolk Ocean Open-Water Placement	Not preferable; no clear environmental benefit; significantly greater fuel consumption and emissions; greater risk to managed and listed species.	Feasible	Minimal	\$121M
5 – Beach Nourishment	Potentially-Preferable for dredged material from the southern portion of the York Spit Channel. Not preferable for dredged material from the northern portion of the York Spit Channel because silty dredged material would cause adverse turbidity and sedimentation if placed on beaches subject to wave action. Greater fuel consumption and emissions and potentially greater risk to managed and listed species.	Feasible, if non-federal sponsor(s) found	Moderate; dredged material from the northern portion of the York Spit Channel would not be beach-compatible; multiple sites needed for adequate capacity	\$135M
6 – Shoreline Restoration	Potentially-preferable; assuming suitable sites can be found where living shorelines would be viable and would not adversely affect other resources.	Feasible, if non-federal sponsor(s) found	Excessive; unlikely to reliably provide adequate capacity over the planning period; doubtful that enough viable sites could be found to meet need	\$76M (partial)
7 – Island Restoration	Potentially-preferable; assuming island restoration and associated habitat conversion is supported, and would not adversely affect other resources.	Feasible, if non-federal sponsor(s) found	High; planning, design, approval and construction would be lengthy and the outcome uncertain; uncertain as to whether sufficient areas could be found	\$125M (partial)
8 – Artificial Island Creation	Not preferable due to the conversion of open water habitat to an artificial island; potential for unacceptable adverse impacts to aquatic resources; significantly greater fuel consumption and emissions	Feasible, if non-federal sponsor found	Excessive; planning, design, approval and construction would be very lengthy and the outcome uncertain.	\$373M
9 – Defer Maintenance Dredging of York Spit Channel	Preferable; would eliminate dredging impacts and need for placement of dredged material.	Feasible, however not supported.	Excessive; large impact to regional and national economic development through draft restrictions on vessels.	\$0M

c. Compliance With Applicable State Water Quality Standards – In full compliance.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act – Not applicable.

e. Compliance with Endangered Species Act of 1973 - Effects from the continued placement in WTAPS on threatened and endangered species was assessed in the 2018 NMFS BO (F/NER/2018/14816). Activities covered under this BO included the construction and maintenance of the Chesapeake Bay Entrance channels and use of the associated dredged material placement sites. In the BO, NMFS concluded that that these activities may adversely affect, but are not likely to jeopardize the continued existence of any distinct population segment (DPS) of Atlantic sturgeon, Kemp's ridley or green sea turtles or the Northwest Atlantic DPS of loggerhead sea turtles, and is not likely to adversely affect leatherback sea turtles, hawksbill sea turtles, shortnose sturgeon, fin whales, sei whales, blue whale, sperm whales, and North Atlantic right whales. The BO acknowledged a certain number of incidental take of listed species over the life of the project (50 years). The BO also included reasonable and prudent measures designed to minimize and monitor the impact of incidental take that might otherwise result from the activities including a TOY restriction for dredging. To minimize adverse impacts to sea turtles, dredging in the York Spit Channel does not occur from September 1 through November 14 in accordance with the BO. USACE, in coordination the NMFS, determined that the effects on listed species from placement of dredged material in WTAPSNE are similar to the effects considered in the 2018 NMFS BO. Therefore, USACE determined that re-initiation with NMFS was not warranted. Coordination with NMFS is currently ongoing.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972 - Not applicable.

g. Evaluation of the Extent of Degradation of the Waters of the United States – No significant adverse impacts to the diversity of the aquatic ecosystem, productivity and stability, and recreation, aesthetics and economic values will occur as a result of the proposed project.

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

- (i) Bottom-dump placement of dredged material typically produces mounded deposits on the bay bottom, and the thickness of such mounds and the force of impacting sediment will be lethal to benthic organisms within the footprint of the deposit. USACE considered requiring the contractor to smooth the deposits out to a roughly uniform thickness, but reworking the sediments in this way would be extremely costly, time consuming and likely ineffective. It would extend the duration of project disturbance, increase vessel traffic and emissions, and exacerbate turbidity. Moreover, distributing the sediments after placement would merely spread adverse effects over a much larger area. While it might

result in somewhat-reduced mortality within the deposit footprint, it would greatly increase mortality and sub-lethal stress on benthic communities over a much larger area, and would result in delayed post-disturbance recovery and greater temporal loss of functions. If deposited “mounds” are left in place, natural tidal currents will gradually redistribute sediments, but this process would occur at a rate similar to that of natural sediment movements within the area, to which native benthic communities can acclimate with minimal risk of harm. For these reasons, USACE believes that spreading deposited material is not a viable measure to reduce project impacts, and would likely increase adverse effects to the benthic community.

- (ii) No actions will be taken to minimize impacts to water quality. Water quality impacts during open water placement activities are expected to be temporary, minimal and similar to conditions of past placement events in WTAPS. The project vicinity has historically been used for the placement of dredged material since the 1950’s. No measurable changes in temperature, salinity, oxygen content or other chemical characteristics are expected. Suspended particles are expected to settle out within a short time, with no long-term measurable effects on water quality.
- (iii) Available data indicate that WTAPS, particularly the southern portion, supports a significant fraction of the population of overwintering female blue crabs within the lower Chesapeake Bay. By proceeding with the proposed action (WTAPSNE), adverse effects to these overwintering female crabs would be greatly reduced, relative to continued placement only in WTAPS. Although blue crab is not managed under the Magnuson-Stevens Act, minimizing impacts to blue crabs mitigates Essential Fish Habitat impacts for those managed fish species evaluated in this document for which blue crab is an important prey item.
- (iv) To avoid/minimize adverse effects to Endangered Species Act (ESA)-listed sea turtles, USACE has implemented a TOY restriction from September 1 through November 14, of any year, on the dredging of the York Spit Channel. Therefore, dredged material placement would not occur in WTAPSNE during this period. Furthermore, USACE generally seeks to perform this work in the winter and early spring, subject to availability of dredging contractors. This TOY would also help to avoid and minimize effects to sandbar shark habitat area of particular concern used for pupping and nursery activities (occurring from May 1 to October 30).

i. On the Basis of the Guidelines the proposed Disposal Site(s) for the Discharge of Dredged or Fill Material is: Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

## References

Lipcius, R.N. and K.E. Knick. 2016. Dredge Disposal Effects on Blue Crab. Virginia Institute of Marine Science.

Schaffner, L.C. 2010. Patterns and Rates of Recovery of Macrobenthic Communities in a Polyhaline Temperate Estuary Following Sediment Disturbance: Effects of Disturbance Severity and Potential Importance of Non-local Processes. *Estuaries and Coasts*. 33: 1300.