US Army Corps of Engineers®

Baltimore District
2 Hopkins Plaza, Baltimore, MD 21201

Draft Environmental Impact Statement

Sparrows Point Container Terminal

January 2025

EISX-202-00-E1R-1731946234

Executive Summary

ES-1. Introduction and Authority

The US Army Corps of Engineers, Baltimore District (Corps), received an application for a Department of the Army permit (NAB–2023–61200) on August 25, 2023, for the proposed Sparrows Point Container Terminal (SPCT) project to construct a new container terminal in the Port of Baltimore (the Port). The application was submitted by Tradepoint TiL Terminal, LLC (TTT or applicant), a joint venture between Tradepoint Atlantic (TPA) and Terminal Investment Limited. The proposed project requires Corps authorization under the following statutory authorities:

- Section 404 of the Clean Water Act (33 US Code 1344) for the discharge of dredged or fill material into Waters of the United States (WOTUS)
- Section 10 of the Rivers and Harbors Act of 1899 (33 US Code 403) for the construction of any structure in or over navigable WOTUS
- Section 408 of the Rivers and Harbors Act of 1899 (33 US Code 408) for alterations or modifications to Corps Civil Works projects by non-Corps entities
- Section 103 of the Marine Protection, Research, and Sanctuaries Act (33 US Code 1413) for ocean disposal of dredged material

As the lead agency under the National Environmental Policy Act (NEPA), the Corps determined the proposed project may significantly affect the quality of the human environment. The Corps has prepared this Draft Environmental Impact Statement (EIS) to assess the potential social, economic, and environmental impacts of the proposed project and contributes information to allow the Corps to make a permit decision with respect to the permit application.

On September 25, 2023, this project was determined to be a covered project under Title 41 of the Fixing America's Surface Transportation Act (FAST-41). The project was subsequently added to the Permitting Dashboard for Federal Infrastructure Projects, which tracks covered projects publicly. FAST-41 is intended to improve the timeliness, predictability, and transparency of the federal environmental review and authorization process.

ES-2. Purpose and Need

The purpose of the proposed action is to develop the SPCT, a new terminal and associated facilities that would be located on the Coke Point Peninsula (Coke Point) within the Patapsco River in Baltimore County, Maryland.

Federal approval is required because TTT has submitted an application to the Corps for construction of the SPCT, including permission to place fill in WOTUS, dredge in WOTUS, and alter a federal channel. The proposed action requires permits from other agencies with the Corps being the lead federal agency.

The proposed project would address several economic and shipping logistical concerns. The SPCT project would enhance the economic strength of the Port by increasing its overall container capacity. This project includes an on-dock rail facility, which in conjunction with the Howard Street Tunnel Vertical Clearance Improvement Project, would increase the throughput of containers through the Port. The proposed project would not only provide direct jobs at the project site but would also provide a foundation for sustained economic growth within the Port and throughout the region. By strengthening and growing the Port, the project enhances the United States' supply chain efficiencies and resiliency.

ES-3. Description of the Proposed Action and Alternatives

After coordination with federal and state agencies and other entities, the Corps determined that the No-action Alternative and one action alternative, the Combined Dredged Material Placement Options Alternative (Combined Options Alternative), will be analyzed in detail in this Draft EIS. The following sections describe the alternatives that are being carried forward for analysis.

No-action Alternative

Under the No-action Alternative, a new terminal and associated facilities would not be developed at Sparrows Point. Current property and land management, including ongoing demolition and soil remediation efforts would continue. TPA, as the property owner, would likely develop Coke Point for some other future commercial use, consistent with the existing development plan for the entire TPA property. The No-action Alternative does not meet the project purpose and need but is carried forward for detailed analysis in this Draft EIS for comparison purposes.

Combined Dredged Material Placement Options Alternative

The Combined Options Alternative was developed through internal planning and review, consultation with federal and state agencies and other entities, and public outreach. This alternative would satisfy the purpose and need of the proposed action. The Combined Options Alternative proposed design consists of the following elements:

- A marginal wharf with a total length of approximately 3,000 feet, sufficient to accommodate two ultra large container vessels with capacity up to 23,000 twenty-foot equivalent units. The wharf top deck elevation would be established at +14.0 feet[1] based on an analysis of future sea level rise and storm surge frequency.
- Marine structures including piles, catwalks, and mooring dolphins, up to nine ship-to-shore cranes for efficient unloading and transfer of containerized cargo, a container yard with a capacity of approximately 50,000 containers, a rail-based intermodal container transfer facility, pavements, drainage, terminal buildings, warehouse buildings, civil / site utilities, electrical systems and service, lighting, and ancillary equipment.
- The Sparrows Point Channel, a non-federal channel, would be widened to approximately 2,110 feet at its connection to the Brewerton Channel, a federal navigation channel, to create a turning basin approximately 1,650 feet in diameter. The channel would gradually transition northward to a channel width of approximately 450 feet and widen adjacent to the proposed wharf to an approximate width of 750 feet with a northern boundary of approximately 500 feet in length. The improved Sparrows Point Channel would be deepened to a channel depth of -50 feet mean lower low water plus -2 feet of over depth allowance.

[1] All elevations discussed in this Draft EIS are relative to North American Vertical Datum of 1988 (NAVD88).

- A revetment to transition between the design dredge depth and the proposed bulkhead beneath the wharf and to the proposed final grades land side of the wharf with a 2.5 (horizontal) to 1 (vertical) slope armored with heavy stone (riprap).

To meet the required design, the project would require an estimated 4.25 million cubic yards (MCY) of dredging using a clamshell bucket on a barge, including an estimated 330,000 cubic yards (CY) of slag, which would likely be removed by a backhoe or hydraulic excavator.

The applicant's original proposed action was a new offshore 100-acre dredged material containment facility (DMCF) in the Patapsco River on the west side of Coke Point. This DMCF would have provided a single placement solution for the entirety of the dredged material, reduce impacts and costs associated with transporting dredged material to other approved DMCFs due to the proximity to the dredging location, and cap existing impacted offshore sediment, serving as a final remedy for the impacted sediment within the footprint of the DMCF. This DMCF, however, would result in permanent impacts on aquatic communities within and near the footprint, as 100 acres of tidal WOTUS and bottom habitat would be taken. The DMCF would extend west into the Patapsco River between 1,100 to 2,400 feet from the Coke Point shoreline, disrupting river flow in the immediate vicinity of the DMCF.

TTT examined the possibility of including multiple placement sites to reduce the impacts on aquatic resources. By constructing a DMCF at High Head Industrial Basin and using two existing Maryland Department of Transportation Maryland Port Administration (MPA) DMCFs (Cox Creek and Masonville), and the Norfolk Ocean Disposal Site (NODS) — a designated offshore disposal area located in the Atlantic Ocean — TTT determined that the offshore DMCF could be reduced to 35 acres, shrinking the footprint and the impacts by a substantial amount.

TTT performed an extensive analysis of the sediment data and evaluation of the amount of dredged material that could be placed at the MPA facilities and NODS. Results of this effort were shared with regulatory agencies for their evaluation. Following this consultation, TTT determined that significant volumes of dredged material could be placed at NODS and an MPA facility. Therefore, TTT concluded that the size of the offshore DMCF could be reduced even further to lessen the potential take of WOTUS and settled on a 19.6-acre DMCF at Coal Pier Channel. The reduced footprint within a previously dredged channel with degraded habitat would greatly reduce impacts on aquatic resources, as well as viewshed and recreation. Additionally, the Coal Pier Channel DMCF would be confined on three sides by an existing landmass, resulting in simpler maintenance and management requirements and a lower risk factor than a DMCF with three perimeter sides in the main river channel.

Thus, the Combined Options Alternative includes the use of multiple options for dredged material placement – High Head Industrial Basin DMCF, Coal Pier Channel DMCF, Cox Creek and Masonville DMCFs, and the NODS. Each of these is described below.

High Head Industrial Basin DMCF

Construction of the High Head Industrial Basin DMCF would create a facility with the capacity to hold approximately 1.2 to 1.7 MCY of dredged material. The DMCF would have an exterior dike elevation of approximately +30 feet, in the existing High Head Industrial Basin located approximately 2.5 miles northeast of the terminal project area within the TPA property. The impounded area of the industrial basin currently covers approximately 38.7 acres with a surface elevation of approximately +7.0 feet that is maintained by an existing pump house. Material for the dike construction would likely consist of common borrow material and / or slag sourced from existing land or stockpiles on the TPA property.

Coal Pier Channel DMCF at Sparrows Point

Coal Pier Channel is an existing in-water channel that had been used for coal barge unloading for the Bethlehem Steel Mill. A new offshore DMCF would be created by constructing a water-side berm across the mouth of the existing Coal Pier Channel to provide placement capacity for dredged material. The DMCF would permanently fill approximately 19.6 acres of tidal WOTUS. A sand dike would be constructed across the mouth of the channel and would be built to an elevation of +15 feet with a side slope of 3 (horizontal) to 1 (vertical). Dredging of approximately 55,000 CY of soft overburden material in the footprint of the proposed dike alignment would be conducted prior to the dike construction. The estimated capacity of the placement area is approximately 750,000 CY. Placement of dredged material in WOTUS would require compliance with all required federal, state, and local permits.

Existing Nearshore Maryland Port Administration DMCFs

Masonville and Cox Creek, two existing nearshore upland confined placement facilities owned, operated, and maintained by the MPA. The Cox Creek DMCF is located in northern Anne Arundel County, Maryland, and the current capacity (with the recently completed dike expansion to +60 feet) is estimated to be 15.3 MCY. The Masonville DMCF is located in South Baltimore with a current capacity of approximately 6.2 MCY. Construction has been approved to raise the dike to +30 feet, increasing the capacity of the site to an estimated 8.2 MCY. Pending the availability of funding, this would be followed by design / permitting for dike raising to +42 feet with anticipated completion in 2029, providing increased total capacity to approximately 10.3 MCY. The Cox Creek and Masonville DMCFs (with planned expansions and innovative reuse) are two primary components of the State of Maryland’s Dredged Material Management Program for Baltimore Harbor maintenance material. In a 2024 letter, the MPA committed to accepting a maximum of 1.5 MCY from the SPCT project for placement at either Cox Creek or Masonville DMCF over a 4-year period.

Existing Ocean Disposal Site

This dredged material placement component includes transport and placement of approximately 1.57 MCY of sediment dredged from the southern portion of the Sparrows Point Channel at the NODS — a designated offshore disposal area located in the Atlantic Ocean, approximately 17 miles east of the mouth of the Chesapeake Bay. The NODS is jointly managed by the Corps and the US Environmental Protection Agency (USEPA) and has unlimited capacity for dredged materials that meet the Limiting Permissible Concentration for water quality criteria, water column toxicity, benthic toxicity, and benthic bioaccumulation. Use of this site is subject to the approval by USEPA under the authority of Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, and the Corps is the federal agency that would issue the permit authorizing the transport of material to the ocean for placement.

ES-4. Potential Environmental Impacts

This Draft EIS addresses the potential impacts of the terminal construction, DMCF construction, and dredging and placement of material on the human and the environmental resources identified during the public interest review. The following sections outline the potential environmental impacts of the two alternatives, the No-action Alternative and the Combined Options Alternative. Table ES-1 provides additional details on the impacts of both alternatives, and Section 4 contains a full discussion of the impacts.

Sediment

Under the No-action Alternative, sediments and chemicals associated with the sediments would stay in place. Sediments in the Sparrows Point Channel would continue to be subject to disturbance by periodic maintenance dredging, and surficial sediments offshore of Coke Point would be subject to disturbance by storm events and vessel traffic. Based on historical data, previous ecological and human health risk assessments, and other supporting studies, there would be an ongoing potential for ecological risk from surficial sediments in the offshore areas west and south / southeast of the Coke Point peninsula and a limited potential for human health risk.

The dredging and removal of sediments east of the Coke Point peninsula to widen and deepen the channel and construct the terminal wharf and revetment structure would permanently remove approximately 4.2 MCY of sediments. A portion of these dredged materials include legacy contaminants from historical industrial activities and would leave behind deeper native sediments with natural background concentrations of metals and other constituents. The removal of sediments in the channel improvement area impacted by metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and other constituents would result in a permanent net improvement of post-project surficial sediment conditions (approximately 52 acres within the existing channel and 60 acres in the channel wideners) for fish, crabs, benthic organisms, and humans. In addition, it would reduce the surface area for surficial chemical exposures of persistent organic contaminants that have the potential to accumulate in benthic organisms and fish tissue and bioconcentrate in the food chain.

In addition to the dredging for the channel improvements, the dredging of material within the proposed exterior dike alignment for the Coal Pier Channel DMCF would permanently remove approximately 55,000 CY of soft sediments underlain by consolidated sand. Because this overburden material would be removed prior to the placement of sand, the potential for material displacement and the creation of a mud wave during dike construction would not be expected.

Dredging, in-water construction, and placement of sand for the Coal Pier Channel DMCF dike construction have the potential to resuspend sediments that would settle back to the bottom of the dredging area and adjacent areas. Best Management Practices (BMPs) would be used where practicable and necessary based on sediment chemistry and site conditions to minimize the release of sediment and contaminants to the water column during dredging and in-water construction activities. Dredging and construction methodologies would be implemented in accordance with all applicable permit conditions. Any resuspension or incidental release of sediment during dredging operations in the southern area of the of the Sparrows Point and near the Brewerton Channel, would be expected to be comparable to those that occur during routine maintenance dredging operations performed in the federal channel. Therefore, adverse impacts on adjacent surficial sediment quality outside and adjacent to the dredging and in-water construction footprints from resuspension and redeposition would be expected to be minimal.

Placement of dredged material in the High Head Industrial Basin would result in the permanent removal of approximately 40 acres of area that currently contains impounded water and would result in the encapsulation of existing sediments that contain elevated concentrations of metals and organic contaminants. Filling of the High Head Industrial Basin DMCF would result in the creation of bermed upland habitat, and the placed sediments would be dewatered and managed as soils. Although fish, wildlife, and birds currently use the site, it is a managed industrial facility. The long-term land use of the High Head Industrial Basin DMCF is expected to remain industrial.

Placement of dredged material in a DMCF at the Coal Pier Channel would result in the permanent loss of 19.6 acres of open water habitat. The existing channel would be filled and converted to bermed, upland habitat, and a net loss of 19.6 acres of sediment surface that functions as habitat for benthic communities would occur. Based on the summer aquatic survey data, this benthic habitat is degraded and subject to seasonal low dissolved oxygen (hypoxia), and the sediments contain elevated concentrations of metals, PAHs, benzene, ethylbenzene, and toluene. Filling the channel would encapsulate impacted sediments and would eliminate exposure pathways for chemicals to benthic organisms, crabs, and fish.

The majority of sediments placed in the two onsite DMCFs would be classified as either Maryland Department of the Environment (MDE) Innovative Reuse Category 1 (Residential Unrestricted Use Soil and Fill Material) or Category 2 (Non-Residential Restricted Use Soil and Fill Material); these materials are suitable as fill in an industrial use area. Any sediments that are classified as MDE Innovative Reuse Category 3 (Restricted Use Soil and Fill Material, Cap Required) would be placed early during the material inflow / filling cycle and would be capped or buried by subsequent placement of either Category 1 or Category 2 material. Human health risks associated with placement of Category 3 material would be mitigated through the capping requirement.

Overall, the SPCT project would have beneficial impacts on sediment quality in the project area by removing and encapsulating impacted sediments containing elevated concentrations of contaminants, improving the quality of aquatic habitat, and reducing chemical exposure pathways to aquatic life. Placement of dredged material at the existing MPA DMCFs would have no new impacts on sediment. Both MPA facilities are permitted to accept dredged material from the Baltimore Harbor channels and the Patapsco River. Only MDE Innovative Reuse Category 1 or Category 2 materials that meet the MPA's sediment quality requirements would be placed at the MPA DMCFs; Category 3 materials would not be placed at MPA DMCFs. The MPA has indicated that a maximum of 1.25 MCY of placement capacity is available for the SPCT project during a 4-year placement period. Dredged material placed at NODS would meet the Limiting Permissible Concentration requirements of Section 103 of the Marine Protection, Research, and Sanctuaries Act and would also comply with the requirements stipulated in the Site Management and Monitoring Plan (USEPA and Corps 2019).; therefore, no impacts on aquatic resources would occur. The materials would be evenly dispersed across a designated placement zone to avoid mounding. Progress surveys of portions of the active zone during placement periods would be conducted to ensure proper placement / distribution of materials.

Floodplain and Flood Hazard

The No-action Alternative would not have any new impacts on the floodplain or flood hazard, as potential future development of Coke Point would not require work in the floodplain beyond the routine maintenance dredging that is already occurring.

No new impacts on floodplains would occur from the development of the terminal or channel improvements or from construction and use of the High Head Industrial Basin DMCF. The Coal Pier Channel DMCF would be the only dredged material placement site with the potential to affect the floodplain and flood hazard; however, changes in water flow or pattern during flood events would be limited to areas within approximately 0.25 mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities. The addition of the DMCF would cause waves in the immediate vicinity of the DMCF to ramp up or wash up against the dike of the DMCF due to increased wave setup and wave runup caused by the dike. This phenomenon would be minimal and limited to the footprint of the proposed dike area. Placement of dredged material at the existing MPA DMCFs and the NODS would have no new impacts on the floodplain or flood hazard.

Hydrodynamics

The No-action Alternative would not have an impact on water currents or water levels. Maintenance dredging would continue to retain the Sparrows Point Channel's existing bathymetry, and potential future development of Coke Point would not affect hydrodynamics.

In the Sparrows Point Channel, tidal currents are directed across the channel — the currents within the footprint of the channel are 0 to 0.19 knots, and the currents outside the footprint are 0.19 to 0.39 knots. The Sparrows Point Channel widening and deepening would expand the area with 0 to 0.19 knot currents from 300 to 450 feet wide. Currents outside of the channel footprint would be unchanged. The Coal Pier Channel DMCF would create new shoreline by closing off the mouth of the channel on the west side of Coke Point. The flood and ebb tidal currents along the western shoreline of Coke Point would continue unimpeded and would therefore not have an impact on the hydrodynamics of the Patapsco River. The High Head Industrial Basin is located in upland habitat, so construction of a DMCF in this location would not impact hydrodynamics. Placement of dredged material at the existing MPA DMCFs and the NODS would have no new impacts on hydrodynamics.

Groundwater

Under the No-action Alternative, groundwater would remain in its current condition. Existing Resource Conservation and Recovery Act interim measures, short-term actions taken to address immediate threats to human health or the environment caused by the release of hazardous waste, would continue to address groundwater impacts. Future development of Coke Point would involve paving and construction of buildings, which would decrease infiltration of precipitation to groundwater. Reduced infiltration would decrease groundwater surface elevation and decrease groundwater flow. This would reduce the movement of groundwater contaminants and decrease the adverse impacts of contaminated groundwater. If the High Head Industrial Basin were to be filled with dry material and the area repurposed, there would be no impact on groundwater.

Terminal development would include paving and construction of buildings on Coke Point, resulting in 95% of Coke Point being impervious to infiltration, as described above. Placement of wet dredged material in the High Head Industrial Basin DMCF could temporarily increase the water level in the basin and compress the sediments currently at the base of the basin. Dike construction would be designed to contain contaminants in the existing sediments within the footprint of the DMCF, and compaction of dredged material would decrease sediment permeability. Construction of the Coal Pier Channel DMCF could affect nearby groundwater flow, as groundwater would flow around or under the compacted dredged material. The increased impervious surface on Coke Point would reduce the groundwater flux (the rate of groundwater movement as it flows through aquifer material), consequently decreasing the volume of groundwater being diverted around the DMCF. Dredged material placement in the Coal Pier Channel DMCF could compress the underlying sediment, reducing permeability and contaminant mobility. Overall, the placement of dredged material in the Coal Pier Channel and High Head Industrial Basin DMCFs would reduce the movement of groundwater contaminants and reduce the risk of contaminants moving from groundwater into surface water. Placement of dredged material at the existing

MPA DMCFs would have no new impacts on groundwater, and placement of dredged material at the NODS would not impact groundwater.

Surface Water Quality

Under the No-action Alternative, surface water would continue to be subject to existing physical conditions and watershed inputs and existing sediment and surface water interactions would continue. Surface water quality in the vicinity of Coke Point would be potentially affected by resuspension of surficial sediment during storm events, as well as ongoing chemical inputs from groundwater. Ongoing potential for movement of chemicals to surface waters and an ongoing potential for ecological risk from offshore areas west and south / southeast of Coke Point would continue. Stormwater and runoff from existing landside areas and from future development of landside areas would be managed under current or future National Pollution Discharge Elimination System (NPDES) permits and planned controls.

Construction of the terminal and wharf would require multiple in-water activities, including dredging and mechanical excavation, demolition of limited relic pier structures, pile installation, and placement of rock and fill for the revetment structure (underneath the open wharf structure), and the capping of the revetment structure with armor stone at the interface between the land and water. Construction of the Coal Pier Channel DMCF will require in-water activities including dredging and placement of fill for the exterior enclosure dike. These in-water construction and dredging activities have the potential to resuspend sediment and contaminants to surface waters. In-water construction BMPs would be used where practicable and necessary based on the sediment chemistry and site conditions to minimize resuspension of sediment and contaminants to surface waters. Any resuspension or incidental release of sediment during in-water activities would be short-term and localized and contained to the immediate work area using BMPs. In addition, in-water construction and dredging methodologies would be conducted in accordance with all applicable permit conditions to protect surface waters. Therefore, adverse impacts on adjacent surface waters during in-water construction would be expected to be minimal.

The construction of the wharf and terminal facilities would also result in impervious surfaces throughout the terminal facility. The two new permitted stormwater outfalls for the terminal at the south end of Coke Point would be incorporated into the regional stormwater plan for the Sparrows Point facilities. Therefore, stormwater discharges from the new terminal would not be expected to adversely impact surface waters.

The dredging needed to construct the wharf and widen and deepen the channel would permanently remove 4.2 MCY of sediments that include legacy contaminants from historical industrial activities and would leave behind deeper native sediments with natural background concentrations of metals and other constituents on the east and southeast side of the peninsula. The removal of sediments impacted by metals, PAHs, PCBs, and other constituents would result in a permanent net improvement of surficial sediment conditions (approximately 52 acres within the existing channel and 60 acres in the channel wideners) for fish, crabs, benthic organisms, and humans. The removal of the sediments would improve the quality of the sediment at the surface-water interface in the project area, and it would reduce the overall (net) surface area in the vicinity of Coke Point where impacted surficial sediments and surface waters interact.

Material from the channel improvements footprint would be mechanically dredged and placed in scow barges and transported by waterway to an offloading location on the east side of Bear Creek. The material would be slurried with surface water and hydraulically pumped to the High Head Industrial Basin DMCF or into the Coal Pier Channel DMCF. The water required to slurry the material would be withdrawn from Bear Creek at the offloading location. To the extent possible, slurry water from the onsite DMCFs would be recirculated and reused in this process to reduce the volume of surface water withdrawal. The use of surface waters and the volume of water withdrawn from Bear Creek would comply with conditions of a Water Appropriation and Use Permit issued by the MDE. Therefore, no impacts on surface waters would be expected for water use to slurry and pump dredged material to the onsite DMCFs.

Dewatering of the dredged material at the two onsite DMCFs would be required for drying and consolidation of the placed material. It is anticipated that the discharges from the High Head Industrial Basin DMCF and the Coal Pier Channel DMCF would be incorporated into TPA’s existing sitewide NPDES permit, and the quantity and quality of the discharge would be subject to the conditions of the permit. Therefore, managed effluent discharges from the onsite DMCFs would not be expected to adversely impact surface waters.

As part of construction of the High Head Reservoir DMCF, filling the basin would eliminate its use for receipt of both local stormwater from nearby portions of Sparrows Point and inputs from the Back River Wastewater Treatment Plant. Stormwater inputs would be incorporated into TPA’s existing sitewide NPDES permit and re-routed to a permitted outfall. Inputs from the Back River Wastewater Treatment Plant would be rerouted to a Baltimore City permitted outfall and incorporated into the plant’s NPDES permit. In both cases, the quantity and quality of the discharges would be subject to the conditions of each respective permit and would not be expected to adversely impact surface waters.

The Coal Pier Channel DMCF would require in-water construction of a berm or dike approximately 600 ft long at the west end to enclose the channel prior to placement of dredged material within the DMCF. The dike would be constructed using clean sand from an offsite source and would be protected with rock sized to stabilize the structure and withstand future storm events and sea-level rise. Soft overburden material would be dredged / removed from the dike alignment prior to placement of sand to construct the dike; therefore, displacement of sediments and the creation of a mud wave during dike construction would not be expected and no impacts on surface waters would be expected.

Following completion of dredged material placement, the existing bottom sediments in the Coal Pier Channel would be encapsulated and the placed dredged material would be capped. This conversion from open water to upland would remove approximately 19.6 acres of aquatic habitat with impacted sediments and would be expected to provide a net improvement / benefit to surface waters in the vicinity of the project area by removing the sediment to surface water exposure pathway for aquatic resources.

Placement of dredged material at the existing MPA DMCFs and the NODS would not create any new impacts on surface water.

Benthic Fauna

Under the No-action Alternative, benthic fauna would continue to be subject to existing physical and chemical sediment quality and water quality conditions. Benthic fauna in the Sparrows Point Channel would continue to be impacted by maintenance dredging with community recovery after dredging. If the High Head Industrial Basin were to be filled under the No-action Alternative, approximately 40 acres of benthic habitat and any benthic-dwelling organisms present in the basin would be permanently lost.

Channel improvement dredging as part of the Combined Options Alternative would impact benthic organisms, causing mortality for any non-mobile organisms in or on the sediments and could create temporary and localized water column turbidity that could affect filter-feeding species. Benthic organism communities would continue to recover after dredging events, but the increased deepwater habitat could change the type of species and community composition present after dredging. Excavation for the wharf would create 6.3 acres of new open water, but the wharf itself would shade most (5.6 acres) of the new open water and 3.3 acres of existing open water, resulting in aquatic habitat that may be less capable of supporting a diverse benthic community. Installation of pilings and mooring dolphins would result in mortality of any benthic organisms present in that footprint and a permanent loss of 0.2 acre of available bottom habitat. The High Head Industrial Basin is not managed to support aquatic habitat; however, any benthic organisms present in the basin would be permanently lost if the basin was used as a dredged material placement site. The construction of the Coal Pier Channel DMCF would result in burial of the existing benthic communities in the DMCF footprint and a permanent loss of 19.6 acres of habitat. Based on sampling for benthic fauna conducted in summer 2023, the habitat in the Coal Pier Channel was determined to be degraded with only one taxon present and a low benthic abundance compared to other sampling locations. Standard BMPs would minimize sediment resuspension during dike construction and the potential for benthic organism burial outside the dike footprint. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on benthic communities.

Fish and Essential Fish Habitat

Under the No-action Alternative, fish, including essential fish habitat (EFH) species, would continue to be temporarily impacted during maintenance dredging. Invertebrate prey species would continue to be impacted by lost benthic organisms and EFH species and sturgeon would be impacted by existing contaminated sediment. If the High Head Industrial Basin were to be filled under the No-action Alternative, approximately 40 acres of aquatic habitat and any fish present in the basin would be permanently lost.

The SPCT project would have both temporary and long-term impacts on fish and EFH. Dredging to widen and deepen the Sparrows Point Channel proposed under the Combined Options Alternative could result in different life stages of fish species in the vicinity of the project area being caught in dredging equipment. Resuspended sediment (increasing turbidity) and habitat alteration would impact fish, especially eggs and larvae. Dredging impacts on juvenile and adult EFH species would be short-term but entrainment of eggs and larvae present in the project area (from water withdrawal during sediment offloading to the DMCF) would be permanent. Turbidity and sediment removal would have more impact on demersal (bottom-dwelling) EFH species. Underwater noise from pile driving could impact fishes through physical damage for organisms near the project area. Behavioral disturbances would occur for organisms within an area extending approximately 2 miles from the immediate project area.

The High Head Industrial Basin is not managed to support aquatic habitat; however, any fish present in the basin would be permanently lost if the basin was used as a dredged material placement site. The construction of the Coal Pier Channel DMCF could cause temporary turbidity and localized impacts on EFH species. The resuspension of sediments would be minimal, temporary, localized, and controlled through BMPs. Fish within the Coal Pier Channel DMCF footprint would be displaced, would experience habitat alteration, and could be trapped or buried within the dike alignments, especially eggs and larvae. The Coal Pier Channel provides sheltered habitat, and the DMCF in this location would result in a loss of habitat for smaller fish. The Coal Pier DMCF footprint represents only a small portion of bottom habitat available in the project area to EFH species that require this habitat during their life cycle. As a result, permanently filling the Coal Pier Channel would have localized impacts on EFH species. Further, sediment sampling indicates historical contamination in the Coal Pier Channel, and the benthic community assessment suggests that the habitat is degraded; therefore, the DMCF footprint does not represent high-quality habitat for fish or prey species.

Aquatic Special Status Species

Under the No-action Alternative, aquatic special status species (sturgeon, fish species in need of conservation, sea turtles, and dolphins) would continue to be temporarily impacted during maintenance dredging. Prey species would continue to be impacted by lost benthic organisms and special status species would be impacted by existing contaminated sediment.

Special status species could suffer behavioral and physiological effects from increased turbidity. Turbidity resulting from dredging, pile driving, and DMCF construction has the potential to temporarily reduce the quality of foraging habitat for transient special status species using the SPCT area. The temporary nature of the turbidity and use of BMPs would result in minimal effects to special status species. Habitat alteration resulting from wharf construction would have minimal impacts on special status species. Habitat alteration in the dredging area due to the deepening of the channel would reduce the quality of bottom habitat by reducing the likelihood of a benthic community re-establishing; however, this area is not expected to support foraging special status species. Creation of the Coal Pier Channel DMCF would directly reduce the quantity of habitat by filling of open water within an area that is isolated from the main river channel which is more suitable habitat for most of the special status species, particularly sturgeon and bottlenose dolphin.

Increased vessel traffic from construction (additional 10 vessels at any time) and operation of the terminal (additional 500 container vessels per year) would cause a minor increase in the risk of striking special status species. Dredged material placement at the NODS site would increase the risk of strike of special status species from barge transit from SPCT to NODS, but the increase in risk is negligible given the high vessel traffic already present in the lower Chesapeake Bay. Additionally, vessel traffic to and from the NODS would be conducted in compliance with the National Oceanic and Atmospheric Administration National Marine Fisheries Service Right Whale Ship Strike Reduction Rule (50 CFR 224.105), which limits vessels greater than 65 feet to speeds less than 10 knots during migration and calving periods.

Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on aquatic special status species.

Vegetation and Habitat

Under the No-action Alternative, potential future development of Coke Point and the High Head Industrial Basin would require removal of vegetation. Because the existing habitats in these areas provide limited value and represent a small portion of similar habitats available in the area, removal of the vegetation would have minimal adverse effects.

Terminal development would require the permanent removal of all terrestrial vegetation in the project area, resulting in adverse but minimal impacts, as the habitat quality is low. Construction of the High Head Industrial Basin DMCF would permanently remove approximately 11.2 acres of riparian, shrub, and forested habitat. After construction of the High Head Industrial Basin DMCF, the area would be closed, resulting in a permanent loss of the riparian habitat. As noted for the No-action Alternative, these existing habitats provide limited value and a small portion of the habitats available to wildlife in the area. The area could be revegetated with native species, which would provide new upland habitat. No additional impacts on vegetation and habitat would occur from construction of the Coal Pier Channel DMCF, and placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on vegetation and habitat.

Birds

Under the No-action Alternative, bird populations would continue to be impacted by ongoing industrial activities, including demolition and razing activities, Port operations, trucking, and warehousing, all of which cause noise and other disturbances to birds. The potential future development of Coke Point and High Head Industrial Basin would likely remove existing degraded habitat currently used by bird populations.

Impacts from terminal development would include construction noise and permanent loss of habitat on Coke Point. Increased turbidity from dredging could temporarily impact foraging sea birds. Terminal operations could impact birds by increasing vessel traffic, and new buildings and structures would increase the risk of bird collisions. New artificial lighting would increase light pollution and could adversely affect bird behavior; however, impacts from new lighting would be minimal given the existing nighttime light intensities. The lack of existing landside natural areas at the site, expansive open water adjacent to the site, and the small number of birds observed during the June 2024 bird survey suggest that impacts on birds and their habitat would be minimal.

Construction of the High Head Industrial Basin DMCF would remove approximately 11.2 acres of terrestrial habitat and permanently remove 40 acres of aquatic habitat and 1 linear mile of riparian habitat along the edge of the basin, which would adversely impact birds. Conversion from aquatic and riparian habitat would permanently exclude birds that use these habitat types, including one state-listed species (least tern). Construction and dredged material placement would exclude birds from the site for approximately 3 years. Construction of the Coal Pier Channel DMCF would cause a minor reduction in the water area available for loafing and foraging; however, the June 2024 survey did not indicate the Coal Pier Channel DMCF area was heavily used by birds, and there is extensive area available locally for loafing and foraging. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on birds.

Aesthetics and Viewshed

Under the No-action Alternative, continued impacts from routine operations would occur. Potential future development of Coke Point and High Head Industrial Basin would be consistent with existing conditions; there would not be any significant aesthetic, light, or glare impacts from future development.

Terminal development would result in temporary and permanent visual changes, including the increase of shoreline development, shipping container storage, and mast lights. However, most of these would not be a substantial alteration from existing aesthetics. The grouping of up to nine ship-to-shore cranes, which are about twice the height of existing cranes, would have a moderate scale contrast and spatial dominance in the foreground view for boaters, the middleground view for some residents of Baltimore County, and the background view for shore viewers in Anne Arundel County and from Fort Howard Park. The scale contrast of the cranes is not projected to be noteworthy for boaters given the transient nature of the view from boats and existing low visual quality.

The High Head Industrial Basin would have no significant changes in aesthetics and viewshed, having limited visibility and being similar in scale to a nearby building. The Coal Pier Channel DMCF would be visible to viewers west of the project and boaters, but the visual impact would not be significant, being similar in scale to existing structures. The DMCF could also increase noticeable light, but the distance is sufficient to suggest that impacts would be minimal. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on aesthetics.

Recreation

Under the No-action Alternative, existing recreational opportunities and subsistence fishing at surrounding parks, boat landings, water trails, and fishing locations would continue to be available to the public. Commercial operations and maintenance dredging of the Sparrows Point Channel would continue to create temporary disturbances to recreation activities in the vicinity of the channel. Potential future development of Coke Point would likely not include in-water work and would therefore not have an impact on water-based recreation.

Terminal development and periodic maintenance dredging would temporarily impact recreational activities. Exclusion zones during construction and dredging activities would have minor impacts on recreational boating. In-water activities could increase turbidity and impact localized fishing, but subsistence fishing in license-free fishing areas would not be impacted. During construction of the Coal Pier Channel DMCF, an exclusion zone would impact recreational boating in the vicinity, but this would be localized and temporary. Construction of and placement of dredged material at the High Head Industrial Basin would not affect water-based recreation, and placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on recreation.

Air Quality

Under the No-action Alternative, vessels would continue to use ports along the east coast of the United States that do not have shore power connections available. At these ports, vessels would continue to run their auxiliary diesel engines while at berth, resulting in diesel and greenhouse gas emissions. Use of non-electrified cargo handling equipment also contributes to greenhouse gas emissions. It is likely that TPA would develop Coke Point or High Head Industrial Basin or both under the No-action Alternative, as they have developed the rest of the Tradepoint Atlantic property. If so, there would be short-term impacts on air quality associated with construction activities.

The primary emissions sources from the SPCT project are concentrated within the construction and cleanup phases (e.g., use of construction equipment and vehicles, demolition operations, transport of dredged material to placement sites), are considered temporary, and are limited to the periods of active construction timelines. The construction period would be expected to be energy-intensive and to result in short-term but significant greenhouse gas emissions. During operation, the terminal would be partially electrified, and the use of shore power would significantly reduce emissions from ships at berth.

Community Noise

Under the No-action Alternative, noise from maintenance dredging and potential future development of Coke Point and High Head Industrial Basin would be expected to peak at 95 dBA and 97 dBA, respectively, at a 50-foot range. These noise levels would attenuate to acceptable residential levels (65 dBA, as defined by the Code of Maryland Regulations) with approximately 2,000 feet or less. No sensitive receptors would be impacted by the No-action Alternative, as the distance from the project area to the nearest residences is more than 8,000 feet.

Terminal development would produce temporary noise during construction and maintenance dredging and continued noise from terminal operations. Peak sustained and periodic noise levels for dredging, construction, and operations would reach over 90 dBA (up to 101 dBA in some cases) at a 50-foot range, but this noise would attenuate to acceptable residential levels (65 dBA, as defined by the Code of Maryland Regulations) within 3,200 feet or less. With the closest residences more than 8,000 feet from the project area, there would be no impact in most atmospheric conditions. Under less typical atmospheric conditions, dredging, construction, and operational noise could promote noise propagation to waterfront areas, but these impacts would not be significant.

Sustained daytime noise from constructing the High Head Industrial Basin and Coal Pier Channel DMCFs would attenuate to acceptable levels (65 dBA). There would be no periodic daytime or nighttime noise impacts from construction or placement of dredged material. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on community noise.

Socioeconomics

Impacts were not quantified for the No-action Alternative because the nature and magnitude of future activities are highly uncertain. No impacts on commercial fishing would occur because the No-action Alternative would not involve any in-water activities.

Terminal development and operation under the Combined Options Alternative would create jobs and county and state tax revenue. Construction activities would take just under 3 years to complete and would generate about 1,090 job-years of employment (or an equivalent of about 363 average annual jobs over 3 years), labor income of about \$80.3 million and industry output of about \$202.9 million, and an estimated \$2.9 million in county and \$6.2 million in state tax revenues. Terminal operations would generate about 1,050 direct jobs and 540 indirect and induced jobs in the local region, generating about \$102 million in labor income and \$194 million in industry output annually. Dredging, terminal construction, and terminal operation would not impact commercial fishing.

Construction of the High Head Industrial Basin and Coal Pier Channel DMCFs, including dredged material placement, would take about 27 months of labor activity, creating 109 job-years of employment (about 48 average annual jobs), generating about \$8 million in labor income and about \$19 million in industry output, and about \$252,000 in county and \$536,000 in state taxes. The High Head DMCF construction would not impact commercial fishing. Construction of and dredged material placement in the Coal Pier Channel DMCF would not have significant impacts on commercial fishing. Although construction noise could deter fish use of the area for 2 to 3 years, construction would be unlikely to limit vessel activity and the DMCF would not spatially overlap with pound net activities. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on socioeconomics.

Overall, the Combined Options Alternative would general about 1,200 job-years of employment, \$222 million in industry output, and about \$3.2 million in county and \$6.7 million in state tax revenue during the active periods. The jobs would generate more than \$3 million in annual county and \$6 million in annual state tax revenues. The new jobs would not significantly impact the economic structure or the socio-demographics of the region. Although the jobs could reduce unemployment and increase incomes, it would only be small percentage of total employment, and the effect would not be significant.

Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (1994) directed each federal agency to make achieving environmental justice part of its mission, and for agencies to address significant adverse impacts on minority and low-income communities analyzed in NEPA documents. Executive Order 14096, "Revitalizing Our Nation's Commitment to Environmental Justice for All" (2023) reiterated the federal government's commitment to environmental justice and defined it as "the just treatment and meaningful involvement of all people regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment. Consistent with the federal definition, the state of Maryland defines environmental justice as "equal protection from environmental and public health hazards for all people regardless of race, income, culture and social status." (Maryland Code Annotated, Environment §1-701).

Under the No-action Alternative, there would be no new impacts on environmental justice. There would be ongoing potential for ecological risk from sediment resuspension during maintenance dredging and ship traffic in offshore areas west and south / southeast of Coke Point. These activities could create limited potential for human health risk.

Overall, the SPCT project is not expected to produce disproportionate and adverse impacts on environmental justice populations.

Air quality impacts would be increased in the short-term during construction above threshold levels, but these levels would return below threshold levels following construction. With the use of electrified equipment for terminal operations, net emissions would be reduced to levels below the federal threshold. The air quality impacts during construction would not have disproportionate effects on environmental justice populations.

The terminal development and construction of the High Head Industrial Basin and Coal Point Channel DMCFs would address legacy environmental contamination through sediment removal and sediment encapsulation. This would improve surficial sediment conditions for fish, benthic organisms, and humans. The removal of contaminated sediments in the vicinity of the project area may reduce uptake by fish, crabs, and benthic organisms, which may reduce potential chemical exposure to contaminants by recreational fishers in the project area. Terminal construction and operation, as well as construction of the High Head Industrial Basin and Coal Pier Channel DMCFs, would create socio-economic benefits for the region, including environmental justice communities. The beneficial effects on groundwater and the local economy would occur consistently across the study area.

Although the proposed SPCT project would not significantly impact aesthetics or light in the project area, new landscape features associated with terminal operation (e.g., ship-to-shore cranes, stacks of containers) and new sources of light (at the terminal and Coal Pier Channel DMCF) would occur consistently to residents in seven of the 17 census tracts; two of these seven meet underserved community criteria.

Under atypical atmospheric conditions occasional elevated noise (periodic and nighttime noise during terminal construction and dredging and daytime, periodic, and nighttime noise during operations) could reach nearby communities. Elevated noise levels during terminal construction and dredging could affect six of the 17 census tracts, two of which include underserved communities.

During terminal construction and operation, increases in traffic on several roads would occur, but the increases would be below the designed capacity of these roads. Traffic impacts would occur in one tract that meets underserved community criteria, but this increase in traffic would occur in an industrial portion of this tract, not near residential neighborhoods.

The project would not produce disproportionate impacts on recreation for underserved communities.

Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on environmental justice.

Traffic

Under the No-action Alternative, traffic would continue to be impacted by existing conditions and potential future development. The Coke Point area of the TPA property would likely be developed for manufacturing and warehouse activity, which would impact traffic during construction and after construction is completed. If the SPCT project were not constructed and Coke Point was developed for manufacturing and warehouse activity, this would result in a projected additional 7,554 daily trips (The Traffic Group 2021). Along Bethlehem Boulevard North and West, the No-action Alternative would generate approximately 596 additional morning peak hour trips and approximately 598 trips during the evening peak hour. These increases in traffic are well below the capacity of the local roads.

Under the Combined Options Alternative, construction of the terminal would increase traffic on Bethlehem Boulevard (North and West), which are the major roads providing access to the site. Traffic impacts would vary by construction phase with the maximum number of additional workers on site daily estimated to be 339, during many phases of construction the number of workers would be less (The Traffic Group 2024c). Using the 2021 analysis, traffic levels were modeled for the years of construction (2025 to 2028) considering construction traffic and expected growth in the area and within the TPA property. Results indicate that roads would still be at between 25 and 58% of capacity (The Traffic Group 2024c). Terminal operation would increase traffic on Bethlehem Boulevard North and West with approximately 3,814 additional daily trips. Peak hours would experience increases in traffic with approximately 517 additional morning trips and 517 additional evening trips. However, these increases in traffic are well below the capacity of the local roads. Construction activities at High Head Industrial Basin would result in a small increase in local traffic that would not be noticeable given the traffic volume on local roads. The construction of the Coal Pier Channel DMCF would impact traffic only in areas from which different work vessels depart to construct the DMCF, and traffic in the vicinity of SPCT would not be impacted. Placement of dredged material at the existing MPA DMCFs and the NODS would not have any new impacts on traffic, as dredged material would be transported to these sites via vessel.

Navigation

Under the No-action Alternative, vessel traffic within and near the project area would continue. Roll-on / roll-off (Ro-Ro) operations would likely be expanded onto Coke Point, increasing the number of Ro-Ro vessels using the Brewerton Channel, a federal navigation channel, and Sparrows Point Channel, a non-federal channel.

Channel improvement dredging under the Combined Options Alternative would only impact the Brewerton Channel during dredging for the proposed turning basin, where the two channels meet, over one construction year, lasting approximately 7 months. Coordination with the Corps and the US Coast Guard would occur in compliance with the required dredging permit conditions and stipulations included in the Section 408 permission, if granted. Following construction, the SPCT would increase the vessel traffic to the Port by approximately 500 vessels. Of these vessels, approximately 150 vessels would be resulting from new weekly services to the Port, averaging an additional 3 vessels per week that would be navigating the Brewerton Channel to enter the Sparrows Point Channel. The initial vessel traffic assumptions are based on the current size of container vessels, which call the ports on the East Coast of the United States. Once larger vessels begin to call the Port of Baltimore, each vessel would be able to move a larger quantity of containers, likely leading to a decrease in overall vessel calls over time.

Container vessels would represent a new vessel type using this area but would navigate through the Brewerton Channel, turning basin, and Sparrows Point Channel in the same way as the existing Ro-Ro vessels currently operate. TTT would be responsible for the operations and maintenance of the expanded Sparrows Point Channel. TTT would also be responsible for the operations and maintenance associated with shoaling at the edge of the Sparrows Point Channel Turning Basin and Brewerton Channel.

Construction of the High Head Industrial Basin DMCF would have no impact on navigation. Dredged material transport to the High Head Industrial Basin DMCF would occur outside of the Brewerton Channel and would have no impact on navigation. Construction of the Coal Pier Channel DMCF would temporarily increase boat traffic outside the Brewerton Channel. A temporary exclusion zone at the mouth of the Coal Pier Channel would have a minimal impact on navigation. Dredged material transport to the Coal Pier Channel DMCF would occur outside of the Brewerton Channel and would have no impact on navigation. Transport from the Sparrows Point Channel to the MPA DMCFs would require dredged material barges and scows with tugs to cross the Brewerton Channel. Transits of dredged material would be coordinated with the harbor pilots, the Corps, and the US Coast Guard to avoid impacts on scheduled shipping traffic within the federal channel. Transport of the dredged material to NODS would require transport vessels to use the Chesapeake Bay navigational channel system, approximately 152 nautical miles. Approximately 262 scow trips would be needed over 291 operational days, split across two dredging seasons. Impacts on navigation would be temporary and limited through coordination with the Corps and US Coast Guard.

ES-5. Cumulative Impacts

Cumulative impact analysis considers the effects on the environment that result from the incremental effects of an action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. For this analysis, projects in the Baltimore Harbor area were considered. Projects considered in the cumulative impacts analysis include the Key Bridge collapse and debris removal, Key Bridge reconstruction, Corps and MPA maintenance dredging activities, the Bear Creek Sediments Superfund Site project, and the Curtis Creek Deepening project.

Overall, the SPCT project would contribute to long-cumulative beneficial impacts on sediment and surface water through the removal and encapsulation of contaminated sediments. The permanent filling and alteration of aquatic habitat and the temporary affects from construction of the SPCT project would contribute to adverse impacts on benthic fauna, fish, EFH, and aquatic special status species, but these impacts would not contribute substantially to the impacts from other planned actions. The SPCT project would also result in minor beneficial impacts on socioeconomics and environmental justice, though those impacts would also not contribute substantially to the impacts from other planned actions.

ES-6. Mitigation

Nine shoreline areas along TPA property were analyzed to assess the existing shoreline conditions and determine areas for potential on-site mitigation opportunities to compensate for the proposed tidal open-water wetland impacts associated with the construction of the SPCT. The locations of these proposed mitigation concepts include areas along Bethlehem Boulevard, the southeast peninsula of Sparrows Point, Craighill Lighthouse Peninsula, Pleasant and North Point Yacht Clubs, High Pier Wharf, and recreational fishing areas in the Chesapeake Bay.

This analysis involved a desktop analysis of on-site shoreline conditions, site visits to documents conditions at the sites and identify key features, and site visits to potential reference sites where local shoreline stabilization projects could be implemented using a combination of Nature-based Solutions and human-made solutions. Recommended mitigation opportunities and preliminary concepts have been developed based on the initial findings of the analysis. The following proposed mitigation concepts continue to be evaluated and refined. Final mitigation plans will be developed in conjunction with National Marine Fisheries Service’s guidance and direction.

- Restoring and creating multi-habitat area by developing multiple types of tidal emergent wetland and aquatic habitat restoration through the following: developing a perimeter sill of natural rock or other materials to create nearshore habitat; improving the bottom surface substrate in shallow water habitats; removing and replacing human-made substrate with a zone of natural materials; introducing woody debris; seeding with native submerged aquatic vegetation species; and creating or restoring low to high tidal marsh tidal emergent wetlands with scattered woody debris structures.
- Restoring and creating tidal open water and tidal wetlands / multi-habitat areas by retreating and restoring the existing shoreline.
- Removing features from tidal open waters, including the existing docks, slips, and pilings at the Pleasant and North Point Yacht Clubs. High Pier Wharf, which was previously removed and resulted in restoration of tidal open water could be recognized as advanced mitigation.
- Removing existing *Phragmites* stems and rhizomes and *Phragmites* control to prevent the spread of the invasive plant into newly created wetlands.
- Removing derelict crab traps would be conducted off-site in recreational fishing grounds. High concentrations of derelict or “ghost” crab traps would be identified in recreational fishing areas and removed in high-concentration areas during the winter season.
- Creating or seeding oyster reefs at an off-site location and could include placement of suitable bedding material (e.g., stone), addition of spat-on-shell (oyster larvae [spat] that are set onto shells, typically empty oyster shells, which serve as a substrate) on top of the foundation stone, and subsequent application of additional spat-on-shell at 5- to 10-year intervals to ensure sustained ecological function.

ES-7. Coordination and Public Involvement

To facilitate the analysis and the decision-making process, the Corps maintains a policy of open communication with interested parties and invites public participation. Public participation opportunities during this project started with public scoping, initiated with the issuance of the Notice of Intent to prepare an EIS in the Federal Register, dated December 18, 2023. The Corps conducted two public scoping meetings, January 23, 2024 (in-person) and January 25, 2024 (virtual) to inform participants about the proposed project and to solicit comments for consideration in the development of the EIS. Federal and state agencies, Tribes, public and private organizations, and members of the public that have a potential interest in the proposed action, including minority, low-income, and / or disadvantaged communities, were invited to participate in the US Army's NEPA and decision-making processes, as guided by Council on Environmental Quality regulations at 40 Code of Federal Regulations Parts 1500-1508 and Army Regulation at 32 Code of Federal Regulations Part 651. In addition to the aforementioned public engagement through the formal NEPA process, TPA and TTT's corporate affairs team developed a robust outreach program to increase public awareness and participation in this process. The program includes the regular engagement of the Tradepoint Atlantic Community Advisory Board, which consists of two dozen representative members of nearby stakeholder communities of Tradepoint Atlantic. Since September 2023, TTT's corporate affairs team has also held and attended more than 50 in-person community stakeholder meetings to present and discuss the project. Public engagement materials are developed in English and Spanish to better engage with and serve the diverse populations within local communities, ensuring that residents have the opportunity to be informed and involved. TTT has also developed a website to provide project information to the public: https://www.spctmd.com / .

The Draft EIS will be made available to federal, state, and local agencies, Tribes, and the public for review and comment for a 60-day period. The Corps published a Notice of Availability for the Draft EIS in the Federal Register, dated January 10, 2025, concurrent with the start of the 60-day public comment period. Public hearings will be scheduled during the 60-day public comment period. The purpose of these hearings will be to receive public comment on the Draft EIS including the proposed action and alternatives, the impacts analysis and proposed mitigation. Comments will be accepted through March 11, 2025.

Table ES-1. Summary of the Potential Impacts from Implementing the Alternatives

This table presents a summary of the impacts from the No-action Alternative the Combined Options Alternative, separated into impacts from development of the terminal and channel improvements and impacts associated with dredged material placement. The impacts are discussed in detail in Section 4.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Sediment	Ongoing potential for ecological risk in offshore areas and limited human health risk from disturbance and resuspension of sediments during maintenance dredging, storm events, and vessel traffic.	Dredging would permanently remove sediments that include legacy contaminants. Removal of sediments would have a net improvement of surficial sediment conditions for aquatic life in the vicinity of the project area. Dredging and in-water construction activities may resuspend sediments but the use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would reduce these impacts which are expected to be minimal.	*High Head Industrial Basin DMCF* – Placement of dredged material would encapsulate existing sediments with elevated contaminant concentrations. *Coal Pier Channel DMCF* – Placement of dredged material would result in the loss of 19.6 acres of sediments that contain elevated concentrations of contaminants, which would be encapsulated, eliminating exposure pathways for aquatic life. Dredging of soft sediments in the alignment of the exterior dike footprint prior to sand placement would minimize displacement and resuspension of sediments and the potential for creation of a mud wave during dike construction. *MPA DMCF* – No new impact. *NODS* – No new impact.
Floodplain and flood hazard	No impact. Potential future development of Coke Point would not require work in the floodplain beyond the routine maintenance dredging that is already occurring.	No impact.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – Changes in water flow or pattern during flood events would be limited to areas within approximately 0.25 mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities. *MPA DMCF* – No new impact. *NODS* – No new impact.
Hydrodynamics	No impact. Maintenance dredging of the Sparrows Point Channel would continue to retain the existing bathymetry, and potential future development of Coke Point would not affect hydrodynamics.	The expanded channel would increase the area with reduced current speed from 300 feet (existing channel width) to 450 feet (proposed channel width) compared to areas outside the channel. No impacts on currents outside of the channel.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – No Coal Pier Channel DMCF would close off the mouth of the channel on the west side of Coke Point. The flood and ebb tidal currents in this area would continue unimpeded and would therefore not have an impact on the hydrodynamics of the Patapsco River. *MPA DMCF* – No new impact. *NODS* – No new impact.
Groundwater	Impacts from an increase in impervious surface, limiting water infiltration and resulting in lowering the groundwater surface elevation, decreasing groundwater flow, slowing the movement of groundwater contaminants, and reducing the adverse impacts of contaminated groundwater, which are being managed through Resource Conservation and Recovery Act interim measures. No impact if the High Head Industrial Basin were to be filled with dry material.	Planned paving and buildings would result in 95% of Coke Point being impervious to infiltration; the impacts would be the same as described for the No-action Alternative.	*High Head Industrial Basin DMCF* – Placement of wet dredged material in the DMCF could temporarily increase the water level in the basin and compress the sediments currently at the base of the basin; however, the sediment would be contained within the DMCF footprint. Compaction of dredged material would decrease sediment permeability, reducing the movement of groundwater contaminants and the risk of contaminants moving from groundwater into surface water *Coal Pier Channel DMCF* – Groundwater near the DMCF would flow around or under the compacted dredged material; however, the increased impervious surface on Coke Point would reduce the groundwater flux, consequently decreasing the volume of groundwater being diverted around the DMCF. Dredged material placement would compress underlying sediment, reducing permeability and contaminant mobility via groundwater in the long-term. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	**Dredged Material Placement**
Surface water	Ongoing potential for resuspension of contaminated surficial sediments into surface waters by natural physical processes, maintenance dredging, and vessel movements. Ongoing chemical inputs to surface water from watershed and agricultural practices, local and regional industrial and stormwater discharges, and groundwater.	In-water construction and dredging have the potential to resuspend sediments and contaminants into surface waters. The use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would minimize these impacts. Impacts would be temporary, localized, reduced, and controlled through the use of BMPs. Removal of sediment with legacy contaminants as part of channel dredging would improve the quality of the sediment at the sediment-water interface and would have a permanent net improvement to surface waters in the vicinity of the project area. Construction of the terminal would increase the impervious surface area on the Coke Point peninsula; stormwater discharges from two new permitted outfalls at the south end of Coke Point would be incorporated into the regional stormwater plan for the Sparrows Point facility and would not be expected to adversely impact surface waters.	*High Head Industrial Basin DMCF* – Filling of the DMCF basin would eliminate its use for stormwater; stormwater inputs would be redirected and managed according to NPDES permit requirements. No impacts from the removal of the existing impounded water from the High Head Industrial Basin, use of surface waters for pumping and offloading of dredged material, and discharge of effluent from dewatering of the dredged materials would be expected; these actions would follow stipulations and conditions of a NPDES permit and a Water Appropriation and Use Permit issued by the MDE. *Coal Pier Channel DMCF* – In-water construction and placement of sand for exterior dike construction would have the potential to resuspend sediments. Pre-dredging of the exterior dike alignment and the use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would minimize these impacts. No impacts from the use of surface waters for pumping and offloading of dredged material and discharge of effluent from dewatering of the dredged materials would be expected; these actions would follow stipulations and conditions of a NPDES permit and a Water Appropriation and Use Permit issued by the MDE. Encapsulation of approximately 19.6 acres of impacted sediments at the sediment - water interface would provide net improvement to surface waters in the vicinity of the project area. *MPA DMCF* – No new impact. *NODS* – No new impact.
Benthic fauna	Continued impacts from existing sediment and water quality conditions. Continued impacts from maintenance dredging with community recovery after dredging. Permanent loss of benthic community if the High Head Industrial Basin were to be filled.	Channel dredging would impact benthic organisms, causing mortality for any non-mobile organisms in or on the sediments and could create temporary water column turbidity that could affect filter-feeding species. Benthic organism communities would recover after dredging events (including the ongoing maintenance dredging), but the increased deepwater habitat could change the type of species present after dredging. New open water habitat would be created by excavation for the wharf, but the wharf would shade 8.9 acres of open water, resulting in aquatic habitat that may be less capable of supporting a diverse benthic community. Installation of pilings and mooring dolphins would result in mortality of any benthic organisms present in that footprint and a permanent loss of 0.2 acre of available bottom habitat.	*High Head Industrial Basin DMCF* – High Head Industrial Basin is not managed to support aquatic habitat; however, approximately 40 acres of benthic habitat and any benthic organisms present in the basin would be permanently lost. *Coal Pier Channel DMCF* – Placement of dredged material would result in burial and permanent loss of the existing benthic communities and 19.6 acres of degraded bottom habitat. Standard BMPs would minimize sediment resuspension during dike construction and the potential for benthic organism burial outside the dike footprint. *MPA DMCF* – No new impact. *NODS* – No new impact.
Fish	Continued impacts from existing historical sediment contamination. Continued temporary impacts during maintenance dredging from disturbance and loss of invertebrate prey species. Permanent loss of approximately 40 acres of aquatic habitat and the associated fish community if the High Head Industrial Basin were to be filled.	Dredging for the deepening and widening of the Sparrows Point Channel could result in different life stages of fish species being caught in dredging equipment, resuspended sediment (increasing turbidity) and habitat alteration impacting fish, especially eggs and larvae. Underwater noise from pile driving could impact fish through physical damage for organisms near the project area and behavioral disturbances for organisms within approximately 2 miles of the project area. Increased vessel traffic (additional 10 vessels at a time during construction and 500 container vessels per year during operation) would continue to affect fish through disturbance from noise and physical disturbance of habitat conditions.	*High Head Industrial Basin DMCF* – High Head Industrial Basin is not managed to support aquatic habitat; however, approximately 40 acres of aquatic habitat and any fish present in the basin (two species were found during sampling) would be permanently lost. *Coal Pier Channel DMCF* – Placed material could cause temporary turbidity impacts; fish within the offshore DMCF footprint would be displaced, would experience increased vessel traffic and habitat alteration, and could be trapped or buried within the dike alignments, especially eggs and larvae. The Coal Pier DMCF footprint does not provide high-quality habitat for benthic organisms or fish species due to historical sediment contamination and represents only a small portion of bottom habitat available to fish. *MPA DMCF* – No new impact. *NODS* – No new impact.
Essential fish habitat (EFH)	Continued impacts from existing conditions, including maintenance dredging, loss of invertebrate prey species, and historical sediment contamination. No impact at High Head Industrial Basin.	Dredging impacts on juvenile and adult EFH species would be short-term; eggs and larvae present in the project area would be permanently lost. Terminal development would impact EFH habitat and species with increased noise, vessel traffic, turbidity, and habitat alteration (as discussed above for fish).	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – Habitat within the DMCF footprint would be permanently lost. EFH species within the footprint of the DMCF would be displaced due to increased turbidity, which could disrupt foraging behaviors. EFH species could be trapped as material is placed, especially eggs and larvae. The Coal Pier DMCF footprint represents only a small portion of bottom habitat available to EFH species; therefore, permanently filling the Coal Pier Channel which does not provide high-quality habitat for EFH species due to sediment contamination would have only localized impacts on EFH species. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	**Dredged Material Placement**
Aquatic special status species	Continued impacts from existing conditions, including maintenance dredging, and existing contaminated sediments. No impact at High Head Industrial Basin.	The impacts of noise and increased turbidity on aquatic special status species would be the same as impacts on fish species (as discussed in the Fish section). Increased vessel traffic from construction and operation of the terminal would cause a minor increase in the risk of striking special status species such as sturgeon and sea turtles; for sea turtles, the risk would increase for vessels traveling between the site and the lower Chesapeake Bay, but this would be negligible since the routes are already highly trafficked. Bottlenose dolphins are expected to be transient in this portion of the river and are not likely to be impacted.	*High Head Industrial Basin DMCF* – No impact *Coal Pier Channel DMCF* – The impacts of construction, increased vessel traffic, and habitat alteration on aquatic special-status species would be the same as impacts on fish species (as discussed in the Fish section). Sturgeon and special status fish species could suffer behavioral and physiological effects from increased turbidity, but the turbidity increase would be temporary, localized, and controlled, and the mobile life stages could move away from the construction area. The more isolated location of the Coal Pier DMCF would be unlikely to be utilized by sturgeon or dolphins, as they utilize open reaches of rivers with faster flowing water. *MPA DMCF* – No impact. *NODS* – The impacts would be limited to the risk of strike of special status species from barge transit from SPCT to the NODS, but the increase in risk is negligible given the vessel traffic already present.
Vegetation / habitat	Minimal adverse impacts from potential future development of Coke Point and High Head Industrial Basin.	Development of the terminal would require the removal of all terrestrial vegetation in the project area, which would result in minimal adverse impacts.	*High Head Industrial Basin DMCF* – Construction of the High Head Industrial Basin DMCF would remove approximately 11.2 acres of riparian, shrub, and forested habitat, resulting in adverse impacts on vegetation and habitat; however, this habitat is not unique and is impacted by past industrial uses. Given the abundance of riparian, shrub, and forested habitat in the area, impacts would be minimal. *Coal Pier Channel DMCF* – No additional impact beyond those described for terminal development. *MPA DMCF* – No new impact. *NODS* – No new impact.
Birds	Continued impacts from existing conditions, including industrial activities, maintenance dredging, buildings, and artificial lighting. Potential impacts from degraded habitat removal during future development of Coke Point and High Head Industrial Basin.	Construction would impact local bird populations due to the noise and loss of habitat on Coke Point. Habitat loss would be minimal and disturbance from construction noise would be temporary. Increased turbidity from dredging could temporarily impact foraging sea birds. Although terminal operations could impact birds by increasing vessel traffic and constructing new buildings and structures, these conditions would be similar to existing conditions and would represent a minimal impact on birds. New artificial lighting would increase light pollution and could adversely affect bird behavior, but impacts from new lighting would be minimal given the existing nighttime light intensities.	*High Head Industrial Basin DMCF* – Construction of the DMCF would remove approximately 11.2 acres of terrestrial habitat and permanently remove approximately 40 acres of aquatic habitat and 1 linear mile of riparian habitat along the edge of the basin. This habitat is not unique and is impacted by past industrial uses, but the change from aquatic habitat to upland would exclude birds that use the aquatic and riparian habitats. Construction and dredged material placement activities would likely displace upland birds from the site for approximately 3 years. The site could be used by upland birds following construction. *Coal Pier Channel DMCF* – Construction of the DMCF would cause a minor reduction in the aquatic habitat available for loafing and foraging; however, the offshore DMCF area is not heavily used by birds and there is extensive area available adjacent to the DMCF footprint. The Coal Pier Channel DMCF would cause small, localized impacts on bird communities that use the area. *MPA DMCF* – No new impact. *NODS* – No new impact.
Aesthetics / viewshed	Continued impacts from existing conditions, including routine operations. Potential future development of Coke Point and High Head Industrial Basin would be consistent with existing conditions.	Terminal development would result in temporary and permanent visual changes, including the increase of shoreline development, shipping container storage, and mast lights. However, most of these would not be a substantial change from existing aesthetics. The grouping of up to 9 ship-to-shore cranes would have a moderate scale contrast and spatial dominance in the foreground view for boaters, the middleground view for some residents of Baltimore County, and the background view for shore viewers in Anne Arundel County and from Fort Howard Park; the scale contrast is not projected to be noteworthy for boaters given the transient nature of the view from boats and existing low visual quality.	*High Head Industrial Basin DMCF* – Construction of the DMCF would not produce significant changes in aesthetics and viewshed, having limited visibility and being similar in scale to a nearby building. *Coal Pier Channel DMCF* – The newly constructed DMCF would be visible to viewers west of the project and boaters, but the visual impact would be minimal, being similar in scale to existing structures. The DMCF could also increase noticeable light, but given the distance from the communities, impacts would be minimal. *MPA DMCF* – No new impact. *NODS* – No new impact.
Recreation	Boating activities near the channel would continue to be temporarily affected by commercial operations and maintenance dredging of the Sparrows Point Channel. Potential future development of Coke Point would not have an impact on water-based recreation.	Terminal development and periodic maintenance dredging would temporarily impact recreational activities. Exclusion zones during construction and dredging activities would have minor impacts on recreational boating. In-water activities could increase turbidity and impact localized fishing, but subsistence fishing in license-free fishing areas would not be impacted.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – During construction of the DMCF, an exclusion zone would impact recreational boating along the western shore of Coke Point, but impacts would be localized and temporary. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	**Dredged Material Placement**
Air quality	Continued vessel use of auxiliary engines at other ports on the east coast of the United States and use of diesel cargo handling equipment would continue to contribute to greenhouse gas emissions. If Coke Point or High head Industrial Basin were further developed, there would be short-term air quality impacts associated with construction activities.	Emissions would be generated primarily during the construction and cleanup phases by sources such as construction and demolition equipment and transport vehicles. The construction period would be expected to be energy-intensive and to result in short-term but significant greenhouse gas emissions. During operation, the terminal would be partially electrified, and the use of shore power would significantly reduce emissions from ships at berth.	*High Head Industrial Basin DMCF* – Emissions would be generated during construction of the DMCF and placement of dredged material; emissions would be limited to 7 months for construction and 3 years for dredged material placement. *Coal Pier Channel DMCF* – Emissions would be generated during construction of the DMCF and placement of dredged material; emissions would be limited to 7 months for construction and 2 to 3 years for dredged material placement. *MPA DMCF* – Emissions would be generated during transport of dredged material to the MPA DMCFs, but this impact would be limited to a 4-year period. *NODS* – Emissions would be generated during transport of dredged material to the NODS via scows, but this impact would be limited to a 2-year period.
Community noise	No new impacts. Noise levels from periodic maintenance dredging and potential future development of Coke Point and High Head Industrial Basin would attenuate to acceptable residential levels at the closest residences. No nighttime noise would occur.	Peak sustained and periodic noise levels for both construction and operations would attenuate to acceptable residential levels at the closest residences, with no impact in most atmospheric conditions. Under less typical atmospheric conditions, periodic and nighttime construction and operational activities could produce noise that would be noticeable to waterfront areas in Turner Station and northern Anne Arundel County.	*High Head Industrial Basin DMCF* – Sustained daytime noise from constructing the DMCF would attenuate to acceptable levels. There would be no periodic daytime or nighttime noise impacts from construction or dredged material placement. *Coal Pier Channel DMCF* – Sustained daytime noise impacts from the construction of the DMCF would attenuate to acceptable levels. There would be no periodic daytime or nighttime noise impacts from construction or dredged material placement. *MPA DMCF* – No new impact. *NODS* – No new impact.
Socioeconomics	Not quantified due to uncertainty of future activities in the area; no impacts on commercial fishing would occur.	Terminal development and operation would create jobs and county and state tax revenue. Construction activities would take just under 3 years to complete and would generate about 1,090 job-years of employment (or an equivalent of about 363 average annual jobs over 3 years), labor income of about $80 million, industry output of about $202.7 million, and an estimated $3 million in county and $6.1 million in state tax revenues. Terminal operations would generate about 1,050 direct jobs and 518 indirect and induced jobs in the local region, generating about $102 million in labor income and $194 million in industry output annually. The jobs would generate more than $3 million in annual county and $6 million in annual state tax revenues. The new jobs would not significantly impact the economic structure or the socio-demographics of the region. Overall, this alternative would generate about 1,200 job-years of employment, $222 million in industry output, and about $3.2 million in county and $6.7 million in state tax revenue. Although the jobs could reduce unemployment and increase incomes, it would only be small percentage of total employment and the effect would not be significant. Dredging, terminal construction, and terminal operation would not impact commercial fishing.	*High Head Industrial Basin DMCF and Coal Pier Channel DMCF* – The construction of both DMCFs would take about 27 months of labor activity, creating 109 job-years of employment (about 48 average annual jobs), generating approximately $8 million in labor income, $19 million in industry output, and $252,000 in county and $536,000 in state taxes. High Head Industrial Basin DMCF construction would not impact commercial fishing. Construction of and dredged material placement in the Coal Pier Channel DMCF would not have significant impacts on commercial fishing. Although construction noise could deter fish use of the area for 2 to 3 years, construction would be unlikely to limit vessel activity and the DMCF would not spatially overlap with pound net activities. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Environmental justice	No new impacts. Continued potential for ecological risk and limited potential for human health risk from sediment resuspension during maintenance dredging and vessel traffic.	Air quality impacts would be temporarily increased above threshold levels during construction, but these levels would return below threshold levels following construction. The project would not produce disproportionate and adverse air quality impacts on environmental justice populations. Terminal development would address legacy environmental contamination through sediment removal and encapsulation, benefiting aquatic organisms and humans consistently across the study area. Terminal construction and operation would create socio-economic benefits for the region that would occur consistently across the study area. New landscape features associated with terminal operation and new sources of light would occur consistently to residents in seven of the 17 census tracts; two of these seven meet underserved community criteria. Under atypical atmospheric conditions occasional elevated noise levels could reach nearby communities, affecting six of the 17 census tracts, two of which include underserved communities. Impacts from increased traffic would occur in one tract that meets underserved community criteria, but this increase would occur in an industrial portion of this tract, not near residential neighborhoods. No disproportionate impacts on recreation for underserved communities.	*High Head Industrial Basin DMCF* – Air quality impacts would increase above threshold levels during construction, returning below threshold levels following construction. Impacts would not be disproportionate for environmental justice populations. Placement of dredged material would decrease the mobility of contaminants, having a potential beneficial effect on groundwater that would occur consistently across the study area. Construction would create socio-economic benefits for the region that would occur consistently across the study area. No disproportionate impacts on aesthetics, noise, or recreation for underserved communities. *Coal Pier Channel DMCF* – Air quality impacts would increase above threshold levels during construction, returning below threshold levels following construction. Placement of dredged material would eliminate exposure pathways for chemicals to aquatic organisms and humans consistently throughout the study area. The DMCF would be visible to viewers west of the project and boaters and would increase noticeable light for one underserved community, but these impacts on aesthetics would not be significant. Construction would create socio-economic benefits for the region that would occur consistently across the study area. No disproportionate impacts on noise or recreation for underserved communities. *MPA DMCF* – No new impact. *NODS* – No new impact.
Traffic	Future development of the TPA property would have limited effects on local traffic. Traffic levels on local roads would remain within the capacity of the local roadways.	During construction activities, traffic would increase on local roads during peak hours with an additional 517 trips in the mornings and the same amount in the evenings. These increases in traffic are well below the capacity of the local roads.	*High Head Industrial Basin DMCF* – Construction of High Head DMCF would result in a small increase in local traffic would not be noticeable given the traffic volume on local roads. *Coal Pier Channel DMCF* – Construction of the DMCF would impact traffic only in areas from which different work vessels depart to construct the DMCF. Traffic near the project area would not be impacted. *MPA DMCF* – No new impact. *NODS* – No new impact.
Navigation	Vessel traffic would continue under existing conditions. Ro-Ro operations would likely be expanded onto Coke Point, increasing the number of Ro-Ro vessels using the Brewerton Channel, a federal navigation channel, and Sparrows Point Channel, a non-federal channel.	Dredging of the Sparrows Point Channel would only impact the Brewerton Channel during dredging for the proposed turning basin, where the two channels meet, over one construction year, lasting about seven months. Coordination with US Coast Guard would occur in compliance with the required dredging permit conditions and stipulations included in the Section 408 permission, if granted. Following construction, the vessel traffic to the Port would increase by approximately 500 vessels per year, about 150 of which would be from new weekly services to the Port of Baltimore, an average of three additional vessels per week navigating the Brewerton Channel to enter the Sparrows Point Channel. Container vessels would represent a new vessel type using this area but would navigate through the Brewerton Channel, turning basin, and Sparrows Point Channel in the same way as the existing Ro-Ro vessels currently operate.	*High Head Industrial Basin DMCF* – Construction would have no impact on navigation. Dredged material transport to the DMCF would occur outside of the Brewerton Channel and would have no impact on navigation. Dredged material placement would occur over three construction years; transporting dredged material from the Sparrows Point Channel to the west side of Sparrows Point. Transit would occur outside the Brewerton Channel. *Coal Pier Channel DMCF* – Increased boat traffic for construction of the DMCF would occur outside the Brewerton Channel. A temporary exclusion zone during construction would be located outside the Breweton Channel and would not impact navigation. Vessels outside the Brewerton Channel would need to navigate around the exclusion zone which could temporarily alter their routes around the western shore of Coke Point. Dredged material transport from the Sparrows Point Channel to the DMCF would occur outside the Brewerton Channel and would have no impact on navigation. Dredged material placement would occur over 2 to 3 construction years. *MPA DMCF* – The transport of dredged materials to the DMCFs would require transport vessels to cross the Brewerton Channel. Impacts on navigation would be temporary and limited through coordination with the Corps and the US Coast Guard. *NODS* – Transport of the of the dredged material to NODS would require transport vessels to use the Chesapeake Bay navigational channel system for approximately 152 nautical miles. Approximately 262 scow trips would be needed over 291 operational days, split across two dredging seasons. Impacts on navigation would be temporary and limited through coordination with the Corps and the US Coast Guard.

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Acronyms and Abbreviations

°F	degrees Fahrenheit
ACAM	Air Conformity Applicability Model
ADT	Average Daily Traffic
AE	Inundation Zone (Floodplains)
AOR	Area of Review
AQCR	Air Quality Control Region
AR	Army Regulation
AVE	Area of Visual Effect
BA	Biological Assessment
BCL	Baseline Control Limits
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act of 1940
B-IBI	Benthic Index of Biotic Integrity
BMP	Best Management Practice
BPW	Maryland Board of Public Works
bss	Below Sediment Surface
CAC	Critical Area Commission for the Chesapeake and Atlantic Coast Bays
Caltrans	California Department of Transportation
CBA	Community Benefits Agreement
CBBMP	Chesapeake Bay Biological Monitoring Program
CBP	Chesapeake Bay Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Channel improvements	Sparrows Point Channel improvements
cKOP	Candidate Key Observation Point
CMRA	Climate Mapping for Resilience and Adaptation
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
Coke Point	Coke Point Peninsula
COMAR	Code of Maryland Regulations
Combined Options Alternative	Combined Dredged Material Placement Options Alternative
CO-OPS	Center for Operational Oceanographic Products and Services
Corps	US Army Corps of Engineers
CY	Cubic Yards
DA	Department of the Army
dB	Decibel
dBA	A-Weighted Decibel
DERA	Diesel Emission Reduction Act
DMCF	Dredged Material Containment Facility
DPM	Diesel Particulate Matter

DPS	Distinct Population Segments
DRO	Diesel Range Organics
DU	Dredging Unit
EA	EA Engineering, Science, and Technology, Inc., PBC
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
FAST-41	Fixing America's Surface Transportation Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FIRM	Federal Insurance Rate Map
FMC	Fishery Management Council
g / m^2	Grams per Meter Squared
GGRA	Greenhouse Gas Reduction Act
GHG	Greenhouse Gas
GIS	Geographic Information System
HAPC	Habitat Area of Particular Concern
HESD	Habitat and Ecosystems Services Division
HUC	Hydrologic Unit Code
Hz	Hertz
I-695	Interstate 695 / Baltimore Beltway
I-895	Interstate 895
IBI	Index of Biotic Integrity
IM	Interim Measures
JE	Joint Evaluation
Key Bridge	Francis Scott Key Bridge
KOP	Key Observation Point
L_{max}	Maximum Sound Level
LPC	Limiting Permissible Concentration
m^2	Meters Squared
MBTA	Migratory Bird Treaty Act of 1918
MCY	Million Cubic Yards
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDOT	Maryland Department of Transportation
MDTA	Maryland Transportation Authority
MERLIN	Maryland's Environmental Resource & Land Information Network
mg / L	Milligram per Liter
MHHW	Mean Higher High Water

MHT	Maryland Historical Trust
MHW	Mean High Water
MLLW	Mean Lower Low Water
MLW	Mean Low Water
MPA	Maryland Port Administration
MPRSA	Marine Protection, Research, and Sanctuaries Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act of 1976
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxic Assessment
NAVD88	North American vertical datum of 1988
NbS	Nature-based Solutions
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NODS	Norfolk Ocean Disposal Site
North Channel	Northern Section of the Sparrows Point Channel
NO_x	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
NTU	Nephelometric Turbidity Unit
O_3	Ozone
OCR	Optical Character Recognition
PAH	Polycyclic Aromatic Hydrocarbon
Pb	Lead
PCB	Polychlorinated Biphenyl
PEL	Probable Effects Levels
PIANC	World Association for Waterborne Transport Infrastructure
PM_{10}	Particulate Matter Less Than or Equal to 10 Micrometers
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Micrometers
Port	Port of Baltimore
POV	Privately Owned Vehicle
Ppm	Parts per Million
ppt	Parts per Thousand
PRD	Office of Protected Resources
RCP	Representative Concentration Pathway
RCRA	Resource Conservation and Recovery Act
RGI	Restoration Goal Index
RMG	Rail Mounted Gantry
RMS	Root Mean Square
Ro-Ro	Roll-on / Roll-off
RSL	Regional Screening Levels
RTG	Rubber-tired gantry

SAP	Sampling and Analysis Plan
SAV	Submerged Aquatic Vegetation
SEL_{cum}	Cumulative Sound Exposure Level over the Duration of a Noise Event
SHA	State Highway Administration
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
South Channel	Southern Section of the Sparrows Point Channel
SPCT	Sparrows Point Container Terminal Project
SPL_{peak}	Maximum Instantaneous Sound Pressure over the Duration of a Noise Event
SQG	Sediment Quality Guidelines
STS	Ship-to-Shore
SVOC	Semivolatile Organic Compounds
TCLP	Toxicity Characteristic Leaching Procedure
TEL	Threshold Effects Levels
TEQ	Toxic Equivalent
terminal	Proposed Container Terminal
TEU	Twenty-Foot Equivalent Unit
TMDL	Total Maximum Daily Load
TPA	Tradepoint Atlantic
TPH	Total petroleum hydrocarbons
tpy	Tons per Year
TSS	Total Suspended Solids
TTT or Applicant	Tradepoint TiL Terminal, LLC
ULCV	Ultra Large Container Vessel
URI	University of Rhode Island
USC	US Code
USCG	US Coast Guard
USDOT	US Department of Transportation
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VE	Velocity Zone (Floodplains)
VIMS	Virginia Institute of Marine Science
VOC	Volatile Organic Compound
WLA	Waste Load Allocation
WOTUS	Waters of the United States
WSDOT	Washington State Department of Transportation

1. Purpose of and Need for Action

1.1 Introduction

1.1.1 Background

The US Army Corps of Engineers, Baltimore District (Corps), received an application for a Department of the Army (DA) permit (Corps number NAB–2023–61200) on August 25, 2023 for the proposed Sparrows Point Container Terminal (SPCT) project to construct a new container terminal (the terminal) in the Port of Baltimore (the Port). The permit was submitted by Tradepoint TiL Terminal, LLC (TTT or applicant), a joint venture between Tradepoint Atlantic (TPA) and Terminal Investment Limited. The proposed project requires authorization from the Corps under the following statutory authorities:

- Section 404 of the Clean Water Act (33 US Code [USC] 1344) for the discharge of dredged or fill material into Waters of the United States (WOTUS)
- Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) for the construction of any structure in or over navigable WOTUS
- Section 408 of the Rivers and Harbors Act of 1899 (33 USC 408) for alterations or modifications to Corps Civil Works projects by non-Corps entities
- Section 103 of the Marine Protection, Research, and Sanctuaries Act (33 USC 1413) for ocean disposal of dredged material

As the lead agency under the National Environmental Policy Act (NEPA), the Corps determined the proposed project may significantly affect the quality of the human environment and has prepared this Draft Environmental Impact Statement (EIS) to assess the potential social, economic, and environmental impacts of the proposed project.

Title 41 of the Fixing America's Surface Transportation Act (FAST-41) is intended to help infrastructure projects that meet specific criteria successfully navigate federal permitting through a coordinated effort. As described on the FAST-41 website, the program is designed to provide "a deliberate, transparent, and predictable federal environmental review and permitting process" while not altering any "applicable statutory or regulatory requirement, environmental law, regulation, or review process, or public involvement procedure" (Performance.gov 2024).

The project applicant requested that the project be included in the FAST-41 program. On September 25, 2023, the Corps notified the Federal Permitting Improvement Steering Council, the agency that leads the FAST-41 program, that the Corps had determined the project is covered under FAST-41.

The Corps was required early in the FAST-41 process to identify and invite agencies to be cooperating or participating agencies in the NEPA process. By email on October 16, 2023, the Corps invited five federal agencies to be cooperating agencies under NEPA, all of whom accepted. Cooperating agencies include the US Environmental Protection Agency (USEPA), US Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), US Coast Guard (USCG), and the Corps Civil Works Division. Seven state / local agencies agreed to be participating agencies in the NEPA process: Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (MDNR), Maryland Historical Trust (MHT), the Critical Area Commission for the Chesapeake and Atlantic Coast Bays (CAC), Maryland Port Administration (MPA), Maryland Board of Public Works (BPW), and Baltimore County. Four federally recognized tribes were invited to participate (Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, and Pamunkey Tribe); however, the Corps did not receive responses from the Tribes. The official FAST-41 kick-off meeting for the project occurred on November 8, 2023.

1.1.2 Overview of the Applicant's Proposed Project

The proposed SPCT would be located in Baltimore County, Maryland within the TPA property on a 330-acre area on the southwest peninsula of Sparrows Point known as Coke Point Peninsula (Coke Point) (Figure 1). The historical uses of this site include coking operations as part of the former Bethlehem Steel Mill. The site is entirely human-made land, created by filling in a portion of the Patapsco River with steel mill slag over several decades. Previously developed areas within the site are currently undergoing demolition and razing of structures. Sparrows Point, with its industrial history, is an example of a brownfield. In recent years, Sparrows Point has been undergoing a major redevelopment initiative aimed at transforming the site into a hub for modern industrial and commercial activities. The SPCT project would continue to redevelop the site.

The proposed terminal would consist of a marginal wharf with a total length of approximately 3,000 feet with ship-to-shore (STS) cranes, a container yard, gate complex, intermodal / rail yard, and various support structures. To provide vessel access to the wharf, the project would include deepening and widening of the existing Sparrows Point Channel and turning basin, which would require dredging and placement of approximately 4.2 million cubic yards (MCY) of dredged material. The proposed project would include the construction of an offshore dredged material containment facility (DMCF) in the Coal Pier Channel adjacent to Coke Point and an upland DMCF on TPA property at High Head Industrial Basin, as well as use of existing permitted nearshore DMCFs managed by MPA (Cox Creek and Masonville DMCFs), and an ocean placement site (Norfolk Ocean Disposal Site [NODS]).

The proposed project would increase the overall container capacity of the Port by 70%. The project represents a long-term commitment by TTT to link the world's largest containership company, Mediterranean Shipping Company, to the Port for the next century. The terminal would leverage the Howard Street Tunnel Vertical Clearance Improvement Project, which will provide the closest link for double-stacked rail cars from an East Coast port to the American Midwest. This link, along with the increased capacity that would be provided by the terminal, would give the Port of Baltimore a

> **Coking** is the process in which coal is heated to very high temperatures in the absence of oxygen, removing any impurities. The resulting coke, a porous substance that is nearly all carbon, is used to produce steel.
>
> **Slag** is a by-product of steel making, produced when impurities in the raw materials are separated out during the conversion from iron to steel. Slag can be used in various applications, such as construction aggregates and cement production.
>
> A **brownfield** is land that was previously used for industrial purposes and has the potential presence of hazardous substances, pollutants, or contaminants. It is typically an abandoned or underused industrial or commercial facility where redevelopment is complicated by environmental contamination.
>
> **Marginal wharf** is a waterfront structure where ships dock directly alongside a shoreline or seawall. The defining feature of a marginal wharf is that it runs parallel to the shoreline and allows vessels to load and unload cargo or passengers without the need for the ship to enter a dock basin.
>
> **Ship-to-shore (STS) cranes** are large, specialized cranes used in container ports to load and unload containers between ships and the shore. These cranes are mounted on the dock and extend over the ship to move cargo containers efficiently between the vessel and the terminal.
>
> A **container yard** is a designated area in a port or terminal where shipping containers are stored, stacked, and organized before or after being loaded onto a ship, truck, or train.
>
> An **intermodal / rail yard** is a facility where shipping containers are transferred between different modes of transportation, such as from ship to rail or from rail to truck. These yards are designed to efficiently handle intermodal freight, which consists of cargo that is transported in standardized containers that can be easily transferred between ships, trucks, and trains without needing to unpack the cargo.

major competitive advantage over other regional ports along the Eastern Seaboard of the United States. Nearly $1 billion would be invested in the terminal with project development estimated to create more than 1,100 direct local jobs. The project would serve as an important economic driver for the region by promoting other indirect economic growth while also providing environmental benefits by addressing legacy environmental contamination through sediment removal and encapsulation.

The Chesapeake Bay Bridge and the former Francis Scott Key Bridge (Key Bridge) had similar vertical clearances, at 186 feet and 185 feet, respectively, limiting the size of vessels that could safely pass beneath them. The Key Bridge collapsed on March 26, 2024 when it was struck by a cargo ship leaving the Port. Maryland Transportation Authority (MDTA) and Maryland State Highway Administration (SHA) will be replacing the Key Bridge in the same location as the original structure with a minimum vertical clearance of 230 feet above mean high water (MHW), giving the new bridge at least 45 additional feet of vertical clearance. The size of the vessel that can travel to the Port is currently limited by the height of the Chesapeake Bay Bridge. MDTA is currently conducting the Chesapeake Crossing Study to address existing and future transportation limitations at the Chesapeake Bay Bridge. As part of this study, MDTA is evaluating raising the bridge to accommodate larger vessels in the future (MDTA 2024a). The proposed terminal and improvements to Sparrows Point Channel (channel improvements) would also be able to accommodate larger vessels than those that currently transit to the Port.

1.2 Purpose and Need

1.2.1 Purpose of the Proposed Action

The purpose of the proposed action is to develop the SPCT, a new terminal and associated facilities that would be located on Coke Point within the Patapsco River in Baltimore, Maryland. This Draft EIS reviews the application received, evaluates the project’s potential impacts, and contributes information to allow the Corps to make a DA permit decision with respect to the application.

1.2.2 Need for the Proposed Action

The federal action is needed because TTT has submitted an application to the Corps for construction of the SPCT. The proposed action requires permits from the Corps and other agencies, with the Corps being the lead federal agency. The applicant has requested Corps permits to place fill in WOTUS, dredge in WOTUS, and alter a federal channel.

The applicant’s proposed project would address several economic and shipping logistical concerns. The SPCT project would enhance the economic strength of the Port by increasing its overall container capacity. This, along with the on-dock rail and Howard Street Tunnel Vertical Clearance Improvement Project, would increase the overall national efficiency of importing goods to the Midwest, and would increase the throughput of containers through the Port. The proposed project would not only provide direct jobs at the project site but would also provide a foundation for sustained regional economic growth within the Port and throughout the region. By strengthening and growing the Port, the project would enhance the United States’ supply chain efficiencies and resiliency.

Figure 1. SPCT Project Vicinity

1.3 Scope and Content of the Environmental Impact Statement

Per current Council on Environmental Quality (CEQ) NEPA regulations, this Draft EIS considers the potential impacts of the proposed action and a range of reasonable alternatives on the potentially affected environment and the degree of the effects or impacts of the action. Effects or impacts are changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and include the following categories:

1. Direct effects are caused by the action and occur at the same time and place.
2. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.
3. Cumulative effects are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 Code of Federal Regulations [CFR] 1508.1 (g)(1)-(3)).

The analysis uses existing information and new data collected specifically for this project. Extensive studies were needed to inform the design of the alternatives and to understand the potential impacts on important resources in the project area. The analysis describes existing environmental conditions and potential impacts on the human environment, including the potential social, economic, and environmental impacts of the proposed project.

1.4 Decision To Be Made

The Corps will determine whether to issue, issue with conditions and / or mitigations, or deny a DA permit for the proposed project.

1.5 Federal Statutes, Permits, and Approvals Relevant to This Draft EIS

TTT must obtain permits and approvals through a Joint Permit Application. These permits would contain stipulations protective of the natural and human environment that must be followed during construction activities, if the SPCT project is implemented. Appendix A presents the applicable federal statutes and anticipated permits and approvals.

1.6 Public Participation

To facilitate the analysis and the decision-making process, the Corps maintains a policy of open communication with interested parties and invites public participation. Public participation opportunities during this project started with public scoping, initiated with the issuance of the Notice of Intent to prepare an EIS in the Federal Register, dated December 18, 2023. The Corps conducted two public scoping meetings, January 23, 2024 (in-person) and January 25, 2024 (virtual) to inform participants about the proposed project and to solicit comments for consideration in the development of the EIS. Federal and state agencies, Tribes, public and private organizations, and members of the public that have a potential interest in the proposed action, including minority, low-income, and / or disadvantaged communities, were invited to participate in the US Army's NEPA and decision-making processes, as guided by CEQ regulations at 40 CFR Parts 1500-1508 and Army Regulation (AR) at 32 CFR Part 651.

The scoping period to provide comments was open for 60 days, concluding February 16, 2024. The Corps accepted written comments at the in-person meeting and via convention mail and email. A total of 18 correspondences (letters, emails, and comment cards submitted at the in-person public meeting) were received. Of these, five letters were received from regulatory agencies, the remaining letters were from individuals and organizations. Questions and comments received during public scoping were considered in the development of this Draft EIS to ensure that substantive questions raised during scoping were addressed within the scope of the analysis in this Draft EIS. More detail is provided in Section 7, Consultation and Coordination.

In addition to the aforementioned public engagement through the formal NEPA process, TPA and TTT's corporate affairs team developed a robust outreach program to increase public awareness and participation in this process. The program includes the regular engagement of the Tradepoint Atlantic Community Advisory Board, which consists of two dozen representative members of nearby stakeholder communities of Tradepoint Atlantic. Since September 2023, TTT's corporate affairs team has also held and attended more than 50 in-person community stakeholder meetings to present and discuss the project. Public engagement materials are developed in English and Spanish to better engage with and serve the diverse populations within local communities, ensuring that residents have the opportunity to be informed and involved. TTT has also developed a website to provide project information to the public: https://www.spctmd.com /.

The Draft EIS will be made available to federal, state, and local agencies, Tribes, and the public for review and comment for a 60-day period. The Corps published a Notice of Availability for the Draft EIS in the Federal Register, dated January 10, 2025, concurrent with the start of the 60-day public comment period. Public hearings will be scheduled during the 60-day public comment period. The purpose of these hearings will be to receive public comment on the Draft EIS, the impacts analysis and proposed mitigation. Comments will be accepted through March 11, 2025.

2. Description of Proposed Action and Alternatives

This chapter describes the proposed action and a range of alternatives considered for the SPCT. NEPA requires that federal agencies explore a range of reasonable alternatives that address the purpose and need for an action and provide an analysis of the impacts that the alternatives have on the natural and human environments.

Two alternatives are analyzed for the SPCT – the No-action Alternative and one action alternative, the Combined Dredged Material Placement Options Alternative (Combined Options Alternative). The Corps must analyze the No-action Alternative (40 CFR 1502.14) and represents the scenario of not implementing the proposed action. The Combined Options Alternative, developed through internal scoping, consultation with federal and state agencies and other entities, and public outreach, would satisfy the purpose and need of the proposed action. Other alternatives and alternative elements were considered during the NEPA process. This chapter also discusses alternatives that were considered but eliminated from detailed analysis.

2.1 Alternatives Development Process

The proposed terminal would be located in a 330-acre area on the southwest peninsula of Sparrows Point known as Coke Point (Figure 2). The proposed SPCT project would include construction of a terminal, channel improvements, and dredged material placement. The terminal is intended to accommodate ultra large container vessels (ULCVs); defined as vessels 1,200 feet long or longer with a minimum capacity of 14,501 TEUs (twenty-foot equivalent units). The term design vessel is used to refer to a representative ship as the basis for the planning and design of maritime structures, facilities, and navigational channels. This project is designed to accommodate design vessels with a capacity up to 23,000 TEUs. Dredging is required to deepen and expand the Sparrows Point Channel to allow these ships to safely access the proposed terminal, resulting in the need to include options for dredged material placement.

> **Twenty-foot equivalent unit (TEU)** is the standard unit of measurement used in the shipping and container industry to describe the capacity of cargo containers and container ships. One TEU represents the dimensions of a standard shipping container that is 20 feet long, 8 feet wide, and 8.5 feet high. It is used as a universal reference for cargo volume, allowing for consistent tracking of container sizes and ship capacities.
>
> **Ultra large container vessels (ULCVs)** are large cargo ships designed to maximize efficiency in transporting goods across oceans. ULCVs can carry more than 14,000 TEUs and exceed 1,200 feet in length and 200 feet in width.

TTT's objective for this project is to develop a state-of-the-art terminal in the Baltimore Harbor. The wharf for the terminal must be capable of hosting (i.e., berthing) two ULCVs at the same time. The wharf is being sized in anticipation of larger vessels calling at the Port should the Chesapeake Bay Bridge be redesigned and reconstructed with a higher clearance, as discussed in Section 1.1.2. Alternatives must support required terminal and vessel operations and meet safety requirements. Because the Sparrows Point Channel must be dredged to provide safe access for the ULCVs, alternatives for dredged material placement must accommodate the anticipated volume. The channel improvements would require the removal of approximately 4.2 MCY of dredged material. This would include approximately 330,000 cubic yards (CY) of slag that would be reused on site and 3.87 MCY of dredged material that would require appropriate placement. Finally, the alternatives should be available and capable of being completed, considering cost, logistics, and existing technology in light of the overall project purpose.

Figure 2. Terminal and Channel Improvements

TTT created an initial concept design for the proposed project in 2022 based on project objectives. This concept was reviewed, revised, and refined by TTT and their consultant team during 2023 and 2024. TTT determined (based on engineering and economic factors) the following minimum requirements of the terminal and associated facilities, access channel, and dredged material placement to meet TTT's objectives for the new facility.

Container Terminal Minimum Requirements

- Approximately 3,000 linear foot marginal wharf face.
- Capacity for up to nine STS cranes.
- Approximately 120-acre container yard with storage for approximately 50,000 containers with dedicated areas for storage of reefer and outsized cargo.
- Intermodal / rail yard loading zone with six working (loading and unloading) tracks served by up to four rail-mounted gantry (RMG) cranes with capability for double stacking rail cars.
- Gate entry complex for road transport, including inbound and outbound optical character recognition (OCR) lanes, remote operated inbound / outbound processing lanes, roadability station, truck holding area, and outbound radiation portal monitors.
- On-terminal buildings to improve efficiency of cargo moves through the port. These on-terminal facilities greatly reduce truck miles and air emissions associated with the movement of the goods once they arrive at the terminal.

Vessel Access Area Minimum Requirements

- Initial dredge depth of -50 feet mean lower low water (MLLW) to match the existing Brewerton Channel and Baltimore approach channels
- Two berths to accommodate ULCVs
- Berth face on the east side of Coke Point
- Turning basin adjacent to Brewerton Channel

> **Gantry cranes** are large, overhead cranes that consist of a bridge structure supported by two or more legs that move along rails or wheels. They are designed for lifting and transporting heavy loads and are essential for handling heavy loads in industrial settings.
>
> A **gate entry complex** is a secured access point that includes various components designed to control and monitor the entry and exit of vehicles, cargo, and personnel, enhancing security, ensuring compliance with regulations, and facilitating efficient operations within a facility.
>
> **Optical character recognition (OCR)** is technology used to automatically scan, recognize, and convert printed or handwritten text from images or documents into machine-readable data. In a terminal, OCR can identify and track cargo containers, vehicles, and other critical information in real-time, enhancing efficiency, and supporting better logistical management.

Dredged Material Placement Requirements

- The total estimate volume of dredged material for the project is 4.25 MCY
  - The total estimated volume of dredged material for channel improvements is 4.2 MCY.
    - The estimated volume of slag material is 330,000 CY (suitable for dike construction or as fill).
    - The estimated volume of silt and clay is 3.87 MCY (would require appropriate placement on-site or off-site).

- The total estimated volume of silt-clay overburden material that would be dredged for construction of the Coal Pier Channel dike is 55,000 CY (would require appropriate placement on-site or off-site).

2.1.1 Dredged Material Placement Alternatives Development and Analysis

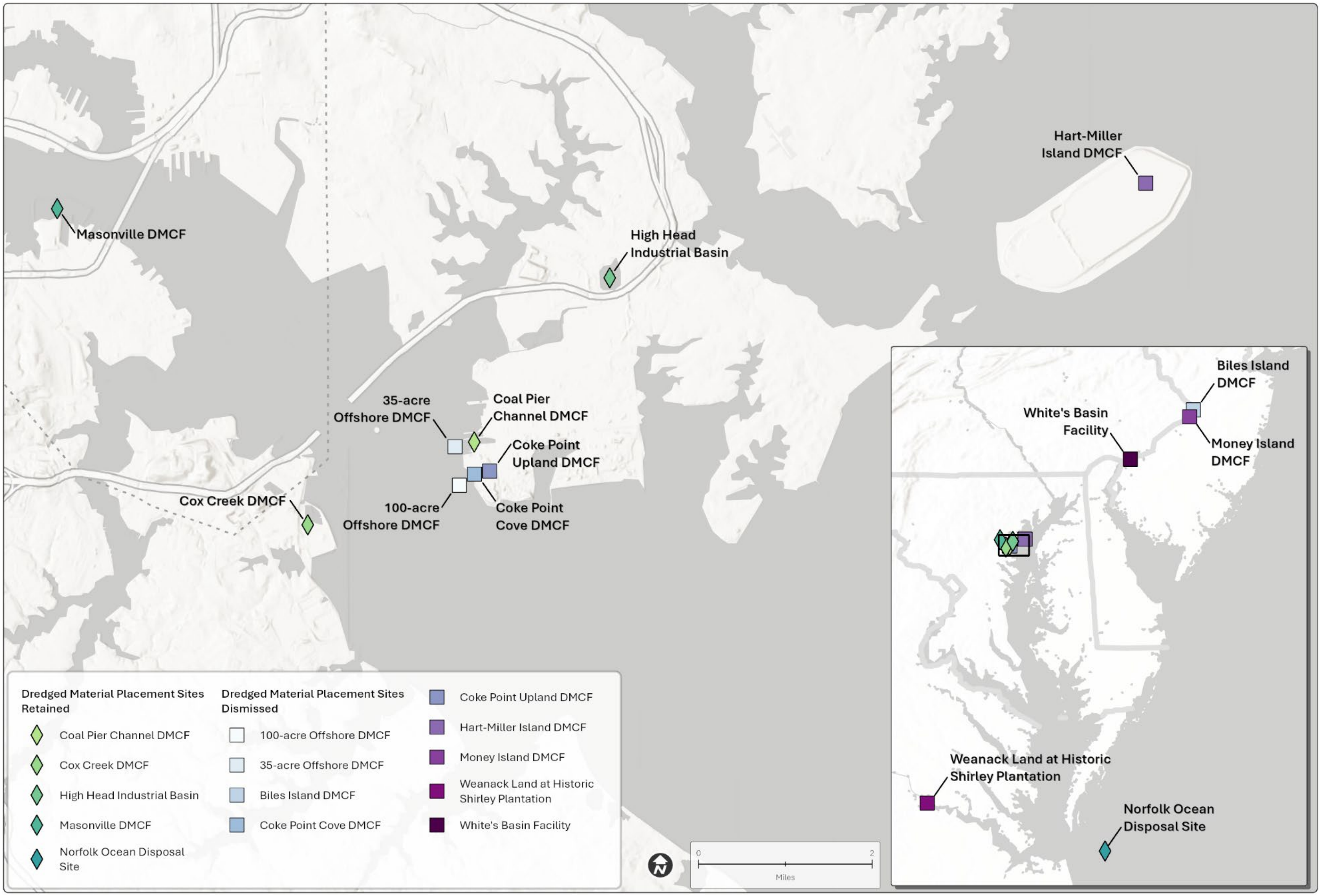
TTT initiated consultation regarding required federal and state permits on June 28, 2023, by presenting the proposed project to the Joint Evaluation (JE) Committee, which includes representatives from the Corps, USEPA, USFWS, NMFS, NMFS-Office of Protected Resources (PRD), NMFS-Habitat and Ecosystems Services Division (HESD), USCG, MDE, CAC, MDNR, MHT, BPW, and local agencies. During the meeting, TTT and the agencies discussed the need to analyze a range of potential dredged material placement options, consistent with permitting authority and natural resource protection objectives. The agencies expressed concern with TTT's initial proposal to create a 100-acre DMCF in the Patapsco River, which would result in the permanent loss of 100 acres of WOTUS. The agencies encouraged TTT to explore alternatives that would avoid or reduce this loss.

State law related to management of dredged material was considered by TTT during further development of the dredged material placement alternatives at a large redevelopment site. The Dredged Material Management Act of 2001 phased out the use of existing open water placement sites in the State of Maryland and prohibited future open water placement of dredged material in the Chesapeake Bay and tributaries within Maryland except for the following beneficial uses: restoration of underwater grasses; restoration of islands; stabilization of eroding shorelines; creation or restoration of wetlands; and creation, restoration, or enhancement of fish and shellfish habitats. The law specifies that dredged material from within Baltimore Harbor cannot be deposited in an unconfined manner within waters or bottomlands of the Chesapeake Bay and tributaries outside of Baltimore Harbor or within 5 miles of the Hart-Miller-Pleasure Island chain in Baltimore County. Baltimore Harbor dredged material, however, may be placed in contained areas approved by the MDE. Effective 01 July 2024, House Bill 343 was passed into law, and it authorized MDE to approve contained areas for the redeposit of dredged material on a large redevelopment site. The "redevelopment site" is specific to the TPA property.

TTT developed and evaluated other potential dredged material placement options and presented other identified options to the JE Committee at an August 30, 2023, JE meeting. Each option was evaluated based on capacity, engineering feasibility, cost, logistics, schedule, technology, potential environmental impacts, and maintenance requirements. Placement options considered included on-site upland placement at two locations on TPA property, in-water placement at two locations adjacent to Sparrows Point, off-site placement at previously approved upland sites or landfills, ocean placement, and use of existing MPA DMCFs.

The Corps considered the benefits and disadvantages of each dredged material placement option; see Figure 3 for locations of all dredged material placement options considered. Using the criteria described above, one action alternative that would use a combination of dredged material placement options was ultimately recommended for detailed analysis in this Draft EIS (Combined Options Alternative; see Section 2.2.2 and Figure 3). This alternative was the most feasible with the least environmental impacts for dredged material placement and also addressed concerns from the community. Section 2.2.2 describes the dredged material placement options that were evaluated but eliminated from detailed consideration in this Draft EIS.

Figure 3. Map of Dredged Material Placement Options Retained and Eliminated



2.1.1.1 Dredged Material Placement Alternatives Eliminated from Detailed Consideration

Dredged material placement options that are impractical or do not meet the project's purpose and need were eliminated from further consideration. Table 1 presents the details of the dredged material placement options considered, and the following sections provide rationale for eliminating options from consideration. One critical criterion for assessing placement options was their capacity to handle the expected volume of dredged material. Additionally, options were evaluated based on feasibility, considering cost, logistics, technology, and potential environmental impacts. All elevations discussed in this Draft EIS are relative to North American Vertical Datum of 1988 (NAVD88).

> **North American Vertical Datum of 1988 (NAVD88)** is a standardized vertical datum used in North America for measuring elevations above or below mean sea level. This datum is essential for mapping, surveying, construction, floodplain management, and other applications that require accurate elevation data.

Offshore DMCF with Perimeter Dike at Sparrows Point

The applicant's original proposed action was a new offshore 100-acre DMCF designed with a capacity of for the entire project in the Patapsco River on the west side of Coke Point. It would extend west into the river between 1,100 to 2,400 feet from the Coke Point shoreline. The current shoreline curves eastward from north to south, such that the northern end of the DMCF would be narrower and the southern end would be wider. This DMCF was originally identified as the proposed action for several reasons — it would provide a single solution for dredged material placement and the proximity to the dredging location would reduce impacts and costs associated with transporting dredged material to other approved DMCFs. This option would also serve to cap existing impacted offshore sediment and serve as a final remedy for the impacted sediment within the footprint of the DMCF.

The impacts of the 100-acre DMCF on resources within and near the project area were analyzed. The 100-acre DMCF would result in a permanent loss of 100 acres of tidal WOTUS and bottom habitat. All benthic organisms, which can serve as important prey to fish species, within the 100-acre footprint would be lost. The loss of the benthic organisms and permanent removal of 100 acres of bottom habitat would impact the local fish community, including federally listed sturgeon species. Construction of the dike would displace fish for the duration of construction, approximately 2 years. The 100-acre DMCF would also impact the viewshed for nearby communities and recreation opportunities and experiences for boaters on the Patapsco River. These impacts would be minimal but noticeable. Although the proposed 100-acre DMCF was deemed technically feasible and safe, a DMCF with three perimeter sides in the main stem of the river would have stringent maintenance and management requirements. Any proposed dike would be required to be reviewed, approved, and periodically inspected by MDE's Dam Safety Program.

Due to these impacts, TTT explored options for reducing the size and impacts of the offshore DMCF and developed the Combined Options Alternative. This alternative would require multiple elements to accommodate the dredged material associated with channel improvements. The Combined Options Alternative would include dredged material placement at the High Head Industrial Basin, an offshore DMCF with a perimeter dike at Sparrows Point, use of existing MPA DMCFs (Cox Creek and Masonville), and use of the NODS. TTT considered several options for the offshore DMCF element: a 35-acre DMCF and two smaller offshore DMCFs. The 35-acre DMCF with perimeter dike would encompass Coal Pier Channel and additional adjacent tidal WOTUS, and the two smaller DMCFs would be confined to Coke Point Cove and Coal Pier Channel, respectively.

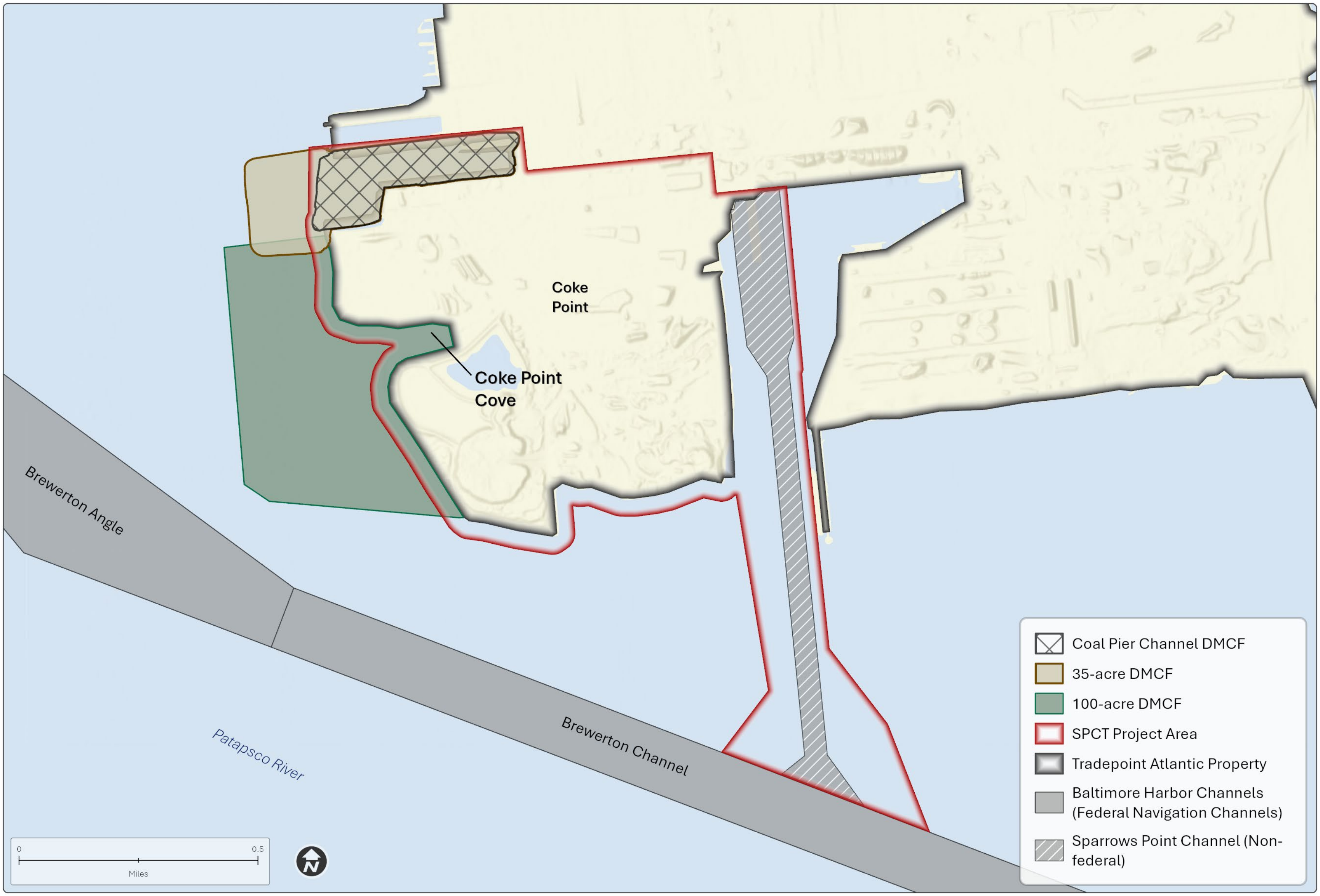
An important consideration to determine the needed capacity of the offshore DMCF was determining the volume of dredged material that could be placed at NODS or an MPA facility. An extensive effort was implemented to collect and analyze sediment data to make this determination. The results of sediment data collection and analysis were shared with regulatory agencies for their evaluation. The agency consultation confirmed that significant volumes of dredged material could be placed at NODS and an MPA facility. This determination made the Combined Options Alternative feasible, eliminating the need for the 100-acre DMCF.

Based on the analyses of the sediment data and evaluation of the volume of dredged material that could be placed at the MPA facilities, NODS and the High Head Industrial Basin DMCF, the applicant determined that the size of the offshore DMCF could be reduced even further to reduce the impacts on WOTUS. TTT determined that the full capacity of a 35-acre DMCF would not be needed and the offshore 35-acre DMCF was eliminated from further consideration.

TTT then examined the potential DMCFs at Coal Pier Channel and Coke Point Cove to determine the best option to meet the needs of the project. The Coal Pier Channel is a previously dredged access channel with degraded benthic habitat due to seasonal hypoxia (low dissolved oxygen) and impaired sediment quality due to multiple contaminants in surficial sediments that exceed threshold concentrations for aquatic life. The Coke Point Cove is a broad shallow cove with impaired sediment quality due to multiple contaminants in surficial sediments exceeding threshold concentrations for aquatic life; however, the area is less subject to seasonal hypoxia and provides habitat that is suitable to support benthic communities. Based on seasonal fish surveys conducted in 2023 and 2024, the Coke Point Cove provides refuge and benthic food resources for juvenile fish and forage fish. The Coal Pier Channel DMCF would provide more capacity for dredged material placement and would avoid impacting habitat within Coke Point Cove. For these reasons, the Coke Point Cove DMCF was eliminated from further consideration.

Based on this analysis, the Coal Pier Channel DMCF was selected as the offshore DMCF to be included in the Combined Options Alternative analyzed in this Draft EIS. The Coal Pier Channel DMCF would reduce the in-water impacts to approximately 19.6 acres, would eliminate the need to extend the Coke Point shoreline into the Patapsco River and would eliminate most impacts on viewshed and recreation. Additionally, a DMCF confined on three sides by an existing landmass would have simpler maintenance and management requirements. Figure 4 shows the footprints of the 100-acre, 35-acre, and Coal Pier Channel DMCF, demonstrating the reduction in the size of the proposed offshore DMCF during this process, and thus the reduction in impacts on WOTUS and other aquatic resources. The Coal Pier Channel DMCF is described in detail in Section 2.2.2.3.

Figure 4. Comparison of the Offshore DMCFs Considered for Dredged Material Placement



Hart-Miller Island DMCF

The Hart-Miller Island DMCF is an existing nearshore upland confined placement facility located in Baltimore County, Maryland that is owned by MDNR. Hart-Miller Island has been closed to dredge material placement since December 2009. However, in early 2024, TTT was approached by community members regarding the use of the Hart-Miller Island DMCF for possible dredged material placement. A community group supporting Hart-Miller Island restoration had identified the need for additional dredged material to complete restoration goals for the north cell on the island. The south cell of Hart-Miller Island has been developed as Hart-Miller Island State Park to support a variety of recreational opportunities, including camping, hunting in lottery-assigned waterfowl blinds, fishing, hiking, and wildlife viewing. The Hart-Miller Island DMCF has residual capacity in its north cell for dredged material but was legislatively prohibited from receiving dredged material as of 2010. Hart-Miller Island's North Cell is estimated to have approximately 8 MCY of capacity and could accommodate the entire 4.2 MCY of dredged material for the SPCT project, optimizing placement efficiencies.

TTT worked with the Maryland State Legislature to pass House Bill 343, "Environment – Dredged Material – Containment, Redeposit, and Oversight," which provided for the placement of dredged material from the SPCT project at the Hart-Miller Island DMCF on the condition that a Community Benefits Agreement (CBA) approved by the Baltimore County Council was in place by December 31, 2024.

TTT supported a public process led by Baltimore County with community leaders to explore the public's interest in entering into a CBA for the use of the inactive Hart-Miller Island DMCF North Cell for placement of approved dredged material from the Sparrows Point Channel. Community members served on a steering committee, established by Baltimore County, to consider a CBA. Baltimore County led these meetings which were open to the public. The decision whether to recommend the CBA to the County Council rested with the selected committee.

At CBA committee meetings in the summer and fall of 2024, community members shared concerns regarding potential environmental impacts and perspectives on the potential benefits of the CBA. The public engagement process revealed long-held community reservations regarding the use of Hart-Miller Island for the placement of dredged material, regardless of the current improved environmental standards for dredged material placement, implementation of modern technology, and the potential for economic and / or social benefits from a CBA. During this time, TTT was also engaged in discussions with the state agencies that operate Hart-Miller Island. These discussions raised significant concerns regarding the facility's readiness to accept dredged material. This timing uncertainty introduced considerable risk in achieving the dredged material placement schedule for the project.

TTT recognized that the risk associated with securing an approved CBA combined with the risk to the project schedule as a result of the facility's readiness made this alternative impracticable. On October 10, 2024, TTT announced that they had decided to withdraw from the process, expressing concern that the project could affect TPA's longstanding commitment to community partnerships. Because a CBA was not approved prior to December 31, 2024, the use of Hart-Miller Island for SPCT is no longer allowable by House Bill 343 and, therefore, is not considered a practicable alternative by the Corps.

Upland DMCF at Coke Point

This alternative would involve building a new DMCF on land at the western upland portion of Coke Point (Figure 3). The area would be enclosed with a perimeter containment dike system (approximately 2 miles in length and constructed with existing slag, gravel, and soil) with a crest elevation of +32 feet. This part of Coke Point includes an old landfill and a former DMCF. A significant amount of earthwork would be required to prepare the site for use as a placement area. This DMCF would have the capacity to hold approximately 3 MCY of dredged material.

Construction of this alternative would severely limit the constructability and available cargo and container storage space of the proposed SPCT. The viability of the terminal is reliant on the ability to efficiently move goods through the Port and into the adjacent markets. For markets greater than 200 miles away, this is generally achieved via rail connectivity. For markets less than 200 miles away, the on-terminal warehouse facilities are a key component in the efficient movement of goods. The location of the potential Coke Point upland DMCF is the only area in proximity to the terminal facilities for the buildings, which are an integral part of the project. Losing this location for the buildings would not allow the terminal to function in a way that meets the overall goals of the project. As such, this alternative was eliminated from further evaluation.

Other Land-Based Placement Sites

This alternative considered placing a portion of the dredged material at other existing and permitted DMCF sites in Virginia, Pennsylvania, and New Jersey (Figure 3):

- *Weanack Land at Historic Shirley Plantation* – This is a private disposal facility along the James River in Charles City, Virginia near and downstream from Richmond, Virginia. This private disposal facility uses dredged material to fill depressions left over from sand and gravel mining. The dredged material undergoes strict testing and acceptance criteria before placement to obtain regulatory approval and evaluate agronomic utility. Weanack is about 250 miles from the SPCT project area and is accessible by barge transit down the Chesapeake Bay and up the James River. Dredged material from the SPCT project area would be mechanically dredged, transported to the site, and then hydraulically pumped to the disposal site. The site does not currently have capacity to accept the entire volume of material that would be dredged and would require additional construction to accept material from SPCT. The long-haul distance, followed by hydraulic unloading of the scows (small barges) and placement of the dredged material would require a long cycle time. The limited number of scows available would cause further delays, resulting in extended cycle times for dredging that would extend the construction schedule. The long cycle schedule, plus additional construction cost made this site infeasible for schedule and economically unfavorable compared to other alternatives and was removed from further evaluation.
- *White's Basin Facility* – This is a private disposal facility along the Delaware River in Logan Township, New Jersey, located north of the Commodore Barry Bridge. The facility consists of a deposit basin where dredged material is placed and an adjacent upland facility for handling dredged material that is pumped out of the deposit basin. The facility is approximately 85 miles via water from the SPCT project site (through the Chesapeake and Delaware Canal). The White's Basin facility confirmed that it only accepts sandy material from external projects and that fine-grained dredged material, as would be generated by the SPCT project, would not be accepted at the facility. For this reason, this alternative was dismissed from further analysis.

- *Biles Island and Money Island* – These are two DMCF facilities on the Delaware River in Pennsylvania, approximately 130 miles from the project by water, through the Chesapeake and Delaware Canal. Acceptance of material is subject to passing testing criteria. Dredged material from the SPCT project area would be mechanically dredged, transported to the facilities, and then hydraulically pumped to the disposal site. The facilities do not have the capacity to accept the volume of material from SPCT. The long-haul distance, followed by hydraulic unloading of the scows, would require a long period to complete one trip. With a limited number of scows available, this would result in extended times for dredging. The extended time required made this site infeasible for schedule and economically unfavorable compared to other alternatives and was dismissed from further analysis.

Table 1. Summary of Dredged Material Placement Options Considered

Dredged Material Placement Options [1]	Existing or New	Elevation (NAVD88)	Capacity
Offshore 100-acre DMCF	New	+12 feet	4.2 MCY [3]
Offshore 35-acre DMCF	New	+12 feet	1.0 MCY
Coal Pier Channel DMCF (offshore) [2]	New	+15 feet	750,000 CY
Coke Point Cove DMCF (offshore)	New	+12 feet	190,000 CY
Upland Coke Point DMCF	New	+32 feet	3.0 MCY
High Head Industrial Basin DMCF [2]	New	+30 feet	1.2 to 1.7 MCY
Hart-Miller Island DMCF	Existing	+44 feet	8.0 MCY
Cox Creek DMCF [2]	Existing	+60 feet	14.8 MCY [4]
Masonville DMCF [2]	Existing	+30 feet [5]	10.4 MCY [4, 6]
Norfolk Ocean Disposal Site (NODS) [2]	Existing	N / A	1.57 MCY [7]

Sources: MDE 2000; Maryland DMMP 2023, 2024

Notes:

1 – Other land-based offsite dredged material placement sites (Weanack Land at Historic Shirley Plantation, White's Basin Facility, Biles Island, and Money Island) were initially considered but were dismissed early in the process. See below for more details on these options.

2 – Options included in the Combined Options Alternative and fully analyzed in this Draft EIS.

3 – Design would have accommodated all dredged material for the project, which would include the 4.2 MCY for channel improvements plus any dredging required for the 100-acre DMCF dike.

4 – Capacity for Cox Creek and Masonville represents total capacity. Of this total capacity, only 1.25 MCY cumulative for both facilities is available for the SPCT project.

5 – Construction is ongoing to raise the dike elevation from +18 to +30 feet with completion expected by the end of 2025.

6 – Capacity upon completion of the dike raising in 2025.

7 – Volume of material from the south segment of the Sparrows Point Channel that meets the requirements of Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA).

On-site Innovative Reuse

Innovative reuse of dredged material (silt and clay) on-site was considered. The Combined Options Alternative includes the use of slag material that is dredged or otherwise removed for this project, estimated to be approximately 330,000 CY. This alternative considered options for the reuse of silt and clay including:

- Re-processing dredged material by mixing with cementitious material for use on- and off-site
- Re-processing dredged material for the creation of lightweight aggregate

Innovative reuse is the practice of repurposing sediment removed from bodies of water (e.g., harbors, shipping channels) for beneficial uses rather than disposing of it as waste. This can involve transforming dredged material into resources for land reclamation, habitat restoration, construction materials, or environmental enhancement efforts.

For a number of reasons, including the inability to identify suitable markets and sites for innovative reuse of dredged material, low production rates (to make the material suitable for re-use), extensive time required to process material, and the infeasibility of stockpiling such volumes of material on-site, the alternatives that use re-processing (cementitious mixing and lightweight aggregate) are not considered viable for the large volume of dredged material generated by this project. Therefore, this alternative was eliminated from further evaluation as an option to address the total of 4.2 MCY of dredged material.

2.1.2 Terminal and Channel Improvement Alternatives Development and Analysis

TTT also considered alternative configurations and layouts for the terminal and channel improvements. Criteria for this analysis included providing necessary functional requirements, ensuring navigational safety, minimizing the quantity of dredged material generated and the in-water footprint for dredging, and providing safe and efficient terminal operations. Design of the features for the terminal and channel improvements include the following:

- *Channel Design* – Geometric assessments were performed for turning basin, approach channel, berth pocket, and channel transition areas. Although the proposed channel improvements are not proposed for a Federal navigation channel, the channel and turning basin widths were developed based on the Corps' Engineer Manual 1110-2-1613, Hydraulic Design of Deep-Draft Navigation Projects and World Association for Waterborne Transport Infrastructure (PIANC) guidelines for deep draft navigation design. The recommended widths calculated from Corps and PIANC resulted in channels wider than proposed for Sparrows Point Channel, which would result in relatively high volumes of dredging. Engineering Manual 1110-2-1613 notes that "simulator studies have consistently showed that it is possible to control ships sailing in quite narrow channels and that the available Corps and international design criteria are overly conservative." To develop the requirements for the channel, TTT started with a channel width that was at the low end of the recommended channel width and used numerical vessel simulation studies to evaluate alternative widths and alignments to optimize the alignment, ensure safe operations, and minimize generation of dredged material. Simulations were performed with the Association of Maryland Pilots to evaluate and optimize the channel design. Based on the simulation results, the minimum width of the proposed channel is approximately 450 feet (2.3 times design vessel beam), and the minimum width of the turning basin is approximately 1,650 feet (1.25 times length of the design vessel) with additional width in transitional areas. Channel wideners would be included along the existing finger pier and adjacent to the proposed SPCT north berth.

A **channel widener** expands the width of an existing channel or widens the intersection of two existing channels to allow for safe and efficient passage of vessels through waterways, ports, and harbors. The construction of a widener is accomplished through dredging.

- *Berthing and Mooring* – Berthing and mooring analyses were performed to ensure the safe accommodation of container ships at berth. Wind speed and direction, vessel approach angles and velocities, tug assistance, mooring arrangements, and numerous other factors were assessed to provide appropriate fender and vessel mooring systems designs at the wharf.

Following evaluation of the benefits and disadvantages of multiple wharf design options, TTT proposed one action alternative for terminal development and channel improvements to be analyzed in this Draft EIS (Combined Options Alternative; see Section 2.2.2). The following section presents the options for wharf design that were considered but eliminated from further consideration.

2.1.2.1 Wharf Design Alternatives Eliminated from Further Consideration

TTT considered alternative configurations and layouts for the terminal development. Criteria for this analysis included providing necessary functional requirements, ensuring navigational safety, minimizing the quantity of dredged material generated and the in-water footprint for dredging, and providing safe and efficient terminal operations.

Solid-Type Marginal Wharf

A solid-type marginal wharf was considered, involving the use of a high-modulus steel sheet pile structure located near the face of the wharf. This structure option would eliminate the need for establishing a revetment slope beneath the wharf and instead would essentially be configured as a closed-wharf fill structure. A wide, pile-supported relieving platform would be provided behind the bulkhead, and a large pile-supported deadman would be provided to resist lateral loads imparted on the wall system.

A solid-type marginal wharf encroaches on the waterway and creates a greater degree of bottom disturbance than the open-type wharf option because any open water beneath a solid-type wharf would be enclosed and likely filled, resulting in a larger permanent loss of habitat. Additionally, based on the geotechnical conditions, the driving of sheets to construct a solid-type wharf presents significant constructability concerns based on the required depth. Further, during design, the solid-type marginal wharf was identified as more costly than an open-type structure. Because there are constructability concerns, it is more costly, and would result in greater environmental impacts, this alternative was eliminated from further consideration.

Marginal Wharf Without Dolphins

A wharf without dolphins was considered, but TTT determined that this design would have greater impacts on WOTUS and other resources than a wharf with mooring dolphins. A shorter wharf with mooring dolphins can provide the STS crane travel necessary to access containers stacked on vessels and mooring points beyond the bow and stern of moored vessels. A wharf without mooring dolphins would have to be longer to perform the same functions, and the longer length would result in greater impacts on WOTUS and associated resources. For this reason, this option was eliminated from further consideration.

2.2 Alternatives Carried Forward for Analysis

2.2.1 No-action Alternative

The No-action Alternative would be a continuation of current property and land management at Sparrows Point and would not include the development of a new terminal and associated facilities. Previously developed areas within the site are undergoing demolition and razing of structures. This effort and efforts to remediate impacted upland soil and groundwater associated with previous site use would continue under the No-action Alternative. TPA, as the property owner, would likely develop Coke Point for some other future commercial, industrial, or marine-related uses, consistent with the existing development plan for the entire TPA property.

The Sparrows Point Channel is currently used for shipping activity and periodic maintenance dredging of the channel is required. In 2017, TPA received a commitment letter from MPA for placement of dredged material from maintenance dredging activities at the Port at MPA facilities. This commitment allows placement over a 10-year period, ending in 2028. Maintenance dredging and material placement would continue under the No-action Alternative. TPA has an active permit for ongoing dredging activities.

The **National Pollutant Discharge Elimination System (NPDES)** is a regulatory program established under the Clean Water Act of 1972 and administered by the US Environmental Protection Agency (USEPA) and authorized by state environmental agencies. It is a permitting system that regulates point sources (specific, identifiable, and discrete locations from which pollutants are discharged) of water pollution. The program's primary goal is to control and minimize the discharge of pollutants into surface waters to protect water quality and public health.

The High Head Industrial Basin is located in the northern portion of the TPA property. This industrial basin currently accepts treated wastewater from the Back River Wastewater Treatment Plant before it is pumped through a discharge pipe to an outfall in Bear Creek; however, independent of the SPCT project, Baltimore City will be ending this use in the near future, and the wastewater will be diverted to bypass the basin. As with other areas within the TPA property that are undergoing change and being developed for future use, the High Head Industrial Basin would likely be filled in and the area repurposed in the future. Development of the High Head Industrial Basin would be designed so stormwater would be rerouted to discharge to the same location (Bear Creek outfall). Modifications would occur under the existing National Pollution Discharge Elimination System (NPDES) permit.

2.2.2 Combined Options Alternative (Proposed Action)

2.2.2.1 Terminal Development and Channel Improvements

The proposed designs for the terminal and channel improvements would achieve the project goals, would be sufficient to support future use of the terminal as a primary entry for the Port, and would meet the necessary safety standards and engineering requirements. These components are described below.

- *Dredging* – The Sparrows Point Channel would be widened and deepened using mechanical means (clamshell bucket or excavator) to provide design vessel access to the terminal, and the channel entrance would continue to connect to the Brewerton Channel (federal navigation channel). Currently, the Sparrows Point Channel includes an approach channel permitted to a depth of -42 feet MLW (29.6 acres), a turning basin and berthing area permitted to a depth of -42 feet MLW (48.1 acres), and an access channel and berthing area permitted to a depth of -47 feet MLW (53 .6 acres) (Figure 5, left panel). For the channel improvements, the entrance to the Sparrows Point

Channel, which is adjacent to the Brewerton Channel, would be widened from approximately 1,075 to 2,110 feet to create a turning basin approximately 1,650 feet in diameter. The channel would then gradually transition northward to a channel width of approximately 450 feet and widen again adjacent to the proposed wharf to a width of approximately 750 feet. The northern channel endpoint would taper to a width of approximately 600 feet. Figure 5 (right panel) illustrates the channel improvements and final dimensions.

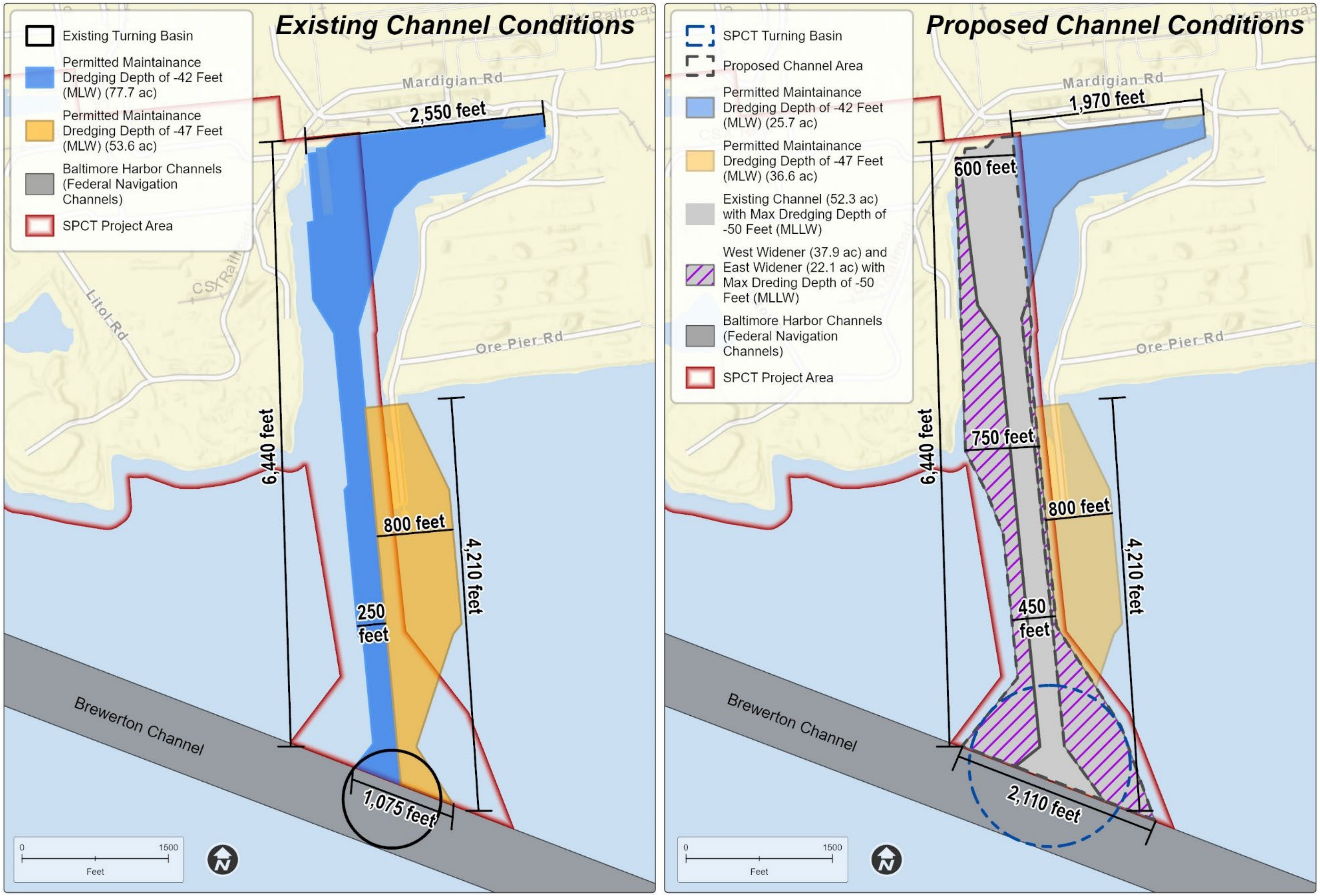
The design vessels would require a minimum berth pocket width of 250 feet adjacent to the channel. Based on the vessel simulations, additional width was added to provide passing clearance between the existing finger pier and the SPCT berth face. To provide additional passing distance while minimizing additional dredged material volume, the berth face would be angled such that the dredging of the berth and channel is wider at the southern end of the terminal and tapers to the north. The navigable depth would be -50 feet MLLW. The maximum proposed dredging depth would be -50 feet MLLW plus -2 feet of over depth allowance. The project would require approximately 4.2 MCY of dredging to meet the required design width and depth for the vessels.

> A **turning basin** is an area in a harbor or waterway where ships can safely turn around without risk of grounding or collision.
>
> The **berth pocket** is a dredged or excavated area adjacent to a dock where a ship can moor. It provides the necessary depth for vessels to berth safely, allowing for loading and unloading of cargo or passengers.
>
> The **berth face** is the vertical portion of the wharf structure that supports mooring devices and energy-absorbing fender systems, which accommodate vessels at berth. The design and construction of the berth face are crucial for ensuring the safety and stability of ships during their stay at the port.

Following construction, maintenance dredging of the Sparrows Point Channel would be required. Approximately 112.3 acres would be maintained to a depth of -50 feet MLLW, 36.6 acres would be maintained to a depth of -47 feet MLW, and 25.7 acres would be maintained to -42 feet MLW. It is anticipated that maintenance dredging would be required on average once every 10 years with an estimated volume of approximately 125,000 CY. Maintenance dredging of the improved Sparrows Point Channel would be incorporated into the overall TPA dredging plan under the existing MPA commitment letter that is currently valid until 2028. The SPCT project would increase the TPA maintenance dredging volume by approximately 26% over a 10-year period.

- *Slag Material* – Approximately 330,000 CY of slag would be excavated and dredged along the east side of Coke Point to construct the wharf. Some of this material would likely be removed by a backhoe or hydraulic excavator that is positioned upland. Any material that the backhoe or hydraulic excavator cannot reach would be removed by way of dredging with a clamshell bucket on a barge. The slag would be used on-site for fill or potentially used for dike construction for an on-site DMCF.

Figure 5. Existing Conditions and Proposed Sparrows Point Channel Improvements



- *Marine Structures* – Marine structure design includes an open-type (steel pipe pile-supported) marginal wharf structure, consisting of a steel sheet pile cutoff wall and steel pipe pile-supported relieving platform. Piles for the relieving platform would be located on land, not in-water. Pile-supported mooring dolphins would allow for safe mooring and minimize the length of the wharf. The mooring dolphins, accessed by short catwalks, would be placed at each end of the wharf structure, providing a mooring point for vessel bow and stern mooring lines. Piles for the mooring dolphins and wharf would be located in-water. The wharf would serve as a platform for vehicles that receive containers offloaded from vessels. The wharf would also support the STS cranes, fender devices, crane, and vessel (shore power) electrical service, and ancillary equipment and safety devices.
- *Vessel Size and Wharf Length* – The proposed design considered the size and number of vessels that would call at the terminal, both simultaneously and each year. The design provides a wharf with a total length of approximately 3,000 feet, sufficient for accommodation of two ULCVs with capacity up to 23,000 containers. The design would allow the wharf to host two ULCVs at the same time, in anticipation of larger vessels calling at the Port should the Chesapeake Bay Bridge be redesigned and reconstructed with a higher clearance, as discussed in Section 1.1.2.

> A **cutoff wall** is a vertical barrier constructed into the ground to block or control the movement of water, often built as part of marine or waterfront structures like wharves.
>
> A **relieving platform** is a horizontal structural element designed to distribute the load of the wharf across a larger area of the underlying soil or substructure, thus "relieving" excessive pressure.
>
> **Mooring dolphins** are specialized structures used in ports and harbors to assist in the mooring (securing) of ships, providing a place where ships can be securely tied. Mooring dolphins keep the vessel in position and prevent it from drifting due to currents, tides, or wind.
>
> A **revetment** is a sloped structure designed to absorb and reduce the energy of waves or flowing water, protecting the shoreline from erosion rather than preventing soil movement.
>
> A **bulkhead** is a vertical retaining wall designed to prevent land from eroding or collapsing into the water. It retains soil and protects the shoreline or waterfront property from wave action and tidal forces.
>
> **Empty container handlers or reach stackers** are specialized types of forklifts used primarily in shipping ports, terminals, and logistics yards for handling empty shipping containers.

- *Elevation* – Currently, the Sparrows Point peninsula (approximately 3,300 acres) is 93.9% above the 100-year floodplain and 93.7% above the 500-year floodplain. Although Coke Point is in an area of minimal flood hazard, long-term sustainability was considered in the design of the proposed terminal. The wharf top deck elevation was established at +14.0 feet based on analysis of future sea level rise and storm surge frequency[2] to provide less than 1% probability of one or more flood exceeding the deck elevation through the year 2100.
- *Revetment* – Establishing the navigation channel and berth pocket depth to an elevation of -50 feet MLLW would require a sloped grade transition between the design dredge depth and the proposed bulkhead beneath the wharf and to proposed final grades land side of the wharf. The proposed grade transition would be accomplished using a 2.5 (horizontal) to 1 (vertical) slope. The established

[2] Sea level rise was analyzed using the K14 Representative Concentration Pathway (RCP) 8.5 emissions scenario. RCPs are a set of scenarios developed by the Intergovernmental Panel on Climate Change to represent different possible trajectories of greenhouse gas concentrations in the atmosphere. RCP8.5 is a high-emissions scenario that is frequently referred to as "business as usual," suggesting that is a likely outcome if society does not make concerted efforts to cut greenhouse gas emissions. Storm surge frequency was based on the Corps *North Atlantic Coast Comprehensive Study* (Corps 2015), a comprehensive assessment to examine the risks and vulnerabilities associated with coastal storm and flood hazards along the North Atlantic coast of the United States.

slope would be armored with heavy stone (riprap) to provide slope stabilization and protect against wave action, propwash, and other erosive forces.

- *STS Cranes* – Based on vessel size and the (up to) 23,000-container capacity of each vessel, up to nine STS cranes would be used for the efficient unloading and transfer of containerized cargo.
- *Container Yard* – The container yard would provide temporary storage of containers offloaded from vessels with a capacity of approximately 50,000 containers, including conventional, refrigerated, and empty boxes. Containers would be stored in blocks up to six containers high (approximately 50 feet). The container yard would receive containers by way of terminal tractors / chassis, which are offloaded and stacked using rubber-tired gantry (RTG) cranes. Empty containers would be handled and stacked using empty container handlers, more commonly called reach stackers.
- *Intermodal / Rail Yard* – A rail-based intermodal container transfer facility would be configured six train tracks wide, served by RMG cranes (cranes that operate on the train track), lifting the containers from terminal tractors / chassis and placing them, stacked two containers high, on rail cars. This facility would link into the existing rail system on the TPA property.
- *Pavements* – A variety of pavements are proposed for the terminal areas. Generally, more than 95% of the terminal area would be paved and considered impervious to infiltration. The remaining (less than) 5% of surface area (typically at electrical substation and equipment locations) would receive a dense graded aggregate surface underlain by geotextile fabric.
- *Drainage* – Through the redevelopment of the 3,300-acre Sparrows Point peninsula, TPA worked with Baltimore County to develop a sitewide stormwater management strategy, which includes the construction of a regional wet pond stormwater facility on the site. This facility provides approximately 5.5 million cubic feet of water quality treatment for 946 acres of impervious area, including nearly 300 acres of the adjacent community. Additionally, prior to the runoff being pumped into the regional wet pond, a pre-treatment volume of approximately 2.4 million cubic feet will be provided within the existing Tin Mill Canal. With the construction of this facility, which is in progress, TPA and Baltimore County have agreed to a credit system for future projects so that individual stormwater management is not required on a project-by-project basis. See Figure 6.

  The SPCT project would not provide on-site treatment of stormwater but would be part of the credit system for the regional stormwater facility. Site drainage would be accomplished using gently graded paved surfaces (less than 2% slope) that direct sheet flow to trench drain collectors. Stormwater collected would be routed by way of lateral drains to pipe culverts for discharge. All drainage systems are proposed as gravity-based, and there are no proposed provisions for pumping, storage, or other stormwater management systems.
- *Terminal Buildings* – Three buildings are proposed at the terminal to provide space for administrative functions and maintenance and repair. Shallow concrete footings would likely be used as foundations, and the building peak for the maintenance building, the tallest proposed terminal building, would be a maximum of 55 feet above finished grade.
- *Warehouse Buildings* – Two warehouse buildings are proposed for the area west of the terminal for temporary storage of items shipped to the terminal prior to transfer offsite. Shallow concrete footings would likely be used as foundations, and the building peaks would be a maximum of 50 feet above finished grade.

Figure 6. Stormwater Management on Tradepoint Atlantic Property (Construction in Progress)

- *Civil / Site Utilities* – Civil / site utility design features would include potable water and sanitary sewer to the two buildings, fire protection water throughout the site, and natural gas to the four emergency generators provided on-site.
- *Lighting* – Lighting design for the terminal would be accomplished using high mast lights, spaced approximately 400 feet apart with a proposed height of 120 feet above finished grade. Each high mast light would be equipped with a multi-fixture luminaire, directed downward, and shielded to minimize both spill light and glare. Lighting level would be as required by the Illuminating Engineering Society guidelines and Occupational Safety and Health Administration standard 29 CFR 1917 "Marine Terminals." Active transfer point work areas, including areas of the wharf, container yard, and intermodal / rail yard, would be illuminated at an average minimum of 5 foot-candles. Other working areas require an average minimum illumination level of 1.0 foot-candles. Security lighting, where provided, would be designed for a minimum of 0.5 foot-candles.
- *Ancillary Equipment* – The terminal would be equipped with a variety of equipment and associated facilities to support operations.
- *Electrical Systems and Service* – The design would include the supply of electricity to all electrified operating equipment, as well as provision of infrastructure for future electrical equipment. The design would also include the supply of shore power for vessels at berth. The electrical systems would include electrical substations, switchgear, conduits, conductors, grounding systems, and all associated electrical equipment. Communication and control systems would be located throughout the terminal.
- *Security* – Site security would be provided throughout the terminal to meet Maritime Transportation Security Act and International Ship and Port Facility Security Code standards. Perimeter fencing would be established to prevent unauthorized access to the site. Internal fencing would be provided to segregate privately owned vehicle (POV) parking areas from the operations. Gated access would be provided for trucks entering and leaving the site. Remote observation via closed-circuit television equipment provided throughout the site would allow the monitoring of the terminal for operational and security needs.

2.2.2.2 Construction Methods and Logistics

In-water Demolition

Prior to initiating in-water work, some demolition would be needed to remove existing structures along the area of the proposed wharf. In-water demolition would be completed using mechanical methods and expected to last approximately 30 calendar days. Existing structures along the west and north sides of the existing wharf would need to be demolished before work could begin.

Dredging

Dredging would occur as designated by potential time-of-year restrictions required to protect aquatic life, which would be determined through consultation with NMFS and MDNR. Dredging would be staged to align with construction phasing and would also be guided by dredged material placement. The total dredged material volume for channel improvements and terminal development would be approximately 4.2 MCY. Dredging would be performed mechanically using water-borne equipment, a clamshell bucket, and landside equipment, where possible and practical. Permits for this project would include stipulations to reduce potential impacts and protect environmental resources. A list of anticipated permits and approvals is included in Appendix A. Additional Best Management Practices (BMPs) and environmental controls could also be implemented based on site conditions (see Section 3.2).

Dredging of the wharf area would occur after the completion of the bulkhead installation and relieving platform. The first step would be to mechanically excavate in-water slag material from the landside, where practical. The slag would be placed into trucks and transported to a designated on-site stockpiling location for reuse as fill or for dike construction. The remaining slag would be dredged using water-borne equipment, as necessary. The slag would be placed into scows, transported to shore, mechanically offloaded into trucks, and transported to a designated on-site location for stockpiling and reuse. Dredging of the silt and clay material underneath slag would be performed using water-borne equipment, a clamshell bucket, and landside equipment, where possible and practical. The silt and clay material would be placed into scows and transported to the appropriate DMCF (see Section 2.2.2.3).

The silt and clay material would be mechanically dredged using water-borne equipment and a clamshell bucket, then transported to the appropriate DMCF.

Marginal Wharf

Construction of the marginal wharf would require a prescriptive sequence of construction:

1. The bulkhead and pile-supported relieving platform would be constructed before the excavation and dredging that would be conducted to establish the revetment slope beneath the marginal wharf. This would include upland excavation at the platform location.
2. Open wharf foundation piles would be installed after the completion of underwater excavation and dredging that would be conducted to establish the revetment slope.
3. Riprap would be installed after the installation of the open wharf foundation piles.

2.2.2.3 Dredged Material Placement Options

To provide vessel access to the wharf, the project would require dredging and placement of an anticipated 4.2 MCY of dredged material for the required widening and deepening of the existing Sparrows Point Channel, including the turning basin. Additionally, Figure 3 presents the locations of the dredged material placement options. The Proposed Action would include multiple options for dredged material placement:

- High Head Industrial Basin DMCF (located on TPA property)
- Coal Pier Channel DMCF (located at the mouth of the Coal Pier Channel along the west shoreline of Coke Point)
- Existing nearshore MPA DMCFs (Cox Creek located in Anne Arundel County or Masonville DMCFs located in Baltimore City)
- Ocean placement at the NODS (located in the Atlantic Ocean)

To determine if dredged material could be placed at NODS or an MPA facility, an extensive effort was implemented to collect and analyze sediment data. Results of this effort were shared with regulatory agencies for their evaluation. Following this consultation, TTT determined that approximately 1.57 MCY of dredged material from the south segment of the Sparrows Point Channel could be placed at NODS. In a 2024 commitment letter for the SPCT project, MPA committed to placement of up to 1.5 MCY of dredged material that complies with MPA requirements at an MPA facility over a 4-year period.

High Head Industrial Basin DMCF

The existing High Head Industrial Basin is located approximately 2.5 miles northeast of the project area within the TPA property. The impounded area of the industrial basin currently covers 38.7 acres with a surface elevation of approximately +7.0 feet that is maintained by an existing pump house. Ground elevations around the periphery of the reservoir range from +8 to +12 feet. A DMCF constructed at this location would have the capacity to hold 1.2 to 1.7 MCY of dredged material with the exterior dike elevation of approximately +30 feet. The High Head Industrial Basin DMCF is presented in Figure 7.

Construction Methods and Logistics – Material for the dike construction would be excavated from within the SPCT project area and would consist of common borrow material sourced from existing land and stockpiles from elsewhere on TPA property. The outboard dike slopes would be seeded with native plant species after construction to prevent erosion.

The stability of the containment dike could be affected by the existing soil conditions. These geotechnical considerations could require additional time to allow for consolidation and strength gain. Consideration must also be given to settlement of the dikes.

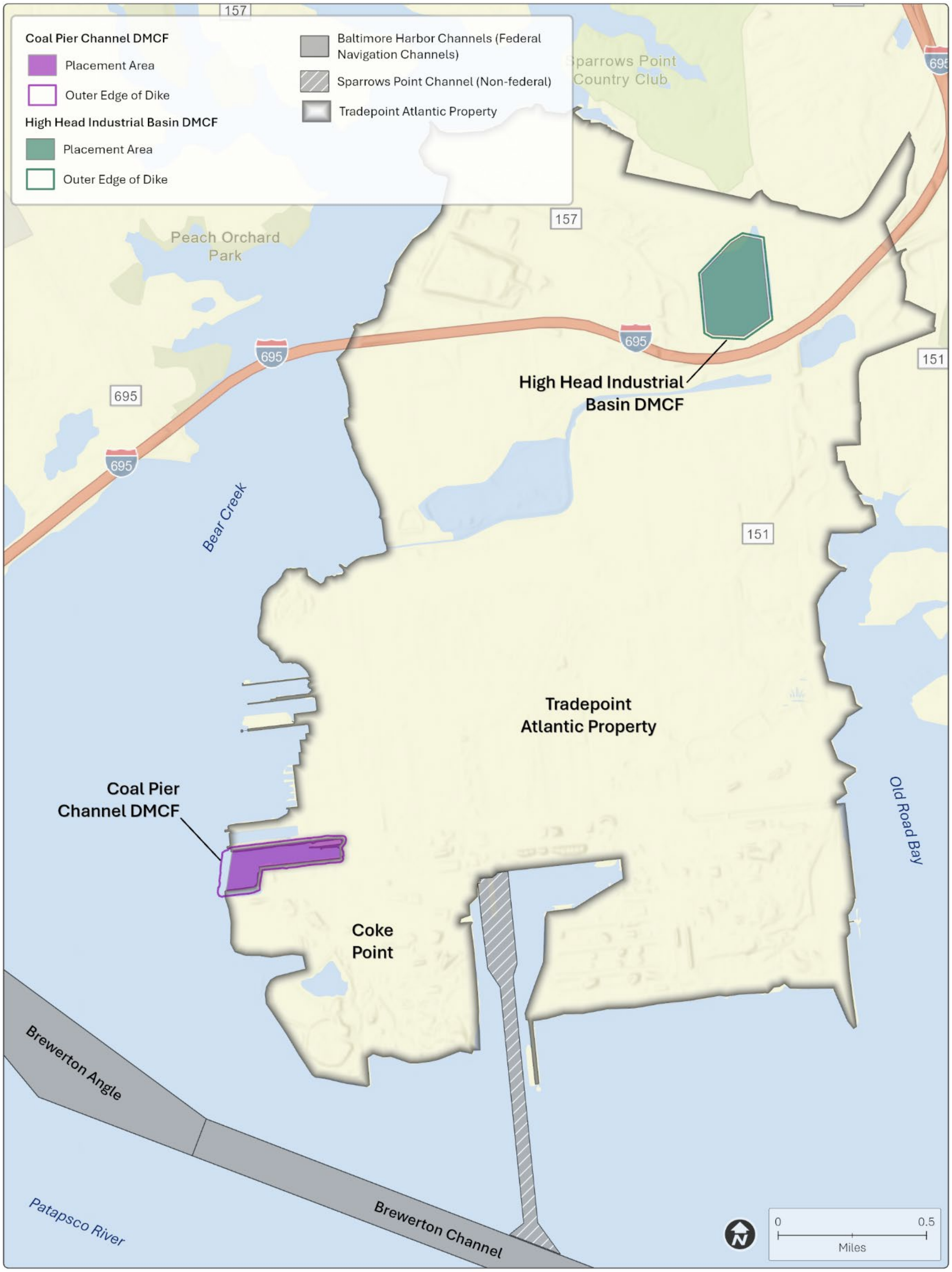
Effluent treated by the Back River Wastewater Treatment Plant currently flows into the High Head Industrial Basin, which is then pumped through a discharge pipe to an outfall in Bear Creek. Baltimore City has a project currently in the design phase to divert this effluent to bypass the basin. It would be necessary to coordinate the alignment of the diversion pipes so that settlement of the DMCF dikes would not cause lateral displacement of the pipe. Modifications would occur under the existing NPDES permit.

The storm drain systems from the developed areas on the east and west sides of the High Head Industrial Basin drain into the basin. It would be necessary to construct a storm drain diversion system along each side of the basin to intercept these drains and then convey runoff to the existing 60-inch culvert under the Baltimore Beltway / Interstate 695 (I-695) located in the southeast corner outside the basin. As noted in Section 2.2.2.1, there is a site-wide stormwater management system being constructed on the TPA property that includes the Tin Mill Canal and a regional wet pond stormwater facility. The drainage pipes at High Head Industrial Basin would tie into this system prior to discharge to tidal waters.

Dredged Material Transport and Placement – Dredged material would be placed in a scow and transported to the west side of Sparrows Point. It would then be hydraulically pumped from the scow through a flexible pipeline along the Tin Mill Canal into the High Head Industrial Basin DMCF. Water would be added to the dredged material to facilitate hydraulic pumping. This added water would be recycled back from the DMCF to the unloader, limiting the volume of water needed for pumping, but additional water from the Patapsco River may be needed. After placement is complete, the dredged material would be properly managed to dewater, dry, and consolidate the material. Recycling water during pumping would also reduce the volume of water discharged from the DMCF to a permitted outfall.

Dredging would be performed in three phases, and each phase would take approximately 1 year to allow for optimal dewatering and consolidation of the placed material. The volume of dredged material placed into the DMCF for each phase would be appropriate for the DMCF capacity at the time of placement. As noted above, the DMCF is constructed in phases and the material would similarly be placed in phases corresponding to construction. Material placement would not exceed the allowable elevation of the DMCF and would maintain a minimum of 2 feet of freeboard.

Figure 7. High Head Industrial Basin and Coal Pier Channel DMCFs



Timeline – Construction of this alternative to an elevation of +30 feet would require approximately 7 months. Dredging and placement into the facility would be performed in phases over 3 years. After placement of dredged material is complete, drying and consolidation of the material would take 5 to 10 years. The DMCF would then be capped (approximately 2-year period) and managed for industrial use.

Coal Pier Channel DMCF at Sparrows Point

The Coal Pier Channel is an existing in-water channel that was historically used for coal barge unloading for Bethlehem Steel Mill. A new offshore DMCF would be created by constructing a water-side berm across the mouth of the existing Coal Pier Channel to provide placement capacity for dredged material (Figure 7). The DMCF would permanently fill approximately 19.6 acres of tidal WOTUS. Placement of dredged material in WOTUS would require compliance with all required federal, state, and local permits.

Construction Methods and Logistics – A sand dike would be constructed across the mouth of the channel to provide a containment area for dredged material. This sand dike would be built to an elevation of +15 feet and have a 3 (horizontal) to 1 (vertical) side slope protected with riprap. It would be constructed on sufficiently firm foundation material. Coal Pier Channel has been dredged often for historical use and the existing sediment is anticipated to consist of a soft surface layer approximately 4 feet in thickness underlain by consolidated sand. The soft overburden material (approximately 55,000 CY) would be dredged along the dike alignment prior to initiation of dike construction. This material would increase the total volume of material to be placed to 4.25 MCY. Because the soft overburden material would be removed from the dike alignment, it is not likely that sediments would be displaced, creating a mud wave during dike construction. BMPs for in-water construction (such as those described in Section 3.2) would be used where practicable and necessary to minimize the resuspension of sediment and contaminants to the water column during in-water placement of dike construction material.

The DMCF would be constructed in phases. The height of the upland perimeter dike would vary between 2 and 7 feet above grade, depending on the adjacent topography, and would be constructed to an elevation of +15 feet. As noted in Section 2.2.2.1, a vast majority of the Sparrows Point peninsula is above both the 100-year and 500-year floodplains, and future sea level rise and storm surge frequency were considered in the design of the Coal Pier Channel DMCF. The estimated capacity of this placement area is 750,000 CY.

Dredged Material Transport and Placement – Dredged material would be mechanically placed into scows, transported to an offloading location, and hydraulically pumped into the Coal Pier Channel DMCF. The water that is mixed with the sediments for hydraulic offloading into the DMCF would be recirculated / recycled back to the unloader and used for the continued pumping operation to reduce the amount of additional water needed, but additional water from the Patapsco River may be needed. Recycling water during pumping would also reduce the volume of water discharged from the DMCF to a permitted outfall.

Dredging would be performed in two to three phases, and each phase would be approximately 1 year apart to allow for optimal dewatering and consolidation of the placed material. The volume of dredged material placed into a DMCF for each phase would be appropriate for the DMCF capacity at the time of placement. Material placement would not exceed the allowable elevation of the DMCF and would maintain a minimum of 2 feet of freeboard.

Timeline – Construction of this DMCF would require approximately 7 months. Dredging and placement into the DMCF would be performed in phases over 2 to 3 years. After placement of dredged material is complete, drying and consolidation of the material would take five to ten years, then the DMCF would be capped (approximately 2-year period). Long-term use of this area would be determined through consultation with the state.

Existing Nearshore MPA DMCFs

Masonville and Cox Creek DMCFs (Figure 3) are two existing nearshore upland confined placement facilities that are owned, operated, and maintained by the Maryland Department of Transportation (MDOT) MPA.

The Cox Creek DMCF is located in northern Anne Arundel County, Maryland. The facility receives dredged material from the Baltimore Harbor channels west of the North Point-Rock Point line. These sediments require placement in a contained facility by the Maryland Dredged Material Management Act of 2001. The current capacity of the Cox Creek DMCF (with the recently completed dike expansion to +60 feet) is estimated to be 15.3 MCY.

The Masonville DMCF is located in South Baltimore, northwest of the Baltimore Harbor Tunnel toll plaza (Interstate 895 [I-895]), in the Fairfield area. The Masonville DMCF covers 141 acres with a current capacity of approximately 6.2 MCY.

In a 2024 commitment letter for the SPCT project, MPA committed to placement of up to 1.5 MCY of dredged material that complies with MPA requirements at an MPA facility over a 4-year period.

Construction Methods and Logistics – This placement option would not involve construction, only transport of the SPCT dredged material to either permitted MPA DMCF. Dredged material would be placed in a barge or hopper and transported to the DMCF, where it would be hydraulically unloaded.

Timeline – There would be no time required for construction. An approved volume of material would be dredged every year for placement into the facility.

Existing Ocean Disposal Site

The NODS is a designated offshore disposal area for placement of dredged material located in the Atlantic Ocean, approximately 17 miles from the entrance to the Chesapeake Bay off the Virginia coastline (Figure 3). The NODS is approximately 50 square nautical miles in size (40 CFR Part 228) and has unlimited capacity for dredged materials that meet the ocean dumping criteria. NODS is jointly managed by the Corps and USEPA. Use of this site is subject to the approval by USEPA under the authority of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, and the Corps is the federal agency that would issue the permit authorizing the transport of material to the ocean for placement.

Placement of material at the NODS would require approval by the USEPA and would require a Section 103 Permit from the Corps as authorized under Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA). Dredged material from the southern segment of the Sparrows Point Channel was subjected to the Tier II (sediment and elutriate) testing and Tier III ecotoxicological) testing required to assess the material suitability for ocean placement at the NODS. Results of the testing indicated that approximately 1.57 MCY of material from the south segment of the channel met the Section 103 MPRSA requirements.

Construction Methods and Logistics – For this placement option, it is assumed material would be mechanically dredged and placed within a bottom-dump barge or scow and transported to the NODS, where it would be released / discharged into a designated area. One-way transport distance from the project site to the NODS is approximately 175 miles. Placement activities (vessel traffic to and from the NODS) would be conducted in compliance with the NOAA Fisheries Right Whale Ship Strike Reduction Rule (50 CFR 24.105), which limits vessels greater than 65 feet to speeds of less than 10 knots during migration and calving periods.

Timeline – There would be no time required for construction. The time limitation would be for equipment to haul dredged material from the site to the ocean placement site. The dredging and placement would be performed within a 2-year period.

3. Avoidance, Minimization, Best Management Practices, and Mitigation Measures

This section describes how the design of the proposed action attempted to avoid and minimize potential impacts identified as the design progressed with the environmental review process. In addition, this section summarizes potential mitigation measures that could be implemented during SPCT construction, including BMPs and environmental controls to reduce potential impacts and protect environmental resources. Construction activities include upland terminal construction, in-water dredging and pile driving, and in-water placement of materials to construct the offshore DMCF. BMPs discussed here represent generally accepted practices used for waterfront and in-water construction projects.

Inclusion of a BMP or environmental control in this section does not mean that the BMP or environmental control would be used for SPCT, nor do the measures described here represent the only potential BMPs or environmental controls that could be implemented. BMPs and environmental controls would be defined within final project design and may be stipulated as permit conditions by regulatory and resource agencies.

3.1 Project Design – Avoidance and Minimization

Measures to reduce impacts on the natural and human environment were incorporated during the design planning process (Table 2). As the design process advances to final design, additional decisions concerning equipment and materials to be used and the final project footprint would be made in an effort to further avoid and minimize impacts to the extent practicable while still achieving the project goals.

Table 2. Avoidance and Minimization Measures Implemented During SPCT Project Design

Project Feature / Resource Consideration	Original Design	Design Evaluated in Draft EIS
Channel dredging footprint	112.6 acres	Reduced to 111.4 acres – The channel was re-designed to optimize safe passage for vessels and minimize the amount of dredging required by angling the berth face such that the dredging of the berth and channel would be wider at the southern end and would taper at the north end.
Number of piles	1,846 piles	Reduced to 1,410 steel pipe piles – The wharf would be a pile-supported open-wharf structure as opposed to a bulkheaded or enclosed structure. Loss of open water would be limited to the footprint / surface area of the piles. – The project design was modified to reduce the maximum number of piles to safely support the load bearing requirements of the wharf and terminal operations.
Berth Alignment	Original alignment was on the west side of Coke Point in the Patapsco River main channel	Moved the berth alignment inside the embayment to make use of the existing Sparrows Point Channel, to significantly reduce dredged material volume, and avoid impacts on the Patapsco River main channel.

Project Feature / Resource Consideration	Original Design	Design Evaluated in Draft EIS
Offshore DMCF footprint	100 acres	Reduced to 19.6 acres – The in-water footprint for the offshore DMCF was first reduced from 100 acres to 35 acres and then further reduced to approximately 19.6 acres. The design changes reduce the loss of open water and bottom habitat to approximately one-fifth (20%) of the original proposed in-water footprint through use of a combination of placement alternatives for the dredged material. The changes also remove the DMCF from the main channel of the Patapsco River. The Coal Pier Channel DMCF would be confined to the existing dredged industrial channel. This avoids impacts on river hydrology and also on aquatic communities and habitat in the river.
Dredged material volume	4.5 MCY	Reduced to 4.25 MCY, which includes 330,000 CY of slag that would be reused and approximately 1.5 MCY of dredged material that would be placed at the NODS – The channel location would use the existing channel footprint, the channel re-design would reduce the size of the channel footprint, and slag removed during dredging would be re-used on-site for upland fill and construction activities. Each of these measures would reduce the volume of material to be dredged and placed.
Shore power	Auxiliary diesel engines while docked would result in emissions of NO_x, PM_{10}, $PM_{2.5}$, SO_x, VOCs, and GHG emissions, including CO_2	Use of shore power would significantly reduce emissions of NO_x, PM_{10}, $PM_{2.5}$, SO_x, VOCs, and GHG emissions, including CO_2, as ships using shore power rely on grid-based electricity instead of burning fuel oil. See Section 4.15.2.2, Table 43
Partial Electrification of Terminal Equipment	TTT considered a facility with only diesel-fueled equipment. This would result in higher emissions. See Section 4.15.2.2, Table 44 for more details.	TTT proposed a partially electrified terminal, STS, RMG, and RTG cranes would all be electric. Stackers, handlers, terminal tractors, standby generators, and rail-based transportation would be diesel. Use of electric cranes would reduce emissions during operations. See Section 4.15.2.2, Table 44 for more details.
Terminal Lighting Fixtures	N / A	All high mast lights at the terminal would be equipped with a multi-fixture luminaire, shielded, and directed downward to minimize both spill light and glare. Lighting level would be as required by the Illuminating Engineering Society guidelines and Occupational Safety and Health Administration standard 29 CFR 1917 "Marine Terminals."

Project Feature / Resource Consideration	Original Design	Design Evaluated in Draft EIS
Upland aesthetics	Aesthetic finishes for SPCT buildings	Reduced use of high-glare materials and finishes to lower visual impacts on surrounding communities / properties – Buildings and equipment constructed as part of the SPCT would be designed to have matte finishes to reduce sources of glare to surrounding areas.
Future sea level rise	N / A	Sea level rise was incorporated into the original design to ensure resiliency for the life of the facility. – Elevation of wharf deck was designed to withstand estimated sea level rise and storm surge frequencies through the year 2100, increasing the resiliency of the facility.

Notes:
CO_2 = carbon dioxide
GHG = greenhouse gas
NO_x = nitrogen oxides
PM_{10} = particulate matter less than or equal to 10 micrometers
$PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers
SO_x = sulfur oxides
VOC = volatile organic compound

3.2 BMPs During Construction

BMPs and environmental controls during construction activities are often used for certain environmental resources in the SPCT project area (Table 3 through Table 6). BMPs and environmental controls for construction-related noise would benefit both the in-water and upland environments. BMPs and environmental controls implemented during certain in-water construction activities and locations would be protective of aquatic resources and would reduce turbidity, reduce the potential for sedimentation impacts on water column and bottom communities, and reduce the potential for release of contaminants to surface waters in and around the SPCT project area.

Table 3. Benefits of Potential Construction BMPs and Environmental Controls for Pile Installation

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Complete in-water pile driving in adherence with time-of-year restrictions (if required by regulatory agencies) to avoid impacts on sensitive life stages of fish and other aquatic resources.	✓			

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Use a “soft start” method for impact hammer. Begin hammering at a reduced energy, which serves as a warning for mobile aquatic / marine life to move away from the project area. This method would also be conducted following re-start after a period where pile driving has not occurred for more than 30 minutes.	✓			
Use a cushion block during impact driving of piles to reduce the intensity and distance for underwater noise propagation.	✓	✓		✓
Use bubble curtains if required during certain times of year during impact driving of piles to reduce the intensity and distance for underwater noise propagation.	✓	✓		✓
Use a vibratory hammer (if / where feasible) followed by use of an impact hammer for individual piles to reduce the duration of the underwater noise created by impact hammer.	✓	✓		✓
Limit the daily window for pile driving activities to 10 to 12 hours or less of daytime operations.	✓	✓		✓

Table 4. Benefits of Potential Construction BMPs and Environmental Controls for General In-Water Construction and Demolition Activities

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Operate construction vessels in adequate water depths to avoid propeller scour and grounding at all tides. Use shallow draft vessels that maximize the navigational clearance between the vessel and the bottom in shallow areas.	✓		✓	
Orient or shield site lighting to avoid illumination of the surrounding waters at night.		✓		✓
Include a sufficient zone of passage that allows listed and managed species to safely traverse around noise and / or turbidity.	✓			

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Remove piles with a vibratory hammer where feasible and vibrate the pile to break the bond between the sediment and pile to minimize the pile breakage and reduce sediment sloughing during removal.	✓		✓	
Cut the existing pile(s) at the mudline (where possible) to avoid sediment resuspension during extraction.	✓		✓	
To the extent that the work generates a sheen, complete in-water work within oil-absorbent booms to contain any surface sheens generated.	✓		✓	
Surround the area of demolition, pile removal, and (as applicable) other bottom disturbing construction activities (e.g., pre-drilling slag for wharf pile installation, material placement for DMCF dike construction) with a full-height, weighted turbidity curtain in areas where sediment contaminants may be present at concentrations of concern and may have the potential to move away from to prevent displaced sediments from leaving the immediate vicinity of the work area, as determined by permit conditions.	✓		✓	
Prohibit direct discharge of any water or effluent that has been used for wash purposes or other similar operations avoiding discharge of associated sand, silt, cement, oil, drilling fluid, and other substances into the river.	✓		✓	
Dispose of construction waste and demolition materials in an approved upland facility. Recycle materials to the extent practicable.	✓	✓	✓	✓

Table 5. Benefits of Potential Construction BMPs and Environmental Controls for Dredging and Dredged Material Transport, Handling, and Placement

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Dredge using mechanical methods that reduce localized turbidity and potential fish entrainment when compared to hydraulic methods.	✓		✓	

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Adhere to time-of-year restrictions for dredging operations (if / as determined by regulatory agencies) to avoid impacts on sensitive life stages of fish and other aquatic resources.	✓		✓	
Use an environmental-type bucket where feasible and where necessary based on sediment chemical data to minimize sediment release from the bucket while ascending through the water column.	✓		✓	
Implement operational controls during dredging, which may include: 1. Perform dredging such that the dredge bucket is not overfilled on each deployment, reducing release of sediment. 2. Control the ascent of the bucket in the water column to minimize incidental release while moving through the water column. 3. Control the descent of the bucket to minimize hard contact with the bottom and resuspension of sediment upon bucket contact. 4. Prohibit dragging of the dredge bucket along the sediment surface.	✓		✓	
Place dredged material in a barge or scow in a manner that maintains sufficient freeboard to eliminate the potential for material leaving / spilling from the barge during transport to the material offloading or placement area.	✓		✓	
Deploy a full-length weighted turbidity curtain with an oil-absorbent boom and enclose the dredging operation in areas where sediment contaminants may be present at concentrations of concern and may have potential to move away from immediate dredge area during dredging.	✓		✓	
Use watertight barges or sealed split-hulled scows for sediment transport to offloading or placement locations.	✓		✓	
Use surface water to slurry dredged material when needed for offloading / pumping to upland DMCFs in compliance with Water Appropriation Use Permit. Recycle slurry water to the maximum extent practicable.	✓		✓	

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Treat (if required) and discharge dredged material effluent to surface waters in compliance with NPDES permit requirements.	✓		✓	
Following completion of dredging for the wharf revetment, stabilize slopes with graded riprap (heavy stone) to reduce the potential for slope erosion and subsequent sediment release into the water column.	✓		✓	
Provide landward slopes of the dredged areas with a protective layer (e.g., riprap) to prevent sloughing.	✓	✓	✓	

Table 6. Benefits of Potential Construction BMPs and Environmental Controls for Upland Construction Activities

Construction Activity	Resource Area Protection			
	Fish / Aquatic Life	Terrestrial Wildlife / Birds	Surface Water Quality	Upland / Community Resources
Site project components in upland areas already under industrial use to avoid impact on forested areas.		✓		✓
Implement a Spill Prevention, Control, and Countermeasures Plan.	✓	✓	✓	✓
Implement erosion and sediment controls under the Maryland NPDES Program and project permit.	✓	✓	✓	✓
Manage stormwater in accordance with project permits under the MDE General Discharge Permit.	✓	✓	✓	✓
Locate new storm drain outfalls to avoid direct discharge into sensitive habitats.	✓		✓	

3.3 Mitigation

Shoreline areas along TPA property were analyzed to assess the existing shoreline conditions and determine areas where there may be potential for on-site mitigation opportunities to mitigate for proposed tidal open-water wetland impacts associated with the development of the SPCT and associated DMCF. Areas investigated included nine separate shorelines areas, including four areas along Bear Creek on the north and west sides of the property, two areas along the Patapsco River on the south side of the property, and four areas along Jones Creek and Old Road Bay on the east side of the property.

Desktop analysis of the on-site shoreline conditions included a review of MDNR's *MERLIN – Maryland's Environmental Resource & Land Information Network* (MDNR 2024a) and *Maryland Coastal Atlas* (MDNR 2024b) interactive GIS websites, and current and historic aerial imagery available on Google Earth. The primary GIS resource layers that were reviewed included historical shorelines and shoreline rates of change, shoreline inventory of key features (e.g., bank cover, shoreline bank height and condition, marsh and beach buffers, stabilization structures, and invasive common reed (*Phragmites australis*)), recent and historic submerged aquatic vegetation (SAV), sea level rise vulnerability, coastal resiliency assessment, living resources, and finfish habitat.

Site visits to document conditions at each of the areas were conducted on June 12, 14 and 15, 2024. Photographs of some of the key features identified were taken at each site. In addition, several local successful shoreline stabilization projects that implemented a combination of nature-based solutions (NbS) and human-made solutions were visited as potential reference sites at nearby Inverness Park in Lynch Cove and Watersedge Park along the west shore of Bear Creek in Dundalk to help guide the development of potential mitigation options.

Recommended mitigation opportunities and preliminary concepts have been developed based on the initial findings from the desktop and site investigations. Although there may be multiple approaches that could be taken to create in-kind or out-of-kind mitigation options for each area, the preliminary concepts described below present a range of approaches for the creation of multiple habitat types to mitigate for potential impacts on tidal open water associated with the development of the Coal Pier Channel DMCF and installation of piers to support the marginal wharf and mooring dolphins.

3.3.1 Proposed Mitigation Concepts

This section provides an overview of the mitigation concepts being proposed for the SPCT project.

3.3.1.1 Multi-Habitat Restoration and Creation at Area Distressed from Historic Operations

Multiple types of tidal emergent wetland and aquatic habitat restoration are proposed at an area of the property and adjacent tidal waters that have shown signs of distress from historic operations at the Sparrows Point site. The multi-habitat restoration and creation would create a more natural shoreline that provides multiple habitat benefits. This would include:

- Placing an approximate 1,850 linear foot (0.21 acre) perimeter sill of natural rock and / or other man-made or proprietary NbS structures (e.g., reef castles, reef balls) that maintain maximum aquatic connectivity along the shallow water interface and edge areas to promote use of the sites by multiple types of aquatic species, attenuate wave energy, and contain materials used to create other nearshore habitats
- Improving the bottom surface substrate in approximately 6.5 acres of shallow water habitat areas immediately behind the perimeter sill or reef structures by introducing a zone featuring natural rock / boulder piles, natural cobble, gravel, and sand

> **Nature-based solutions** (**NbS**) are actions that protect, sustainably manage, and restore natural or modified ecosystems to address societal challenges, such as climate change, disaster risk, and food and water security, while simultaneously providing benefits for biodiversity and human well-being. NbS emphasize working with nature rather than against it, offering a holistic approach to environmental management that enhances ecosystem health and resilience. Examples of NbS include restoring wetlands, reforestation, and green infrastructure in urban areas.

materials sourced from a nearby quarry, adding shell bags or loose shell materials to promote use by multiple aquatic species, and removing and replacing human-made materials (e.g., slag, tires) that appear to currently underlie or sit on the surface in some of the area

- Introducing woody debris, potentially with attached root wads, and other NbS habitat structures or improvements, and seeding with native SAV within the same 6.5-acre shallow water zone with species such as wild celery (*Vallisneria americana*)
- Creating or restoring approximately 1.75 acres of low to high marsh tidal emergent wetlands with scattered woody debris structures to improve shoreline habitat in nearshore areas

If human-made or proprietary NbS structures are proposed at the site, TTT would contact the manufacturers of those structures to discuss alternative materials that could be used to reduce carbon dioxide (CO_2) releasing concrete emissions during production of the structures. Tidal wetland boundaries would need to be delineated and surveyed to identify the limits of existing wetlands and existing land, and topographic and bathymetric surveys of the surrounding waters would be conducted to accurately depict existing land conditions above and shallow water habitat conditions below MHW to the proposed limits of the work.

The multi-habitat restoration and creation actions would provide greater edge to water ratio than what currently exists, which would promote use and provide greater protection for multiple aquatic species, including species in need of conservation. The layered effect of the actions would provide multiple ecological benefits and considerable ecological uplift at the project site as compared to creating a single habitat type.

The improved substrate and habitat structures introduced into the shallow water areas would improve benthic conditions, provide potential shellfish attachment sites, and provide habitat improvements including feeding, foraging, and cover areas for tidal adult finfish, juvenile herring, and white perch spawning. The reduced boat wake and wave action along the shoreline would allow the shallow water habitat zone to be seeded with native SAV species. The tidal emergent wetlands in the nearshore areas along with the SAV would provide vegetative diversity using a mix of shallow water aquatic and low to high marsh zones that would transition to native scrub-shrub species near the toe of the slope.

Wetlands enhanced by the introduction of woody materials or other NbS features would allow for increased finfish forage and refuge areas and would enhance herpetofauna, wading bird, and waterfowl foraging opportunities. The wetlands would also improve water quality and filtering of waters at the site in this highly urban watershed. The SAV provides cover for crabs, juvenile and small fish, and foraging sites for larger fish species. The predominant fish species known to use these areas are species that would benefit from more consistent SAV occurrence and diversity.

Cobble and gravel substrate and / or other reef making materials introduced into waters immediately behind the perimeter sill structures to the edge of the shallow water areas would improve open water habitat and vertical structure. Substrate improvements would improve benthic conditions, which would improve the forage opportunities for fish. An increase in three-dimensional structure of the bottom substrate would provide additional habitat for epibenthic colonization, cover for crabs, juvenile and small fish, and foraging sites for larger fish species. Many of the fish species known to use the waters surrounding the TPA site are species that would benefit from the improved refugia, especially compared to some of the human-made land that extends into the waters currently that included historic pushing of slag and other waste materials towards and into the open waters. The hard vertical structure may also provide substrate for encrusting bivalves.

More detail on this mitigation concept would be developed as additional information has been collected at the site, including wave and boat wake action to inform the size and strength of materials and the engineering design to ensure stability of the sill and habitat features to be installed, and the concept would be updated in a revised Phase I Mitigation Plan following agency approval of this initial concept. Additional information regarding the need for and type of remedial actions that may need to be undertaken within the proposed mitigation area and / or landward of the area to address historical contamination issues would also be provided in the plan. The revised plan would also include information on the proposed sources of natural stone and materials (i.e., cobble, gravel, sand, shell, woody debris, etc.) to improve substrate within the mitigation areas, and a monitoring and adaptive management plan that outlines clear performance criteria, interim checkpoints, and suggested corrective measures for the proposed mitigation. In addition, a maintenance schedule would be developed for ongoing removal of trash and debris that washes up onto shore within the mitigation areas as part of the revised plan.

3.3.1.2 Tidal Open Water and Tidal Wetlands / Multi-Habitat Restoration and Creation in Existing Uplands

Tidal open water and tidal wetlands / multi-habitat restoration and creation is proposed at three separate upland areas within the TPA property, where the existing shoreline would be pulled back and restored without encroaching channelward into WOTUS / Waters of the State, including tidal waters and existing shallow water habitat areas. Tidal wetland boundaries would need to be delineated and surveyed at each of the sites to identify the limits of existing wetlands and existing land, and topographic and bathymetric surveys of the surrounding waters would be conducted to accurately depict existing land conditions above and shallow water habitat conditions below MHW. Geotechnical borings or test pits would also be conducted at each of the land areas to characterize the materials to be removed, including historic fill. The Sparrows Point Material Reuse Screening Program would be implemented for this material.

During detailed design, appropriate elevations would be determined for the newly created tidal open waters, shallow water habitat areas, and / or low to high marsh tidal wetlands along new shoreline areas. This would include determining if there is a potential need for over-excavation to subgrade elevations, followed by placement of clean fill materials appropriate for the establishment of wetland vegetation and to provide improved substrate for shallow water habitat areas. The detailed design would include grading that focuses on improving the edge to water ratio (e.g., creation of coves for tidal adult and juvenile finfish habitat), erosion and sediment control (e.g., silt or super silt fence on land, turbidity curtains in water), existing habitat protection, and native wetland species planting plans with the goal of creating multiple tidal open water and wetland habitat types within each area. The multi-habitat restoration and creation efforts would provide similar ecological benefits to these former upland areas as those described above in Section 3.3.1.1. More detail on this mitigation concept would be developed as additional information is collected at the sites and the concepts would be updated in a revised Phase I Mitigation Plan following agency approval of this initial concept.

3.3.1.3 Removal of Docks, Slips, and Posts from Tidal Open Waters

Existing docks, slips, and pilings at the Pleasant Yacht Club cover an area of approximately 860 linear feet or 0.11 acres and include one main “T” shaped dock that extends into Jones Creek with approximately 30 slips (depending upon boat sizes). At the North Point Yacht Club, two separate large docks with slips and pilings and three smaller docks cover areas of approximately 1,800 linear feet or 0.23 acre, including the northern dock with between 35 and 40 slips and the southern dock with between 40 and 50 slips. One small dock at the Pleasant Yacht Club adjoining the existing boat ramp is anticipated to remain for local boaters to use to put boats into Jones Creek at the ramp. Removal of the docks at both yacht clubs could result in up to 0.34 acre of tidal open water being restored, depending on how mitigation credits for the removal actions are approved by the agencies.

The High Pier wharf structure removed from within the embayment totaled 70,400 square feet (1.62 acres) in size. Pursuant to guidance from MDE, TPA submitted a letter to MDE referencing their issued Tidal Wetland License No. 13-0966(R) on April 27, 2018, in which they noted that they were evaluating and deliberating forthcoming berth projects that would involve impacts on tidal open water areas. They requested that the 1.62-acres of tidal open water restoration associated with the demolition and removal of the existing High Pier wharf structure be documented and recognized as advanced mitigation (TPA 2018). A copy of this correspondence is included in Appendix B. The High Pier was demolished in its entirety and the structure was removed to restore the area to open water in 2018. The notification to MDE was made in anticipation of the tidal open water mitigation needs for the forthcoming SPCT and other marine projects proposed at the site.

3.3.1.4 Invasive Species Management

Several stands of *Phragmites* that are immediately adjoining areas proposed for new tidal wetland and multi-habitat restoration and creation are proposed for *Phragmites* control. Removal of existing plant stems and rhizome and control of the *Phragmites* is recommended to prevent the spread of the invasive plant into newly created wetlands.

The mitigation concept includes *Phragmites* spot treatment and large patch control, consisting of a minimum of 2 years of fall herbicide treatment using herbicides approved in Maryland for aquatic use such as glyphosate or imazapyr. It would also include mowing or cutting the plants to ground level when not in seed, and physical removal of plant materials, followed by excavation and removal of the upper 1 to 2-foot layer of rhizomes to lower the wetland marsh plain elevations where feasible. This would help to promote reestablishment of native high to low-marsh wetland species in these areas. Supplemental plantings of native wetland species would be introduced on the new marsh plain elevations to prevent recovery of *Phragmites* in these areas.

A detailed *Phragmites* Control Plan would be developed detailing the protective measures to be implemented to contain the herbicide application and reduce exposure to non-targeted species, as well as the overall restoration and enhancement process and seasonality of the proposed mitigation action as part of a revised Phase I Mitigation Plan following agency approval of this initial concept. The plan would also include a long-term monitoring and adaptive management plan to ensure the long-term ecological function of the enhanced areas.

The enhancement of these tidal wetlands through *Phragmites* control would provide a greater degree of vegetative diversity by using a mix of high to low-marsh species with a scrub-shrub buffer near the toe of slope. Removal of the invasive species in areas immediately adjoining other proposed mitigation areas would also help to prevent establishment of *Phragmites* in newly created or restored tidal wetlands and improve the visual appearance of the shoreline to boaters and properties on the opposite shorelines from the site. The improved substrate conditions and wetland habitat would increase finfish forage and refuge opportunities, and enhance wading bird, herpetofauna, and waterfowl foraging opportunities. The enhanced wetlands would also improve water quality and filtering of waters draining to the site in this highly urbanized portion of the watershed.

3.3.1.5 Off-Site Mitigation Project #1 – Derelict Crab Trap Removal

MDNR maps recreational fishing grounds within the Chesapeake Bay and its larger estuarine tributaries on the *Maryland Coastal Atlas* website (MDNR 2024b). These areas are also locations where "ghost" or derelict crab traps are often found. There are no recreational fishing grounds located within the 8-digit Patapsco River watershed (02130903), but numerous mapped recreational fishing grounds are located within the adjacent Middle Chesapeake Bay 8-digit watershed (02139997), north of the Chesapeake Bay Bridge. These include several near the mouth of the Patapsco River and between Hart-Miller Island and Tolchester Beach in Kent County, Maryland.

This proposed mitigation effort would initially include conducting research into recent and available bathymetric and hydrographic surveys using side-scan sonar to map the bottom of the Chesapeake Bay and identify potential derelict crab traps at the recreational fishing grounds nearest the mouth of the Patapsco River, as well as between Hart-Miller Island and Tolchester Beach in Kent County, Maryland. If recent bathymetric and hydrographic surveys are unavailable, TTT would subcontract with a firm or partner with an organization to complete new surveys of these areas.

Once an area with a high density of derelict crab traps is located, TTT would develop a mitigation work plan and work with their partner to hire and train a fleet of waterman on methods to remove the traps during the winter season when the mitigation efforts would take place. Ideally, potential watermen to assist on this project would first be identified from within environmental justice communities in the vicinity of the TPA site that are familiar with the nearby waters, before locating watermen from other areas around the Bay, where available. Fleet operations would be conducted to maximize derelict trap recovery, focusing on the area with the greatest mapped trap concentrations. The total number of derelict crab traps and gear removed would be tallied each day and the recovered traps and gear would be inspected for trapped organisms and documented by the watermen. Any traps and gear recovered would be disposed of at the nearby Eastern Sanitary Landfill in Baltimore County following procedures outlined in the work plan. A site protection instrument, performance standards, adaptive management plan, and financial assurances would be outlined in the Phase II Mitigation Plan. A maintenance plan, monitoring requirements, and long-term management plan would not be necessary if the trap removal is a one-time effort.

According to MDE, based on previous crab pot mitigation projects, MDE determined that the value of removing one crab pot is $83.33. Based on a mitigation in lieu fee of $90,000 per acre, crab pot removal would be acceptable to MDE as mitigation based on 1,080 crab pots per acre of required mitigation. It is understood that these prices may differ in today's market and further coordination with the agencies would be needed to refine the mitigation crediting for this activity (MDE 2024b). For a crab pot removal mitigation project completed by the Maryland Department of Transportation – State Highway Administration (MDOT SHA) in the winter 2017 / 2018, a fleet of up to 25 watermen were able to remove 1,451 derelict pots over a period of approximately 10 working days. This would equate to approximately 1.34 acres of mitigation credit based on the calculations provided by MDE. The final amount of mitigation TTT achieves from the derelict crab trap removal efforts would be based on the quantity of traps removed over a set amount of time that the watermen hired for the activity work.

3.3.1.6 Off-Site Mitigation Project #2 – Oyster Reef Creation or Replenishment

The proposed mitigation package also includes oyster reef creation or seeding at a location yet to be determined within Chesapeake Bay. The project would involve TTT partnering on, coordinating, and implementing a new oyster reef creation or an existing oyster reef replenishment project at a location acceptable to the agencies. The acreage of the project would depend upon the remaining mitigation needs of the project following implementation of the on-site mitigation projects and off-site mitigation project #1.

NMFS recommended a similar project at the nearby Fort Carroll Sanctuary in comments received on the initial draft mitigation package submitted to the agencies for review in October 2024. That project would entail placement of suitable bedding material (e.g., stone), the addition of spat-on-shell on top of the foundation stone, and subsequent application of additional spat-on-shell at 5- to 10-year intervals to ensure sustained ecological function. The long-term maintenance of any new reef created at Fort Caroll should be coordinated with MDNR (NMFS 2024a).

TTT is seeking agency feedback on oyster reef mitigation options, sustainable reef locations, and anticipated crediting before fully planning this mitigation project. Baseline information on alternative oyster reef creation sites in areas with higher salinity within the Chesapeake Bay where creation may be more sustainable would need to be gathered if the agencies approve this mitigation concept and the additional mitigation is necessary.

At a minimum, the oyster reef creation or replenishment project work plan would include the following elements: 1) geographic boundaries of the project, 2) reef construction methods, 3) timing and sequence of reef construction, 4) amount of oyster spat to be deployed (if applicable), and 5) timing and sequence of oyster spat seeding (if applicable). A detailed maintenance plan, defined performance standards, a mitigation monitoring plan, a long-term management plan, an adaptive management plan, and financial assurances for the oyster reef project would be detailed in the revised Phase I Mitigation Plan.

3.3.2 Proposed Mitigation Locations

This section provides an overview of the on-site mitigation concepts being proposed for the SPCT project at Bethlehem Boulevard, the southeast peninsula of Sparrows Point, the Craighill Lighthouse Peninsula, the Pleasant and North Point Yacht Clubs, and the High Pier Wharf. The portion of the Bear Creek shoreline along Bethlehem Boulevard west of 6001 Bethlehem Boulevard extends from I-695 south approximately 1,900 linear feet. This shoreline is dominated by a thick stand of *Phragmites* in the northern area near Riverside Drive and an overhead utility crossing. The shoreline narrows to the south for 1,000 feet encroaching to within 50 feet of Bethlehem Boulevard. Trees and shrubs within the narrow roadway slope and buffer are dominated by staghorn sumac (*Rhus typhina*) and invasive tree-of-heaven. The buffer expands to 250 to 300 feet wide at the south end of the area. Trees within the buffer are generally species that grow in poor soil conditions including sumac, tree-of-heaven (*Ailanthus altissima*), mulberry (*Morus* spp.), and black locust (*Robinia pseudoacacia*). Much of the shoreline in this area is rocky rather than sandy at the base of the slope, with a mix of cobble to gravel size rocks and a considerable amount of rubble and construction debris.

The point at the southeast peninsula of Sparrows Point extends from the mouth of Old Road Bay in the Pennwood Wharf area south into the Patapsco River near Pennwood Channel. It measures approximately 775 linear feet and 4.0 acres in size. Vegetation along the point is very sparse with a narrow buffer of trees and shrubs measuring between 10 to 50 feet wide. Much of the shoreline throughout this area is slag that historically had been pushed into the open waters to extend the Sparrows Point land. Banks range from about 10 to 30 feet in height and are heavily eroding, slumping, and sloughing off into open waters due to wave action. Much of the vegetation is sparse and it generally consists of pioneer species that commonly grow on poor quality soil.

The Craighill Lighthouse Peninsula is located just south of the security gate along Wharf Road on the eastern shoreline of the SPCT site. The shoreline runs along Old Road Bay, north of the Pennwood Channel and south of the mouth of Jones Creek. The peninsula has several gravel roads and appears to be used frequently as a temporary staging and stockpile / laydown area. The shoreline is predominantly a mix of gravel, cobble, and boulders, as well as a considerable amount of slag and some asphalt, with sparse vegetation. The southern half of the peninsula consists of made land pushed into tidal open waters in the late 1950's to early 1960's. Some of the shoreline is vegetated with a mix of salt-tolerant shrub species such as groundsel tree (*Baccharis halimifolia*), marsh elder (*Iva frutescens*), false indigo bush (*Amorpha fruticosa*), and wax myrtle (*Morella cerifera*). A 100' long narrow gravel and sandy beach with scattered debris that has washed up from offshore is in the bend between the two lobes of the peninsula, near the lighthouse.

The Pleasant and North Point Yacht Clubs are located along Wharf Road on the eastern shoreline of the site along Jones Creek, south of Sparrows Point Boulevard, with Pleasant Yacht Club to the immediate north of the North Point Yacht Club. The Pleasant Yacht Club includes a main boat dock with slips and a smaller dock and boat ramp for placing boats into the water, which would likely remain as part of a future community boat ramp and parking area. The shoreline to the north is covered in *Phragmites.* South of the main dock the shoreline is grass leading to rock reinforcement with some salt tolerant shrub species that appear to be cut back. There is a tidal pond within the cove separating the two yacht clubs that is surrounded by *Phragmites* and groundsel tree shrubs. The North Point Yacht Club includes two (2) large boat docks with slips and a series of three (3) smaller docks and a boat ramp for putting boats into the water. The shoreline near the northern boat dock with slips is dominated by *Phragmites*. The shoreline near the boat ramp is primarily a mix of concrete and rubble with minimal vegetation, but then leads to another patch of *Phragmites* along the shoreline close to the southern boat dock and slips. Upland areas at both yacht clubs consist of gravel and asphalt parking lots, roadways, and driveway, gardens, picnic areas, boat laydown areas, maintained lawn, and the associated yacht club buildings and appurtenant structures.

Figure 8, Figure 9, Figure 10 and Table 7 present the types of on-site and off-site mitigation that are proposed to be implemented, and the mitigation ratio, minimum acreage, and mitigation credit anticipated for these efforts. A Draft Phase I Tidal Mitigation Plan with a full description of the proposed mitigation for the SPCT project is presented in Appendix B.

Figure 8. Proposed Limits and Type of Mitigation at Bethlehem Boulevard and High Pier Wharf

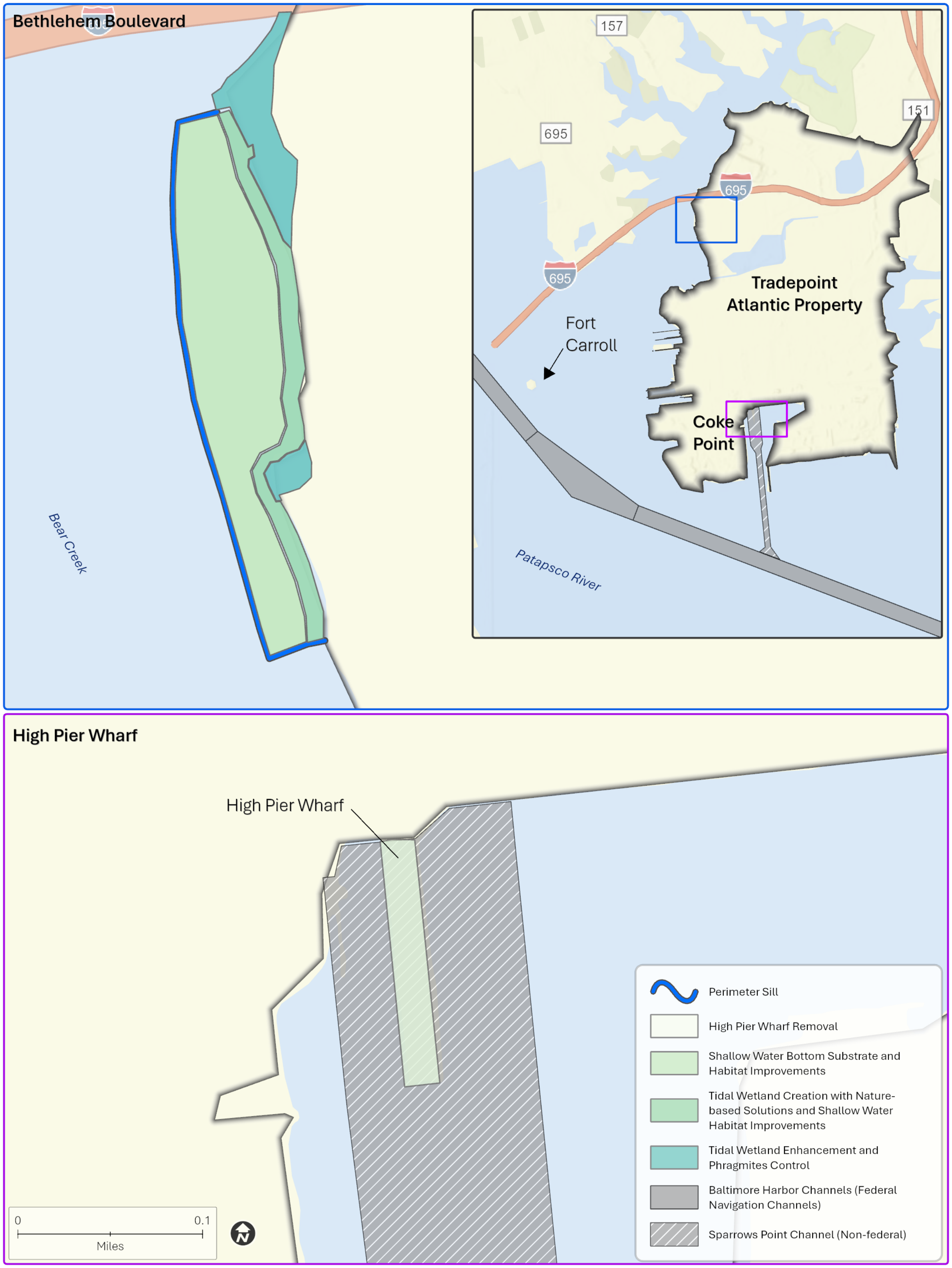


Figure 9. Proposed Limits and Type of Mitigation at North Point and Pleasant Yacht Clubs, Craighill Lighthouse Peninsula, and the Southeast Peninsula

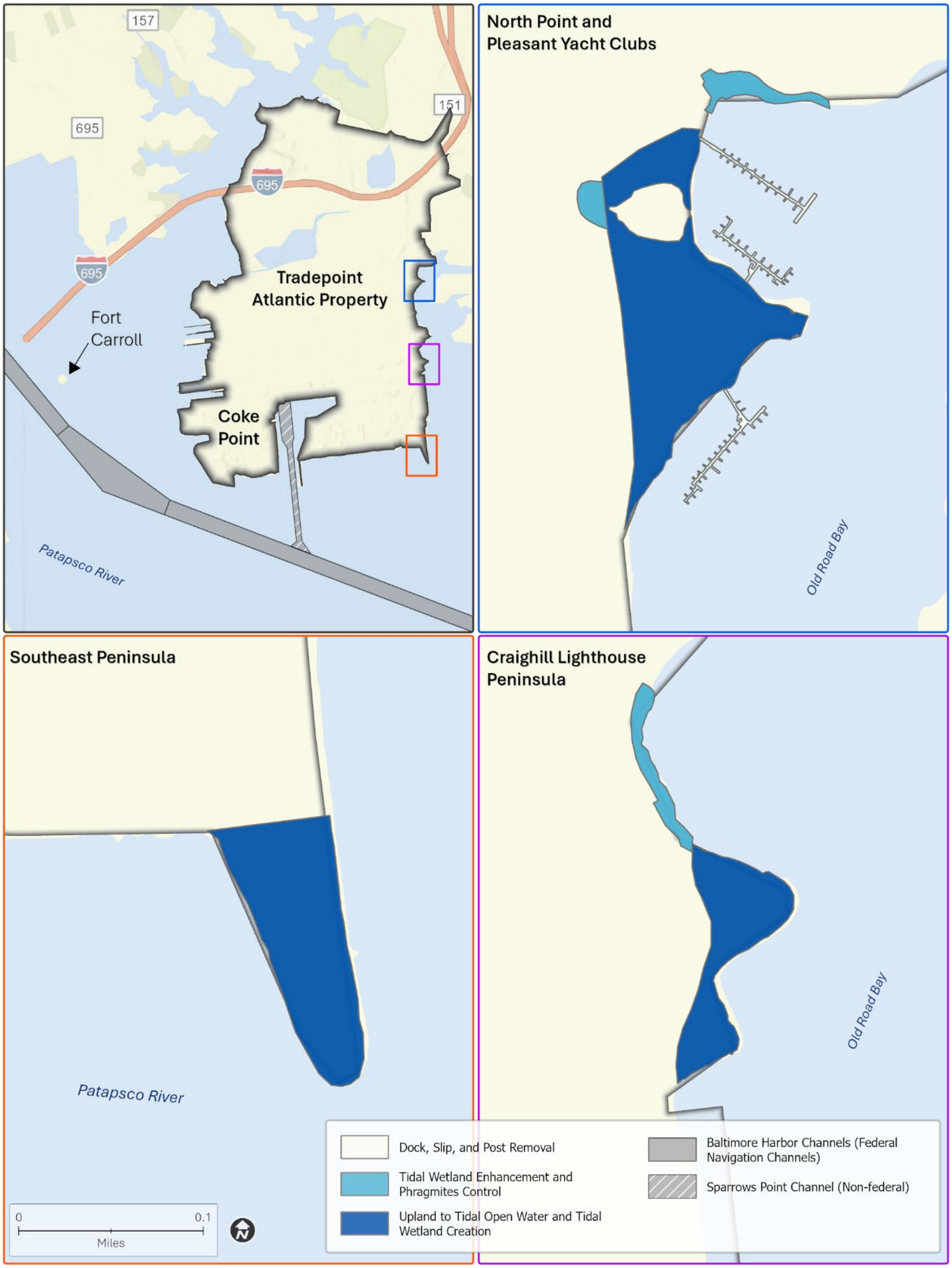


Figure 10. Recreational Fishing Ground Locations with Potential Derelict Crab Traps

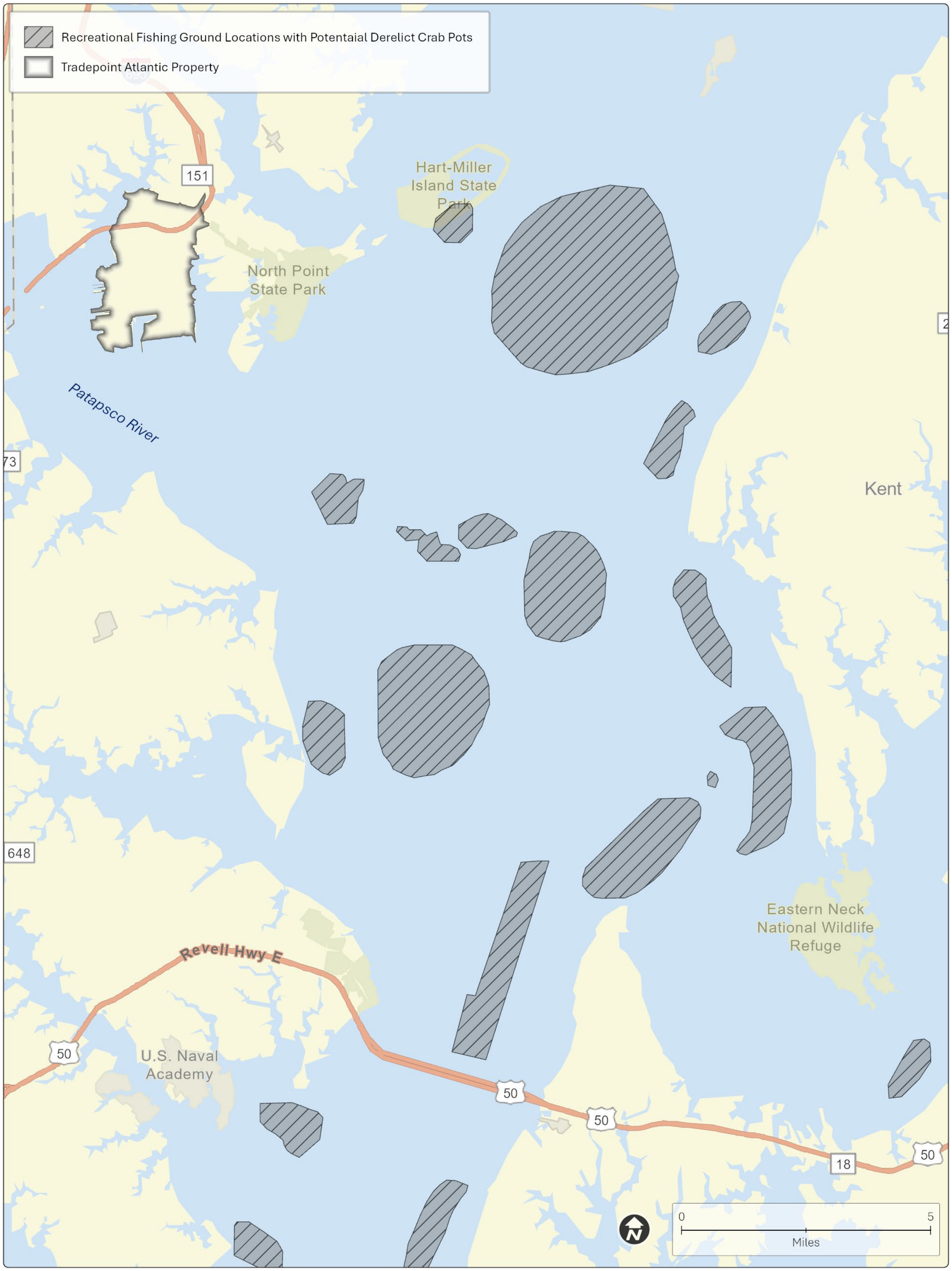


Table 7. On-Site and Off-Site Mitigation Concepts for Recommended Sites

Mitigation Type	Mitigation Measure	Proposed Mitigation Ratio	Credit (acres)	Yacht Basins, Craighill Lighthouse Peninsula and Southeast Peninsula	High Pier Wharf	Bethlehem Boulevard
Open water restoration action [1]	Uplands conversion to tidal open water and tidal wetlands / multi-habitat restoration and creation	1:1		11.6 acres		
	Tidal open water restoration with wharf / dock and pier removal and shallow to deepwater habitat improvements	1:1		0.34 acres / 2,660 linear feet	1.62 acres	
Multi-habitat restoration and creation action [2]	Perimeter sill (natural stone sill, reef castles / balls)	2:1				0.21 acres / 1,850 linear feet (0.105 acres credit)
	Shallow water bottom substrate and habitat improvements	2:1				6.5 acres (3.25 acres credit)
	Tidal wetland creation with Nature-based Solutions and shallow water habitat improvements	2:1				1.75 acres (0.875 acres credit)
Enhancement and terrestrial action [2]	Invasive species (*Phragmites*) management	4:1		1.05 acres (0.26 acres credit)		1.8 acres (0.45 acres credit)
Derelict crab trap removal [3]	Derelict crab trap removal in middle Chesapeake Bay		1.3			
Oyster reef creation / replenishment [3]	Oyster reef restoration / seeding at location to be determined		TBD			
Totals Credits [4]	**Total credits provided = 19.8 acres**		1.3 acres	12.2 acres	1.62 acres	4.68 acres

Notes:

1 – On-Site, In-Kind Mitigation Efforts

2 – On-Site, Out-of-Kind Mitigation Efforts

3 – Off-Site, Out-of-Kind Mitigation Efforts – Acreage may be adjusted if additional mitigation acreage needed

4 – Total credits are based on mitigation ratios.

4. Affected Environment and Environmental Consequences

This chapter describes the affected environment and the environmental consequences that could result from implementing the No-action Alternative and the Proposed Action (Combined Options Alternative) for the SPCT project. The affected environment discussion for each resource precedes the impact analysis and describes the baseline conditions within the project area. The resources described in this chapter are sediment, floodplain and flood hazard, hydrodynamics, groundwater, surface water, benthic fauna, fish, essential fish habitat (EFH), aquatic special status species, vegetation / habitat, birds, aesthetics / viewshed, recreation, air quality, community noise, traffic, socioeconomics, environmental justice, and navigation. The discussion of impacts for each resource topic includes the potential environmental impacts (adverse or beneficial) of the alternatives, including direct, indirect, long-term, and short-term impacts. This chapter is organized by resource topic so that the alternatives can be compared to each other. The discussion of cumulative impacts is presented in Section 5, and the discussion of irreversible or irretrievable commitments of resources related to the proposed project is presented in Section 6.

The avoidance, minimization, and mitigation measures described in Section 3 are considered part of the action alternative (Combined Options Alternative). Where appropriate, these measures for adverse impacts are also described and incorporated into the evaluation of impacts. The impact analyses and conclusions are generally based on a review of existing literature, studies, and research, information provided by subject matter experts, professional judgment, and public input.

4.1 Scope of the Analysis

To develop a full understanding of the environment in and around the SPCT project area and how the project may impact specific resources, existing information was reviewed, and additional field and desktop studies were conducted as needed in 2023 and 2024. This information established the baseline conditions for the physical environment, natural resources, community setting, and navigation. Results of this background research and recent field and desktop studies were evaluated in the context of potential construction methods and the Corps public interest review factors (described in Section 4.1.1). This preliminary review helped determine which natural and socioeconomic resources had the greatest potential to be affected by the proposed action, and therefore, should be analyzed in greater detail in this Draft EIS.

4.1.1 Corps Public Interest Review Factors

Pursuant to 33 CFR Part 320.4(a)(1), the Corps considers specific factors before issuing a DA permit that may be of particular interest to the public. The decision to issue a DA permit is “based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use in the public interest. Evaluation of the probable impact the proposed activity may have on the public interest requires careful weighing of all those factors relevant in each case. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments.” Table 8 provides a list of the public interest review factors considered for inclusion in the resources analyzed for this Draft EIS.

Table 8. Description of the Corps Public Interest Review Factors

Corps Public Interest Review Factor	Description of Factor
Flood hazard and floodplain	Direct and cumulative changes to the floodplain that may occur from a proposed action are of public interest and must be evaluated for the proposed action. This factor considers the impacts of development in the floodplain, including flooding potential.
Land use	Projects are reviewed to consider if a significant change in land use is being proposed and what the impact of the change may be on the public.
Shore erosion and accretion	Erosion and accretion processes are considered during the project review. Accretion or erosion of shoreline areas has the potential to fill WOTUS and therefore has the potential to impact the public and use of public areas.
Water quality	Projects that may adversely affect the quality of WOTUS during the construction and subsequent operation of the proposed activity must be evaluated for compliance with applicable effluent limitations and water quality standards.
Wetlands	Wetland constitute a valuable public resource, and any potential impacts must be weighed with the benefits of the proposed action during environmental review.
Water supply / conservation	Water supply is a critical public resource and projects that use a significant amount of water or that significantly affect the availability of water for alternative uses must be reviewed to consider this factor.
Fish and wildlife values Special status species Waterfowl	The opinions of the USFWS, NMFS, and state agencies, as the lead agencies responsible for conservation of these resources, are considered when evaluating fish, wildlife, and waterfowl resources (including threatened and endangered species) during the review of the proposed action.
Economics	When a private enterprise applies for a permit, the Corps generally assumes that appropriate economic evaluations have been completed, the proposal is economically viable, and the proposal is needed in the marketplace. However, in select cases, the Corps may perform an independent review of the need for the project from the perspective of the overall public interest.
Aesthetics Historic properties Recreation	Projects should be reviewed to determine if they involve areas that possess recognized historic, cultural, scenic, conservation, recreational, or similar values. Full evaluation of the general public interest requires that due consideration be given to the effect that the proposed action may have on values.
Energy needs	Energy conservation and development are significant public (and national) interest areas. Projects with an energy development component are reviewed.
Safety	Projects must be reviewed in consideration of general public safety, both during construction and once the project is complete.
Navigation	Projects must be compliant with Section 10 of the Rivers and Harbors Act of 1899.
Food and fiber production	Projects proposing food or fiber production components or including activities that may impact existing food / fiber resources must be reviewed for the potential impact on the public, region, and existing industry.
Mineral needs	Projects proposing mineral use that may alter mineral supply must be reviewed for the potential impact of that use on the public and region.
Property ownership	Activities undertaken in the proposed action must be evaluated for any impact on property ownership, injury to property, or invasion of property rights.

4.1.2 Geographic Scope of the Analysis

The geographic scope of the analysis will vary for some resources, as the potential impact could be beyond the proposed project's footprint. The SPCT project area includes Coke Point, the Sparrows Point Channel out to the juncture with the Brewerton Channel (a federal navigation channel), the High Head Industrial Basin, and the area offshore the west side of Coke Point (Figure 11). Alternatives for dredged material placement outside of the SPCT project area are described in Section 2.2.2.3 and pictured in Figure 3. Within individual resource topics, the study area for impact analysis could be the same as the SPCT project area or extend beyond the SPCT project area. For resource study areas that do not match the SPCT project area, the study area will be defined at the beginning of the resource topic.

> **SPCT project area** is Coke Point, the Sparrows Point Channel out to the juncture with the Brewerton Channel, the High Head Industrial Basin, and Coal Pier Channel.

4.1.3 Resources Analyzed

Resource topics for this proposed project have been identified based on federal laws, regulations, and orders; review of Corps Public Interest Review Factors; and knowledge of resources within the SPCT project area.

Issues (resources) should be analyzed in detail if:

- There are potentially significant impacts on resources associated with the issue.
- The environmental impacts associated with the issue are central to the proposal or of critical importance.
- A detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives.
- The environmental impacts associated with the issue are of particular concern among the public or other governmental agencies or are the source of controversy over the scope of potential impacts.

Impact topics that are being carried forward for further analysis are sediment, floodplain and flood hazard, hydrodynamics, groundwater, surface water, benthic fauna, fish, essential fish habitat, aquatic special status species, vegetation / habitat, birds, cultural resources, aesthetics / viewshed, recreation, air quality, community noise, traffic, socioeconomics, environmental justice, and navigation (including safety). A summary of the impacts of the alternatives on the resources is provided in Table 9.

4.1.4 Resources Not Subject to Detailed Consideration

Several issues were initially considered but were ultimately dismissed from detailed analysis. These dismissed issues are not potentially significant, are not critical to choosing among alternatives, or are not subject to concern from the public or governmental agencies. Additionally, some of the Corps Public Interest Review factors did not apply to the type of project being proposed and evaluated by this Draft EIS. These issues are described in Appendix C, including the reason(s) why further analysis was not warranted.

Figure 11. SPCT Project Area

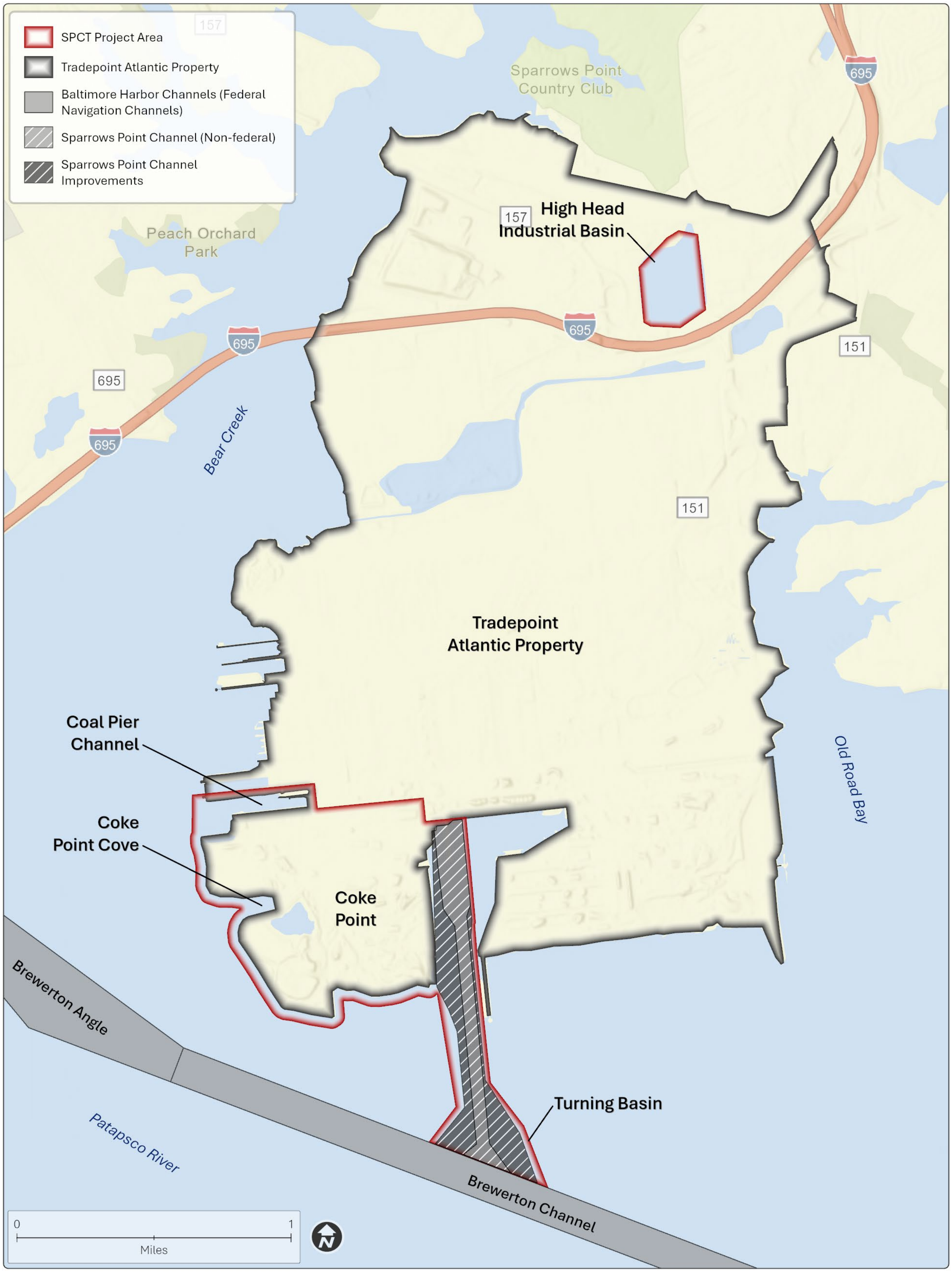


Table 9. Summary of the Potential Impacts from Implementing the Alternatives

This table presents a summary of the impacts from the No-action Alternative and the Combined Options Alternative, separated into impacts from development of the terminal and channel improvements and impacts associated with dredged material placement. The impacts are discussed in detail in the sections following this table.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Sediment	Ongoing potential for ecological risk in offshore areas and limited human health risk from disturbance and resuspension of sediments during maintenance dredging, storm events, and vessel traffic.	Dredging would permanently remove sediments that include legacy contaminants. Removal of sediments would have a net improvement of surficial sediment conditions for aquatic life in the vicinity of the project area. Dredging and in-water construction activities may resuspend sediments but the use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would reduce these impacts which are expected to be minimal.	*High Head Industrial Basin DMCF* – Placement of dredged material would encapsulate existing sediments with elevated contaminant concentrations. *Coal Pier Channel DMCF* – Placement of dredged material would result in the loss of 19.6 acres of sediments that contain elevated concentrations of contaminants, which would be encapsulated, eliminating exposure pathways for aquatic life. Dredging of soft sediments in the alignment of the exterior dike footprint prior to sand placement would minimize displacement and resuspension of sediments and the potential for creation of a mud wave during dike construction. *MPA DMCF* – No new impact. *NODS* – No new impact.
Floodplain and flood hazard	No impact. Potential future development of Coke Point would not require work in the floodplain beyond the routine maintenance dredging that is already occurring.	No impact.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – Changes in water flow or pattern during flood events would be limited to areas within approximately 0.25 mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities. *MPA DMCF* – No new impact. *NODS* – No new impact.
Hydrodynamics	No impact. Maintenance dredging of the Sparrows Point Channel would continue to retain the existing bathymetry, and potential future development of Coke Point would not affect hydrodynamics.	The expanded channel would increase the area with reduced current speed from 300 feet (existing channel width) to 450 feet (proposed channel width) compared to areas outside the channel. No impacts on currents outside of the channel.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – No Coal Pier Channel DMCF would close off the mouth of the channel on the west side of Coke Point. The flood and ebb tidal currents in this area would continue unimpeded and would therefore not have an impact on the hydrodynamics of the Patapsco River. *MPA DMCF* – No new impact. *NODS* – No new impact.
Groundwater	Impacts from an increase in impervious surface, limiting water infiltration and resulting in lowering the groundwater surface elevation, decreasing groundwater flow, slowing the movement of groundwater contaminants, and reducing the adverse impacts of contaminated groundwater, which are being managed through Resource Conservation and Recovery Act interim measures. No impact if the High Head Industrial Basin were to be filled with dry material.	Planned paving and buildings would result in 95% of Coke Point being impervious to infiltration; the impacts would be the same as described for the No-action Alternative.	*High Head Industrial Basin DMCF* – Placement of wet dredged material in the DMCF could temporarily increase the water level in the basin and compress the sediments currently at the base of the basin; however, the sediment would be contained within the DMCF footprint. Compaction of dredged material would decrease sediment permeability, reducing the movement of groundwater contaminants and the risk of contaminants moving from groundwater into surface water *Coal Pier Channel DMCF* – Groundwater near the DMCF would flow around or under the compacted dredged material; however, the increased impervious surface on Coke Point would reduce the groundwater flux, consequently decreasing the volume of groundwater being diverted around the DMCF. Dredged material placement would compress underlying sediment, reducing permeability and contaminant mobility via groundwater in the long-term. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Surface water	Ongoing potential for resuspension of contaminated surficial sediments into surface waters by natural physical processes, maintenance dredging, and vessel movements. Ongoing chemical inputs to surface water from watershed and agricultural practices, local and regional industrial and stormwater discharges, and groundwater.	In-water construction and dredging have the potential to resuspend sediments and contaminants into surface waters. The use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would minimize these impacts. Impacts would be temporary, localized, reduced, and controlled through the use of BMPs. Removal of sediment with legacy contaminants as part of channel dredging would improve the quality of the sediment at the sediment-water interface and would have a permanent net improvement to surface waters in the vicinity of the project area. Construction of the terminal would increase the impervious surface area on the Coke Point peninsula; stormwater discharges from two new permitted outfalls at the south end of Coke Point would be incorporated into the regional stormwater plan for the Sparrows Point facility and would not be expected to adversely impact surface waters.	*High Head Industrial Basin DMCF* – Filling of the DMCF basin would eliminate its use for stormwater; stormwater inputs would be redirected and managed according to NPDES permit requirements. No impacts from the removal of the existing impounded water from the High Head Industrial Basin, use of surface waters for pumping and offloading of dredged material, and discharge of effluent from dewatering of the dredged materials would be expected; these actions would follow stipulations and conditions of a NPDES permit and a Water Appropriation and Use Permit issued by the MDE. *Coal Pier Channel DMCF* – In-water construction and placement of sand for exterior dike construction would have the potential to resuspend sediments. Pre-dredging of the exterior dike alignment and the use of BMPs where practicable, necessary, and feasible based on sediment chemistry and site conditions would minimize these impacts. No impacts from the use of surface waters for pumping and offloading of dredged material and discharge of effluent from dewatering of the dredged materials would be expected; these actions would follow stipulations and conditions of a NPDES permit and a Water Appropriation and Use Permit issued by the MDE. Encapsulation of approximately 19.6 acres of impacted sediments at the sediment - water interface would provide net improvement to surface waters in the vicinity of the project area. *MPA DMCF* – No new impact. *NODS* – No new impact.
Benthic fauna	Continued impacts from existing sediment and water quality conditions. Continued impacts from maintenance dredging with community recovery after dredging. Permanent loss of benthic community if the High Head Industrial Basin were to be filled.	Channel dredging would impact benthic organisms, causing mortality for any non-mobile organisms in or on the sediments and could create temporary water column turbidity that could affect filter-feeding species. Benthic organism communities would recover after dredging events (including the ongoing maintenance dredging), but the increased deepwater habitat could change the type of species present after dredging. New open water habitat would be created by excavation for the wharf, but the wharf would shade 8.9 acres of open water, resulting in aquatic habitat that may be less capable of supporting a diverse benthic community. Installation of pilings and mooring dolphins would result in mortality of any benthic organisms present in that footprint and a permanent loss of 0.2 acre of available bottom habitat.	*High Head Industrial Basin DMCF* – High Head Industrial Basin is not managed to support aquatic habitat; however, approximately 40 acres of benthic habitat and any benthic organisms present in the basin would be permanently lost. *Coal Pier Channel DMCF* – Placement of dredged material would result in burial and permanent loss of the existing benthic communities and 19.6 acres of degraded bottom habitat. Standard BMPs would minimize sediment resuspension during dike construction and the potential for benthic organism burial outside the dike footprint. *MPA DMCF* – No new impact. *NODS* – No new impact.
Fish	Continued impacts from existing historical sediment contamination. Continued temporary impacts during maintenance dredging from disturbance and loss of invertebrate prey species. Permanent loss of approximately 40 acres of aquatic habitat and the associated fish community if the High Head Industrial Basin were to be filled.	Dredging for the deepening and widening of the Sparrows Point Channel could result in different life stages of fish species being caught in dredging equipment, resuspended sediment (increasing turbidity) and habitat alteration impacting fish, especially eggs and larvae. Underwater noise from pile driving could impact fish through physical damage for organisms near the project area and behavioral disturbances for organisms within approximately 2 miles of the project area. Increased vessel traffic (additional 10 vessels at a time during construction and 500 container vessels per year during operation) would continue to affect fish through disturbance from noise and physical disturbance of habitat conditions.	*High Head Industrial Basin DMCF* – High Head Industrial Basin is not managed to support aquatic habitat; however, approximately 40 acres of aquatic habitat and any fish present in the basin (two species were found during sampling) would be permanently lost. *Coal Pier Channel DMCF* – Placed material could cause temporary turbidity impacts; fish within the offshore DMCF footprint would be displaced, would experience increased vessel traffic and habitat alteration, and could be trapped or buried within the dike alignments, especially eggs and larvae. The Coal Pier DMCF footprint does not provide high-quality habitat for benthic organisms or fish species due to historical sediment contamination and represents only a small portion of bottom habitat available to fish. *MPA DMCF* – No new impact. *NODS* – No new impact.
Essential fish habitat (EFH)	Continued impacts from existing conditions, including maintenance dredging, loss of invertebrate prey species, and historical sediment contamination. No impact at High Head Industrial Basin.	Dredging impacts on juvenile and adult EFH species would be short-term; eggs and larvae present in the project area would be permanently lost. Terminal development would impact EFH habitat and species with increased noise, vessel traffic, turbidity, and habitat alteration (as discussed above for fish).	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – Habitat within the DMCF footprint would be permanently lost. EFH species within the footprint of the DMCF would be displaced due to increased turbidity, which could disrupt foraging behaviors. EFH species could be trapped as material is placed, especially eggs and larvae. The Coal Pier DMCF footprint represents only a small portion of bottom habitat available to EFH species; therefore, permanently filling the Coal Pier Channel which does not provide high-quality habitat for EFH species due to sediment contamination would have only localized impacts on EFH species. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	**Dredged Material Placement**
Aquatic special status species	Continued impacts from existing conditions, including maintenance dredging, and existing contaminated sediments. No impact at High Head Industrial Basin.	The impacts of noise and increased turbidity on aquatic special status species would be the same as impacts on fish species (as discussed in the Fish section). Increased vessel traffic from construction and operation of the terminal would cause a minor increase in the risk of striking special status species such as sturgeon and sea turtles; for sea turtles, the risk would increase for vessels traveling between the site and the lower Chesapeake Bay, but this would be negligible since the routes are already highly trafficked. Bottlenose dolphins are expected to be transient in this portion of the river and are not likely to be impacted.	*High Head Industrial Basin DMCF* – No impact *Coal Pier Channel DMCF* – The impacts of construction, increased vessel traffic, and habitat alteration on aquatic special-status species would be the same as impacts on fish species (as discussed in the Fish section). Sturgeon and special status fish species could suffer behavioral and physiological effects from increased turbidity, but the turbidity increase would be temporary, localized, and controlled, and the mobile life stages could move away from the construction area. The more isolated location of the Coal Pier DMCF would be unlikely to be utilized by sturgeon or dolphins, as they utilize open reaches of rivers with faster flowing water. *MPA DMCF* – No impact. *NODS* – The impacts would be limited to the risk of strike of special status species from barge transit from SPCT to the NODS, but the increase in risk is negligible given the vessel traffic already present.
Vegetation / habitat	Minimal adverse impacts from potential future development of Coke Point and High Head Industrial Basin.	Development of the terminal would require the removal of all terrestrial vegetation in the project area, which would result in minimal adverse impacts.	*High Head Industrial Basin DMCF* – Construction of the High Head Industrial Basin DMCF would remove approximately 11.2 acres of riparian, shrub, and forested habitat, resulting in adverse impacts on vegetation and habitat; however, this habitat is not unique and is impacted by past industrial uses. Given the abundance of riparian, shrub, and forested habitat in the area, impacts would be minimal. *Coal Pier Channel DMCF* – No additional impact beyond those described for terminal development. *MPA DMCF* – No new impact. *NODS* – No new impact.
Birds	Continued impacts from existing conditions, including industrial activities, maintenance dredging, buildings, and artificial lighting. Potential impacts from degraded habitat removal during future development of Coke Point and High Head Industrial Basin.	Construction would impact local bird populations due to the noise and loss of habitat on Coke Point. Habitat loss would be minimal and disturbance from construction noise would be temporary. Increased turbidity from dredging could temporarily impact foraging sea birds. Although terminal operations could impact birds by increasing vessel traffic and constructing new buildings and structures, these conditions would be similar to existing conditions and would represent a minimal impact on birds. New artificial lighting would increase light pollution and could adversely affect bird behavior, but impacts from new lighting would be minimal given the existing nighttime light intensities.	*High Head Industrial Basin DMCF* – Construction of the DMCF would remove approximately 11.2 acres of terrestrial habitat and permanently remove approximately 40 acres of aquatic habitat and 1 linear mile of riparian habitat along the edge of the basin. This habitat is not unique and is impacted by past industrial uses, but the change from aquatic habitat to upland would exclude birds that use the aquatic and riparian habitats. Construction and dredged material placement activities would likely displace upland birds from the site for approximately 3 years. The site could be used by upland birds following construction. *Coal Pier Channel DMCF* – Construction of the DMCF would cause a minor reduction in the aquatic habitat available for loafing and foraging; however, the offshore DMCF area is not heavily used by birds and there is extensive area available adjacent to the DMCF footprint. The Coal Pier Channel DMCF would cause small, localized impacts on bird communities that use the area. *MPA DMCF* – No new impact. *NODS* – No new impact.
Aesthetics / viewshed	Continued impacts from existing conditions, including routine operations. Potential future development of Coke Point and High Head Industrial Basin would be consistent with existing conditions.	Terminal development would result in temporary and permanent visual changes, including the increase of shoreline development, shipping container storage, and mast lights. However, most of these would not be a substantial change from existing aesthetics. The grouping of up to 9 ship-to-shore cranes would have a moderate scale contrast and spatial dominance in the foreground view for boaters, the middleground view for some residents of Baltimore County, and the background view for shore viewers in Anne Arundel County and from Fort Howard Park; the scale contrast is not projected to be noteworthy for boaters given the transient nature of the view from boats and existing low visual quality.	*High Head Industrial Basin DMCF* – Construction of the DMCF would not produce significant changes in aesthetics and viewshed, having limited visibility and being similar in scale to a nearby building. *Coal Pier Channel DMCF* – The newly constructed DMCF would be visible to viewers west of the project and boaters, but the visual impact would be minimal, being similar in scale to existing structures. The DMCF could also increase noticeable light, but given the distance from the communities, impacts would be minimal. *MPA DMCF* – No new impact. *NODS* – No new impact.
Recreation	Boating activities near the channel would continue to be temporarily affected by commercial operations and maintenance dredging of the Sparrows Point Channel. Potential future development of Coke Point would not have an impact on water-based recreation.	Terminal development and periodic maintenance dredging would temporarily impact recreational activities. Exclusion zones during construction and dredging activities would have minor impacts on recreational boating. In-water activities could increase turbidity and impact localized fishing, but subsistence fishing in license-free fishing areas would not be impacted.	*High Head Industrial Basin DMCF* – No impact. *Coal Pier Channel DMCF* – During construction of the DMCF, an exclusion zone would impact recreational boating along the western shore of Coke Point, but impacts would be localized and temporary. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Air quality	Continued vessel use of auxiliary engines at other ports on the east coast of the United States and use of diesel cargo handling equipment would continue to contribute to greenhouse gas emissions. If Coke Point or High head Industrial Basin were further developed, there would be short-term air quality impacts associated with construction activities.	Emissions would be generated primarily during the construction and cleanup phases by sources such as construction and demolition equipment and transport vehicles. The construction period would be expected to be energy-intensive and to result in short-term but significant greenhouse gas emissions. During operation, the terminal would be partially electrified, and the use of shore power would significantly reduce emissions from ships at berth.	*High Head Industrial Basin DMCF* – Emissions would be generated during construction of the DMCF and placement of dredged material; emissions would be limited to 7 months for construction and 3 years for dredged material placement. *Coal Pier Channel DMCF* – Emissions would be generated during construction of the DMCF and placement of dredged material; emissions would be limited to 7 months for construction and 2 to 3 years for dredged material placement. *MPA DMCF* – Emissions would be generated during transport of dredged material to the MPA DMCFs, but this impact would be limited to a 4-year period. *NODS* – Emissions would be generated during transport of dredged material to the NODS via scows, but this impact would be limited to a 2-year period.
Community noise	No new impacts. Noise levels from periodic maintenance dredging and potential future development of Coke Point and High Head Industrial Basin would attenuate to acceptable residential levels at the closest residences. No nighttime noise would occur.	Peak sustained and periodic noise levels for both construction and operations would attenuate to acceptable residential levels at the closest residences, with no impact in most atmospheric conditions. Under less typical atmospheric conditions, periodic and nighttime construction and operational activities could produce noise that would be noticeable to waterfront areas in Turner Station and northern Anne Arundel County.	*High Head Industrial Basin DMCF* – Sustained daytime noise from constructing the DMCF would attenuate to acceptable levels. There would be no periodic daytime or nighttime noise impacts from construction or dredged material placement. *Coal Pier Channel DMCF* – Sustained daytime noise impacts from the construction of the DMCF would attenuate to acceptable levels. There would be no periodic daytime or nighttime noise impacts from construction or dredged material placement. *MPA DMCF* – No new impact. *NODS* – No new impact.
Socioeconomics	Not quantified due to uncertainty of future activities in the area; no impacts on commercial fishing would occur.	Terminal development and operation would create jobs and county and state tax revenue. Construction activities would take just under 3 years to complete and would generate about 1,090 job-years of employment (or an equivalent of about 363 average annual jobs over 3 years), labor income of about $80 million, industry output of about $202.7 million, and an estimated $3 million in county and $6.1 million in state tax revenues. Terminal operations would generate about 1,050 direct jobs and 518 indirect and induced jobs in the local region, generating about $102 million in labor income and $194 million in industry output annually. The jobs would generate more than $3 million in annual county and $6 million in annual state tax revenues. The new jobs would not significantly impact the economic structure or the socio-demographics of the region. Overall, this alternative would generate about 1,200 job-years of employment, $222 million in industry output, and about $3.2 million in county and $6.7 million in state tax revenue. Although the jobs could reduce unemployment and increase incomes, it would only be small percentage of total employment, and the effect would not be significant. Dredging, terminal construction, and terminal operation would not impact commercial fishing.	*High Head Industrial Basin DMCF and Coal Pier Channel DMCF* – The construction of both DMCFs would take about 27 months of labor activity, creating 109 job-years of employment (about 48 average annual jobs), generating approximately $8 million in labor income, $19 million in industry output, and $252,000 in county and $536,000 in state taxes. High Head Industrial Basin DMCF construction would not impact commercial fishing. Construction of and dredged material placement in the Coal Pier Channel DMCF would not have significant impacts on commercial fishing. Although construction noise could deter fish use of the area for 2 to 3 years, construction would be unlikely to limit vessel activity and the DMCF would not spatially overlap with pound net activities. *MPA DMCF* – No new impact. *NODS* – No new impact.

Resource Topic	No-action Alternative	Combined Dredged Material Placement Options Alternative	
		Terminal Development and Channel Improvements	Dredged Material Placement
Environmental justice	No new impacts. Continued potential for ecological risk and limited potential for human health risk from sediment resuspension during maintenance dredging and vessel traffic.	Air quality impacts would be temporarily increased above threshold levels during construction, but these levels would return below threshold levels following construction. The project would not produce disproportionate and adverse air quality impacts on environmental justice populations. Terminal development would address legacy environmental contamination through sediment removal and encapsulation, benefiting aquatic organisms and humans consistently across the study area. Terminal construction and operation would create socio-economic benefits for the region that would occur consistently across the study area. New landscape features associated with terminal operation and new sources of light would occur consistently to residents in seven of the 17 census tracts; two of these seven meet underserved community criteria. Under atypical atmospheric conditions occasional elevated noise levels could reach nearby communities, affecting six of the 17 census tracts, two of which include underserved communities. Impacts from increased traffic would occur in one tract that meets underserved community criteria, but this increase would occur in an industrial portion of this tract, not near residential neighborhoods. No disproportionate impacts on recreation for underserved communities.	*High Head Industrial Basin DMCF* – Air quality impacts would increase above threshold levels during construction, returning below threshold levels following construction. Impacts would not be disproportionate for environmental justice populations. Placement of dredged material would decrease the mobility of contaminants, having a potential beneficial effect on groundwater that would occur consistently across the study area. Construction would create socio-economic benefits for the region that would occur consistently across the study area. No disproportionate impacts on aesthetics, noise, or recreation for underserved communities. *Coal Pier Channel DMCF* – Air quality impacts would increase above threshold levels during construction, returning below threshold levels following construction. Placement of dredged material would eliminate exposure pathways for chemicals to aquatic organisms and humans consistently throughout the study area. The DMCF would be visible to viewers west of the project and boaters and would increase noticeable light for one underserved community, but these impacts on aesthetics would not be significant. Construction would create socio-economic benefits for the region that would occur consistently across the study area. No disproportionate impacts on noise or recreation for underserved communities. *MPA DMCF* – No new impact. *NODS* – No new impact.
Traffic	Future development of the TPA property would have limited effects on local traffic. Traffic levels on local roads would remain within the capacity of the local roadways.	During construction activities, traffic would increase on local roads during peak hours with an additional 517 trips in the mornings and the same amount in the evenings. These increases in traffic are well below the capacity of the local roads.	*High Head Industrial Basin DMCF* – Construction of High Head DMCF would result in a small increase in local traffic would not be noticeable given the traffic volume on local roads. *Coal Pier Channel DMCF* – Construction of the DMCF would impact traffic only in areas from which different work vessels depart to construct the DMCF. Traffic near the project area would not be impacted. *MPA DMCF* – No new impact. *NODS* – No new impact.
Navigation	Vessel traffic would continue under existing conditions. Ro-Ro operations would likely be expanded onto Coke Point, increasing the number of Ro-Ro vessels using the Brewerton Channel, a federal navigation channel, and Sparrows Point Channel, a non-federal channel.	Dredging of the Sparrows Point Channel would only impact the Brewerton Channel during dredging for the proposed turning basin, where the two channels meet, over one construction year, lasting about seven months. Coordination with US Coast Guard would occur in compliance with the required dredging permit conditions and stipulations included in Section 408 permission, if granted. Following construction, the vessel traffic to the Port would increase by approximately 500 vessels per year, about 150 of which would be from new weekly services to the Port of Baltimore, an average of three additional vessels per week navigating the Brewerton Channel to enter the Sparrows Point Channel. Container vessels would represent a new vessel type using this area but would navigate through the Brewerton Channel, turning basin, and Sparrows Point Channel in the same way as the existing Ro-Ro vessels currently operate.	*High Head Industrial Basin DMCF* – Construction would have no impact on navigation. Dredged material transport to the DMCF would occur outside of the Brewerton Channel and would have no impact on navigation. Dredged material placement would occur over three construction years; transporting dredged material from the Sparrows Point Channel to the west side of Sparrows Point. Transit would occur outside the Brewerton Channel. *Coal Pier Channel DMCF* – Increased boat traffic for construction of the DMCF would occur outside the Brewerton Channel. A temporary exclusion zone during construction would be located outside the Breweton Channel and would not impact navigation. Vessels outside the Brewerton Channel would need to navigate around the exclusion zone which could temporarily alter their routes around the western shore of Coke Point. Dredged material transport from the Sparrows Point Channel to the DMCF would occur outside the Brewerton Channel and would have no impact on navigation. Dredged material placement would occur over 2 to 3 construction years. *MPA DMCF* – The transport of dredged materials to the DMCFs would require transport vessels to cross the Brewerton Channel. Impacts on navigation would be temporary and limited through coordination with the Corps and the US Coast Guard. *NODS* – Transport of the of the dredged material to NODS would require transport vessels to use the Chesapeake Bay navigational channel system for approximately 152 nautical miles. Approximately 262 scow trips would be needed over 291 operational days, split across two dredging seasons. Impacts on navigation would be temporary and limited through coordination with the Corps and the US Coast Guard.

4.2 Sediment

Sediment consists of particulate matter that has settled to the bottom of a waterbody. Sediment provides a substrate and food resource for benthic organisms and other wildlife, and people may come into contact with sediment while swimming, fishing, or working in shallow water areas. Sediment serves as a repository for materials and chemical constituents that enter waterways, including nutrients from agricultural practices, chemical constituents from industrial processes and discharges and from stormwater runoff. Sediments may be redistributed from the bottom of a waterbody back to surface water if storms, fish and wildlife activity, or human activities disturb bottom sediments.

Sediments are described by physical and chemical properties. The site-specific physical and chemical characteristics of sediment are used to determine the quality of the sediment with respect to suitability for supporting aquatic life and for determining placement options for dredged sediments. The quality of surface sediment is used to assess potential impacts on aquatic life and the quality of the entire column of sediment to be dredged (both surface and sub-surface sediment) is used to assess potential impacts related to sediment disturbance / dredging and to identify appropriate placement options for dredged material.

4.2.1 Affected Environment

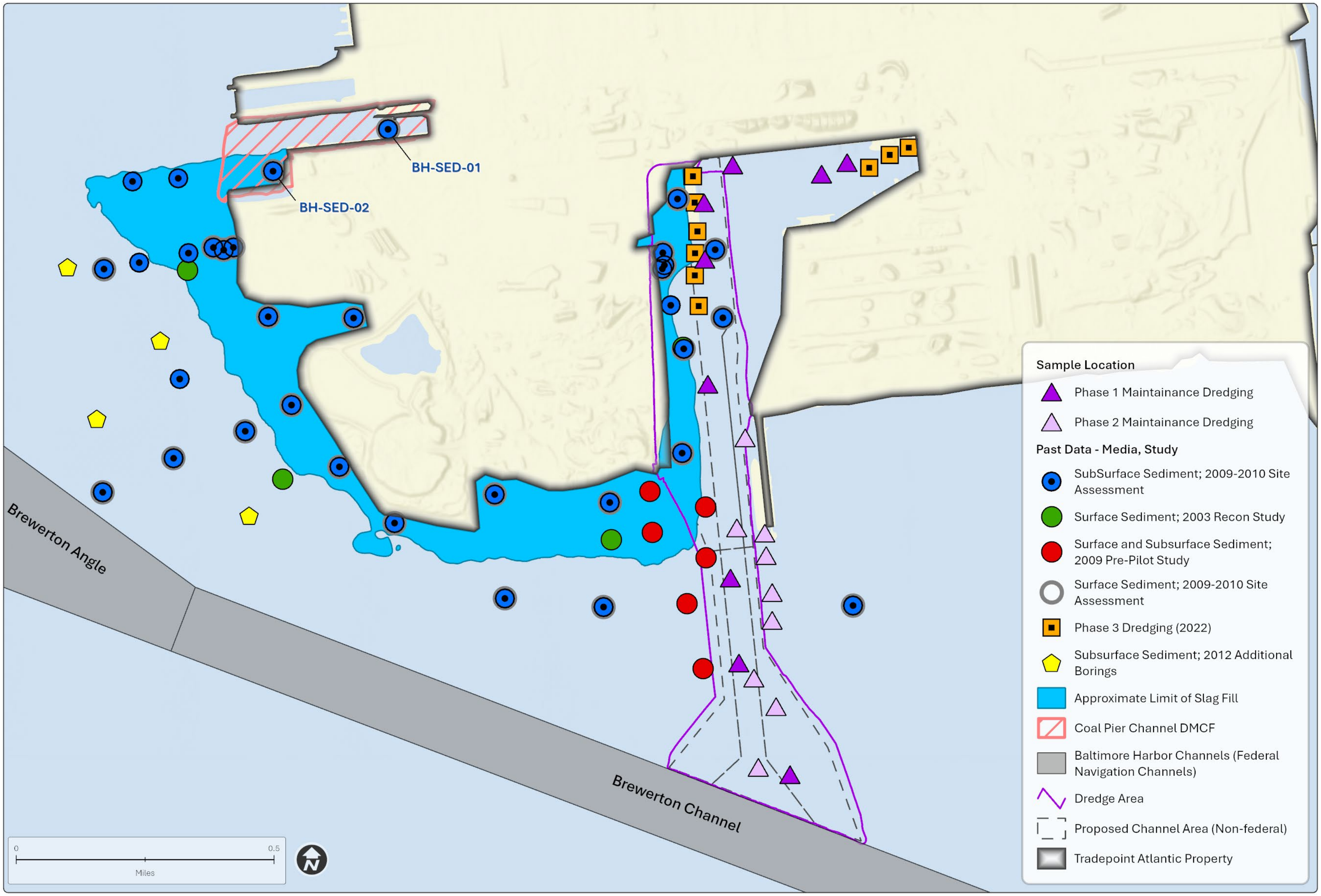
Sediments that could be affected by the SPCT project are sediments in the Patapsco River around Coke Point, including sediments in and adjacent to the existing Sparrows Point Channel where dredging would occur, sediments on the west side of Coke Point in the area proposed for construction of the Coal Pier Channel DMCF, and sediments present in the High Head Industrial Basin. Characterization of sediments in this section is based on both historical data and physical and chemical data collected specifically for this project.

Summary of Sediment Studies

Past Studies – Sediments immediately offshore of Coke Point have been the subject of numerous past investigations (EA Engineering, Science, and Technology, Inc., PBC [EA] 2003, 2009, 2010a, 2010b, 2011). Figure 12 shows historical sampling locations from previous offshore sediment studies conducted from 2003 through 2011.

Prior to purchase by TPA, MPA conducted due diligence / site assessment studies between 2009 and 2011with the intent to purchase the property for development of a DMCF that would use existing upland area and extend offshore west side of Coke Point. The due diligence / site assessment studies included an investigation of the distribution of contaminants in the upland soils and groundwater, as well as in the offshore sediments (EA 2009, 2010a, 2010b). The offshore investigations included both surface and sub-surface sediments, focused on the west side of Coke Point where the proposed DMCF would be located and also included sediments on the south side of Coke Point to assist with the identification of potential habitat improvement areas. A pre-pilot sediment characterization study evaluated horizontal and vertical delineation of impacts on the offshore sediments and identified potential constituents of concern in areas that were targeted for dredging as part of the proposed DMCF project (EA 2010a). The studies of offshore sediment identified elevated concentration of metals, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). Generally, concentrations of contaminants were highest in the surficial sediments and decreased with depth below sediment surface and in areas further away from the Coke Point shoreline.

Figure 12. Historical Sampling Locations from Previous Sediment Studies (2003 through 2011) and Slag Limits



The chemical data for the surficial offshore sediments in combination with water quality, fish and crab tissue, benthic community, and clam and worm tissue bioaccumulation data were used for the preparation of an ecological and human health risk assessment (EA 2011). The risk assessment work plan and results were reviewed extensively by both USEPA Region 3 and MDE, and the results identified several offshore areas with impacted sediments on the west and south side of Coke Point contributing to elevated risk for human health and ecological communities.

Other past studies relevant to the quality of sediments in the proposed channel improvements footprint include recent geotechnical investigations (Kozera 2023), maintenance dredged material characterizations for the existing Sparrows Point Channel (Robert Balter Company 2018, 2019; EA 2022), and past characterization of maintenance material for the Brewerton Channel (EA 2014, 2020).

Sediment Quality Guidelines (SQGs) are numerical benchmarks used to assess the potential impact of sediment-bound contaminants on aquatic life. These guidelines help in evaluating whether concentrations of specific chemicals in sediment could be harmful to organisms living in or on the surface of sediments. SQGs are typically derived from compilation of multiple laboratory toxicity studies and field studies.

The **Threshold Effects Level (TEL)** is the concentration below which adverse biological effects on aquatic life are rarely observed. Sediment concentrations at or below the TEL suggest a low risk of harmful effects to aquatic species.

The **Probable Effects Level (PEL)** is the concentration above which effects on aquatic are more frequently observed. It represents a threshold where there is a higher probability that exposure to sediment contaminants may result in adverse effects to aquatic species.

Dredging units (DUs) are used to delineate and characterize sediments within a proposed dredging area. The sediments with each DU are sampled and tested separately for physical, chemical, and biological properties. Based on the results of the testing, the volume (cubic yards) of material from each DU can be managed separately with respect to feasible disposal options and with respect to BMPs that may be required.

Sediment Studies to Support Assessment of Aquatic Resources – Surficial sediment quality was evaluated as a component of the summer aquatic resource surveys that were performed for the SPCT project area (EA 2024a). Sediment quality samples were co-located with the benthic community assessment locations (Section 4.7; Figure 13). Samples were tested for physical properties and a full suite of chemical constituents, including metals, PCBs, PAHs, pesticides, dioxin and furans, and nutrients. Concentrations of chemical constituents were compared to sediment quality guidelines (SQGs) for aquatic life, specifically Threshold Effects Levels (TELs) and Probable Effects Levels (PELs) (Long et al. 1998, Long et al. 1995, MacDonald et al. 1996). TELs typically represent concentrations below which adverse biological effects are rarely observed, while PELs typically represent concentrations above which effects are more frequently observed. Concentrations that are between the TEL and PEL represent the concentrations at which adverse biological effects occasionally occur.

Sediment Studies to Support SPCT Channel Dredging – Comprehensive studies were conducted to evaluate the sediments proposed for dredging to widen and deepen the existing Sparrows Point Channel (EA 2024b, 2024c). The proposed dredging footprint was divided into 28 dredging units (DUs) for evaluation: 15 DUs located in the southern section of the Sparrows Point Channel (South Channel) and 13 DUs located in the northern section of the Sparrows Point Channel (North Channel) (Figure 14, Figure 15, and Figure 16). A summary of location, material type, volume, and characterization depth for each DU is provided in Table 10.

Figure 13. Surficial Sediment Sampling Locations for the 2023 Aquatic Resources Studies

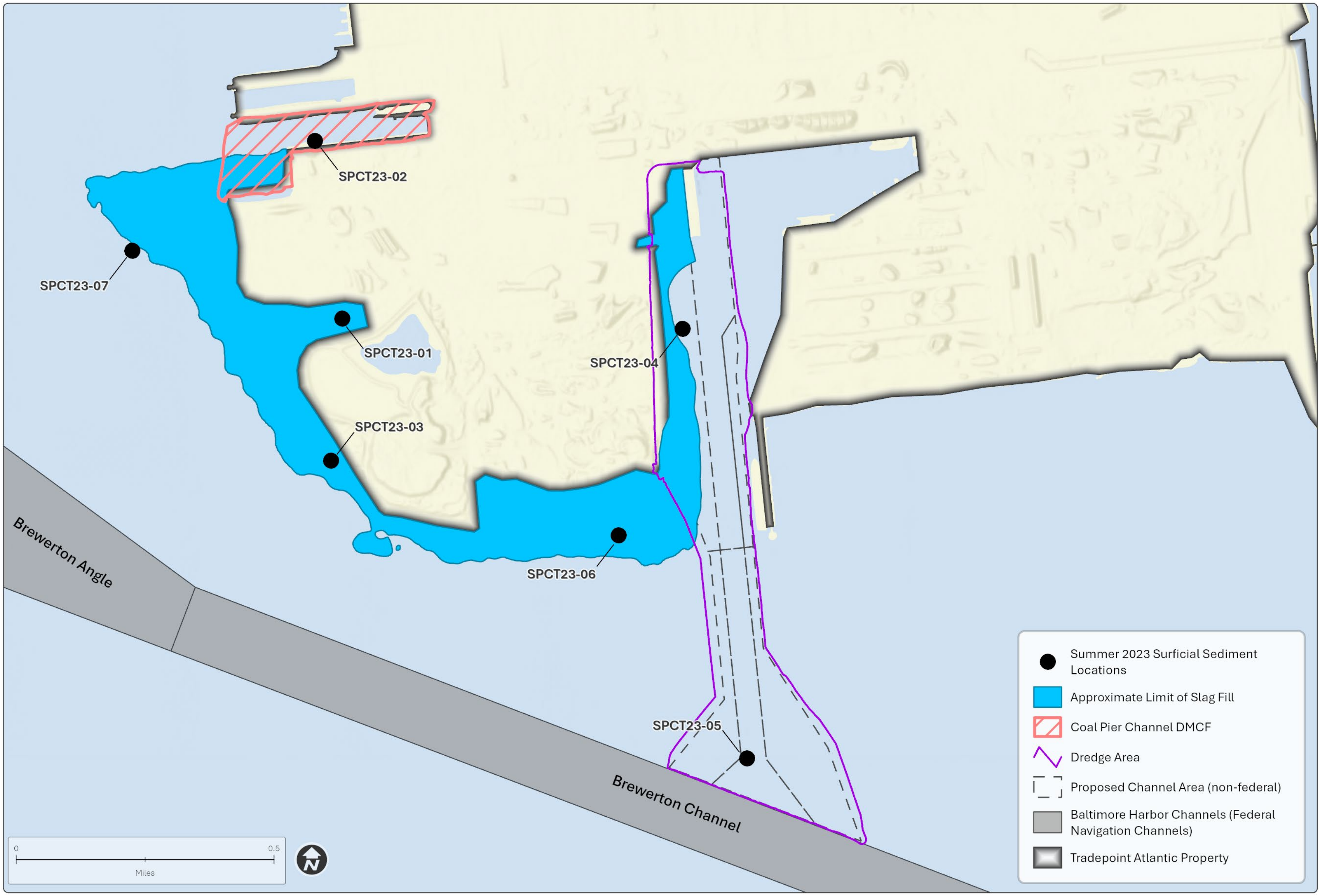


Figure 14. Dredging Units for the North Channel (Existing Sparrows Point Channel and West Widener / Revetment Dredging Units Combined)

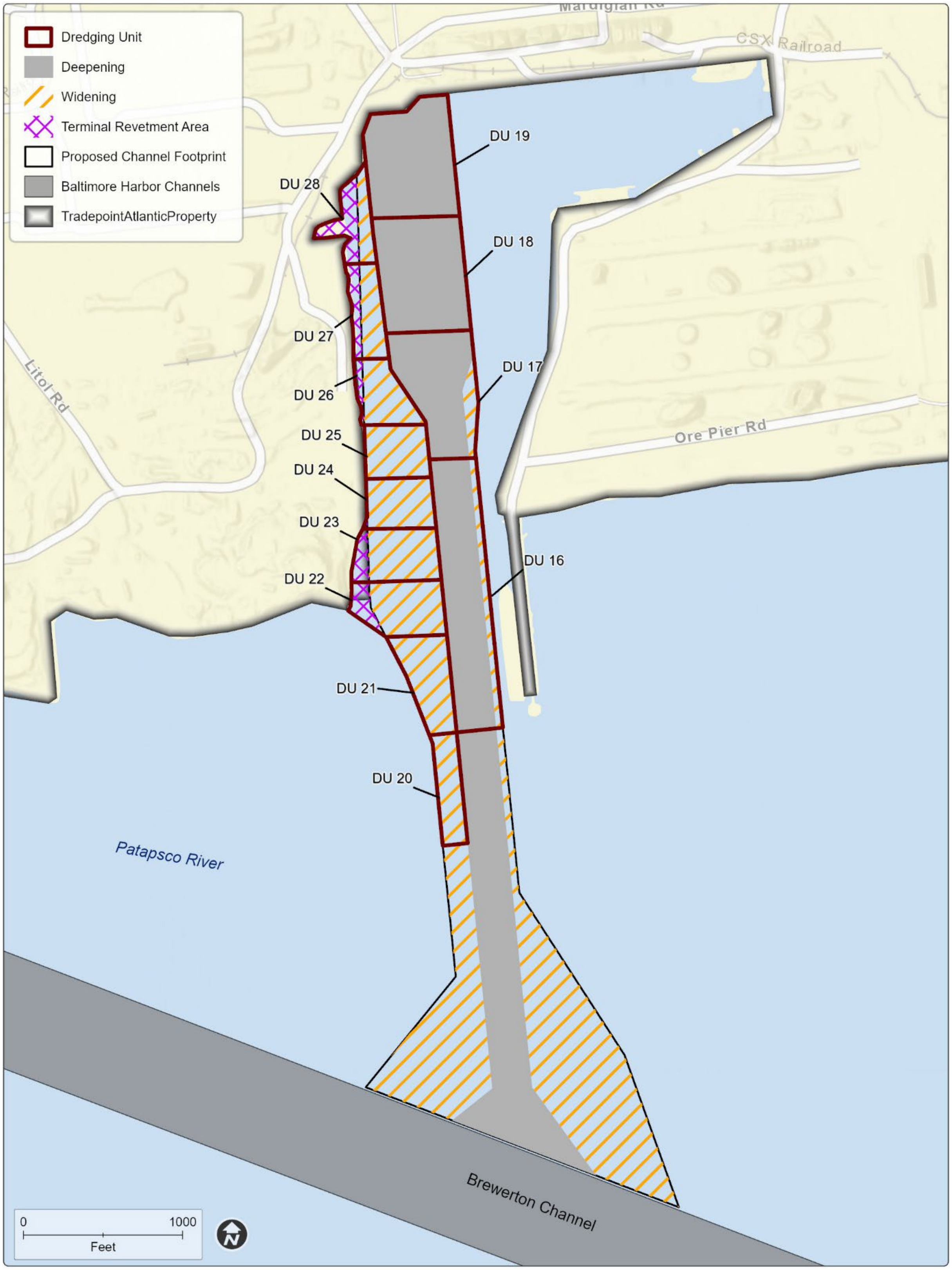


Figure 15. Dredging Units for the South Channel (Existing Sparrows Point Channel Dredging Units and Top Dredging Units for Wideners)

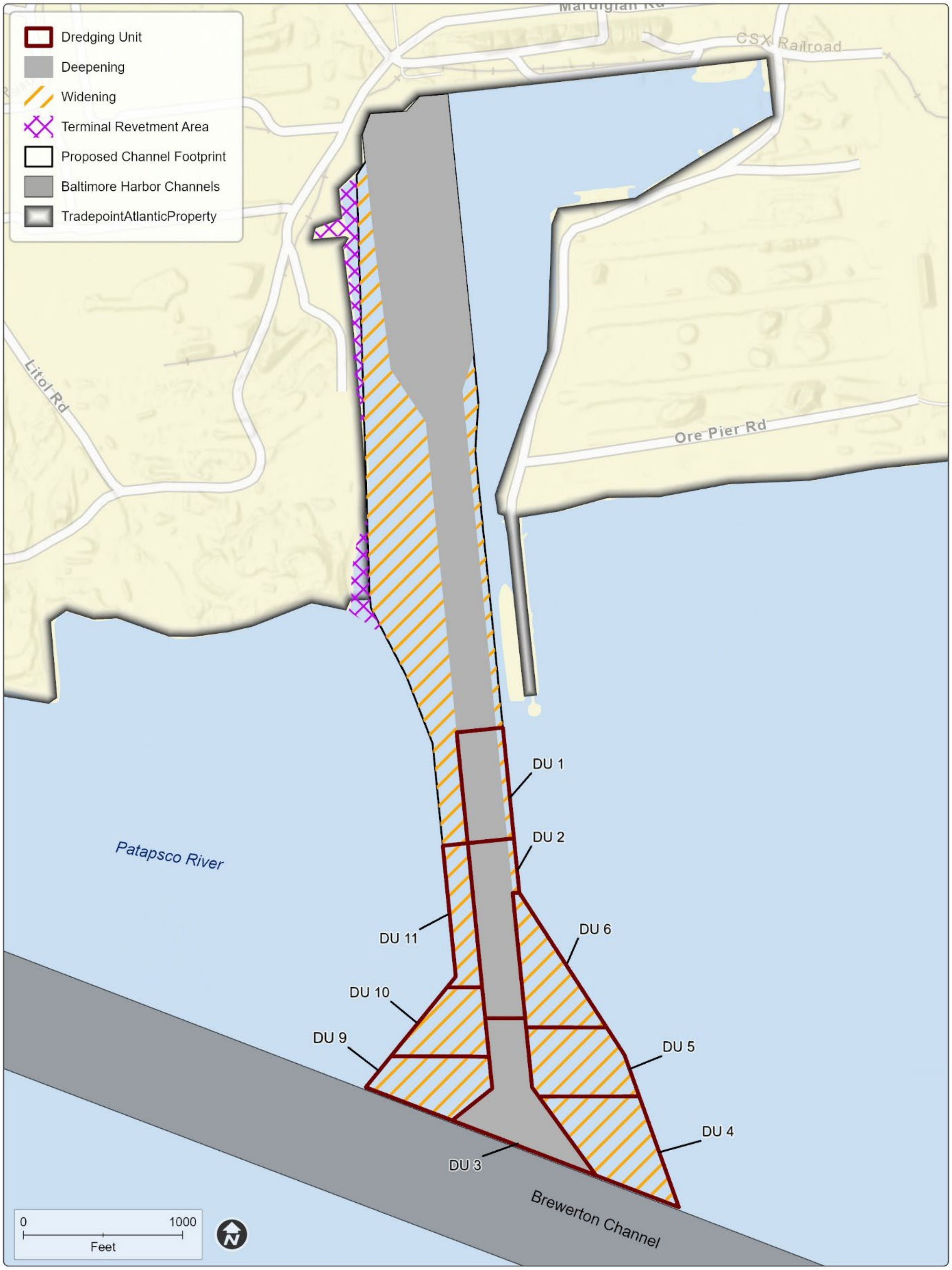


Figure 16. Dredging Units for the South Channel (Bottom Dredging Units for Wideners)

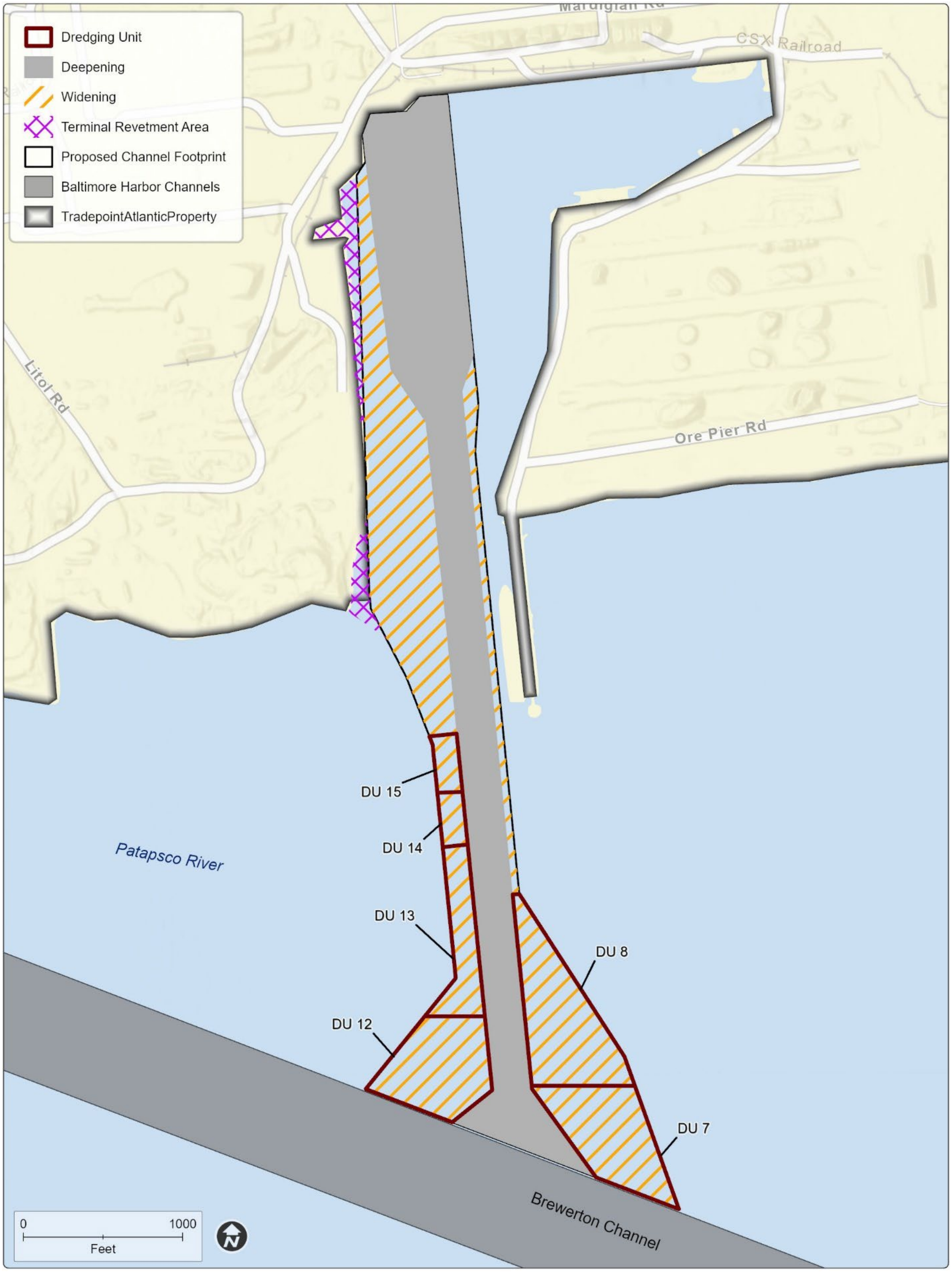


Table 10. Number of Sampling Locations, Sediment Characterization Depth, and Estimated Dredged Material Volume for Each Dredging Unit

Channel Segment	Dredging Unit	Material to be Characterized	Number of Sampling / Coring Locations	Sediment Characterization Depth	Approximate Dredging Unit Volume (CY) [1]	Placement Options Evaluated
South	DU1	Maintenance / Deepening	3	-52 feet MLLW	100,000	Upland / Ocean
South	DU2	Maintenance / Deepening	3	-52 feet MLLW	100,000	Upland / Ocean
South	DU3	Maintenance / Deepening	3	-52 feet MLLW	80,000	Upland / Ocean
South	DU4	East Widener – Top	3	surface to 7 feet bss	80,000	Upland / Ocean
South	DU5	East Widener – Top	3	surface to 7 feet bss	80,000	Upland / Ocean
South	DU6	East Widener – Top	3	surface to 7 feet bss	80,000	Upland / Ocean
South	DU7	East Widener – Bottom	3	7 feet bss to -52 feet MLLW [2]	185,000	Upland / Ocean
South	DU8	East Widener – Bottom	3	7 feet bss to -52 feet MLLW [2]	185,000	Upland / Ocean
South	DU9	West Widener – Top	3	surface to 10 feet bss	90,000	Upland / Ocean
South	DU10	West Widener – Top	3	surface to 10 feet bss	90,000	Upland / Ocean
South	DU11	West Widener – Top	3	surface to 10 feet bss	90,000	Upland / Ocean
South	DU12	West Widener – Bottom	3	10 feet bss to -52 feet MLLW [2]	185,000	Upland / Ocean
South	DU13	West Widener – Bottom	3	10 feet bss to -52 feet MLLW [2]	185,000	Upland / Ocean
South	DU14	West Widener – Bottom	3	10 feet bss to -52 feet MLLW [2]	60,000	Upland / Ocean
South	DU15	West Widener – Bottom	3	10 feet bss to -52 feet MLLW [2]	60,000	Upland / Ocean
North	DU16	Maintenance / Deepening	4	-52 feet MLLW [2]	220,000	Upland

Channel Segment	Dredging Unit	Material to be Characterized	Number of Sampling / Coring Locations	Sediment Characterization Depth	Approximate Dredging Unit Volume (CY) [1]	Placement Options Evaluated
North	DU17	Maintenance / Deepening	4	-52 feet MLLW [2]	230,000	Upland
North	DU18	Maintenance / Deepening	4	-52 feet MLLW [2]	250,000	Upland
North	DU19	Maintenance / Deepening	4	-52 feet MLLW [2]	230,000	Upland
North	DU20	West Widener	4	-52 feet MLLW [2]	140,000	Upland
North	DU21	West Widener	4	-52 feet MLLW [2]	220,000	Upland
North	DU22	West Widener / Revetment	4	-52 feet MLLW [2]	215,000	Upland
North	DU23	West Widener / Revetment	4	-52 feet MLLW [2]	215,000	Upland
North	DU24	West Widener	4	-52 feet MLLW [2]	185,000	Upland
North	DU25	West Widener	4	-52 feet MLLW [2]	185,000	Upland
North	DU26	West Widener / Revetment	4	-52 feet MLLW [2]	185,000	Upland
North	DU27	West Widener / Revetment	4	-52 feet MLLW [2]	150,000	Upland
North	DU28	West Widener / Revetment	4	-52 feet MLLW [2]	125,000	Upland

Notes:

CY = cubic yards

bss = below sediment surface

MLLW = mean lower low water

1 – Approximate maximum volume based on bathymetric surveys from September / October 2023. Volume based on characterization depth of -52 feet MLLW.

2 – Characterization depth = -50 feet MLLW + 2 feet overdepth allowance

> **Overdepth allowance** refers to the additional depth below the target dredging depth from which material may be removed due to excavation inaccuracies in the dredging process. The type of dredging equipment, the site-specific physical conditions (such as wind, waves, currents, and tides), and design of the dredging prism influence overdepth. The depth to which sediments are characterized for physical and chemical constituents includes the overdepth allowance that is applied to the project.

Sediment cores were collected to the maximum dredging depth of -52 feet MLLW (-50 feet + 2 feet overdepth allowance) from multiple locations within each DU using either vibracoring or sonic drilling equipment. Composite sediment samples representative of the material to be dredged were created and tested for each DU. The testing program for the North Channel DUs was designed to evaluate the suitability of the sediments for upland placement at onsite or offsite DMCFs (EA 2024c). The testing program for the South Channel DUs was designed to evaluate the suitability of sediments for upland placement at onsite or offsite DMCFs and for ocean placement at the NODS (EA 2024b). MDE and MPA reviewed and approved the Sampling and Analysis Plan (SAP) for the DMCF evaluation and the USEPA Region 3 reviewed and approved the SAP for the ocean placement evaluation prior to the initiation of the sampling / testing program. A total of 52 locations were sampled in the North Channel and 45 locations were sampled in the South Channel (Figure 17, Figure 18, and Figure 19). Each sediment composite sample was tested for a comprehensive list of physical properties and chemical characteristics:

Chemical Constituents

- Metals
- Mercury
- Chlorinated pesticides
- Organophosphorus pesticides
- Polychlorinated biphenyl congeners
- Tributyltin
- Semivolatile organic compounds
- Polycyclic aromatic hydrocarbons
- Dioxins and furan congeners
- Cyanide, total
- Cyanide, free
- Total sulfide
- Total sulfate
- Ammonia (as nitrogen)
- Total Kjeldahl nitrogen
- Total phosphorus
- Nitrate
- Nitrite
- Total organic carbon
- Acid volatile sulfide and simultaneously extracted metals (cadmium, copper, lead, nickel, and zinc)
- Hexavalent chromium
- Volatile organic compounds
- PCB Aroclors
- Total petroleum hydrocarbons – gasoline range organics (C6 to C10)
- TPH – diesel range organics (C10 to C34)
- TPH – oil range organics (C22 to C32)
- Oil and grease
- Toxicity Characteristic Leaching Procedure

Physical Properties

- Grain size
- Specific gravity
- Atterberg limits
- Total solids
- Unified soil classification system
- pH
- Percent moisture

Figure 17. Sediment Sample Locations for the North Channel (Existing Sparrows Point Channel and West Widener / Revetment Dredging Units Combined)

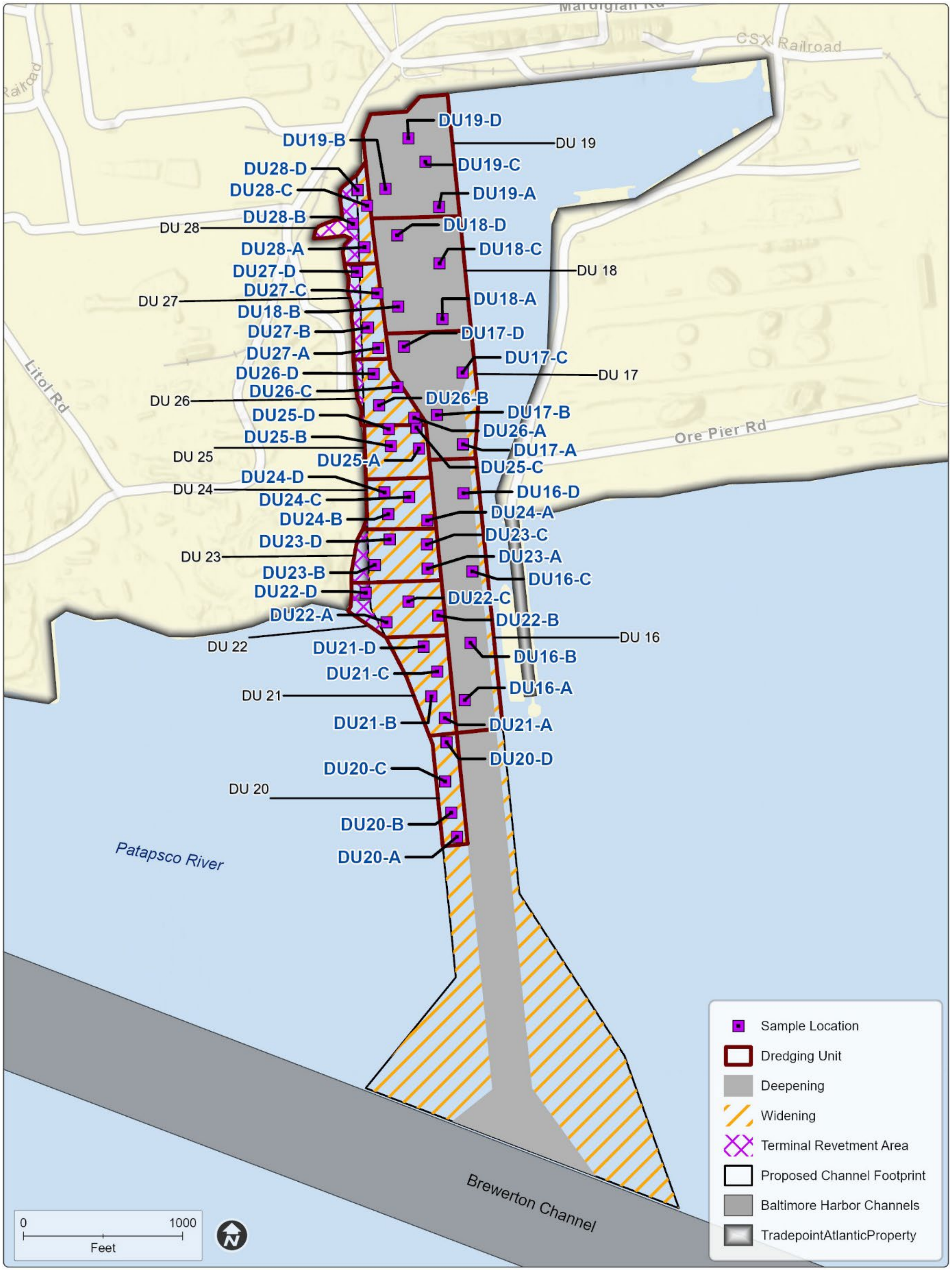


Figure 18. Sediment Sample Locations for the South Channel (Existing Sparrows Point Channel Dredging Units and Top Dredging Units for Wideners)

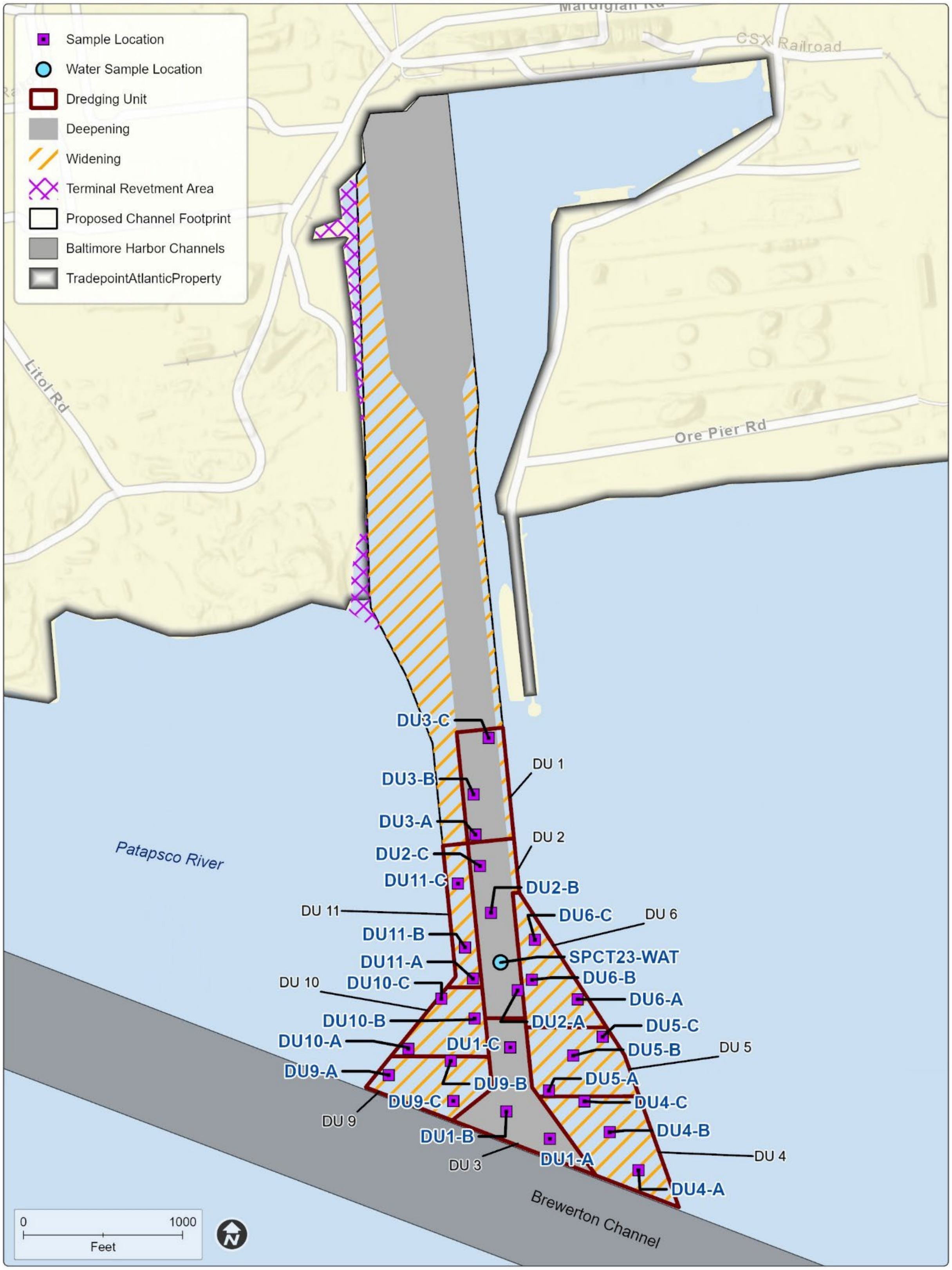
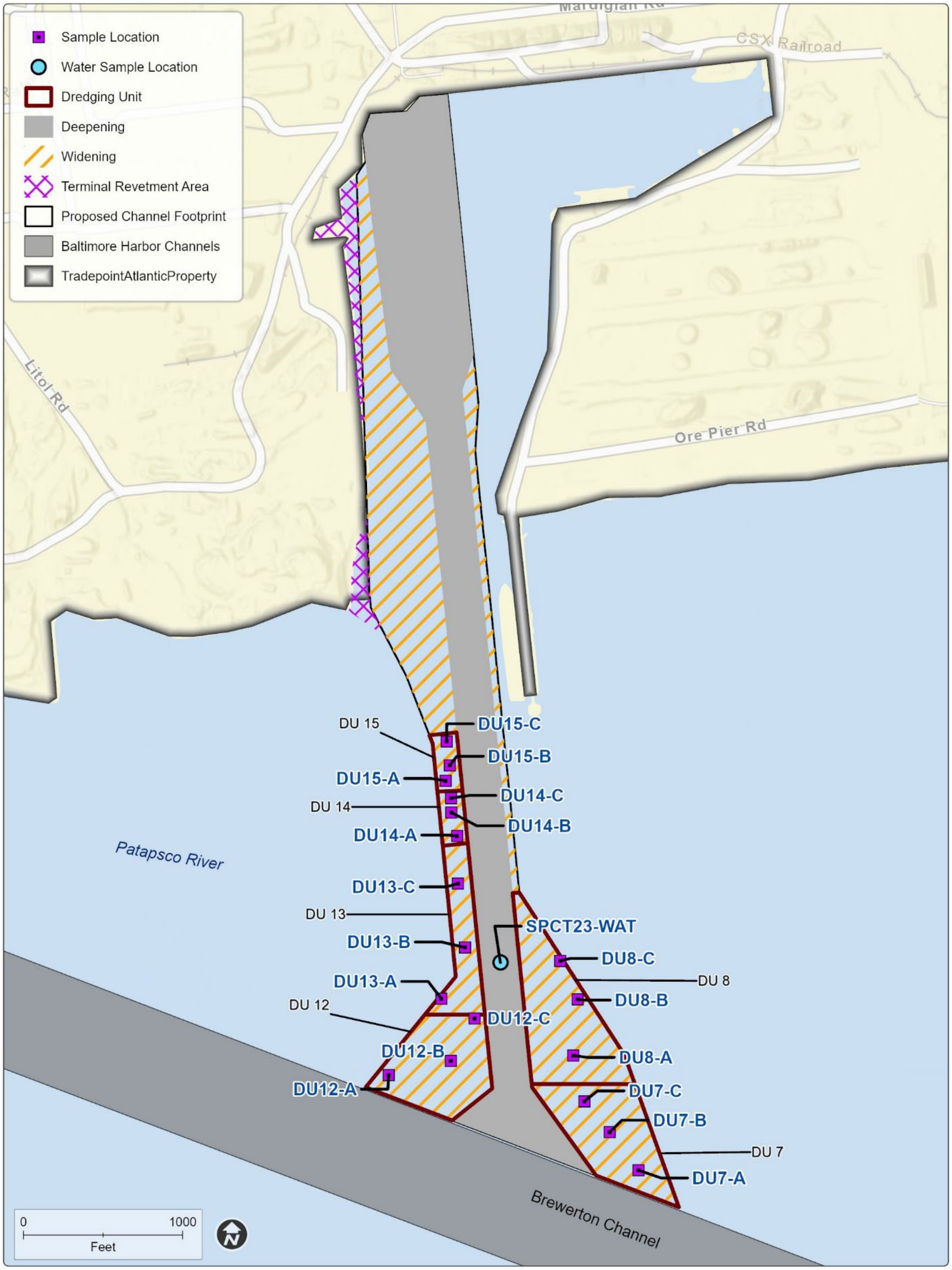


Figure 19. Sediment Sample Locations for the South Channel (Bottom Dredging Units for Wideners)



To assess the sediment quality with respect to upland placement of the material within onsite DMCFs, the chemical data were compared to USEPA Regional Screening Levels (RSLs) for soils (USEPA 2024a). Chemical concentrations that exceeded RSLs were included in risk calculations to classify the material within each DU based on the MDE Innovative Reuse categories (MDE 2019). In addition, the chemical data from the Toxicity Characteristic Leaching Procedure (TCLP) analysis were compared to the regulatory criteria in 40 CFR 261.24 to verify that the material would not be classified as a hazardous waste. To assess the sediment quality with respect to upland placement of the material at offsite DMCFs managed and operated by the MPA, the chemical data were compared to Baseline Control Limits (BCLs) that have been established for the MPA facilities (MPA 2022).

Ocean placement requires evaluation of the sediments with respect to the potential for adverse effects to aquatic organisms at the ocean placement site. Additional ocean placement testing for the South Channel DUs included the creation and chemical testing of standard elutriate samples, water column bioassays, whole sediment bioassays, and 28-day laboratory bioaccumulation studies (EA 2024b). These studies were conducted, and the data were evaluated in accordance with USEPA and Corps protocols (USEPA 2000; USEPA and Corps 1991, 2008). The results of the elutriate chemical tests and water column bioassays (using larval fish, mysid shrimp, and blue mussel embryos) were used to model the material placement, movement of the elutriate within the ocean placement site, and the potential for effects to aquatic organisms within the water column. The results of the whole sediment bioassays (using two amphipod species) were used to determine if the sediments were toxic to benthic organisms. The results of the bioaccumulation studies were used to assess uptake of contaminants from sediment to the tissue of clams and marine worms following exposure to the sediments and to assess the potential for movement of contaminants through the food chain.

Regional Screening Levels (RSLs) are contaminant concentration thresholds developed by the USEPA to assess environmental and human health risks at contaminated sites. These screening levels provide a baseline for determining whether contaminants present in sediment, soil, or water require further investigation or remediation.

Toxicity Characteristic Leaching Procedure (TCLP) is a laboratory test established by the USEPA under the Resource Conservation and Recovery Act (RCRA) to simulate leaching of contaminants from solid materials, like sediments or industrial waste. The results of the test are used to classify waste and to determine appropriate disposal options.

Bioaccumulation studies measure the extent to which organisms accumulate contaminants from their environment, particularly from ingestion of sediments or water. In laboratory tests, organisms are exposed to sediments from the dredging area, and following a defined exposure period, their tissues are analyzed to quantify contaminant levels. These studies provide information regarding the potential for chemicals found in sediment to move through the food chain.

Standard elutriates are created using water / sediment mixtures to simulate the potential release of chemicals from sediment into the water column when sediment is placed in open water. The elutriate is analyzed to determine the concentration of chemical constituents that may be released into the water column, helping to predict impacts on water quality and aquatic life.

Water column bioassays are tests conducted to determine the toxicity of water or elutriate samples. In these bioassays, early life stages of aquatic organisms such as fish, crustaceans, or bivalves are exposed to the samples, and their responses (e.g., mortality, growth inhibition) are observed to evaluate the potential for impacts on aquatic life.

Whole sediment bioassays are tests that expose benthic organisms directly to sediment samples to determine the sediment toxicity. Survival of the benthic organisms is measured following a defined exposure period. These bioassays provide information related to how sediments containing contaminants may affect sediment-dwelling organisms following placement of the material in open water.

Overview of Sediment Quality around Coke Point

Sediments around Coke Point consist of a soft, fine-grained silty top layer above deep layers of clay and sands. Some surficial sediments along the shoreline of Coke Point contain slag or gravel mixed with the soft, fine-grained sediments from activities on land and from the human-made construction of Coke Point. Within the vicinity of the channel improvements, the silty surface layer overlays deep materials that predominantly consist of native clays in the South Channel and consist of a combination of native clays and sands in the North Channel (Kozera 2023; EA 2024b, 2024c).

The column of sediment in the South Channel is uniform with little layering or stratification of material types. Within the deepening area of the South Channel segment, the sediments are primarily comprised of a combination of silt and clay that extend to the depth to which the Sparrows Point Channel would be deepened (-50 feet MLLW). In the South Channel wideners, the silty top materials extend from the sediment surface to depths ranging from approximately 7 to 10 feet below sediment surface (bss) and are underlain by native silty clays extending below the proposed dredging depth (-50 feet MLLW).

The column of sediment in the North Channel includes layers of differing material types. Within the deepening area in the North Channel and in the west widener, the silty top materials extend from the sediment surface to varying depths. Native clays and sands are present at depth within the dredging prism and extend below the proposed dredging depth (-50 feet MLLW).

Chemical constituents associated with human activities, such as metals, PAHs, and PCBs, are present in the surface and upper sediment column, while deeper sediments have lower concentrations of chemical constituents that represent natural background concentrations.

The chemical testing of surficial sediments (EA 2024a) at seven locations surrounding Coke Point (Figure 13) indicated that surficial sediment quality varies by location and distance offshore. PAHs and metals are the constituents that most frequently exceed PELs for aquatic life. Collectively, nine metals, 13 individual PAHs, total PAHs, and dioxin toxic equivalents (TEQs) exceeded PELs in the offshore surficial sediments surrounding the peninsula. The highest total PAHs were detected in surficial sediments in Coke Point Cove on the west side (SPCT23-01) and along the southeast side (SPCT23-06) of Coke Point with concentrations in Coke Point Cove approximately ten times higher than concentrations on the southeast side of the peninsula. The highest concentrations of metals were detected in the nearshore area on the southwest side of Coke Point (SPCT23-03). The location near the Brewerton Channel (SPCT23-05) was furthest offshore and had the fewest PEL exceedances.

Tests of sediment physical properties (EA 2024a, 2024b, 2024c) indicate that surface sediments close to the shoreline west of Coke Point and in Coke Point Cove are a mix of sands, silts, and clay, and sediments in the Coal Pier Channel, within the Sparrows Point Channel, and south of Coke Point contain mostly silt and clay. Nutrient constituents, including ammonia, nitrate, nitrite, and total phosphorus are present in the sediments with highest concentrations in surface samples. Total organic carbon concentrations in the sediments range from 1 to 11% with highest concentrations in surface samples.

Sediment Quality in the Area of the Proposed Coal Pier Channel DMCF

Surface sediments within the Coal Pier Channel DMCF footprint consist of fine-grained silts and clays in the east and central portion of the channel and are predominantly comprised of sand (approximately 80%) near the mouth of the channel (EA 2009, 2024a). Chemical concentrations of six metals (chromium, copper, lead, nickel, silver, and zinc), two PAHs (acenaphthylene and naphthalene), and the dioxin TEQ in surficial sediments in the central portion of the channel (SPCT23-02; Figure 13) exceeded PEL values (EA 2024a). Benzene, ethylbenzene, and toluene were detected in the subsurface sediment near the mouth Coal Pier Channel (sampling location BH-SED-02; Figure 12), and sheens and hydrocarbon odors were noted in the subsurface samples on the east side of Coal Pier Channel (BH-SED-01) and at the mouth of Coal Pier Channel (BH-SED-02) (EA 2009).

Sediment Quality in the High Head Industrial Basin

Surficial sediment sampling was conducted at 12 locations in the High Head Industrial Basin in early 2023 (ARM Group 2023). Arsenic, lead, total petroleum hydrocarbon (TPH) diesel range organics (DRO), oil and grease, and several PCB Aroclors were detected at elevated concentrations in the sediments. Concentrations of arsenic and lead in a portion of the samples exceeded composite worker / industrial soil RSLs.

Sediment Quality in the Dredging Footprint

The physical and chemical properties of the sediment within the footprint of the proposed Sparrows Point Channel deepening and widening varies within the North Channel and South Channel and varies by DU (EA 2024b, 2024c). The DUs are described in relation to the categories established by MDE's Innovative Reuse and Beneficial Use of Dredged Material Program, described in the text box to the right.

- *South Channel* – The South Channel segment is comprised of DU1 through DU15 and includes approximately 1.65 MCY of sediment. Sediments in the South Channel dredging area are predominantly comprised of fine-grained silts and clays. Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, and dioxin / furan congeners were detected most frequently in the sediments; the specific analytes detected, and their concentrations varied by DU (EA 2024b, 2024c). Highest concentrations of metals and PAHs were present in the sediments from DUs 1, 2, and 3 (channel deepening), DU8 (east widener), and DU11 (west widener). Arsenic concentrations in each DU and the dioxin TEQ concentration in DU3 exceeded the industrial soil RSLs. Risk calculations indicated that two of the South Channel DUs are classified as Category 1 (Residential Unrestricted Use Soil and Fill Material) and

> ***MDE's Innovative Reuse and Beneficial Use of Dredged Material Program*** is an initiative aimed at promoting the sustainable and productive use of dredged material from Maryland's waterways. Given the significant volume of dredged material generated annually through the maintenance of navigational channels in the Chesapeake Bay and surrounding waters, this program seeks to reduce the environmental impact of disposal while turning dredged material into valuable resources.
>
> Dredged material may be categorized based on results of a full sediment characterization, comparison to screening criteria, and assessment of environmental and human health risk.
>
> **Category 1: Residential Unrestricted Use Soil and Fill Material –** Chemicals detected in the material are at a concentration that is not considered a concern for human health, making it suitable for unrestricted use, including in residential settings, parks, schools, and other areas with high potential for human contact. This material can be used without special restrictions or controls.
>
> **Category 2: Non-Residential Restricted Use Soil and Fill Material –** Chemicals detected in the material are at concentrations that are not considered a concern for specific land uses and limit its use to non-residential areas, such as industrial or commercial sites, where human exposure is limited. This material is safe for areas that have land use controls to ensure that development of residences, recreational areas, and schools will not occur.
>
> **Category 3: Restricted Use Soil and Fill Material, Cap Required –** Chemicals detected in the material are at concentrations that require additional protective measures, such as a physical cap or barrier, to prevent exposure. This material is typically restricted to specific, non-sensitive locations (e.g., industrial sites, closed landfills) where exposure to humans and the environment can be minimized and controlled.
>
> **Category 4: Ineligible for Soil and Fill Material –** Chemicals detected in the material are at high concentrations that deem it unsuitable for use as soil or fill material due to significant risks to human health or the environment. This material cannot be used in any applications where it might come into contact with people, plants, animals, or water sources, and it requires special handling, treatment, or disposal in a secure, permitted facility.

thirteen of the DUs are classified as Category 2 (Non-Residential Restricted Use Soil and Fill Material). Overall, approximately 245,000 CY of material is classified as Category 1 and approximately 1,405,000 CY of material is classified as Category 2. The MDE Innovative Reuse category for each South Channel DU is provided in Table 11 and is depicted in Figure 20 and Figure 21.

With respect to comparisons to BCLs for MPA DMCFs, the concentration of naphthalene for DU3 and DU11 exceeded the BCL; however, total PAH concentrations did not exceed the BCL. Several other individual constituents exceeded BCLs in varying DUs, but the constituent concentrations were not substantially higher than the BCLs, indicating that the concentrations were similar to those of materials previously placed in MPA DMCFs.

With respect to ocean placement criteria, each of the South Channel DUs, with the exception of DU3, met the Limiting Permissible Concentration (LPC) for water quality criteria, water column toxicity, benthic toxicity, and benthic bioaccumulation in accordance with 40 CFR 220-228.

Results of the TCLP testing indicated that none of the tested materials in the South Channel DUs were classified as hazardous waste. A summary of dredged material placement options for each South Channel DU (based on sediment chemical characteristics) is provided in Table 11.

- *North Channel* – The North Channel is composed of DU16 through DU28 and includes approximately 2.55 MCY of sediment. Sediments in the North Channel are a combination of sand and fine-grained silts and clays with highest proportions of sand (29 to 38.6%) in the northern DUs in the west widener (DU24, DU25, DU26, DU27, DU28). Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, dioxin / furan congeners, volatile organic compounds (VOCs), TPH, and oil and grease were detected most frequently in the sediments; the specific analytes detected, and their concentrations varied by DU (EA 2024c). Highest concentrations of total PAHs were present in the sediments from DUs 16, 17, 18 (channel deepening) and DUs 26 and 28 (west widener). Arsenic concentrations in each DU, the dioxin TEQ concentration in DU16, and three PAHs (1-methylnaphthalene, naphthalene, and benzo(a)pyrene) in DU18 exceeded the industrial soil RSLs. Risk calculations indicated that three of the North Channel DUs are classified as Category 1 (Residential Unrestricted Use Soil and Fill Material), eight of the DUs are classified as Category 2 (Non-Residential Restricted Use Soil and Fill Material), and two DUs (17 and 18) are classified as Category 3 (Restricted Use Soil and Fill Material, Cap Required). Overall, approximately 555,000 CY of material is classified as Category 1, approximately 1,515,000 CY of material is classified as Category 2, and approximately 480,000 CY of material is classified as Category 3. The MDE Innovative Reuse category for each North Channel DU is provided in Table 11 and is depicted in Figure 22.

  With respect to comparisons to BCLs for MPA DMCFs, the concentrations of multiple individual PAHs and total PAHs exceeded the BCLs in DUs 16, 17, 18, 19, 23, 26, and 28. Concentrations of lead in DUs 17 and 23, concentrations of zinc in DUs 16, 17, and 19, concentration of dibenzofuran in DU18, and concentrations ethylbenzene and toluene in DU22 also exceeded BCLs. Several other individual constituents exceeded BCLs in various DUs, but the concentrations were not substantially higher than the BCLs, indicating that the concentrations were similar to those of materials previously placed in MPA DMCFs.

  Results of the TCLP testing indicated that none of the tested materials in the North Channel DUs were classified as hazardous waste. A summary of dredged material placement options for each North Channel DU (based on sediment chemical characteristics) is provided in Table 11.

Table 11. MDE Innovative Reuse Categories, Approximate Placement Volume, and Placement Options for Each Dredging Unit

Dredging Unit	Location	MDE Innovative Reuse Category [1]	Placement Options			Approximate Material Volume (CY)
			Offsite MPA DMCF	Onsite DMCF [2]	Ocean Placement at NODS	
DU1	North Channel	2	✓	✓	✓	100,000
DU2	North Channel	2	✓	✓	✓	100,000
DU3	North Channel	2	✓	✓		80,000
DU4	North Channel	2	✓	✓	✓	80,000
DU5	North Channel	2	✓	✓	✓	80,000
DU6	North Channel	2	✓	✓	✓	80,000
DU7	North Channel	1	✓	✓	✓	185,000
DU8	North Channel	2	✓	✓	✓	185,000
DU9	North Channel	2	✓	✓	✓	90,000
DU10	North Channel	2	✓	✓	✓	90,000
DU11	North Channel	2	✓	✓	✓	90,000
DU12	North Channel	2	✓	✓	✓	185,000
DU13	North Channel	2	✓	✓	✓	185,000
DU14	North Channel	2	✓	✓	✓	60,000
DU15	North Channel	1	✓	✓	✓	60,000
DU16	South Channel	2	✓	✓		220,000
DU17	South Channel	3		✓		230,000
DU18	South Channel	3		✓		250,000
DU19	South Channel	2	✓	✓		230,000
DU20	South Channel	2	✓	✓		140,000
DU21	South Channel	1	✓	✓		220,000
DU22	South Channel	2	✓	✓		215,000
DU23	South Channel	2	✓	✓		215,000
DU24	South Channel	1	✓	✓		185,000
DU25	South Channel	2	✓	✓		185,000
DU26	South Channel	2	✓	✓		185,000

Dredging Unit	Location	MDE Innovative Reuse Category [1]	Placement Options			Approximate Material Volume (CY)
			Offsite MPA DMCF	Onsite DMCF [2]	Ocean Placement at NODS	
DU27	South Channel	1	✓	✓		150,000
DU28	South Channel	2	✓	✓		125,000

Notes:

CY = cubic yards

1 – MDE 2019. *Innovative Reuse and Beneficial Use of Dredged Material Guidance Document.*

Category 1 = Residential Unrestricted Use Soil and Fill Material

Category 2 = Non-Residential Restricted Use Soil and Fill Material

Category 3 = Restricted Use Soil and Fill Material, Cap Required

2 – Onsite DMCFs include High Head Industrial Basin DMCF and Coal Pier Channel DMCF

Figure 20. MDE Innovative Reuse Categories for the South Channel (Existing Sparrows Point Channel Dredging Units and Top Dredging Units)

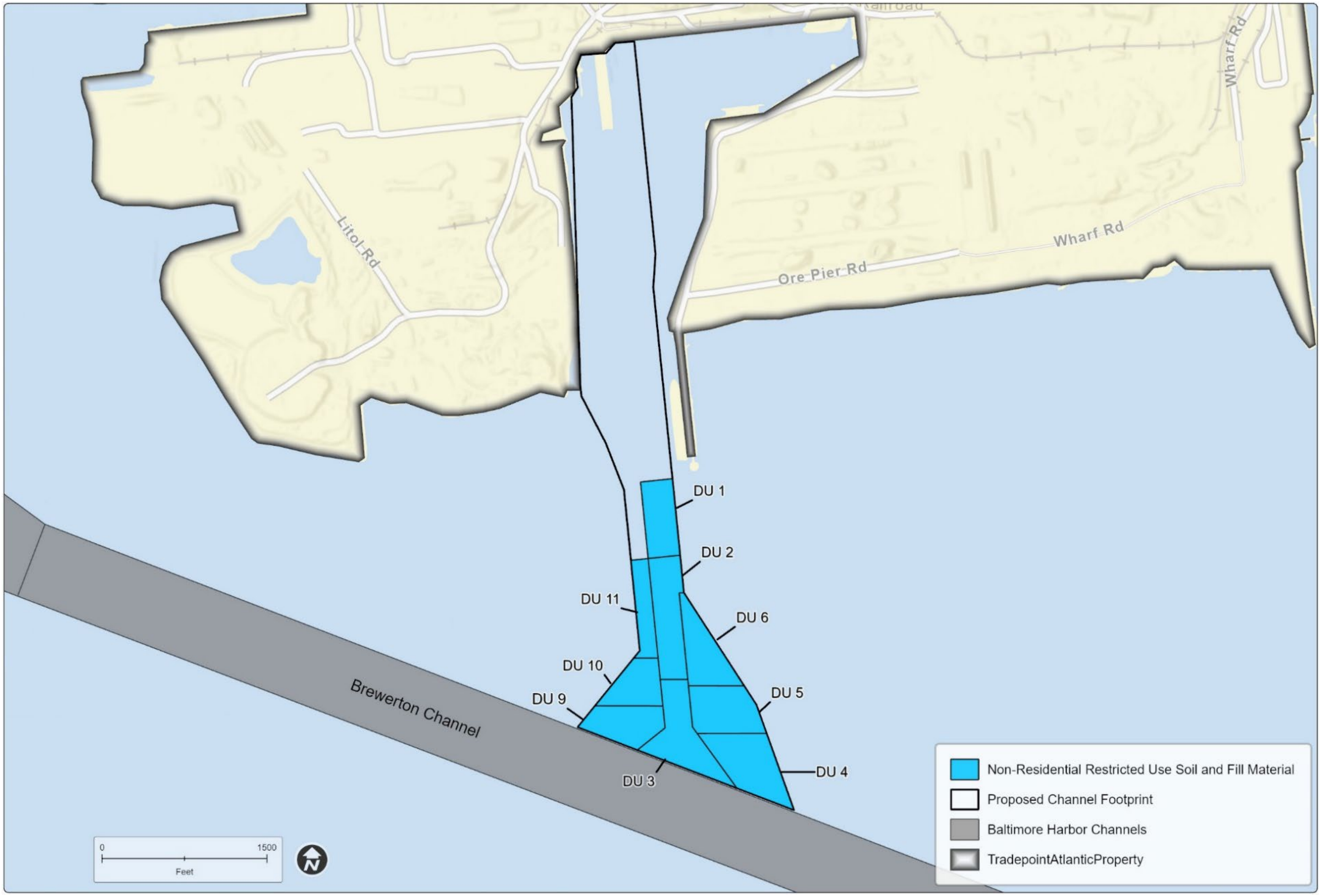


Figure 21. MDE Innovative Reuse Categories for the South Channel (Bottom Dredging Units for Wideners)

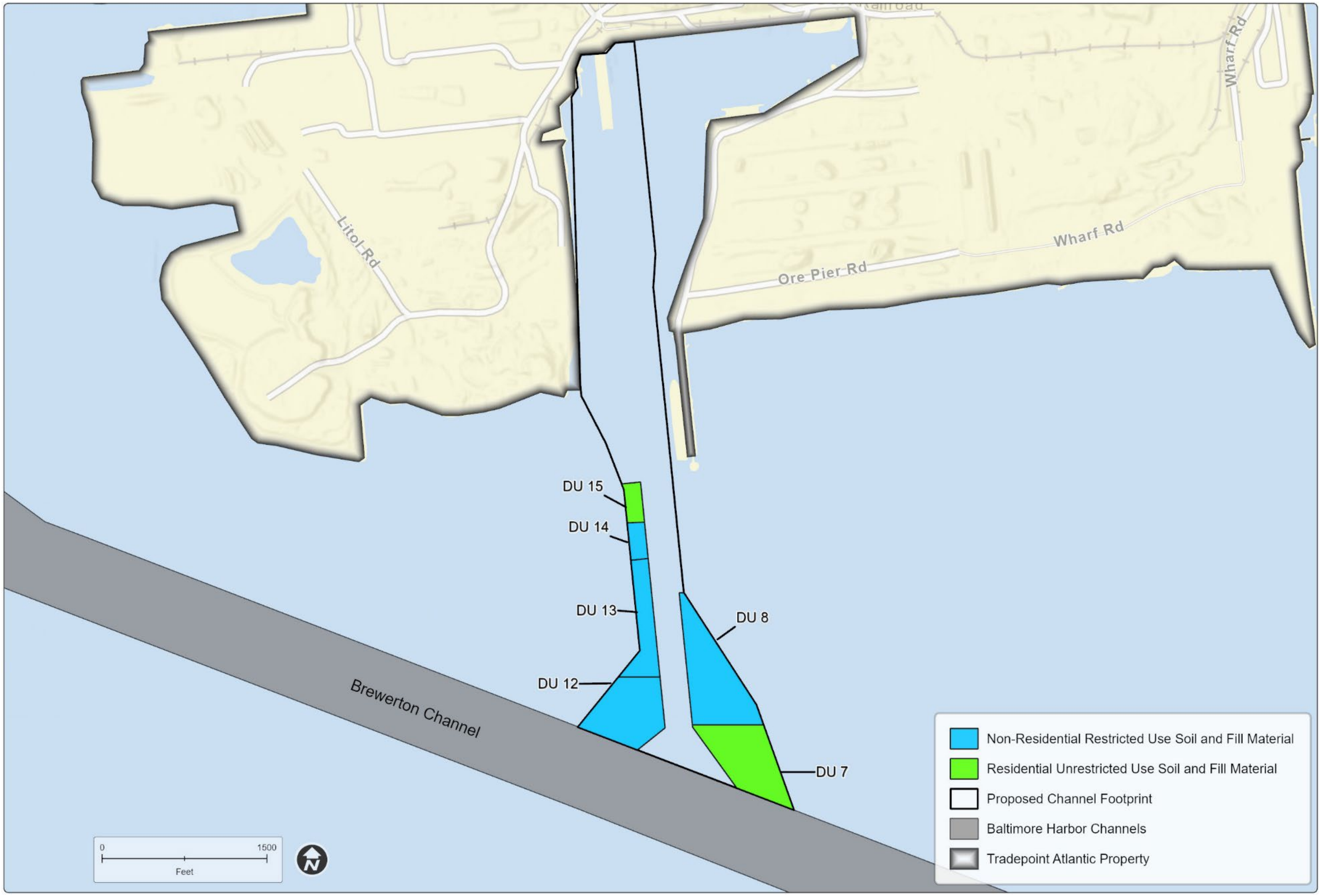
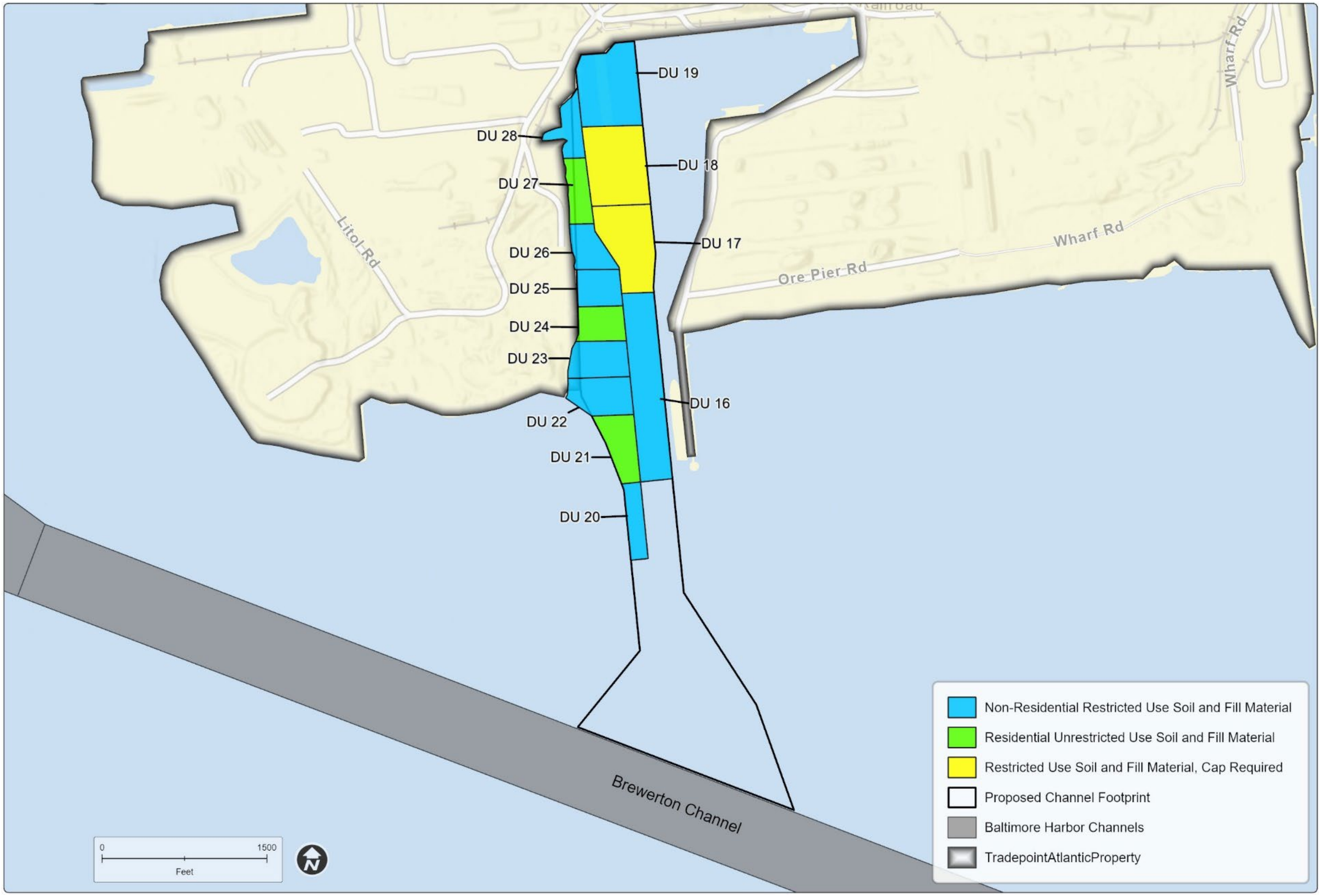


Figure 22. MDE Innovative Reuse Categories for the North Channel (Existing Sparrows Point Channel and West Widener / Revetment Dredging Units Combined)



4.2.2 Environmental Consequences

4.2.2.1 No-action Alternative

Under the No-action Alternative, bedded sediments and chemicals associated with the sediments would stay in place. Sediments in the existing Sparrows Point Channel would be subject to disturbance by future periodic maintenance dredging. Surficial sediments throughout the Coke Point offshore area would be subject to disturbance by storm events and vessel traffic. Based on historical data, previous ecological and health risk assessments (EA 2011), and other supporting studies, there would be an ongoing potential for ecological risk in offshore areas west and south / southeast of Coke Point and a limited potential for human health risk.

4.2.2.2 Combined Options Alternative – Terminal Development and Channel Improvement

The dredging and removal of sediments east of the peninsula to widen and deepen the channel and construct the terminal wharf and revetment structure would permanently remove 4.2 MCY of sediments. A portion of these materials include legacy contaminants from historical industrial activities and would leave behind deeper native sediments with natural background concentrations of metals and other constituents. The removal of sediments impacted by metals, PAHs, PCBs, and other constituents would result in a permanent net improvement of surficial sediment conditions (approximately 52 acres within the existing channel and 60 acres in the channel wideners) for fish, crabs, benthic organisms, and humans. In addition, it would reduce the surface area for surficial chemical exposures of persistent organic contaminants (such as PCBs and dioxins) that have the potential to accumulate in benthic organisms and fish tissue and bioconcentrate in the food chain.

Dredging may resuspend some sediments that would settle back to the bottom of the dredging area and adjacent areas. Dredging BMPs (such as those described in Section 3.2) would be used where practicable and necessary based on sediment chemistry and site conditions to minimize the release of sediment and contaminants to the water column during dredging operations. Any resuspension or incidental release of sediment during dredging operations, particularly in the South Channel and near the Brewerton Channel, would be comparable to maintenance dredging operations performed in the federal channel. Therefore, adverse impacts on adjacent surficial sediment quality from redeposition are expected to be minimal.

4.2.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Placement of dredged material in the High Head Industrial Basin would result in the permanent removal of approximately 40 acres of impounded water and would result in the encapsulation of existing sediments that contain elevated concentrations of arsenic, lead, TPH-DRO, oil and grease, and PCBs. Filling of the High Head Industrial Basin DMCF would result in the creation of bermed upland habitat, and the placed sediments would be dewatered and managed as soils. Although fish, wildlife, and birds currently use the site, it is a managed industrial facility. The long-term land use of the High Head Industrial Basin DMCF is expected to remain industrial. The majority of sediments placed in the DMCF would be classified as either MDE Innovative Reuse Category 1 (Residential Unrestricted Use Soil and Fill Material) or Category 2 (Non-Residential Restricted Use Soil and Fill Material); these materials are suitable as fill in an industrial use area. Any sediments that are classified as MDE Innovative Reuse

Category 3 (Restricted Use Soil and Fill Material, Cap Required) would be placed early during the material inflow / filling cycle and would be capped or buried by subsequent placement of either Category 1 or Category 2 material. Human health risks associated with placement of Category 3 material would be mitigated through the capping requirement.

Coal Pier Channel DMCF

Placement of dredged material in a DMCF at the Coal Pier Channel would result in the permanent loss of 19.6 acres of open water habitat. The existing channel would be filled and converted to bermed, upland habitat, and a net loss of 19.6 acres of sediment surface that functions as habitat for benthic communities would occur. Based on the summer aquatic survey data (EA 2024a), this benthic habitat is degraded and subject to seasonal low dissolved oxygen (hypoxia), and the sediments contain elevated concentrations of metals, PAHs, benzene, ethylbenzene, and toluene. Filling the channel would encapsulate impacted sediments and would eliminate exposure pathways for chemicals to benthic organisms, crabs, and fish.

The majority of sediments placed in the DMCF would be classified as either MDE Innovative Reuse Category 1 (Residential Unrestricted Use Soil and Fill Material) or Category 2 (Non-Residential Restricted Use Soil and Fill Material); these materials are suitable as fill in an industrial use area. Sediments that are classified as MDE Innovative Reuse Category 3 (Restricted Use Soil and Fill Material, Cap Required) would be placed early during the material inflow / filling cycle and would be capped or buried by subsequent placement of either Category 1 or Category 2 material. Therefore, human health risks associated with placement of Category 3 material would be mitigated through the capping requirement.

The sediment along the alignment of the channel enclosure dike is anticipated to consist of a soft surface layer approximately 4 feet in thickness underlain by consolidated sand. This soft overburden material would be removed from the dike alignment prior to the placement of sand, eliminating the potential for material displacement and the creation of a mud wave during dike construction. Any sediments that would be resuspended during the placement of material for the construction of the enclosure dike have the potential to re-deposit on adjacent bottom sediments. BMPs for in-water construction (such as those described in Section 3.2) would be used where practicable and necessary to minimize the resuspension of sediment and contaminants to the water column during both dredging and in-water placement of dike construction material. Construction methodologies would be implemented in accordance with all applicable permit conditions. Therefore, adverse impacts on adjacent surficial sediment quality outside the enclosure dike from resuspension and redeposition would be expected to be minimal.

Existing MPA DMCFs

No new impacts would be expected as a result of placement of the dredged material at either the Cox Creek or Masonville DMCFs. Both facilities are permitted to accept dredged material from the Baltimore Harbor channels and the Patapsco River. The MPA has indicated that a maximum of 1.25 MCY of placement capacity is available for the SPCT project during a 4-year placement period. Only those DUs that meet MPA BCL requirements and that are classified as MDE Innovative Reuse Category 1 (Residential Unrestricted Use Soil and Fill Material) and Category 2 (Non-Residential Restricted Use Soil and Fill Material) would be placed at the MPA DMCFs. Material placed at MPA facilities would be conducted in phases that do not exceed the annual operational capacity for the facilities. Therefore, no change to DMCF site conditions, operations, or practices at these facilities would be expected and no impact to capacity needs for other federal, state, or local projects would be anticipated as a result of dredged material placement from the SPCT project.

Existing Ocean Disposal Site

Placement of dredged material at the NODS is regulated under Section 103 of the MPRSA. Tier II (sediment and elutriate) and Tier III (ecotoxicological) testing of the dredged material has been conducted in conformance with the requirements under Section 103 of the MPRSA and 40 CFR 220-228. Results of the testing for 14 DUs (totaling approximately 1.57 MCY) have demonstrated that no adverse impact on the marine environment at the NODS would occur as a result of the material placement. Only those 14 DUs that meet the LPC for water quality criteria, water column toxicity, benthic toxicity, and benthic bioaccumulation would be placed at the NODS. The NODS was designated to accept material that meets these requirements (USEPA 1992). Physical placement of the material at the NODS would comply with the requirements stipulated in the Site Management and Monitoring Plan (USEPA and Corps 2019). The materials would be evenly dispersed across a designated placement zone to avoid mounding. Progress surveys of portions of the active zone during placement periods would be conducted and used, if warranted, to ensure proper placement / distribution of materials.

4.3 Floodplain and Flood Hazard

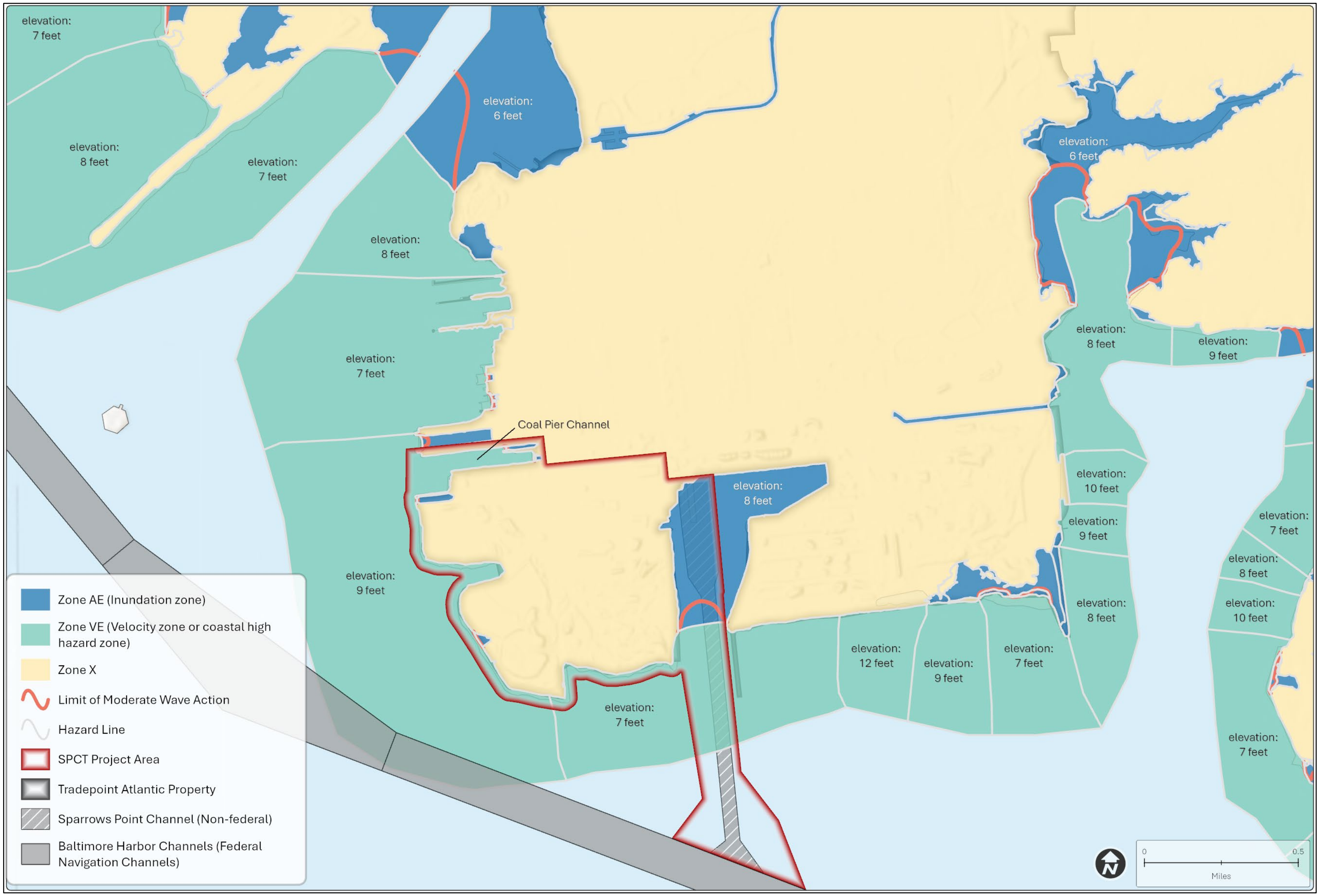
4.3.1 Affected Environment

Executive Order 11988, *Floodplain Management*, requires federal agencies to evaluate all proposed actions within the 1% annual exceedance (100-year) floodplain. Actions include any federal activity involving 1) acquiring, managing, and disposing of federal land and facilities, 2) providing federally undertaken, financed, or assisted construction and improvements, and 3) conducting federal activities and programs affecting land use, including water and related land resources planning and licensing activities. The 0.2% annual exceedance (500-year) floodplain should be evaluated for critical actions or facilities, such as storage of hazardous materials or construction of a hospital. Additionally, through Executive Order 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Future Soliciting and Considering Stakeholder Input,* federal agencies must strive to improve the resiliency of communities and federal assets against the impacts of flooding, which are anticipated to increase over time due to the effects of climate change.

The project location is mapped across two Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) — 2400100535G and 2400100555G, effective May 5, 2014 (FEMA 2023a) (see Figure 23). FIRMs are official maps of a community that show special flood hazard areas, risk zones, base flood elevations, floodways, and community information. FIRMs are a critical tool for floodplain management and insurance purposes.

FEMA uses two main categories for delineating coastal flood hazard zones: an inundation zone ("AE" designation) and a velocity zone ("VE" designation). Zone AE indicates areas that have at least a 1% annual chance of being flooded but where wave heights are less than 3 feet. Zone VE, also known as the coastal high-hazard zone, is where wave action and fast-moving water can cause extensive damage during a base flood event.

Figure 23. FEMA Floodplain Map



> **Limit of moderate wave action** represents areas where wave heights could exceed 1.5 feet. The limit of moderate wave action helps define areas that are at risk from not only inundation but also wave-related impacts, such as erosion, structural damage, and storm surge effects.
>
> **Base flood elevation (BFE)** is a computed elevation to which floodwater is expected to rise during a base flood (a flood with a 1% annual chance of occurring, also called a 100-year flood). The BFE is used to determine areas at risk of flooding.

On some FIRMs, FEMA depicts a limit of moderate wave action to depict areas where wave heights greater than 1.5 feet may exist. Areas within the limit of moderate wave action that are not depicted as Zone VE are sometimes referred to as Coastal A Zone area. Post-storm observations have shown that in addition to Zone VE areas, waves as small as 1.5 feet can also cause significant damage, and as such, the Coastal A Zone is regulated similarly to Zone VE (FEMA 2021).

Base flood elevation (BFE) is the elevation of the surface water resulting from a flood that has a 1% chance of being equaled or exceeded in any given year and includes the effects of wave action. In coastal areas, BFEs reflect the increase in water levels during a flood event due to extreme tides, storm surge, and overland wave effects. For areas that are susceptible to coastal flooding, FEMA estimates coastal BFEs by conducting the following coastal flood hazard analyses: storm surge, wave setup, wave runup, wave generation, dune erosion, and overland wave propagation (FEMA 2023b).

The SPCT project area is along the Patapsco River, a tidally influenced river that flows into the Chesapeake Bay. The Patapsco River is located in Zones AE and VE, and Coke Point is in Zone X, an area of minimal flood hazard (FEMA 2023a, see Figure 23). Zone AE within the inlet on the west side of Sparrows Point has a BFE of 6 feet, and zone VE has a BFE of 9 feet west of Sparrows Point and a BFE of 7 feet to the southeast of Sparrows Point.

4.3.2 Environmental Consequences

4.3.2.1 No-action Alternative

Potential future development of Coke Point would not affect the floodplain because there would be no in-water work beyond the routine maintenance dredging that is already occurring.

4.3.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

There are no impacts on floodplains from the development of the terminal or channel improvements.

4.3.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

No impacts on the floodplain would occur because the High Head Industrial Basin is located in an upland area.

Coal Pier Channel DMCF at Sparrows Point

The DMCF would be created by constructing a water-side berm across the mouth of the Coal Pier Channel and therefore would not decrease the width of the flood zone in the SPCT project area. The addition of the DMCF would cause waves in the immediate vicinity of the DMCF to ramp up or wash up against the dike of the DMCF. This activity would be due to increased wave setup and wave runup caused by the dike. This phenomenon would be minimal and limited to the footprint of the proposed project area. Changes in water flow or pattern during flood events would be limited to areas within approximately ¼ mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities.

The Coal Pier Channel DMCF would be located within Zone VE with a BFE of +9 feet, and approximately 19.6 acres of WOTUS would be filled to create the DMCF. Preliminary coastal flood hazard analyses for overland wave propagation, wave setup, and wave runup were conducted for the proposed 100-acre DMCF prior to its dismissal to determine the flood hazards in the project area with the addition of the DMCF, similar to those conducted to determine the existing and future conditions. (Storm surge and wave generation are driven by offshore weather conditions and tides, which would not be influenced by the DMCF. There are no dunes in the vicinity of the project site, so a dune erosion analysis is not applicable.) Equations in FEMA's Coastal Construction Manual (2011) were used to analyze the maximum wave crest propagating (spreading) across the site. These equations show that as water depth decreases at the site, so would the maximum wave crest. Wave setup and runup were analyzed using methods outlined in FEMA's November 2023 *Guidance for Flood Risk Analysis and Mapping*. The analysis showed wave setup and wave runup would be increased in the immediate vicinity of the DMCF but not elsewhere. These analyses were for the larger, 100-acre DMCF which would have extended between 1,100 and 2,400 feet into the Patapsco River. The Coal Pier Channel DMCF would not extend into the river and represents a much smaller impact, limited to within ¼ mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities.

> **Overland wave propagation** is the movement of floodwaters as waves travel across the floodplain, away from the primary river or stream channels. This can occur during storm surges or heavy rainfall events where water inundates the land surface.
>
> **Wave setup** is the increase in the average water level due to the breaking of waves as they approach the shore. This setup occurs as the momentum from the waves is transferred to the water body, raising the water level above the expected tide level.
>
> **Wave runup** is the height to which waves run up the slope of a revetment, bank, or dike above the still water level. In a setting like the Baltimore Harbor, wave runup is generally more influenced by anthropogenic (human-made) structures and the specific design of the harbor compared to the more natural processes on an open coast.

Existing Nearshore MPA DMCFs

No impacts on the floodplain would occur because the MPA DMCFs are existing permitted confined placement sites and no new material would be placed in the floodplain.

Existing Ocean Disposal Site

No impacts on the floodplain would occur because NODS is an existing USEPA-designated ocean placement site.

4.4 Hydrodynamics

4.4.1 Affected Environment

The study area for the hydrodynamics analysis includes the waterways in the vicinity of Sparrows Point including Bear Creek, the Patapsco River from the confluence with Bear Creek downstream past Sparrows Point, and the Sparrows

> **Hydrodynamics** in a river system refers to the study of water movement, including how it flows, transports sediments, interacts with riverbeds and banks, and responds to changes in the environment, such as seasonal water levels, topography, and human interventions. River hydrodynamics is fundamental in understanding how rivers shape landscapes, support ecosystems, and respond to environmental changes, both natural and human induced.

Point Channel. Tidal currents of the upper Chesapeake Bay under existing conditions were assessed using a regional two-dimensional hydrodynamic MIKE 21 Flexible Mesh model. MIKE 21 is modeling software developed by the Danish Hydraulics Institute for oceanographic, coastal, and estuarine dynamics applications. The model can predict time-dependent flow conditions, such as free surface elevation and current speed, at each point in the computational domain.

The hydrodynamic model domain includes the upper Chesapeake Bay from Annapolis, Maryland to Tolchester Beach, Maryland, as well as the Patapsco River and Baltimore Harbor. Time-varying tidal signals were applied at the Annapolis and Tolchester Beach boundaries using measured tide data from NOAA Center for Operational Oceanographic Products and Services (CO-OPS) stations 8575512 and 8573364, respectively. Time-varying discharge from the Patapsco River and Gwynns Falls are also incorporated into the model using measured discharge data from US Geological Survey (USGS) stations 01589035 and 01589352, respectively. The model domain and boundaries are shown in Figure 24.

The tides in Baltimore Harbor are characterized as semi-diurnal with two high tides and two low tides per day. Spring and neap tides are experienced in Baltimore Harbor in two-week cycles where the tide range is largest during spring tides and smallest during neap tides. The mean tide range reported at the Fort McHenry tide gauge (NOAA CO-OPS Station 8574680) is relatively small at 1.15 feet, which results in low current speeds throughout the harbor. Tidal data for Baltimore Harbor are provided in Table 12 for reference.

Table 12. Tidal Datums in Baltimore Harbor (NOAA CO-OPS Station 8574680)

Tidal Datum	Elevation (feet)
MHHW	+0.82
MHW	+0.53
MSL	-0.03
MLW	-0.62
MLLW	-0.84

Notes:

MHHW = mean higher high water; MHW = mean high water; MSL = mean sea level; MLW = mean low water; MLLW = mean lower low water

Modeled tidal currents under existing conditions were evaluated and assessed near Sparrows Point and the adjacent waterbody of Bear Creek. The duration of the model simulation was one month to capture multiple spring-neap tidal cycles. The current flow fields during a simulated spring flood and ebb tide are shown in Figure 25 and Figure 26, respectively.

A **knot** is a unit of speed equivalent to one nautical mile (or 1.15 statute miles per hour).

Current speeds in Baltimore Harbor are relatively slow. The highest current speeds (0.25 to 0.41 knots) were modeled in the Brewerton Channel adjacent to Sparrows Point. Other notable tidal currents were observed at the southwest corner of Sparrows Points, as well as between Fort Carroll and the former Key Bridge site (0.20 to 0.33 knots). The slowest modeled current speeds were within the L-shaped basin at Sparrows Point and were less than 0.02 knots. The modeled current speeds were generally higher during flood tides than during ebb tides.

Current speeds were also evaluated in Bear Creek and were generally slower than what was modeled in the Brewerton Channel or around Sparrows Point. The modeled current speeds in Bear Creek were 0.12 to 0.21 knots. The current direction in Bear Creek showed to flow south-to-north during flood tides and north-to-south during ebb tides.

The modeled current speeds under existing conditions during a spring flood and spring ebb tide are presented in Table 13.

Table 13. Summary of Modeled Current Speeds

Area	Modeled Current Speed (knots)	
	Flood Tide	Ebb Tide
Brewerton Channel	0.41	0. 25
Sparrows Point	0.33	0.20
Bear Creek	0.21	0.12

Figure 24. Model Domain and Boundaries

Figure 25. Modeled Current Flow Field during Typical Flood Tide

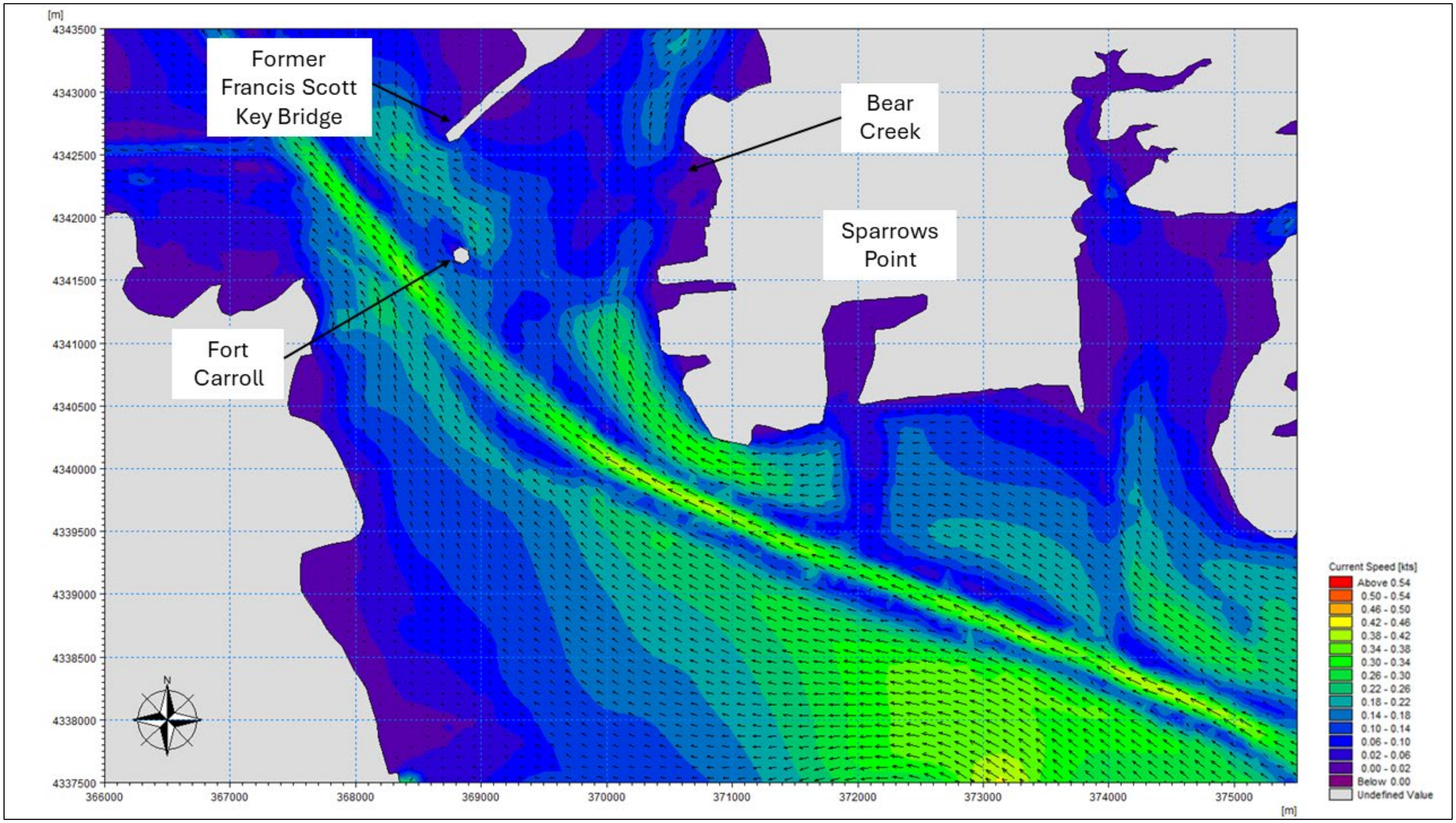
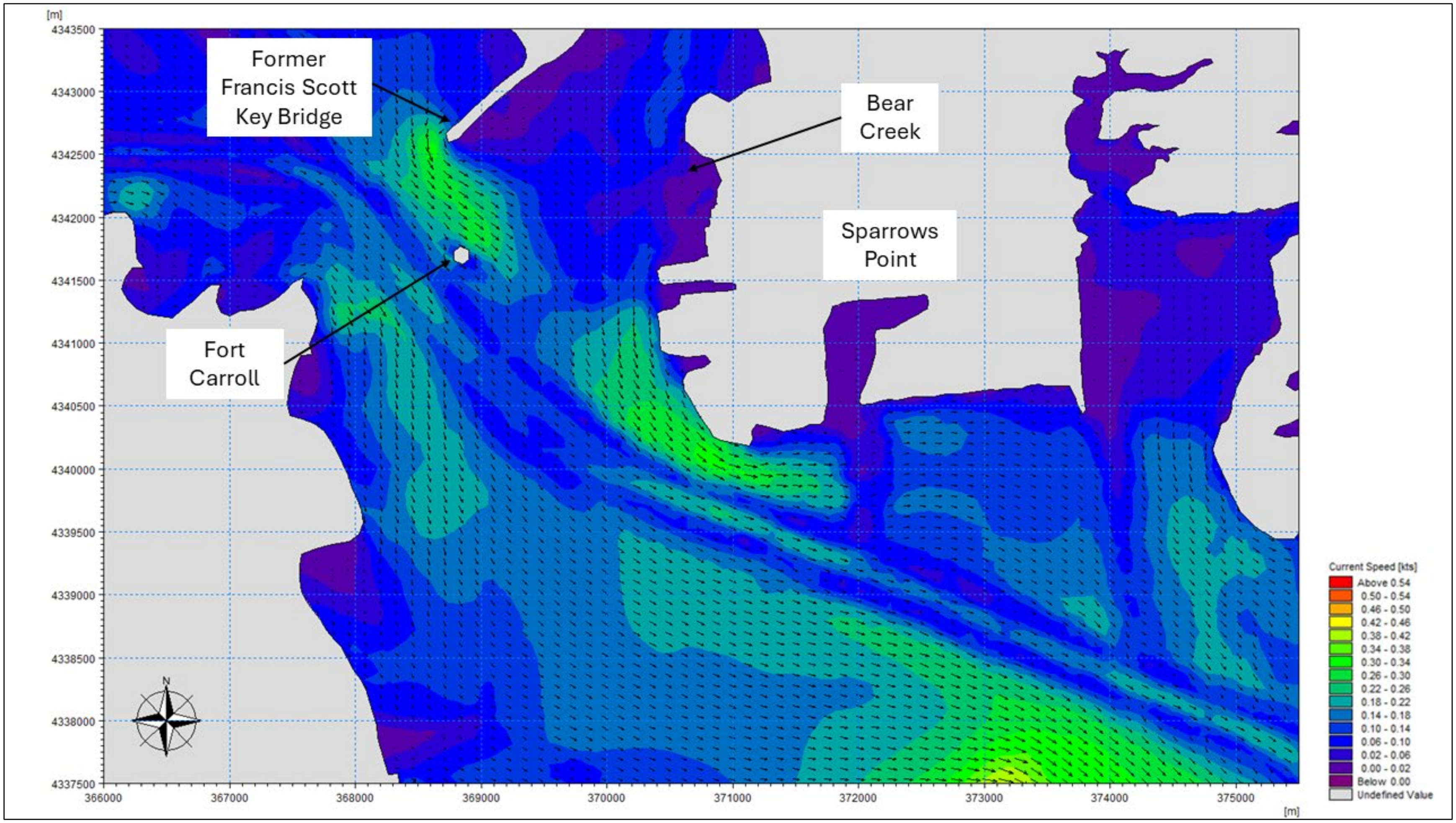


Figure 26. Modeled Current Flow Field during Typical Ebb Tide



4.4.2 Environmental Consequences

4.4.2.1 No-action Alternative

The No-action Alternative would not have an impact on water currents or water levels. Maintenance dredging would continue to retain the Sparrows Point Channel's existing bathymetry. As such, elevations within the Sparrows Point Channel would continue to vary from approximately -2 feet MLLW at the northern end of the channel where it meets the wharf to the typical depth of -44 feet MLLW. Potential future development of Coke Point would not affect hydrodynamics.

4.4.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Tidal currents are directed across the Sparrows Point Channel. The currents within the footprint of the channel (0 to 0.19 knots) differ from those outside the footprint (0.19 to 0.39 knots). The modifications to the channel would expand the area with 0 to 0.19 knot currents from 300 to 450 feet wide. Currents outside of the channel footprint would be unchanged.

4.4.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

No impacts on tidal hydrodynamics would occur because the High Head Industrial Basin is located in an upland area.

Coal Pier Channel DMCF at Sparrows Point

Existing currents within the Coal Pier Channel are negligible (0 to 0.02 knots) with minimal water exchange. Filling this area to create a DMCF would have a negligible impact outside of the area itself – both flood and ebb tidal currents along the western shoreline of Coke Point would continue unimpeded. The exterior dike of the Coal Pier Channel DMCF would be nearly flush to the existing Coke Point shoreline. Any changes to the current speed would be limited to the immediate vicinity of the DMCF and would not impact the hydrodynamics of the Patapsco River.

Existing Nearshore MPA DMCFs

No new impacts on the coastal hydrodynamics would occur because the existing MPA DMCFs are existing permitted placement sites.

Existing Ocean Disposal Site

No new impacts on hydrodynamics would occur because NODS is an existing USEPA-designated ocean placement site.

4.5 Groundwater

4.5.1 Affected Environment

Groundwater in the SPCT project area site is not used for human consumption and does not pose a direct risk to human health except when construction activities require digging to depths that could cause contact with groundwater. Groundwater conditions have been affected by historical activities. Constructed features may prevent infiltration and therefore impact groundwater flow. Dredging and placement of dredged material may also influence groundwater infiltration and the flow of groundwater to surface water along shorelines.

> **Groundwater** is water that exists beneath the Earth's surface, filling the porous spaces in soil, sediment, and rock formations. It is stored in and slowly moves through geological formations known as aquifers. Groundwater is a crucial component of the Earth's hydrological cycle, contributing significantly to drinking water supplies, irrigation for agriculture, and maintaining river flows and ecosystems, especially during dry periods.
>
> **Infiltration** is the process by which water on the ground enters and percolates through the soil and subsurface layers to replenish underground aquifers. Factors influencing groundwater infiltration include soil composition, vegetation cover, land use, precipitation patterns, and the presence of impermeable surfaces.

4.5.1.1 Coke Point

The upper 10 to 70 feet of fill on Coke Point consists of fill material (predominantly slag) generated during historical steelmaking operations. Shallow groundwater within this slag layer generally flows radially from the center of Coke Point outward toward the surface water bodies present to the east, south, and west (turning basin to the east and Patapsco River to the south and west). The majority of the groundwater surface elevation beneath Coke Point varies from sea level along the shorelines and southern portion to approximately 3 feet above sea level within the northeast portion. Groundwater surface elevation rises as Coke Point transitions to Sparrows Point "mainland." Groundwater flow on Coke Point out toward the shoreline is slow due to this flat groundwater gradient, numerous subsurface obstructions, and previously constructed features within Coke Point. This groundwater may discharge into surface water.

Below the slag fill, groundwater is present in natural silty-clay material. This intermediate zone groundwater generally flows to the south-southwest; however, groundwater pumping from this depth is conducted as part of the graving dock operations at the Sparrows Point Shipyard immediately northwest of Coke Point. This causes portions of the intermediate groundwater in the northwest region of Coke Point to flow north towards the graving dock.

Historically, Coke Point was the site of coke processing activities related to steelmaking, and industrial chemicals associated with the coke processing have impacted groundwater beneath Coke Point. Groundwater studies have been completed in association with environmental investigations beginning in the 1980s and 1990s with Resource Conservation and Recovery Act (RCRA) assessments. A sitewide groundwater study was completed in 2001 (CH2M Hill 2001), and a site assessment focusing on Coke Point was conducted in 2009 (EA 2009). Sampling events conducted as part of these investigations identified two primary areas of groundwater impact associated with coke processing activities on the northern half of Coke Point:

1. in the northwestern part of Coke Point, groundwater is contaminated with benzene, naphthalene, and related VOCs
2. in the east-central portion of Coke Point, groundwater is contaminated with naphthalene and related SVOCs

Exposure to groundwater at the site is currently restricted; however, these compounds could cause negative effects if human and ecological receptors were exposed to the groundwater beneath Coke Point. RCRA interim measures (IMs) to address these impacts were initiated in 2010 and are ongoing (TPA 2023a). Recovery of non-aqueous phase liquids continues to remove sources of impact on groundwater. Contaminated groundwater removed via the IM pumping activities is treated before reinjection (TPA

2023a). Annual reports summarize the progress of these IMs in addressing groundwater impacts (TPA 2023a).

Using hydrogeological modeling, the infiltration rate of precipitation under current conditions has been calculated to be approximately 10 inches of water per year (CH2M Hill 2001). This represents the portion of annual precipitation that does not run off the surface or evaporate and instead percolates into the groundwater.

4.5.1.2 High Head Industrial Basin

Shallow groundwater in the vicinity of the High Head Industrial Basin is present in fill materials, including slag sourced from the former steelmaking activities. Groundwater sampling conducted in 2023 around the perimeter of the High Head Industrial Basin has not identified impacts of concern to human health or the environment under current site use and conditions (TPA 2023b).

4.5.2 Environmental Consequences

The hydraulic gradient of Coke Point influences the average rate at which groundwater migrates from the upland area toward surface water. Groundwater migration can impact associated contaminant plumes. Changes to these existing conditions under each alternative are discussed below.

4.5.2.1 No-action Alternative

Groundwater would remain in its current condition, and the existing IMs would continue to address groundwater impacts. Future development of Coke Point would involve paving and construction of buildings, which would decrease infiltration of precipitation to groundwater, and resulting impacts on groundwater would be similar to those associated with terminal construction (see Section 4.5.2.2). If the High Head Industrial Basin were to be filled with dry material and the area repurposed, there would be no impact on groundwater.

4.5.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Planned paving and construction of buildings on Coke Point for the proposed terminal would result in approximately 95% of Coke Point being considered impervious to infiltration. This increase of impervious surfaces, combined with management of stormwater runoff, would greatly decrease subsurface infiltration of precipitation through the slag to groundwater. Given that much of the groundwater on Coke Point comes from infiltration of precipitation (rather than lateral flow), this would result in decreased groundwater recharge, decreased groundwater elevations and hydraulic gradients, and decreased groundwater flow rates. The shallow groundwater surface elevation across Coke Point would gradually fall to 0 to 2 feet above sea level rather than approximately 3 feet above sea level under current conditions. Groundwater gradient is directly correlated with groundwater flow rate so that an impervious cap would decrease both the groundwater gradient and flow rate to less than 20% of their current values. Although this would not likely affect the concentrations of contaminants in groundwater beneath Coke Point, the contaminants would be largely immobilized within groundwater beneath the paved surface and would continue to be addressed using IMs. Groundwater is not used for human consumption, so the mobility of contaminants from groundwater to surface water is the primary concern when considering potential impacts. Therefore, paving Coke Point would substantially decrease the adverse effects of existing groundwater impacts. The benefits of decreased groundwater flow rates are addressed further in the discussion of impacts in Section 4.6 on surface water.

4.5.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Placement of wet dredged material in the High Head Industrial Basin DMCF could temporarily increase the water level in the basin and potentially compress the sediments currently at the base of the basin. The High Head Industrial Basin DMCF dike would be designed to contain contaminants in the existing sediments within the footprint of the DMCF. Mobility of contaminants in the sediment would be further offset by compaction of the dredged materials and underlying sediment, which would decrease their permeability.

Coal Pier Channel DMCF at Sparrows Point

The Coal Pier Channel DMCF adjacent to Coke Point Cove would have minor impacts on groundwater proximate to the DMCF. Groundwater flow directions would be slightly modified as groundwater would flow around or under the compacted dredged material. However, paving Coke Point would greatly decrease groundwater flux overall, such that the volume of groundwater diverted around the DMCF would be substantially decreased from current groundwater flux. Placement and consolidation of wet dredged material could compress the underlying river sediments and could result in downward mobilization of contaminants from these sediments, temporarily impacting the quality of groundwater under the river. However, as the dredged materials are compacted, and fine particles filter down into the river sediments, permeability and contaminant mobility would decrease. In the long term, the resulting low-permeability cover over the existing sediments would decrease upward migration of groundwater and chemicals through the sediments to surface water. See Section 4.2 for more information on sediment.

Existing Nearshore MPA DMCFs

No new groundwater impacts would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

Placement of dredged material at NODS would not impact groundwater.

4.6 Surface Water

Surface water provides habitat and resource for fish and wildlife, means for shipping of goods and for transit of people, and a place for recreation and fishing. Surface waters are also used to support the economy through agriculture, industrial processes, and power production. Site-specific physical and chemical characteristics of surface water are used to determine the quality of the water with respect to suitability for supporting aquatic life and human uses. The quality of surface water may be influenced by watershed and local inputs, including non-point source land and agricultural practices, groundwater, regulated point-source industrial discharges and stormwater, and displacement or resuspension of underlying sediments during storm events, during vessel movements, and during waterfront and marine construction activities.

4.6.1 Affected Environment

State of Maryland surface waters affected by the SPCT project are the tidal waters of the Patapsco River in the vicinity of Coke Point and near the mouth of Bear Creek. This includes waters in the vicinity of the existing Sparrows Point Channel where dredging would occur, waters on the east side of Coke Point where the wharf would be constructed, waters on the southeast side of Coke Point where stormwater from the terminal would be discharged, waters on the west side of Coke Point where the proposed Coal Pier Channel DMCF would be constructed, and waters within or near the mouth of Bear Creek where effluent from dewatering of onsite DMCFs would be discharged.

The tidal waters surrounding the project area and extending eastward into the Upper Chesapeake Bay are classified as Use Class II (Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting) by MDE. The individual designated uses of Use Class II waters include: growth and propagation of fish, other aquatic life, and wildlife; water contact sports; leisure activities involving direct contact with surface water; fishing; agricultural water supply; industrial water supply; propagation and harvesting of shellfish; seasonal migratory fish spawning and nursery use; seasonal shallow-water SAV use; open-water fish and shellfish use; seasonal deep-water fish and shellfish use; and seasonal deep-channel refuge use.

MDE classifies the state's waterbodies into **Waterbody Use Classes** to define the intended uses and water quality standards needed to support those uses. By setting and enforcing standards for each class, MDE aims to manage pollution sources and preserve water quality across its diverse waterways. Each class has specific criteria to protect activities (e.g., swimming, fishing, providing habitats for aquatic life). Waterbodies are classified based on location, ecological significance, and recreational or commercial value.

Class I: Water Contact Recreation and Protection of Nontidal Warmwater Aquatic Life – Protects waters for recreational activities involving direct contact, like swimming, and ensures aquatic life (other than trout) can thrive. Provides agricultural and industrial water supply.

Class II: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting – Intended for estuarine and coastal waters that support marine life and shellfish, ensuring these areas are suitable for harvesting seafood safely.

Category III: Nontidal Cold Waters – Protects waters suitable for supporting naturally reproducing trout populations and other coldwater obligate species.

Category IV: Recreational Trout Waters – Designed for waters where trout are managed for recreational fishing but may not reproduce naturally. Allows for slightly warmer temperatures but still supports stocked trout populations for recreational fishing.

Under Section 303(d) of the Clean Water Act, waterbodies that do not meet established water quality standards are subject to Total Maximum Daily Loads (TMDLs). TMDLs establish the maximum limits for impairing substances or pollutants that a waterbody can receive from combined sources and meet water quality standards for its designated use(s). TMDLs distribute the total limited load between point and nonpoint sources, also known as a Waste Load Allocation (WLA).

The Chesapeake Bay TMDL, approved by USEPA in 2010, established watershed limits for nutrients (nitrogen and phosphorus) and total suspended solids (TSS). In Maryland, the USEPA approved a Baltimore Harbor TMDL specifically for nutrients (nitrogen and phosphorus), chlordane in sediments, trash and debris for the Middle Branch and Northwest Branch Portions of the Patapsco River, and PCBs in fish tissue within the Patapsco River. Point-source discharges, including discharges from DMCFs are subject to the Chesapeake Bay TMDL and the WLAs. WLAs are enforced in Maryland under the NPDES permit program through individual discharge permits.

4.6.1.1 Overview of Surface Water Quality Adjacent to Coke Point

Coke Point is surrounded by the Patapsco River to the west and south, the mouth of Bear Creek to the northwest, and the existing Sparrows Point Channel to the east. Surface water quality in these areas is affected by river flow and precipitation, daily tides, and the groundwater flow patterns under Coke Point. Surface water physical measurements, nutrient data, and chemical data from past and present data sources are used to describe the surface water quality of the SPCT project area. In addition, known inputs and sources to adjacent surface waters from stormwater and groundwater are also described. Data sources include past studies that assessed surface water quality in combination with offshore sediment quality between 2003 and 2011 (EA 2003, 2009, 2010a, 2010b, 2011), nutrient data and in situ (in place) water quality measurements collected during seasonal aquatic resource surveys in 2023 and 2024 (EA 2024a, 2024d, 2024e, 2024f), and data collected from project-specific dredged material characterization studies (EA 2024b, 2024c, 2024g).

Total Maximum Daily Load (TMDL) is a regulatory term of the Clean Water Act that represents the maximum amount of a pollutant that a waterbody (e.g., river, lake, estuary) can receive daily while still meeting water quality standards. TMDLs are established to restore impaired waters by addressing pollutants that cause water quality degradation. Once a TMDL is established, states and local agencies implement strategies to limit pollutant levels to help improve water quality and support designated uses, such as recreation, drinking water, and aquatic habitats.

Waste Load Allocations (WLAs) set the amount of specific pollutants that can be safely released into a river, lake, or other body of water from specific sources, such as factories or treatment plants, without harming the water's health or quality. WLA is an essential part of the TMDL calculation. These limits help ensure that water quality objectives are met and are essential for managing and reducing pollution in streams, rivers, lakes, and coastal waters.

Physical Conditions and Water Quality Measurements

Baltimore Harbor includes an approximate 15-statute mile tidal portion of the Patapsco River with water depths generally less than 20 feet with the exception of the federal navigation channels and other state and private access channels that are dredged to provide safe navigation for waterborne commerce (Wang et al. 2004). Surface water circulation and exchange within the harbor are governed by the effects of wind, tides, salinity-based density gradients, and river flows (Garland 1952; Boicourt et al. 1982). Vertical stratification of the water column is common, particularly in areas of deeper waters (such as the navigation channels) where denser (heavier), saltier and cooler bottom waters move upstream with incoming tides and remain below less dense (lighter) freshwater or low salinity surface waters moving downstream towards the Chesapeake Bay. Due to water column density, salinity stratification, limited vertical mixing, and use of dissolved oxygen by organisms and chemical degradation processes, low dissolved oxygen concentrations in deep bottom waters are often present below the requirements to support aquatic life, particularly in the late summer and fall seasons. The severity of this condition in the Patapsco River varies from year-to-year based on precipitation and freshwater inflow and is most common in deep water areas, including the navigation channels.

Water depths in the SPCT project area vary and range from less than 2 feet up 15 feet in the nearshore areas, from approximately 15 feet up to 45 feet in the west and south offshore areas, and from approximately 10 feet up to 47 feet in the proposed channel improvements footprint. Water quality measurements recorded at seven locations in the vicinity of Coke Point (Figure 27) during seasonal nutrient surveys in summer and fall 2023 and winter and spring 2024 (EA 2024a, 2024d, 2024e, 2024f) indicated that water temperature, salinity, pH, and dissolved oxygen varied by season and water depth. Within the project area, salinities are typically classified as oligohaline (≤ 0.5 to 5 parts per thousand [ppt]) within the winter and spring and as either low mesohaline (≥5 to 12 ppt) or high mesohaline (≥12 ppt to 18 ppt) during the summer and fall. During the seasonal surveys, salinities in the project area ranged from 1.6 to 17.8 ppt with highest salinities measured in the summer and fall season bottom waters. Water temperature ranged from 41.2 to 81.7 ºF (degrees Fahrenheit) with highest and lowest water temperatures measured in summer and winter season surface waters, respectively. Dissolved oxygen ranged from 0.5 to 13.4 mg / L with low dissolved oxygen and hypoxic conditions measured in the summer season bottom waters. pH ranged from 7.1 to 10.2, with highest and lowest pH values measures in the winter and spring / summer, respectively. Turbidity (measured as nephelometric turbidity units or NTUs) ranged from 1.0 to 32.3 NTU and tended to be higher in bottom waters, regardless of season.

Nutrients

Nutrients are important for support of aquatic life, but in excess and through degradation, nutrients may consume and deplete dissolved oxygen in the water column. Nutrients (nitrogen and phosphorus) may be present in dissolved form or bound to particles within the water. Excess nitrogen and phosphorus have been identified as a concern for Baltimore Harbor surface waters, and the inputs and the TMDL for these nutrients are managed and regulated by MDE through the NPDES process.

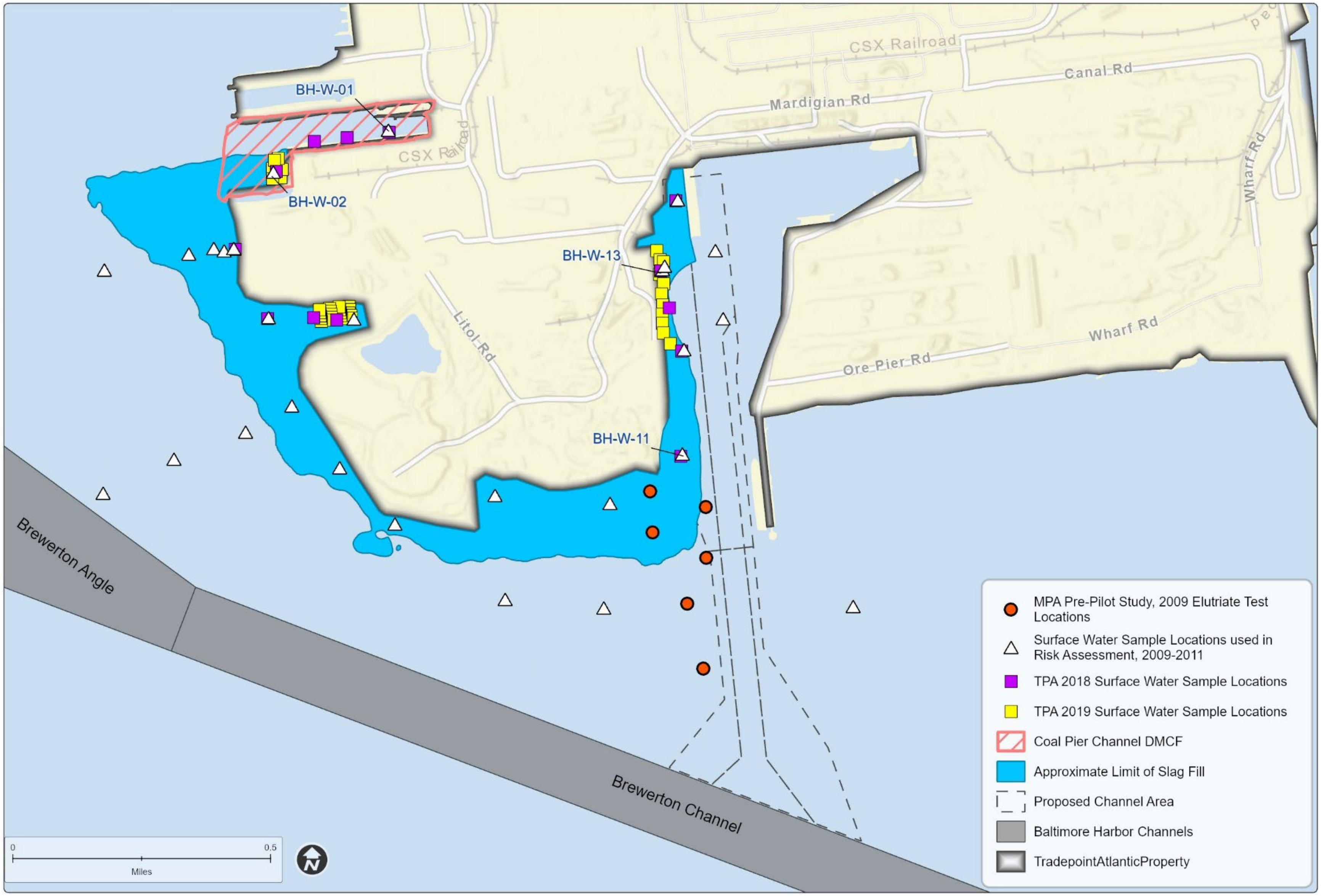
Surface water nutrient samples were collected from seven locations in the vicinity of the SPCT project area in summer and fall 2023 and winter and spring 2024 (Figure 27) (EA 2024a, 2024d, 2024e, 2024f). Overall, total nitrogen concentrations were higher in the winter and spring (between 1 and 2 milligrams per liter [mg / L]) and lower in summer and fall (less than 1 mg / L). Most nitrogen was present in dissolved form in the winter and spring and was as a combination of particulate and dissolved nitrogen in the summer and fall. Total phosphorus concentrations were generally higher in summer and fall and varied by sampling location. Most phosphorus was present bound to particulates in the fall, winter, and spring; highest dissolved phosphorus was present during the summer season. Organic carbon concentrations in the SPCT project area surface waters ranged from 2.4 mg / L in the winter to 4.4 mg / L in the summer.

Chemical Constituents

Characterization of surface water chemistry around Coke Point has been investigated through several decades of study of the offshore area. The most comprehensive evaluation of existing conditions from chemical impacts in surface water was a series of due diligence investigations performed by the MPA (EA 2003, 2009, 2010a, 2010b, 2011). During multiple sampling events conducted for these studies, approximately 96 surface water samples were collected and tested for metals, PAHs, SVOCs, VOCs, PCBs, dioxins, and other constituents (Figure 28). Chemical concentrations in surface water, sediment, and bioaccumulation tests (tissue) samples were used to model potential risks to human health, fish, benthos, and wildlife and to identify the geographic areas contributing the most to risks. Most chemicals in surface water were either below benchmarks protective of human health or aquatic life or were comparable to concentrations found throughout the Lower Patapsco River. PAHs were the only chemicals identified in surface water as posing potential risks. For aquatic life, PAHs in surface water posed risks in the western and southern offshore areas of Coke Point. For human health, the same PAH concentrations in surface water were identified as potentially posing a risk for recreational use for swimming. However, because people are unlikely to frequently and repeatedly swim in the nearshore areas where these high PAH concentrations were found, these risks were considered to be conservative and overestimated.

Figure 27. Surface Water and Nutrient Sampling Locations

Figure 28. Historical Sampling Locations from Previous Surface Water Studies (2003 through 2011) and Slag Limits



Additional studies of surface water chemistry were conducted in 2018 and 2019 to support ongoing remediation activities at Coke Point (Enviroanalytics Group and ARM Group 2018, 2019). The studies included joint sampling of groundwater, porewater, and surface water and focused on specific areas of potential groundwater inputs to surface water. A total of 95 samples from 50 locations were collected as part of these studies, and samples were analyzed for either PAHs, VOCs, or both dependent on potential sources of chemicals in groundwater nearby. Results of these studies are included in the discussion of inputs to surface water from groundwater.

Inputs to Surface Water

Surface water may receive inputs from stormwater discharges and runoff, leaching from groundwater, and resuspension of sediments from storm events, vessel movements, maritime activities, and periodic maintenance dredging. Existing contributions of nutrients, chemical constituents, and particulates / sediment to surface water from Coke Point via runoff / stormwater and via groundwater inputs are discussed below.

- *Stormwater / Runoff* – Onsite stormwater and runoff is managed using controls such as drainage ways, settling ponds, and monitored outfalls that form a system for routing water away from loose soils and into basins where it can collect, and solids can settle out. Stormwater management at Sparrows Point is governed by a Sitewide NPDES permit (State Discharge Permit No. 05-DP-0064, NPDES Permit No. MD0001201) that establishes approved discharge locations (outfalls) and includes specific monitoring requirements and discharge limits for nutrients, organics, metals, and TSS . These discharge limits include both maximum loadings for nitrogen, phosphorus and suspended solids and concentration-based limits for pH, select metals, oil, and grease, and select PAHs and VOCs. Discharge monitoring and sampling at the permit-specified outfalls has demonstrated compliance with NPDES permit limits (TPA 2023c). In addition to current stormwater controls, TPA has worked with Baltimore County to develop a sitewide stormwater management strategy that includes construction of a regional wet pond stormwater facility on the site. This regional wet pond stormwater facility will provide 5,502,794 cubic feet of water quality treatment for 946 acres of impervious area, including 299 acres of the adjacent community. Prior to the runoff being pumped into the regional wet pond, a pre-treatment volume of approximately 2,359,230 cubic feet will be provided within the existing Tin Mill Canal. Based on the substantial capacity and the excess treatment of this new system, TPA and Baltimore County have agreed to a credit system for future projects so that individual stormwater management is not required on a project-by-project basis. The new system is currently under construction and is anticipated for completion and use in 2026.
- *Groundwater* – As discussed above in Section 4.5.1, past industrial activities at Coke Point have contributed to chemical impacts of groundwater. TPA has been actively working with the USEPA and MDE and implementing measures to remove these chemicals. There are some areas where groundwater containing chemicals remain within the pores of slag and soil. This groundwater may flow underground and upward through sediments and provide a source of chemicals to surface waters. Two specific areas on Coke Point are known to have had groundwater plumes moving in the direction of surface water (CH2M Hill 2001; EA 2009). One of these areas is located in the northwestern part of Coke Point where groundwater contains benzene, naphthalene, and related VOCs; this area is immediately south of the Coal Pier Channel. The other area is located in the east-central portion of Coke Point where groundwater contains naphthalene and other semi-volatile

compounds; this area is west of the proposed SPCT wharf and revetment. Past sampling found elevated concentrations of naphthalene and benzene in surface water samples collected immediately offshore of these areas. Naphthalene and benzene were detected in surface waters samples west of the graving dock on the west side of Coke Point, in Coke Point Cove, and on the east side of Coke Point near the north end of the channel turning basin (EA 2009, 2010a; Enviroanalytics Group and ARM Group 2018, 2019). Over the past decade, both of these areas have been subject to remediation. In 2010, RCRA IMs were initiated in both areas of groundwater plumes to remove or reduce sources of naphthalene, benzene, and other chemicals in groundwater. The remedial actions have included excavating a source area of non-aqueous phase (oily) liquids on the east side of Coke Point and installing systems to pump out water and treat it to remove chemicals at both areas (TPA 2023a). Annual reports summarize the progress of IMs in addressing groundwater impacts (TPA 2023a). Sampling of surface water in 2018 and 2019 found that benzene and naphthalene concentrations were less than the Maryland surface water quality standards east of Coke Point and near the Coal Pier Channel; concentrations of benzene, but not naphthalene, exceeded benchmarks in a few samples in Coke Point Cove on the west side of Coke Point (Enviroanalytics Group and ARM Group 2019). Continuation of activities to remediate source areas are expected to decrease and eventually eliminate the potential for naphthalene, benzene, or other constituents to reach surface water.

4.6.1.2 Surface Water Quality on the East Side of Coke Point and Sparrows Point Channel

Surface water quality data for the Sparrows Point Channel and for east side of Coke Point include physical measurements and nutrient data collected during the 2023-2024 aquatic resource surveys (EA 2024a, 2024d, 2024e, 2024f), historical chemical data (EA 2003, 2009, 2010a, 2010b, and 2011), and chemical data of site water (surface water) collected to support the dredged material testing for the proposed widening and deepening of the channel (EA 2024b, 2024c, 2024g). Seasonal water column measurements collected in 2023 and 2024 from two locations in the vicinity of the Sparrows Point Channel (SCPT23-04 and SPCT23-05; Figure 27) indicated a stratified water column with respect to salinity at both locations (approximately 30 feet and 45 feet deep, respectively). The combined seasonal data for these locations indicated that salinity ranged from approximately 2 to 11 ppt in surface waters and from approximately 5 to 18 ppt in bottom waters throughout the year. Water column stratification with hypoxic conditions (low dissolved oxygen concentrations) was present in bottom waters in the summer at both locations. Concentrations of nutrients in surface water were consistent with those described for the overall surface waters adjacent to Coke Point.

Historical surface water samples from with the northern portion of the turning basin on the east side of Coke Point (EA 2003, 2009, 2010a, 2010b, 2011) indicated that concentrations of PAHs, specifically naphthalene, were detected above background concentrations in surface waters along the shoreline in the north part of the turning basin (location BH-W-13, Figure 28) and off the southeast tip of Coke Point (location BH-W-11, Figure 28). Recent chemical analysis of three surface water samples area (SPCT24-NORTH-01-WAT, SPCT24-NORTH-02-WAT, and SPCT24-WAT) (Figure 27) indicated that low concentrations of nutrients (nitrate-nitrite, total Kjeldahl nitrogen, and total phosphorus), eleven metals, one chlorinated pesticide (4,4’-DDD), and one SVOC [bis(2-ethylhexyl)phthalate] were detected in the surface waters (EA 2024b, 2024c, 2024g). Each of the detected concentrations was well below USEPA and State of Maryland water quality criteria / standards for aquatic life. Other tested organic constituents

(PCBs, PAHs, dioxin / furan congeners, and butyltins) were not detected above the laboratory reporting limits in the surface water samples.

1.1.1.4 Surface Water Quality in the High Head Industrial Basin

High Head Industrial Basin is an industrial impoundment and is not a regulated surface waterbody. High Head Industrial Basin is approximately 40 acres in size with a water depth ranging from approximately 2 to 10 feet. High Head Industrial Basin receives treated effluent from the Baltimore City Back River Wastewater Treatment Plant, as well as stormwater runoff from local surrounding areas (TPA 2023b). Water is released from the south end of the basin via a pipeline that runs westward to an outfall near the mouth of Bear Creek.

Surface water sampling was conducted at eight locations in the High Head Industrial Basin in early 2023 (ARM Group 2023). Low concentrations of oil and grease and TPH-DRO were detected below concentrations that would be expected to pose risks to human health or aquatic life based on the current site industrial use. Concentrations of detected metals were below ecological benchmarks. Low concentrations of two SVOCs and three VOCs were also detected in the surface water samples (ARM Group 2023).

4.6.1.3 Surface Water Quality in the Area of the Proposed Coal Pier Channel DMCF

Surface water quality data for the Coal Pier Channel includes physical measurements and nutrient data collected during the 2023 / 2024 aquatic resource surveys (EA 2024a, 2024d, 2024e, 2024f) and historical chemical data (EA 2011). Seasonal water column measurements collected in 2023 and 2024 from one central location in the Coal Pier Channel (SCPT23-02; Figure 27) indicated a uniform water column with respect to water temperature and pH. Higher salinities in bottom waters were measured in summer, fall, and winter. Hypoxic conditions were present in the bottom waters during the summer sampling event; dissolved oxygen was measured at a concentration of 1.3 mg / L at a bottom depth of approximately 22 feet. Concentrations of nutrients in surface water were consistent with those described for the overall surface waters adjacent to Coke Point.

Historical surface water samples collected at two locations in the Coal Pier Channel DMCF footprint (BH-W-01 and BH-W-02, Figure 28) indicated that PAHs in surface waters exceeded ecological risk benchmarks (EA 2011).

4.6.1.4 Surface Water Quality in the Vicinity of the MPA DMCFs

The Masonville and Cox Creek DMCFs are upland facilities with adjacent surface waters of the Patapsco River. Surface waters in the vicinity of the Masonville and Cox Creek DMCFs are subject to the same physical processes and watershed-based inputs as other locations within the Patapsco River. Discharges from both facilities to the surface waters of Patapsco River are managed through the NPDES process with consideration of the Baltimore Harbor TMDLs and WLA requirements.

4.6.1.5 Surface Water Quality at the NODS

The NODS is located in marine surface waters of the Atlantic Ocean. The NODS has a surface area of approximately 50-square nautical miles with water depths ranging from approximately 43 to 85 feet (USEPA and Corps 2019). The water column at the NODS is typically well mixed, with little to no evident stratification. To support the dredged material evaluation for ocean placement, a surface water sample was collected from mid-depth of the water column at the NODS in early March 2024. Surface water chemical data were used to assess water quality criteria compliance for the NODS receiving water and were used as input to the model that predicts the dilution achieved within the water column with distance and time following material discharge / placement (EA 2024b). Results of testing indicated that low concentrations of total phosphorus, arsenic, vanadium, and di-n-butyl phthalate were the only constituents detected above laboratory reporting limits in the receiving water and each concentration was well below established USEPA water quality criteria for aquatic life. Water quality measurements of temperature, salinity, pH, dissolved oxygen, and turbidity from mid-depth of the water column at the time of water collection were consistent with a well-mixed offshore marine environment.

4.6.2 Environmental Consequences

4.6.2.1 No-action Alternative

Under the No-action Alternative, surface water would continue to be subject to existing physical conditions and watershed inputs. Sediments and chemicals associated with sediment in the project area would stay in place. Existing sediment and surface water interactions would continue. Surface water quality in the vicinity of Coke Point would be potentially affected by resuspension of surficial sediment during storm events, as well as ongoing chemical inputs from groundwater. However, IMs to reduce chemicals in groundwater would continue. Based on the risk assessment performed for surface water, sediment, and bioaccumulation (tissue) data, there would be an ongoing potential for movement of chemicals to surface waters and an ongoing potential for ecological risk from offshore areas west and south / southeast of Coke Point. Stormwater and runoff from existing landside areas and from future development of landside areas would be managed under current or future NPDES permits and planned controls, and the construction and subsequent use of the regional stormwater wet pond facility would occur. Future in-water activities would be limited to periodic maintenance dredging of the existing channel that would be conducted in accordance with permit conditions.

4.6.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Construction of the wharf would require multiple in-water activities, including dredging and mechanical excavation, demolition of limited relic pier structures, pile installation, and placement of rock and fill for the revetment structure (underneath the open wharf structure), and the capping of the revetment structure with armor stone at the interface between the land and water. These in-water construction activities have the potential to resuspend sediment and contaminants to surface waters. In-water construction BMPs (such as those described in Section 3.2) would be used where practicable and necessary based on the sediment chemistry and site conditions to minimize resuspension of sediment and contaminants to surface waters. Any resuspension or incidental release of sediment during in-water activities would be short-term and localized and contained to the immediate work area using BMPs. In addition, all in-water construction methodologies would be conducted in accordance with all applicable permit conditions to protect surface waters. Therefore, adverse impacts on adjacent surface waters during in-water construction would be expected to be minimal.

The dredging needed to construct the wharf and widen and deepen the channel would permanently remove 4.2 MCY of sediments that include legacy contaminants from historical industrial activities and would leave behind deeper native sediments with natural background concentrations of metals and other constituents on the east and southeast side of the peninsula. The removal of sediments impacted by metals, PAHs, PCBs, and other constituents would result in a permanent net improvement of surficial sediment conditions (approximately 52 acres within the existing channel and 60 acres in the channel wideners) for fish, crabs, benthic organisms, and humans. The removal of the sediments would improve the quality of the sediment at the surface-water interface in the vicinity of the project area, and it would reduce the overall (net) surface area in the vicinity of Coke Point where impacted surficial sediments and surface waters interact.

Mechanical dredging may resuspend some sediments to surface waters that would settle back to the bottom of the dredging area and adjacent areas. Dredging BMPs (such as those described in Section 3.2) would be used where practicable and necessary based on sediment chemistry and site conditions to minimize the release of sediment and contaminants to the water column during dredging operations. Studies conducted by multiple entities have documented that fine-grained sediments resuspended from dredging operations settle within several hundred feet of the point of dredging (Burton 1993; Wilber and Clarke 2001, EA 2007, TPA 2024). Any resuspension or incidental release of sediment to surface waters during dredging in the north channel would be short-term and localized (due to low current velocity). Any resuspension or incidental release of sediment to surface waters during dredging operations in the south channel area and near the Brewerton Channel would be expected to be comparable to routine maintenance dredging operations performed within the federal channel. With respect to the potential for release of dissolved chemical constituents from the sediments during dredging, recent and historical site-specific dredged material studies using elutriate testing have shown that the majority of contaminants would be bound to particulates and not readily released in dissolved form (EA 2010b, 2024b, 2024g). Overall, adverse impacts on surface waters from dredging would be expected to be minimal, temporary, localized, and controlled. Dredging activities would be conducted in accordance with all applicable permit conditions to protect surface waters.

The construction of the wharf and terminal facilities would result in impervious surfaces throughout the terminal facility. The planned stormwater conveyance system would consist of a series of pipes that would discharge stormwater effluent to surface waters through two permitted outfalls at the south end of Coke Point. It is anticipated that the stormwater discharge from the new terminal would be incorporated into the regional stormwater plan for the Sparrows Point facilities. It is anticipated that these discharges would use credits generated through the over-treatment of local Sparrows Point stormwater by the regional wet pond stormwater facility that is currently under construction at Sparrows Point. Therefore, stormwater discharges from the new terminal would not be expected to adversely impact surface waters.

4.6.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Use of the High Head Industrial Basin as a DMCF would require removal of water from the existing basin, hydraulic offloading and pumping of dredged material to the site, and management and discharge of effluent from the de-watering of the dredged material. It is anticipated that the water in the industrial basin would be removed through the existing pump, conveyance pipe / system, and permitted outfall in Bear Creek that is currently used for the managed release and discharge of water from the facility. The future DMCF discharges would be regulated under a NPDES permit; therefore, no impacts on surface water would be expected for the removal and discharge of the existing water.

Material from the channel footprint would be mechanically dredged and placed in scow barges and transported by waterway to an offloading location on the east side of Bear Creek. The material would be slurried with surface water and hydraulically pumped to the High Head Industrial Basin DMCF. The water required to slurry the material would be withdrawn from Bear Creek at the offloading location. To the extent possible, slurry water from the DMCF would be recirculated and reused in this process to reduce the volume of surface water required for withdrawal. The use of surface waters and the volume of water withdrawn from Bear Creek would comply with conditions of a Water Appropriation and Use Permit issued by MDE. Therefore, no impacts on surface waters would be expected for water use to slurry and pump dredged material to the DMCF.

Dewatering of the dredged material would be required for drying and consolidation of the material in the DMCF. Following pumping of the slurried material to the DMCF, the solids would settle and separate. The overlying water (or effluent) would be pumped westward via pipe or conveyance system to discharge through a permitted outfall in Bear Creek. Modified elutriates (Corps 2003), which conservatively predict total and dissolved constituents that may be in effluent released during the DMCF dewatering process, were prepared and tested for the north channel DUs (EA 2024g). These data indicated that the majority of chemical constituents predicted in effluent would be bound to sediment particles, and the concentrations of most constituents detected in the effluent would not be expected to exceed the existing maximum daily discharge limits stipulated in TPA's sitewide NPDES permit. Additional settlement or treatment would address constituents detected in the effluent that could exceed the existing maximum daily discharge limits stipulated in TPA's sitewide NPDES permit. It is anticipated that the discharge from the High Head Industrial Basin DMCF would be incorporated into TPA's existing sitewide NPDES permit, and the quantity and quality of the discharge would be subject to the conditions of the permit. Therefore, managed DMCF effluent discharges would not be expected to adversely impact surface waters.

As part of construction of the High Head Reservoir DMCF, filling the basin would eliminate its use for receipt of both local stormwater from nearby portions of Sparrows Point and inputs from the Back River Wastewater Treatment Plant. Stormwater inputs would be incorporated into TPA's existing sitewide NPDES permit and re-routed to a permitted outfall. Inputs from the Back River Wastewater Treatment Plant would be rerouted to a Baltimore City permitted outfall and incorporated into the plant's NPDES permit. In both cases, the quantity and quality of the discharges would be subject to the conditions of each respective permit and would not be expected to adversely impact surface waters.

Coal Pier Channel DMCF at Sparrows Point

The Coal Pier Channel DMCF would require in-water construction of an approximate 600-foot berm or dike at the west end to enclose the channel prior to placement of dredged material within the DMCF. The dike would be constructed using clean sand from an offsite source and would be protected with rock sized to stabilize the structure and withstand future storm events and sea-level rise. The sediment present within and adjacent to the alignment of the channel enclosure dike is anticipated to consist of a soft surface layer approximately 4 feet thick underlain by consolidated sand. Because this soft overburden material would be removed from the dike alignment prior to placement of sand to construct the dike, displacement of sediments and creation of a mud wave during dike construction would not be expected and therefore would not impact surface waters.

In-water placement of fill associated with berm / dike construction would have the potential to resuspend sediment and contaminants to surface waters. In-water construction BMPs (such as those described in Section 3.2) would be used where practicable and necessary based on the sediment chemistry and site conditions to minimize resuspension of sediment and contaminants to surface waters. Any resuspension or incidental release of sediment during in-water berm / dike construction would be short-term and localized and contained to the immediate work area using BMPs. In addition, all in-water construction methodologies would be conducted in accordance with all applicable permit conditions to protect surface waters. Therefore, adverse impacts on adjacent surface waters outside the enclosure dike from resuspension of sediments would be expected to be minimal.

Following completion of the enclosure dike, hydraulic offloading and pumping of dredged material into the DMCF and management and discharge of effluent from the de-watering of the dredged material would be required. Material from the channel footprint would be mechanically dredged and placed in scow barges and transported by waterway to an offloading location immediately adjacent to the Coal Pier Channel DMCF. The material would be slurried with surface water and hydraulically pumped into the Coal Pier Channel DMCF. The water required to slurry the material could be withdrawn from the Patapsco River (near the mouth of Bear Creek) at the offloading location. To the extent possible, slurry water would be recirculated from the Coal Pier Channel DMCF and reused in this process to reduce the volume of surface water required for withdrawal. The use of surface waters and the volume of water withdrawn from the Patapsco River would comply with the conditions of a Water Appropriation and Use Permit issued by the MDE. Therefore, no impacts on surface waters would be expected for water use to slurry and pump dredged material to the DMCF.

Dewatering of the dredged material would be required for drying and consolidation of the material in the DMCF. Following pumping of the slurried material into the DMCF, the solids would settle and separate. The overlying water (or effluent) would be managed and discharged through a permitted outfall on the west enclosure dike. Modified elutriates (Corps 2003), which conservatively predict total and dissolved constituents that may be in effluent released during the DMCF dewatering process, were prepared and tested for the north channel DUs (EA 2024g). These data indicate that the majority of chemical constituents predicted in effluent wound be bound to sediment particles, and concentrations of most constituents detected in the effluent would not be expected to exceed the existing daily maximum discharge limits stipulated in TPA's sitewide NPDES permit. Additional settlement or treatment would address constituents detected in the effluent that could exceed the existing maximum daily discharge limits stipulated in TPA's sitewide NPDES permit. It is anticipated that the discharge from the Coal Pier Channel DMCF would be incorporated into TPA's existing sitewide NPDES permit, and the quantity and quality of the discharge would be subject to the conditions of the permit. Therefore, managed DMCF effluent discharges would not be expected to adversely impact surface waters.

Following completion of dredged material placement, the existing impacts sediments in the Coal Pier Channel would be encapsulated and the placed sediments would be capped. This conversion from open water to upland would remove approximately 19.6 acres of impacted sediments at the sediment-water interface and provide a net improvement / benefit to surface waters in the vicinity of the project area by removing the sediment to surface water exposure pathway for aquatic resources.

Existing MPA DMCFs

Both Masonville and Cox Creek are permitted DMCFs that accept dredged material from the Baltimore Harbor channels and the Patapsco River west of the North Point-Rock Point line. These facilities discharge effluent from dredged material dewatering through permitted outfalls to the Patapsco River in accordance with NDPES requirements. Only those DUs that meet MPA BCL requirements and that are classified as MDE Innovative Reuse Category 1 (Residential Unrestricted Use Soil and Fill Material) and Category 2 (Non-Residential Restricted Use Soil and Fill Material) would be placed at the MPA DMCFs. Therefore, the effluent from the dewatering of the SPCT dredged material would not be expected to differ substantially from effluent for materials previously and currently being placed in the facilities. No change to DMCF site conditions, operations, practices, or discharges to surface water would be expected as a result of the SPCT dredged material placement at either the Cox Creek DMCF or the Masonville DMCF.

Existing Ocean Disposal Site

Placement of dredged material at the NODS is regulated under Section 103 of the MPRSA. Tier II (sediment and elutriate) and Tier III (ecotoxicological testing) testing of the dredged material has been conducted in conformance with the requirements under Section 103 of the MPRSA and 40 CFR 220-228 (EA 2024b). These tests included chemical and ecotoxicological analysis of standard elutriate samples, which are used to evaluate chemical and biological impacts on surface waters. Results of the elutriate testing indicated that each of the 14 DUs proposed for placement at the NODS demonstrated no adverse impact on marine surface waters; each of the 14 DUs met the LPC for water quality criteria and water column toxicity. Therefore, no impacts on marine surface waters in the Atlantic Ocean would be expected from ocean placement of material from the SPCT project. Physical placement of the material at the NODS would comply with the requirements stipulated in the Site Management and Monitoring Plan for the disposal site (USEPA and Corps 2019).

4.7 Benthic Fauna

4.7.1 Affected Environment

Benthic fauna encompasses a wide range of bottom-dwelling organisms, including mollusks, crustaceans, and macroinvertebrates, among others. Benthic macroinvertebrates are important in the trophic structure of the Chesapeake Bay (USEPA 1994) and serve as a food / prey resource for bottom-feeding fish. Benthic macroinvertebrates are typically soft-bodied, greater than 0.02 inch in size, and include organisms such as polychaete worms, bivalves (e.g., clams, oysters, mussels), and amphipods.

Benthic organisms live within or on the surface of the sediments. The majority of bottom sediments in the Chesapeake Bay are soft bottom habitat (e.g., mud, sand) (Chesapeake Bay Biological Monitoring Program [CBBMP] 2004). The Chesapeake Bay is home to several commercially important benthic species, including razor clams (*Tagelus plebius*), soft-shell clams (*Mya arenaria*), eastern oysters (*Crassostrea virginica*), blue crabs (*Callinectes sapidus*), and horseshoe crabs (*Limulus polyphemus*) (Corps 2009). Some benthic organisms provide a critical service to the Chesapeake Bay by filtering material from the water column, improving water quality and clarity.

The overall health of the benthic macroinvertebrate community is a key indicator of the environmental stresses that may be affecting a water body (USEPA 1994). Benthic communities serve as a biological measure of environmental conditions that can be used in conjunction with other physical and chemical indicators (USEPA 1994). Benthic organisms that are classified as pollution-sensitive are more susceptible to the physical and chemical conditions caused by pollution, are long-lived, and are typically found in areas with undisturbed conditions in a water body. Pollution-indicative organisms are more tolerant to fluctuating physical and chemical conditions in a water body.

The health of benthic communities in the Chesapeake Bay has been studied under the CBBMP since 1984 (Versar 2022). The Chesapeake Bay Benthic Index of Biotic Integrity (B-IBI) is used as the primary means to understand the health of a benthic community. The B-IBI is based on habitat metrics (e.g., abundance, biomass, diversity) that are evaluated and compared to conditions at established reference sites. Between 1984 and 2017, the abundance, species diversity, and biomass of many benthic species declined in the Chesapeake Bay with significant decline in these metrics and the overall benthic community score noted in sampling stations in the Baltimore Harbor (Versar 2017). The decline in these community metrics at the Baltimore Harbor stations was attributed to seasonal hypoxic (low oxygen in bottom waters) conditions.

Benthic Community

Sampling for benthic fauna was conducted in the summer of 2023 (EA 2024a) at seven locations within the SPCT project area: one location within Coal Pier Channel (SPCT23-02), one location within Coke Point Cove (SPCT23-01), two locations west of the Coke Point shoreline (SPCT23-03 and SPCT23-07), two locations within the proposed dredging footprint for the Sparrows Point Channel (SPCT23-04 and SPCT23-05), and one location along the southern shoreline of Coke Point (SPCT23-06) (Figure 29). At these locations, a ponar grab sampler was used to collect benthic macroinvertebrates in the top 6 inches of sediment. *In situ* water quality measurements were recorded at each location and co-located surficial sediment samples were collected for physical and chemical analyses.

Benthic Macroinvertebrates

Several types of information are presented in this section to characterize the benthic fauna and bottom habitat. Data on the benthic community composition collected at each location (species present, number of individuals, and biomass (weight)) are presented and used to calculate standard metrics that describe a benthic community. Diversity, abundance, biomass, species dominance, evenness, and pollution tolerance are standard metrics used (Weisberg et al. 1997; EA 2024a) to describe benthic communities. The results of these metrics are combined to provide a condition assessment using the criteria that have been defined for the Chesapeake Bay B-IBI. The following sections describe the summer condition of the benthic community in the SPCT project area. The focus on the summer condition is prescribed by the B-IBI protocol.

Habitat Classification

The habitat at each benthic sampling location was classified based on the physical characteristics of sediment (grain size) and the salinity of the bottom water. These attributes are primary factors that influence benthic community structure (Versar 2002). The salinity and bottom substrate at each location was classified as one of the following:

- tidal freshwater (0 to 0.5 ppt)
- oligohaline (≥ 0.5 to 5 ppt)
- low mesohaline (≥ 5 to 12 ppt)
- high mesohaline sand (≥ 12 to 18 ppt) and 0 to 40% silt-clay content by weight
- high mesohaline mud (≥ 12 to 18 ppt) and > 40% silt-clay content by weight
- polyhaline sand (≥ 18 ppt) and 0 to 40% silt-clay content by weight
- polyhaline mud (≥ 18 ppt) and > 40% silt-clay content by weight

Figure 29. Benthic Fauna and Crab Pot Sampling Locations

Based on the water column salinity measurements at the time of summer sampling, three SPCT sampling locations were classified as low mesohaline (SPCT23-01, SPCT23-03, and SPCT23-06), and four SPCT sampling locations were classified as high mesohaline (SPCT23-02, SPCT23-04, SPCT23-05, and SPCT23-07). Based on the physical analysis of surface sediments from each location, the substrate at six sampling locations (SPCT23-02, SPCT23-03, SPCT23-04, SPCT23-05, SPCT23-06, and SPCT23-07) was classified based on grain size as mud habitat (containing greater than 40% silt / clay content). The grain size at SPCT23-01 consisted of a combination of sand, gravel, and silt / clay. See Figure 29 for the sampling locations.

Community Composition

For the combined seven sampling locations in the SPCT project area, 22 unique benthic macroinvertebrate taxa were collected. Of these, nine taxa were polychaetes (bristle worms), five were bivalves (clams and mussels), and three were crustaceans. The remaining taxa included ribbon worms, segmented worms, and snails. Nineteen of the 22 taxa were collected at SPCT23-01 (Coke Point Cove); one taxon was collected at SPCT23-02 within the Coal Pier Channel; no taxa were recovered from samples collected at SPCT23-05 (deep water channel habitat near the Brewerton Channel). For the remaining locations, the number of unique taxa ranged from four (SPCT23-04 within the Sparrows Point Channel) to 13 (SPCT23-06 along the southern Coke Point shoreline). The total benthic mean abundance (number of organisms per meter squared [m^2]) varied substantially among the six sample locations where organisms were recovered. A notable difference in total benthic mean abundance was evident between locations SPCT23-01 (Coke Point Cove) and SPCT23-02 (Coal Pier Channel). SPCT23-01 had a benthic abundance of 13,170 organisms / m^2, and SPCT23-02 had a benthic abundance of only 6.8 organisms / m^2. Overall, the community abundance at SPCT23-01 (west cove area) was at least five times higher than the locations with the next highest abundance (SPCT23-03 (western Coke Point shoreline) and SPCT23-07 (Coke Point offshore)). Hypoxia was present in bottom waters at five of the seven sampling locations and likely influenced the benthic community structure and condition at these locations. SPCT23-01, which had the highest number of recovered organisms, did not have hypoxic conditions present in the area at the time of sampling.

Overall, polychaete worms were present in the highest numbers at each sampling location where organisms were recovered and comprised more than 50% of the community organisms at all locations. Biomass (weight of each taxon in grams per meter squared [g / m^2]) ranged between 0.007 g / m^2 at SPCT23-04 (within the proposed dredging footprint) and 5.61 g / m^2 at SPCT23-06 (southeast of Coke Point). By weight, bivalves were dominant at locations along the western and southern Coke Point shoreline, and polychaete worms were dominant by weight at the remaining sampling locations.

Community Condition

The Chesapeake Bay B-IBI approach involves scoring habitat metrics as 5, 3, or 1, depending on whether its value at a site approximates (5), deviates slightly (3), or deviates greatly (1) from conditions measured at established reference sites (Weisberg et al. 1997). The values for each metric at each location are presented in Table 14 and discussed below (definitions of each metric are in the footnotes on Table 14). Each metric value is given a score (5, 3, or 1) and the final Chesapeake Bay B-IBI score is derived by summing individual scores for each metric (diversity, abundance, biomass, species dominance, evenness, abundance of omnivores and carnivores, and pollution tolerance) and calculating an average overall B-IBI score for each sampling location (Table 15).

The B-IBI was used to establish benthic restoration goals for Chesapeake Bay (Weisberg et al. 1997). The Chesapeake Bay Restoration Goal Index (RGI; Ranasinghe et al. 1994) was patterned after the same approach used to develop the Index of Biotic Integrity (IBI) for freshwater systems (Karr et al. 1986). A Chesapeake Bay RGI score of 3 represents the minimum restoration goal. RGI values less than 3 are indicative of a stressed community, and scores of 3 or greater indicate habitats that meet or exceed the Chesapeake Bay restoration goals (Ranasinghe et al. 1994).

Based on the Chesapeake Bay RGI, the CBBMP classifies the benthic community into four levels (Versar 2002):

- Meets goals (B-IBI that is ≥ 3.0)
- Marginally degraded (B-IBI of 2.7 to 2.9)
- Degraded (B-IBI of 2.1 to 2.6)
- Severely degraded (B-IBI that is ≤ 2.0)

Only one benthic sampling location (SPCT23-06 along the southeast shoreline of Coke Point) met the RGI with an average score of 3, meaning that location is not classified as degraded (Table 15). The sampling locations in the Coal Pier Channel and the furthest location offshore to the west of Coke Point were classified as degraded (scores of 2.33 each), and the remaining three locations with benthic taxa present were classified as severely degraded (scores between 1.3 and 1.8) (Table 15).

Summary and Influence of Water Quality Conditions

Overall, the benthic community condition was the best (no degradation) along the southeast shoreline of Coke Point (SPCT23-06); this benthic community met the RGI and also had the highest benthic biomass and a dominant pollution-sensitive polychaeta taxa. Additionally, this location had the highest bottom dissolved oxygen concentration. These conditions likely supported the high biomass and second-highest number of unique taxa (13) comprising a more suitable environment for benthic fauna. Although the highest number of individual unique taxa and the highest overall benthic abundance were found in Coke Point Cove (SPCT23-01), this location had the second lowest total B-IBI score (1.8) indicating the community, while abundant and taxonomically diverse, is severely degraded. Bottom dissolved oxygen concentrations at SPCT23-02, SPCT23-03, SPCT23-04, SPCT23-05, and SPCT23-07 showed hypoxic conditions, which is typical for the lower Patapsco River in summer months.

Table 14. Benthic Community Metrics

Metric	Metric Values						
	SPCT23-01	SPCT23-02	SPCT23-03	SPCT23-04	SPCT23-05	SPCT23-06	SPCT23-07
Habitat Classification	LM	HMM	LM	HMM	HMM	LM	HMM
Abundance (# / m^2)	13,063	6.8	2,414	187	--	1,680	2,319
Total Biomass (g / m^2)	2.33	0.008	0.229	0.007	--	5.61	0.255
Shannon-Wiener Diversity	2.27	0	1.65	0.729	--	2.42	1.1
Abundance Pollution-Sensitive Taxa (%)	NC	NC	NC	NC	--	NC	NC
Abundance Pollution-Indicative Taxa (%)	42.7	NC	49.5	NC	--	23.2	NC
Abundance of Carnivores / Omnivores (%)	NC	100	NC	0	--	NC	1.26
Biomass of Pollution-Sensitive Taxa (%)	8.41	0	23.8	0	--	0.526	44.2
Biomass of Pollution-Indicative Taxa (%)	NC	0	NC	19.5	--	NC	14.1

Source: EA 2024a

Notes:

The calculations in this table exclude species not meeting B-IBI macrofaunal criteria.

Abundance = the total number of benthic organisms per square meter.

Total biomass = the total mass (weight) of benthic organisms in a square meter.

Shannon-Weiner diversity = a measurement of the proportional abundances of each species at a location to determine diversity of the community.

Pollution-sensitive taxa = organisms that are most likely to be impacted by a change in physical or chemical conditions of a water body.

Pollution-indicative taxa = organisms that are more likely to be tolerant of polluted conditions in a water body.

Carnivores and omnivores = percent abundance contribution of taxa currently classified as carnivores or omnivores to the total number of organisms.

/ m^2 = number per square meter

g / m^2 = grams per square meter

LM = Low mesohaline

HMM = High mesohaline mud

-- = No species recovered

NC = Metric not calculated for habitat class

Table 15. Benthic Community Metrics

Metric	Metric Values						
	SPCT23-01	**SPCT23-02**	**SPCT23-03**	**SPCT23-04**	**SPCT23-05**	**SPCT23-06**	**SPCT23-07**
Habitat Classification	LM	HMM	LM	HMM	HMM	LM	HMM
Abundance (# / m^2)	13,063	6.8	2,414	187	--	1,680	2,319
Total Biomass (g / m^2)	2.33	0.008	0.229	0.007	--	5.61	0.255
Shannon-Wiener Diversity	2.27	0	1.65	0.729	--	2.42	1.1
Abundance Pollution-Sensitive Taxa (%)	NC	NC	NC	NC	--	NC	NC
Abundance Pollution-Indicative Taxa (%)	42.7	NC	49.5	NC	--	23.2	NC
Abundance of Carnivores / Omnivores (%)	NC	100	NC	0	--	NC	1.26
Biomass of Pollution-Sensitive Taxa (%)	8.41	0	23.8	0	--	0.526	44.2
Biomass of Pollution-Indicative Taxa (%)	NC	0	NC	19.5	--	NC	14.1

Source: EA 2024a

Notes:

The calculations in this table exclude species not meeting B-IBI macrofaunal criteria.

Abundance = the total number of benthic organisms per square meter.

Total biomass = the total mass (weight) of benthic organisms in a square meter.

Shannon-Weiner diversity = a measurement of the proportional abundances of each species at a location to determine diversity of the community.

Pollution-sensitive taxa = organisms that are most likely to be impacted by a change in physical or chemical conditions of a water body.

Pollution-indicative taxa = organisms that are more likely to be tolerant of polluted conditions in a water body.

Carnivores and omnivores = percent abundance contribution of taxa currently classified as carnivores or omnivores to the total number of organisms.

/ m^2 = number per square meter

g / m^2 = grams per square meter

LM = Low mesohaline

HMM = High mesohaline mud

-- = No species recovered

NC = Metric not calculated for habitat class

Blue Crabs

Crab pots were placed at each of the seven sampling locations to capture blue crabs in the summer and fall of 2023 (EA 2024a, 2024d) and in the spring of 2024 (EA 2024f). The crab pots used were square wire mesh pots containing two funnels that allowed crabs to enter but not escape the pots. Four pots were deployed approximately one meter apart at each location and retrieved after a maximum of 48 hours in the water. Although some blue crabs (24 individuals) were caught incidentally as part of the fish sampling, the community discussed here pertains to the individuals collected during sampling specifically for crabs. During the summer sampling, a combined total of 33 blue crabs were caught at six of the crab pot locations (22 males, nine females, and two immature crabs); no crabs were caught at SPCT23-02 within the Coal Pier Channel (Figure 29) (EA 2024a). The highest number of crabs were captured at SPCT23-04 and SPCT23-06, in the Sparrows Point Channel and south of Coke Point, respectively (8 individuals at each) (EA 2024a). During the fall sampling, a combined total of four individual blue crabs (all males) were caught at two of the sampling locations (SPCT23-01 in Coke Point Cove and SPCT23-02 in Coal Pier Channel); crabs were not captured at the other sampling locations during the fall survey (EA 2024d). During spring sampling, a combine total of 13 individual blue crabs (all males) were caught at five of the sampling locations; no crabs were caught at SPCT24-01 and SPCT24-07 (EA 2024f). The highest number of crabs were collected from location SPCT24-02 (5 individuals), which was relocated during the summer 2024 sampling effort from within the Coal Pier Channel to just outside the Coal Pier Channel due to high level of vessel activity resulting in the loss of three crab pots.

4.7.2 Environmental Consequences

4.7.2.1 No-action Alternative

Benthic fauna would continue to be subject to existing physical and chemical sediment quality and water quality conditions. Benthic fauna within the existing channel would be impacted by maintenance dredging with recovery of the community after dredging (impacts from dredging are discussed in detail in Section 4.7.2.2). In addition, the benthic communities in the lower Patapsco River and in the vicinity of the Coke Point peninsula would continue to be subject to episodic hypoxia in the summer months. Although Coke Point could be developed under the No-action Alternative, there would be no in-water construction activities outside of routine maintenance dredging, so no additional benthic impacts would occur. If the High Head Industrial Basin were to be filled, approximately 40 acres of aquatic habitat within the industrial basin would be permanently removed. High Head Industrial Basin is not managed to support aquatic habitat; however, any benthic-dwelling organisms present in the basin would be lost if the basin were filled and the area repurposed.

4.7.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Dredging the Sparrows Point Channel would remove or entrain benthic organisms and would potentially create temporary water column turbidity that could affect filter-feeding species. Turbidity refers to the clarity of water and is measured by the amount of light that is scattered and absorbed by materials (such as suspended sediment or phytoplankton) within the water column (Johnson 2018). BMPs would be implemented to reduce the impacts from resuspension of sediment during wharf construction and dredging activities (see Section 3.2).

Construction of the wharf would require the excavation of the existing shoreline to provide the angle required for the preferred wharf alignment, this excavation would create 6.3 acres of new open water habitat. The newly constructed wharf would block sunlight to both existing open water (3.3 acres) and a portion of the newly created open water (5.6 acres) below the structure, resulting in a permanent shading of 8.9 acres of water. Shading of this area reduces primary production in the water column and the waters beneath the wharf may be less capable of supporting a diverse benthic community or usage by fish and other aquatic organisms. Construction of the wharf and installation of mooring dolphins would result in permanent structures (pilings and dolphins) in the river bottom. Placement of these structures would result in mortality of any benthic organisms present in that footprint and would also cause a loss of approximately 0.2 acre of available bottom habitat.

Removal of the river bottom sediments would cause mortality for any non-mobile organisms living on or within the sediments; however, studies have shown that the benthic community typically recolonizes quickly following dredging activities (Brooks et al. 2006). Recolonization in dredging areas typically follows successive and progressive steps similar to those in disturbed terrestrial systems. Opportunistic organisms with high reproductive rates typically characterize the initial communities, followed by slower-growing specialists. Eventually, the community would succeed toward pre-disturbed levels of diversity following cessation of dredging activity and disturbance. The existing channel is periodically disturbed by maintenance dredging, and the community has been previously disturbed during these events. The deep channel areas are also subject to seasonal hypoxic conditions, which limits the ability of benthic organisms to colonize these areas. When benthic organisms are disturbed (through anthropogenic or natural events), communities in mud and silt substrates generally recover / recolonize slower than communities in clean sand areas (Dernie et al. 2003), and recovery can typically take between 1 and 5 years across all substrate types (Blake et al. 1996). Recent studies conducted following dredging of the New York and New Jersey Harbor show that in an estuarine (mud and silt substrate) environment, the post-dredging benthic community metrics (measured by abundance, richness, diversity, etc.) generally recovered to pre-dredging conditions within 1.5 years (Corps 2017a).

Deepening of the channel would create deepwater habitat. Benthic communities in deeper waters are subject to different physical and geochemical conditions, which can impact the community condition and structure as a whole. The deepened channel would be more subject to low dissolved oxygen conditions during the summer, as the sediment surface is further removed from atmospheric exchange and sunlight and stratification of the water column occurs with higher salinity (salt content) and lower dissolved oxygen in bottom water, and lower salinity and higher dissolved oxygen in surface water. No benthic organisms were found in deepwater channel habitat in the existing Sparrows Point Channel near the Brewerton Channel during sampling conducted in the summer of 2023; therefore, it is likely that benthic communities would not recolonize in the deepened and widened channel created by dredging. This would result in a loss of the benthic habitat in the channel footprint.

4.7.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Placement of dredged material in the High Head Industrial Basin DMCF would convert the basin to upland habitat. Any benthic organisms present in the High Head Industrial Basin would be permanently lost to burial.

Coal Pier Channel DMCF at Sparrows Point

Construction of and placement of dredged material in the Coal Pier Channel DMCF would result in burial of the existing benthic communities in the DMCF footprint (approximately 19.6 acres). The Coal Pier Channel is degraded from historical uses and has been dredged, only one benthic taxon was found during sampling in the Coal Pier Channel. The existing sediment is anticipated to consist of a soft surface layer approximately 4 feet in thickness underlain by consolidated sand. Because this soft overburden material would be removed prior to the placement of sand for the dike alignment, displacement of these sediments and creation of a mud wave during dike construction was not expected. BMPs for in-water construction (such as those described in Section 3.2) would be used where practicable and necessary to minimize the resuspension of sediment and contaminants to the water column during in-water placement of dike construction material. Therefore, sediments resuspended during dike construction would be expected to be minimal, which would minimize the area outside of the dike footprint where benthic organisms could be buried.

Existing Nearshore MPA DMCFs

No new impacts on benthic organisms would occur because the MPA DMCFs are existing upland placement sites.

Existing Ocean Disposal Site

No new impacts on benthic organisms would occur because NODS is an existing USEPA-designated ocean placement site.

4.8 Fish

4.8.1 Affected Environment

Regional Fish Community Overview

The Chesapeake Bay supports 348 species of fish at some point in their life cycle (NMFS 2024b). The distribution of fish populations is dependent upon water quality factors (temperature, pH, salinity), larval recruitment, availability of prey species (fish and benthic organisms), and migration patterns (Lippson and Lippson 1994). The Bay supports both resident and migratory species. Migratory species either spawn in the ocean and reside for the rest of their life cycle in the Chesapeake Bay or spawn in the Chesapeake Bay and spend the remaining time in the open ocean (Corps 2009). The Chesapeake Bay has many fish species that are recreationally and commercially harvested. In Maryland, fisheries are managed by MDNR. Atlantic menhaden (*Brevoortia tyrannus*) has been the top fishery in the Chesapeake Bay for several decades with over 150,000 metric tons caught per year. The striped bass (*Morone saxatilis*) fishery stocks suffered a decline during the 1970s and 1980s due to overfishing and are in the recovery process. Although not currently overfished, stocks remain low, largely due to loss of spawning habitat and pollution in the Chesapeake Bay (Chesapeake Bay Program [CBP] 2020).

Important predator fish species (including those that are part of commercially significant fisheries) rely on smaller prey species, such as bay anchovy (*Anchoa mitchilli*), Atlantic menhaden, and American shad (*Alosa sapidissima*) (Zastrow and Houde 1991, CBP 2020). Smaller forage species provide a critical food source and may also break down plant detritus on the seafloor (CBP 2020). Most forage fish species in the Chesapeake Bay use a variety of habitats and rely on phytoplankton, zooplankton, and benthic invertebrate communities for food sources. Water quality and food availability largely determine fish abundance and distribution in the Bay, particularly during juvenile life stages (CBP 2015).

Fish Community

To understand the fish community both within and adjacent to the SPCT project area, fisheries surveys were conducted in summer (late August / early September) and fall (November) 2023 and early winter (February) and spring (late April / early May)2024 (EA 2024a, 2024d, 2024e, 2024f). Sampling locations and procedures were reviewed by USFWS, NMFS, and MDNR before the surveys were conducted. The study area for fish includes the in-water portion of the SPCT project area and surrounding areas, as depicted in Figure 30; the High Head Industrial Basin was also surveyed for fish. The surveys were performed using different types of fish collection equipment: beach seine, gillnet, and bottom trawl. Each gear type targeted collection of fish species within a specific area of the water column or bottom habitat. Use of the combination of sampling methods provides a comprehensive view of the fish assemblages in different habitat types (shallow nearshore, deeper water, middle of the water column, and near the bottom sediments) and captures fish at various life stages, as they use the portion of the Patapsco River in and around the SPCT project area. Each of the three collection methods were used during the spring, summer, and fall surveys; only gillnet and bottom trawl collections were performed during the winter survey. For the 2024 sampling events, one gillnet location and one trawl location had to be relocated (as noted on Figure 30) due to the collapse of the Key Bridge in March 2024. At each location, the captured fish were identified to species, counted, measured, and weighed. At each of the gillnet locations, plankton tows were also performed during the spring and summer 2024 surveys to characterize the zooplankton (tiny, often microscopic animals that drift with currents) and ichthyoplankton (eggs and larvae of fish) community in and around the project area. Additional data to understand water quality during sampling were collected during the surveys and included water temperature, dissolved oxygen, and salinity.

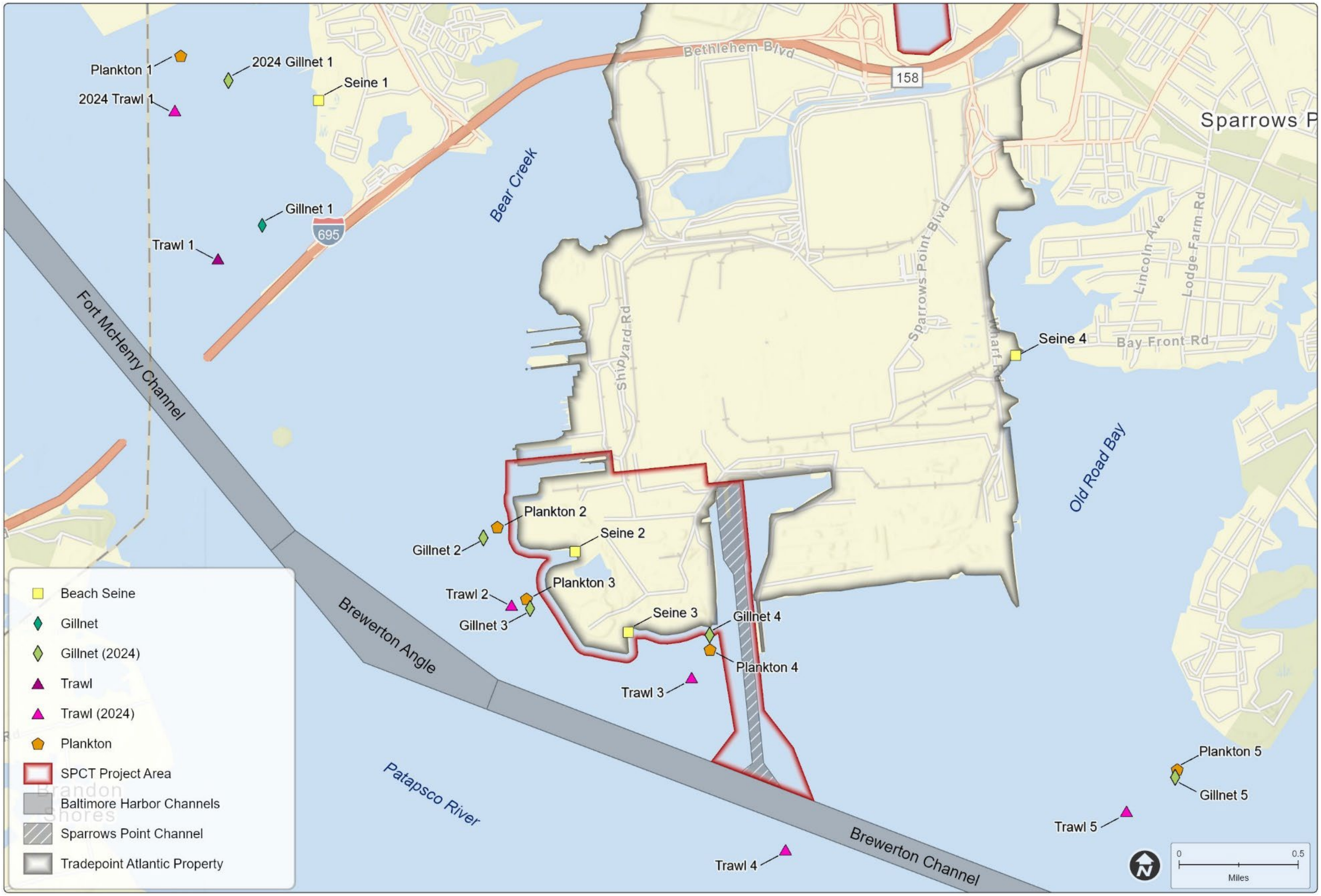
A summary of the fish collected by each method in each season is provided in the following sections, along with a description of the fish collected by each type of equipment. Sampling for each method was conducted at several locations directly within the SPCT project area (near or within the proposed offshore DMCF footprint and the proposed dredging footprint), as well as one location each upstream and downstream of the SPCT project area (Figure 30).

Nearshore Fish (Beach Seine Surveys)

A **beach seine** is a fishing net that is set from the shore and used to encircle fish. Beach seines are used to collect fish that live in shallow waters close to the shoreline.

Beach seines are deployed in an arc shape perpendicular to the shoreline and then towed by hand along a section of shoreline. The beach seine sampling locations within and around the SPCT project area were selected based on the presence of and accessibility to shallow water areas that were large enough to complete adequate tows of the seine. Seasonal fish collection data for beach seine surveys are summarized in Table 16. Four of the species caught — Atlantic silverside (*Menidia menidia*), inland silverside (*Menidia beryllina*), banded killifish (*Fundulus diaphanus*), and striped killifish (*Fundulus majalis*) — were only caught by the seine method.

Figure 30. Fish Survey Locations



In the summer, the nearshore fish community was largely comprised of Atlantic silverside (71% of all fish caught by seine) and Atlantic menhaden (18% of all fish caught by seine). Eleven unique fish species were collected from the combined sample locations. One location outside of the SPCT project area had the most diversity; 10 different species were collected at this location (Seine 4 in Figure 30). Overall, a total of 1,070 individual fish (all species combined) were collected from the seine locations during the summer season. The largest number of total fish collected at one sampling location was 591 individuals collected along the southern shoreline of Coke Point within the SPCT project area (Seine 3 in Figure 30).

During the fall season, Atlantic silverside was also the most abundant species (81% of all fish caught by seine) collected in the nearshore habitat. Six unique fish species were collected across all locations. Within the SPCT project area, a total of four unique fish species were present in nearshore sampling areas. A total of 660 individual fish were collected by beach seine in the fall sampling season with the most fish (273 individuals) collected along the southern shoreline of Coke Point (Seine 3 in Figure 30).

In spring 2024, herring (*Alosa* spp.) was the most abundant taxon collected in the nearshore habitat (83% of all fish caught by seine). Eight unique fish species were collected across all locations. Within the SPCT project area, a total of four unique fish species were present in nearshore sampling areas. A total of 5,629 individual fish were collected by beach seine in the spring sampling season, with the most fish (2,650 individuals) collected along the southern shoreline of Coke Point (Seine 3 in Figure 30).

Pelagic Fish (Gillnet Surveys)

A **gillnet** is a fishing net that hangs vertically in the water with floats on the top and weights on the bottom. Gillnets can be set at various depths and are used to catch fish in pelagic (water column) habitat within a water body.

Pelagic fish live in the open water column, spending little time close to the shore or near the seafloor. A single 150-foot-long gillnet with five, 30-foot panels made of varying-sized mesh (designed to capture fish of a range of sizes) was deployed at five sampling locations in the SPCT project area to capture pelagic species (Figure 30). Gillnets were deployed for one to two hours based on surface water temperatures (one hour when temperature was equal to or exceeded 68 °F, and two hours when temperatures were below 68°F). Gillnets were checked after the appropriate duration and were repeated if no fish were collected during the first soak. Seasonal fish collection data for gillnet surveys are summarized in Table 16.

During the summer surveys, the pelagic fish community was largely comprised of Atlantic menhaden (77% of all fish caught by gillnet) and striped bass (10% of all fish caught by gillnet). A combined total of seven unique fish species and 96 total individual fish were collected from the gillnet sample locations. One of the seven species (bluefish (*Pomatomus saltatrix*) was only caught during the summer gillnet surveys. The sampling location downstream of the SPCT project area (Gillnet 5 in Figure 30) had the most diversity with five unique species collected. A total of 56 individual fish (all species combined) were collected from the location along the southern shoreline of Coke Point (Gillnet 4 in Figure 30), which was the highest number of individual fish collected at any location.

In the fall gillnet survey, gizzard shad (*Dorosoma cepedianum*) was the most abundant fish species caught by gillnet (80% of all fish caught). Only one other species (pumpkinseed sunfish (*Lepomis gibbosus*)) was caught. No fish were caught at the sampling locations within the offshore DMCF footprint or along the southern shoreline of Coke Point (Gillnets 3 and 4 in Figure 30).

Table 16. Summary of Individual Fish Collected by Each Method per Season

Fish Species	Sampling Method and Season										
	Beach Seine			Gillnet				Bottom trawl			
	Summer	Fall	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring
Atlantic croaker (*Micropogonias undulatus*)	6	0	72	2	0	0	0	26	2	3	342
Atlantic menhaden (*Brevoortia tyrannus*)	195	0	0	74	0	0	9	4	0	1	0
Atlantic silverside (*Menidia menidia*)	755	539	263	0	0	0	0	0	0	0	0
Banded killifish (*Fundulus diaphanus*)	1	7	5	0	0	0	0	0	0	0	0
Bay anchovy (*Anchoa mitchilli*)	6	78	557	0	0	0	0	379	151	8	231
Bluefish (*Pomatomus saltatrix*)	0	0	0	3	0	0	0	0	0	0	0
Blueback herring (*Alosa aestivalis*)	0	3	0	0	0	0	1	0	0	0	2
Gizzard shad (*Dorosoma cepedianum*)	5	0	0	1	4	0	3	0	0	0	0
Herring (*Alosa* spp.)	0	0	4,662	0	0	0	0	0	0	0	0
Hogchoker (*Trinectes maculatus*)	0	0	0	0	0	0	0	1	0	0	1
Inland silverside (*Menidia beryllina*)	4	0	61	0	0	0	0	0	0	0	0
Northern pipefish (*Syngnathus fuscus*)	0	0	0	0	0	0	0	1	0	0	0
Pipefish species	1	0	0	0	0	0	0	0	0	0	0
Pumpkinseed sunfish (*Lepomis gibbosus*)	22	0	0	0	1	0	0	0	0	0	0
Spot (*Leiostomus xanthurus*)	0	0	0	4	0	0	8	170	0	0	1
Striped bass (*Morone saxatilis*)	1	0	0	10	0	0	2	0	0	0	0
Striped killifish (*Fundulus majalis*)	0	33	8	0	0	0	0	0	0	0	0
Summer flounder (*Paralichthys dentatus*)	0	0	0	0	0	0	0	3	0	0	0
Weakfish (*Cynoscion regalis*)	0	0	0	2	0	0	0	3	0	0	0
White perch (*Morone americana*)	74	3	1	0	0	0	0	19	0	0	19
Total individuals	**1,070**	**660**	**5,629**	**96**	**5**	**0**	**23**	**606**	**153**	**12**	**596**

In the winter survey, no pelagic fish were caught by gillnet at any of the sampling locations, even with a second two-hour deployment of a net at each area (four hours total time in the water per location).

In the spring gillnet survey, Atlantic menhaden was the most abundant fish species caught by gillnet (58% of all fish caught). No fish were caught at the sampling location along the southern shoreline of Coke Point (Gillnet 3 in Figure 30). Twenty-three individual fish were caught across all sample locations.

Deepwater and Demersal Fish (Bottom Trawl Surveys)

A **bottom trawl** is a fishing net that is towed by boat along the sea floor. This type of net targets collection of both fish that use the deepest part of the water column and bottom-dwelling species that spend most of their life on the seafloor.

Seasonal fish collection data for the bottom trawl surveys is summarized in Table 16. During the summer surveys, the deepwater and demersal (bottom-dwelling) fish community was largely comprised of bay anchovy (*Anchoa mitchilli*) (63% of all fish caught by trawl) and spot (*Leiostomus xanthurus*) (28% of all fish caught by trawl). Nine unique fish species and 606 total individuals (all species combined) were collected across the trawl sample locations. The southern shoreline of Coke Point (Trawl 3 in Figure 30) had the highest number of unique fish species with eight different species collected. The highest number of fish (all species combined) collected at a single location was 167 fish at the sampling location downstream from the SPCT project area (Trawl 5 in Figure 30). Overall, more individual fish were collected at the upstream and downstream locations than within the SPCT project area.

In the fall, two fish species were collected in the trawl surveys. Bay anchovy was the most abundant fish species caught by trawl (99% of all fish caught), although individuals caught in the fall were smaller in length and weight than those caught in the summer. Atlantic croaker (*Micropogonias undulatus*) was also caught by trawl during the fall survey. A total of 153 individual fish were collected during fall trawl surveys. Almost half (68 individuals) of the total collected fish were caught at the sampling location upstream from the SPCT project area (Trawl 1 in Figure 30).

The winter bottom fish community was comprised of Atlantic menhaden, Atlantic croaker, and bay anchovy. Only 12 total individuals (all species combined) were collected in the winter trawl survey with the most (eight individuals) collected offshore near the entrance to the Sparrows Point Channel (Trawl 4 in Figure 30). No fish were collected by trawl off the western shoreline of Coke Point (Trawl 2 in Figure 30) or at the downstream sampling location (Trawl 5 in Figure 30).

The spring bottom fish community was comprised of six unique taxa. A total of 596 individuals were collected, with the most individuals (171) collected at the sampling location along the southern shoreline of Coke Point (Trawl 3 in Figure 30). Atlantic croaker had the highest abundance (57%) across all sampling locations with juveniles measuring less than 4 inches comprising most of the individuals captured. Bay anchovy had the next highest abundance (38%), and white perch, blueback herring, spot, and hogchoker (*Trinectes maculatus*) comprised 3.9% abundance.

Plankton Community

Zooplankton are small, water-column organisms and include crustaceans, copepods, and insect larvae. They are important in the aquatic food chain as a food source for invertebrate and fish predators and can function as indicators of nutrient water quality due to their sensitivity to nutrient pollution (USEPA 2024b). Ichthyoplankton are the eggs and larvae of fish that are generally found in near-surface waters.

These early stages in the fish life cycle are brief but form the basis of the estuarine fish community and stock (Zhang et al. 2022). Distribution of zooplankton in the Chesapeake Bay is largely driven by salinity, temperature, and food availability (CBP 2024a).

Plankton surveys (tows) were conducted at the locations shown in Figure 30. These are generally co-located with the gillnet locations, although due to the Key Bridge collapse in March 2024, the upstream plankton tow location was moved to avoid a restricted zone around the former bridge. Plankton sampling consisted of a near-surface and near-bottom tow (using a fine-mesh size net) traveling against and in parallel to the prevailing flood tide (EA 2024a, 2024h).

A total of 3,150 individual zooplankton were collected during the spring surveys. Plankton 1 (upstream of the SPCT project area, see Figure 30) had the highest number of individuals (3,014) and density (the number of organisms within a unit volume of water). Copepods and mollusks (including *Acartia tonsa*) were the dominant zooplankton taxa collected across all sample locations. The next highest number of zooplankton (119 individual mollusks) was found at Plankton 2 off the western shoreline of Coke Point. In the summer, 15,943 individual zooplankton were collected. The highest number of individuals (7,383) were collected at Plankton 2 off the western shoreline of Coke Point near the Coal Pier Channel. Zooplankton collected at this location consisted largely of crab, copepod, and shrimp larvae (Table 17). The next highest number of zooplankton was found at Plankton 3 also along the western shoreline of Coke Point, south of Plankton 2. The community captured here also consisted of crab, copepod, and shrimp larvae.

Ichthyoplankton were collected at each location in spring 2024 except for Plankton 3 on the western shoreline of Coke Point. No ichthyoplankton were collected in bottom waters at Plankton 1 or 4, and Plankton 5 had no ichthyoplankton collected in the surface tows. In all samples, the only ichthyoplankton collected were yolk sac larvae of inland silverside fish. Only 28 larvae were collected during the spring survey across the combined five plankton sampling locations. In the summer survey, ichthyoplankton were more diverse across the sampling locations. Ichthyoplankton of six fish tax (Table 18) were collected with the majority being yolk-sac larvae and post yolk-sac larvae of bay anchovy. The highest number of individual ichthyoplankton was collected at Plankton 5 downstream of the project area (98 total individuals).

Table 17. Zooplankton Communities in Spring and Summer 2024

Group / Common Name	Spring (number of individuals)	Summer (number of individuals)
Water flea	3,010	18
Copepod	18	458
Mollusk	120	0
Barnacle	2	0
Crab	0	15,045
Shrimp	0	405
Jellyfish	0	10
Mysid	0	6

Table 18. Ichthyoplankton Communities in Spring and Summer 2024

Group / Common Name	Spring (number of individuals)	Summer (number of individuals)
Inland Silverside	28	16
Bay Anchovy	0	143
Northern Pipefish	0	2
Naked Goby	0	119
Herring	0	27
Feather Blenny	0	1
Unidentified	0	3

Electrofishing at High Head Industrial Basin

An electrofishing survey was completed at High Head Industrial Basin in June 2024. Two species of fish were identified during this survey, pumpkinseed sunfish and mummichog (*Fundulus heteroclitus*). A total of 340 individuals (216 pumpkinseed sunfish and 124 mummichog) were collected during sampling of both the perimeter of the basin and transects across the basin. Pumpkinseed sunfish was the most abundant species with the majority of individuals captured along the perimeter habitat of the basin.

> **Electrofishing** is a survey method used in freshwater environments. This technique involves using low electric current to temporarily stun fish, making them easier to collect for identification, study, and monitoring.

Summary and Influence of Water Quality Factors on the Fish Community

The highest number of unique species was observed in the summer with 17 unique species (1,772 individual fish) collected in the waters in and around the SPCT project area. During the fall collections, the number of unique and total number of individual fish collected declined to nine unique species and 818 individual fish. In the winter, even fewer unique species and individual fish were captured in the vicinity of the project area (three unique species and 12 individual fish for all locations combined). The following spring (2024), 5,629 total fish were captured with most of the individuals collected along the southern shoreline of Coke Point and downstream of the project area. While some hypoxic conditions were present in the bottom and pelagic waters during the summer months, there were still significantly more fish present across all habitat types than in the fall or winter season. Table 19 presents the water quality data collected during the seasonal fisheries surveys in 2023 and 2024.

Based on the seasonal survey data, fish assemblages and abundance in habitats in and around the SPCT project appear to be highly driven by seasonal water temperature and salinity. In the spring, hypoxia was only present at sampling location 5 (downstream of the SPCT project area), which had the lowest bottom dissolved oxygen concentration and bottom temperature. Low dissolved oxygen during the summer months in the deeper water areas may also affect fish distribution, as pelagic species are mobile and will avoid areas area with low dissolved oxygen. Fish moving upstream from the Chesapeake Bay can thrive in the higher summer salinities and move downstream away from the project area as the salinity and water temperature decrease throughout the water column in the late fall and winter months. Among the individual sampling stations, the number of unique species found in the fish communities outside of the direct SPCT project area (the upstream and downstream locations) and within the SPCT project area were largely consistent with only one or two additional unique species found at the downstream location in the summer. The overall number of nearshore fish collected was higher at locations within the SPCT project area than the locations outside the SPCT project area in the summer and fall, while the upstream and downstream locations had a larger bottom-dwelling fish community. In the spring, total numbers of nearshore fish were highest at the downstream location and within shallow water areas on the south side of Coke Point.

Table 19. Water Quality Parameters Collected during Fisheries Surveys

The water quality measurements reported here present the range (lowest and highest values) recorded during each survey across the sampling locations. Measurements provided represent the conditions at near-bottom at the time of the trawl surveys.

Water Quality Parameter	Summer Survey (late August / early September)		Fall Survey (November)		Winter Survey (February)		Spring Survey (late April / early May)	
	Low	High	Low	High	Low	High	Low	High
Dissolved oxygen (mg / L)	0.5	5.7	6.2	9.9	7.2	13.4	2.7	13.4
Salinity (ppt)	9.7	15.7	13.1	17.8	3.8	16.2	1.7	11.7
Water temperatures (°F)	79.2	80.2	58.5	59.9	41.2	42.1	60.4	67.1

Notes:

mg / L = milligrams per liter; ppt = parts per thousand; °F = degrees Fahrenheit

4.8.2 Environmental Consequences

A variety of important predator fish species (including those that are part of commercially significant fisheries), as well as smaller prey species (e.g., bay anchovy, Atlantic menhaden, blueback herring) use the SPCT project area, as described in Section 4.8.1. Although commercial species occur in the project area, no commercial operations are active in the Baltimore Harbor at this time. This impact analysis includes consideration of construction activities and dredging and material placement effects on all fish species, as well as their potential invertebrate prey sources.

4.8.2.1 No-action Alternative

Fish species would be subject to existing conditions in and around the SPCT project area. There would be no change in the aquatic habitat potentially used by fish. Fish using habitat within the existing channel and immediately adjacent to the existing channel would be temporarily disrupted by periodic maintenance dredging activities (see Section 4.8.2.2 for a full discussion on dredging impacts on fish. Similarly, invertebrate prey species would be adversely affected by periodic maintenance dredging, as discussed in Section 4.7.2.1. Implementation of the No-action Alternative would not involve in-water construction and therefore would have no additional impacts on fish. If the High Head Industrial Basin were to be filled in and the area repurposed, approximately 40 acres of aquatic habitat would be lost; however, the industrial basin is not managed to support aquatic habitat. While only two species of fish were found during sampling at High Head Industrial Basin, these individuals would be lost if the basin were filled.

4.8.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Impingement is the process when aquatic organisms, such as fish or other large marine life, are trapped against water intake screens or barriers. This occurs when these organisms are unable to avoid being drawn into the intake flow, leading to injury or death.

Entrainment occurs when smaller aquatic organisms, such as fish eggs, larvae, and plankton, are drawn into and carried through a water intake system These organisms are usually small enough to pass through intake screens, often resulting in their death due to mechanical or thermal stress. Small fish can also be incidentally captured or entrained by dredging equipment.

Impingement / Entrainment of Fish and Plankton from Dredging Operations

Fish species could potentially be caught by the equipment used to mechanically dredge the SPCT channel and to hydraulically offload the material to a placement area. Fish can potentially become captured in the clamshell dredge bucket (entrained) (depending upon size and life stage). Most fish, however, would avoid the area of the dredging operations. Capture by clamshell dredge bucket is uncommon and would only impact demersal fish that are unable to move away from the operation. When water is pumped to slurry dredged material for hydraulic offloading, fish may become caught on the pipe screen (impinged), depending upon the size of the fish and the size of the openings of any fish screen that may be used on the pipe, or be pulled into the pipe (entrained) past the screen. Eggs and larvae would be the life stages most susceptible to entrainment in the hydraulic pipe, as mobile life stages would be more likely to move away from the area of the operation. The hydraulic pumping operation for offloading of dredged material would comply with any requirements from MDNR to reduce impingement / entrainment impacts, which may include using an intake screen with a specific size mesh openings and limiting intake velocities.

Underwater Noise from Pile Driving

Noise impacts from anthropogenic sources (e.g., in-water construction activities) have the potential to impact fish, sea turtles, and other marine species that rely on hearing underwater to forage, communicate, detect predators, and navigate (NMFS 2022a). Receptor response to noise varies by the types and characteristics of the noise source, distance from the source, water depth, receptor sensitivity, and temporal scale. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by either mobile or stationary sources.

Noise Impact Types and Scenario Overview

Construction activities that could generate noise with the potential to impact fish are associated with construction of the SPCT terminal. These activities include:

1. Installation of steel pilings during construction of the marginal wharf with piling diameters of 24, 30, and 36 inches
2. Installation of steel pilings during construction of mooring dolphins with piling diameters of 24 inches
3. Water-based near-shore demolition activities before construction of the terminal
4. Potential concurrent construction of the marginal wharf and mooring dolphins

Noise that would rise to the level of affecting fish could also be associated with vessel traffic during construction, operation, and dredging activities. During construction, the noise generated by pile driving would far outweigh that of vessel traffic. These activities are the scenarios that were modeled to assess underwater noise impacts on fish.

The details on the pile driving activities for each construction scenario are summarized in Table 20. During the terminal design process, measures to reduce the overall number of piles necessary for the terminal wharf structure were used to the extent practicable.

Table 20. In-water Pile Driving Activities

Activity	Approximate Activity Duration (days)	Average Number of Piles Installed per Day	Number and Diameter of Steel Piles	Method of Pile Driving
Wharf piling installation	243	6	150 24-inch piles 600 30-inch piles 600 36-inch piles	Impact and vibratory
Mooring dolphin piling installation	20	3	60 24-inch piles	Impact and vibratory
Concurrent wharf piling and mooring dolphin piling installation	20	9	120 36-inch piles (maximum expected for wharf piling) 60 24-inch piles	Impact and vibratory
Water-based demolition	20	NA	Varied	Vibratory

Notes:
NA = not applicable

Both vibratory and impact hammers are proposed to be used to install piles for the terminal construction. This Draft EIS presents an overview of the noise modeling inputs and methods and the model results for the scenarios that have the potential to produce the largest noise impact on fish. Detailed discussion of the model inputs and results is included in Appendix D.

Fish Physiology and Morphology

Though the injury criteria distinguish between fish of different sizes (fish weighing less than 2 grams and those weighing 2 grams or more), the criteria do not distinguish between fish of different hearing sensitivity. However, criteria are expected to be conservative and protective of pelagic and demersal fish potentially present within the project area. It is worth noting that the hearing sensitivity of fish varies by species and has been linked to morphology, specifically the presence of a swim bladder, the proximity of the swim bladder to the ear, and the presence of adaptations that link the swim bladder to the ear. Fish with swim bladders closest to the ear and those with specialized adaptations are most sensitive to sound since they are stimulated by sound pressure via the gas within the swim bladder as well as by particle motion, whereas fish without swim bladders and fish without swim bladders near the ear are only stimulated by particle motion (Popper and Hawkins 2019).

Within the different morphological groups, hearing sensitivity also varies by species; for example, Black Sea Bass, an EFH species potentially present in the project area, is fairly sensitive to sound compared to related species (Stanley et al. 2020). Several species of clupeid fishes are able to detect and respond to ultrasonic sounds, likely due to an ear specialization unique to clupeids (Popper et al. 2004). Clupeid fishes are of particular concern given proximity of the site to migratory corridors for anadromous herrings. Blueback herring (*Alosa aestivalis*), unidentified herring species, Atlantic menhaden, and gizzard shad, all clupeid fishes, were found during surveys, indicating that fish with high hearing sensitivity may be in the project area during pile driving. Though given the sensitivity to underwater sound, it is still anticipated that these fish would be protected using the Fisheries Hydroacoustic Working Group (FHWG) criteria.

Acoustic Thresholds

Acoustic thresholds for the onset of underwater acoustic impacts from pile driving activities were calculated for fish in the project area using the Optional Multi-Species Pile Driving Calculator Tool, VERSION 1.2-Multi-Species: 2022 (Multi-Species Tool), provided on the NMFS website (NMFS 2022b). The calculations were used to create a multi-ring buffer of isopleths (i.e., sound contours) diminishing in 1 decibel (dB) increments from the sound source. These thresholds are the lowest level where injury could occur (FHWG 2008) and are used to indicate the distance from the noise source where fishes are anticipated to potentially be exposed to injury or disturbance.

Different types of sound pressure effects can cause different reasonable noise source levels that may result from pile driving. The peak pressure effect occurs from impact driving, as opposed to vibratory driving, which creates a more constant sound pressure with no peak decibel level. The modeled fish thresholds for physical injury and behavioral disturbance were used to determine the distances to onset of physical injury and behavioral disturbances (Table 21). Physical injuries to fish from noise sources can include inner ear tissue damage and hearing loss (Casper et al. 2013) and rupture or damage to the swim bladder (California Department of Transportation [Caltrans] 2020). Behavioral disturbances include showing a brief awareness of the sound, small movements, or escape responses to move away from the noise source entirely (University of Rhode Island [URI] 2017). Thresholds for these effects are measured by evaluating the cumulative sound exposure level over the duration of a noise event (SEL_{cum}), the maximum instantaneous sound pressure over the duration of a noise event (SPL_{peak}), and the average intensity of the sound signal over time (RMS).

> **Root mean square (RMS)** pressure calculation provides a consistent measure of sound exposure, even in environments with fluctuating noise levels.
>
> **Peak sound pressure level (SPL_{peak})** is the measure of the highest-pressure variation in a sound signal, providing an indication of the loudest moment within the underwater sound wave.
>
> **Cumulative sound exposure level (SEL_{cum})** is used to quantify the total sound energy exposure over an extended period, aggregating multiple noise events into a single metric that reflects the overall noise exposure during that period.

Table 21. Fish Impact Pile Driving Injury Guidance

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing less than 2 grams	183 dB	206 dB	150 dB

Notes:

RMS = root mean square; SEL^{cum} = cumulative sound exposure level over the duration of a noise event; SPL^{peak} = maximum instantaneous sound pressure over the duration of a noise event; dB = decibel

Sound Attenuation

A sound reduction measure was included in the modeling for noise impacts from SPCT construction. The NMFS Multi-Species Tool used for noise modeling does not include a sound reduction for use of a cushion block but does include a 5 dB reduction for use of a bubble curtain surrounding the work area. A cushion block is frequently used during pile driving to reduce sound propagation. TPA evaluated recent studies and reports along with recently accepted sound reductions for modeling fish impacts for wharf construction projects in the Philadelphia area.

Washington State Department of Transportation (WSDOT) (2006a) conducted a study to evaluate the effectiveness of wood, micarta, and nylon cushion blocks in reducing underwater sound during the driving of 12-inch diameter steel pipe piles generation (Molnar et al. 2020). A range of decibel reduction for wood cushion blocks was reported to be between 11 and 26 dB (WSDOT 2006b as cited in Caltrans 2009). The range of 11 to 26 dB reduction for wood cushion blocks originated from a technical report that measured sound levels during pile driving using different cap materials (Laughlin 2006). The study is limited and included use of a wood cushion block while pile driving one 12-inch-diameter standard steel pile and one 12-inch pile with 1.5-foot-wide interlocking steel ‘wings’ at two different water depths at the Cape Disappointment boat launch facility near Ilwaco, Washington (Laughlin 2006). The piles used in these studies are different than the ones proposed for use at SPCT; therefore, only the lowest recommended decibel reduction from these studies (11dB) is considered for use in noise modeling as a conservative approach. Additionally, at least two recent Endangered Species Act Biological Opinions from NMFS Greater Atlantic Regional Fisheries Office (NMFS 2022c, 2022d) contained noise modeling for impacts from wharf construction projects in the Philadelphia area, which used impact driving of larger 20 and 30-inch steel piles. For these biological opinions, the parameters used in the acoustic calculator tool included proxy sound levels with an 11 dB attenuation to account for a cushion block, the most conservative reduction in the range presented in Caltrans 2009.

> **Cushion blocks** are used in reducing the impacts of impact pile driving to absorb and distribute the energy from the hammer blows, thus reducing the intensity of the underwater noise generated during impact pile driving. Cushion blocks can be made from wood, nylon, or other materials of varying thickness.

During impact pile driving at SPCT, a combination of a bubble curtain and wood cushion block may be used to reduce underwater sound. To be conservative, a reduction of 11 dB was applied for the modeling. The actual BMPs employed to attain a sufficient zone of passage during the spring anadromous fish migration period would be determined in consultation with NMFS (see Appendix D for detail). This decibel reduction applies only to the use of an impact hammer for driving piles, as cushion blocks are not used on vibratory hammers. Therefore, the results presented in this Draft EIS show the distances to onset of behavioral disturbance from a vibratory hammer (with no sound reduction measure) and physical injury and behavioral disturbance from an impact hammer (for the highest noise producing activity) with the use of a cushion block with an 11db sound attenuation. Noise modeling results are presented in Figure 31 through Figure 34 based on two in-water sound source locations for the SPCT pile driving activities — one location within the embayment on the east side of Coke Point and one location outside the embayment on the south tip of the Coke Point peninsula.

Noise Impacts

The full modeling results of each pile driving activity are included in Appendix D. The models indicate concurrent wharf and mooring dolphin piling installation has the largest potential noise impact area due to impact pile driving. Without noise mitigation, the concurrent wharf and mooring dolphin piling installation can potentially impact fish over 11 miles away due to behavioral disturbance and approximately 1 mile away due to physical injury without any mitigative measures.

Figure 31. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Northern Point with -11 dB Sound Attenuation

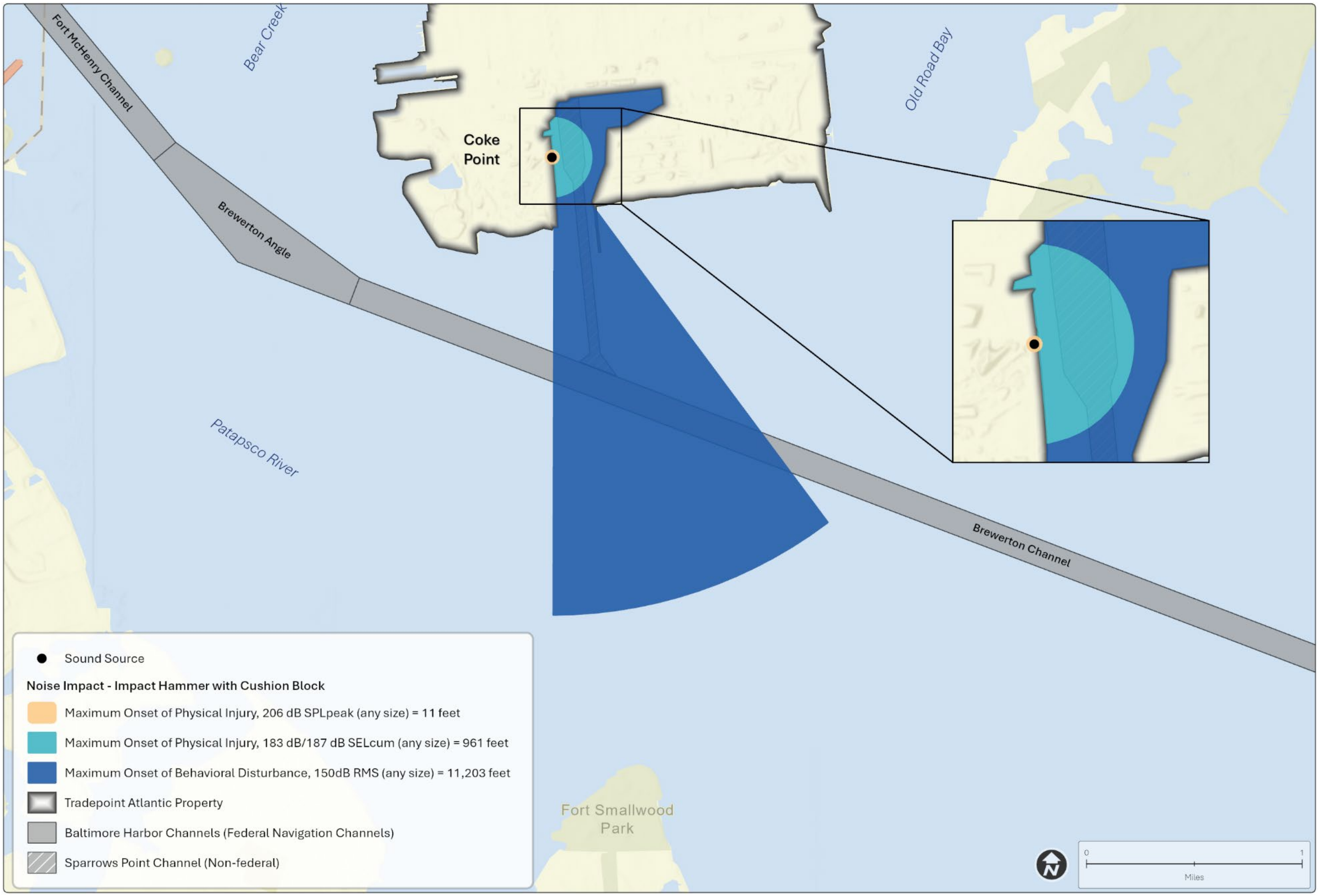


Figure 32. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point with -11 dB Sound Attenuation

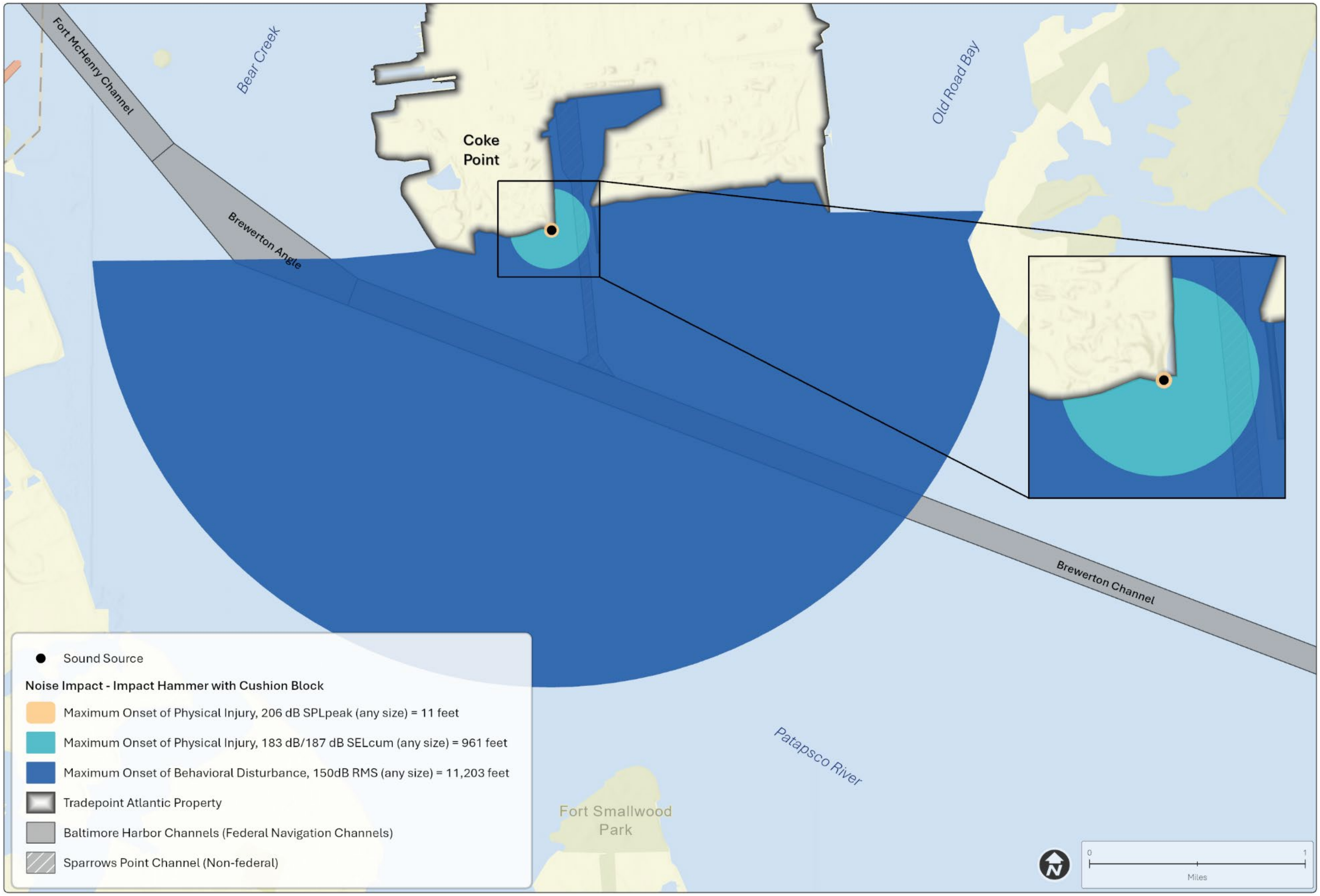


Figure 33. Maximum Distance to Noise Impacts from Vibratory Hammer – Wharf Construction at Northern Point

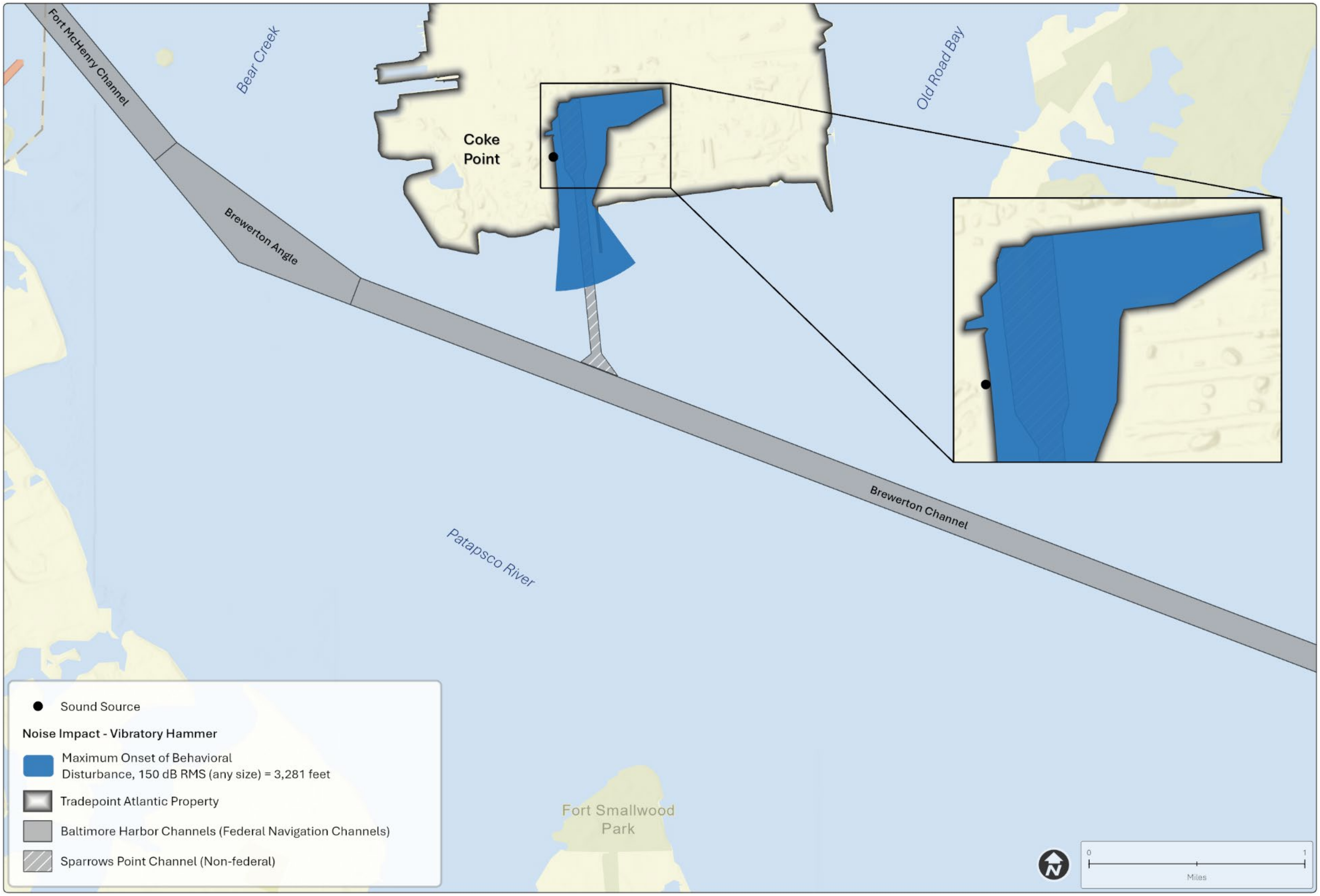
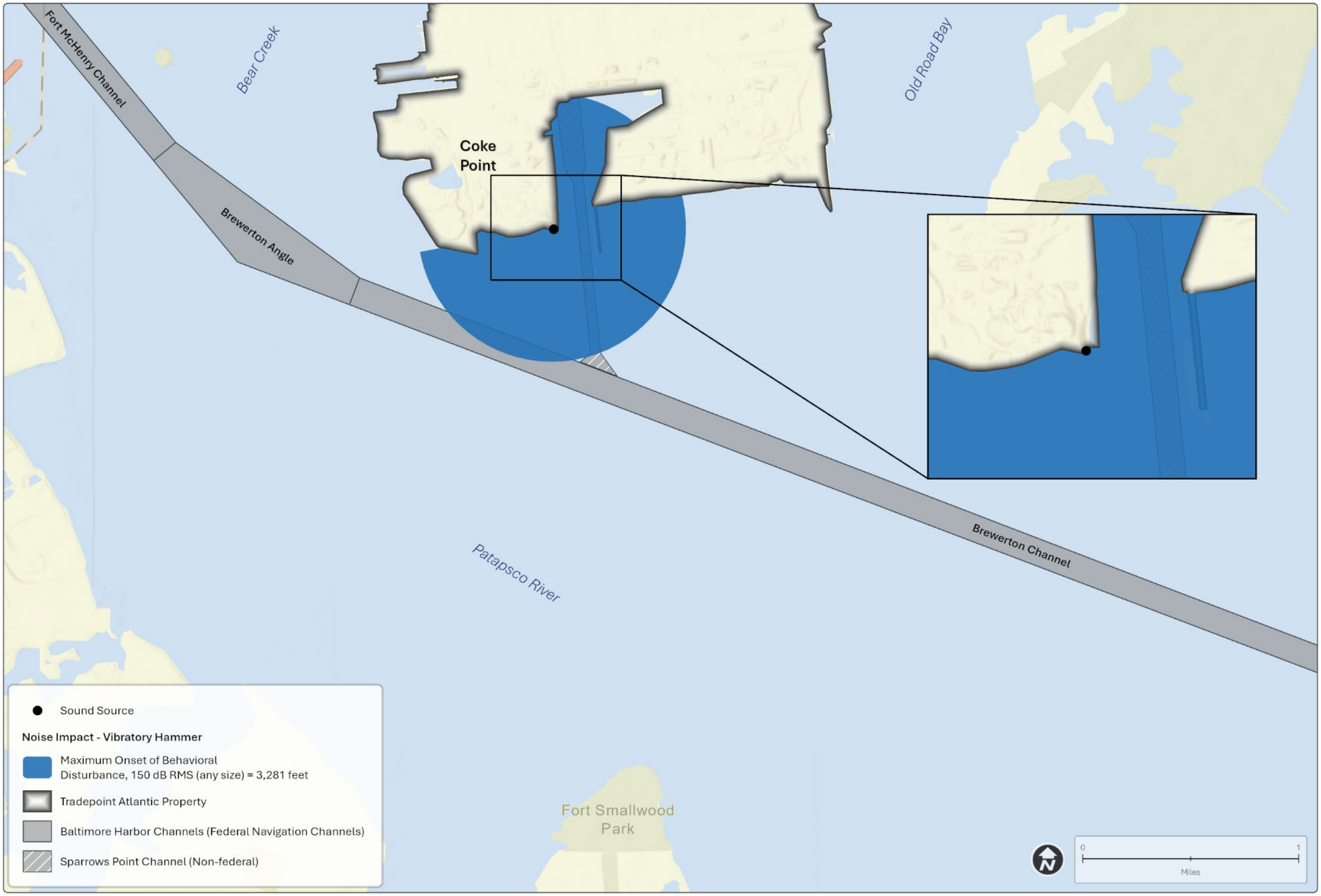


Figure 34. Maximum Distance to Noise Impacts from Vibratory Hammer – Wharf Construction at Southern Point



Due to the large areas of potential disturbance without noise mitigation, the concurrent wharf and mooring dolphin piling installation was also modelled with the use of a wood cushion block to reduce the impacts from operation of the impact hammers. The maximum distances the sound from impact pile driving could have the potential to affect fish with the cushion block are presented in Table 22. For the concurrent wharf and mooring dolphin piling installation with an impact hammer and a cushion block, the distance to the peak onset of physical injury for any size fishes is approximately 11 feet and the distance for physical injury is approximately 961 feet (Table 22). Behavioral disturbance onset from impact pile driving occurs within approximately 11,203 feet (or 2.1 miles) from either sound source location. For pile driving activities occurring inside the embayment, the noise impact distance would provide a zone of passage in the mainstem of the Patapsco River approximately 4,000 feet wide where fish could transit and avoid noise impact (Figure 31). A zone of passage approximately 2,000 feet wide would be present when pile driving activities occur closer to the mouth of the embayment (Figure 32). In addition to use of a cushion block, a soft start (gradual startup of impact pile driving) may be used to produce small sound waves that would encourage fish to move away from the project area before pile driving begins. Construction on the southern end of Coke Point may be phased to avoid impact driving of steel piles during the time-of-year restriction window for fish.

Concurrent wharf and mooring dolphin piling installation and water-based demolition activities were modeled for a vibratory hammer. For behavioral disturbance, the maximum distance to onset of impact is 3,281 feet from the sound source from water based demolition (Figure 33 and Figure 34); concurrent wharf and mooring dolphin piling installation would have a maximum distance of approximately 1,523 feet. For activities inside and near the mouth of the embayment, the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 12,000- and 10,700- feet wide where fish could transit and avoid noise impact, respectively. No sound mitigation was modeled for vibratory pile driving.

Turbidity and Habitat Alteration

Turbidity From Dredging, Wharf Construction

Dredging operations could affect egg, larval, juvenile, and adult life stages of fishes within the project area through direct removal or burial, turbidity / siltation effects, temporary shifts in dissolved oxygen during dredging operations, entrainment, visual and noise disturbances, and alteration of habitat. Turbidity is measured in the field in NTU. Water with higher turbidity will often have higher concentrations of TSS, which can be measured in samples sent to a laboratory. Although there are natural contributors to turbidity within a water body (e.g., storm events, plankton blooms), construction activities such as dredging can increase turbidity.

Table 22. Maximum Distances to Fish Sound Thresholds

The values presented in this table are the distances to fish sound thresholds from a vibratory hammer and impact hammer (showing both behavioral disturbance and physical injury distances). The onset of behavioral disturbance from a vibratory hammer is without a cushion block or other sound mitigation. The impact distances shown are for use of impact hammer with a cushion block.

Activity	Pile Count and Size / Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)	
		150 dB RMS (any size fish)	**150 dB RMS (any size fish)**	**206 dB SPL_{peak} (any size fish)**	**183 dB / 187 dB SEL_{cum} (any size fish)**
Concurrent wharf piling and mooring dolphin piling installation (with cushion block for impact hammers)	120 36-inch steel pipe piles (maximum size for wharf piling) 60, 24-inch steel pipe piles	1,523	11,203	11	961
Water Based Demolition	Varied	3,281	NA	NA	NA

Notes:

RMS = root mean square; SEL^{cum} = cumulative sound exposure level over the duration of a noise event; SPL^{peak} = maximum instantaneous sound pressure over the duration of a noise event; dB = decibel

NA = not applicable

NMFS has estimated TSS concentrations associated with certain in-water activities, including mechanical dredging of fine-grained material, based on numerous studies in the greater Atlantic region. Based on these studies, elevated suspended sediment concentrations at several hundreds of mg / L above background may be present near the bucket but would settle rapidly within a 2,400-foot radius of the dredge location. The TSS levels expected for mechanical dredging (up to 445.0 mg / L) are below those shown to have adverse effects on fish (typically up to 1,000 mg / L; see summary of scientific literature in Burton 1993; Wilber and Clarke 2001). It can be noted, however, that studies have also shown effects at lower than 1,000 mg / L in certain species and life stages that are present in the project area. For striped bass and white perch, hatching can be delayed by TSS as low as 100 mg / L in one day exposure time. Larval stages of striped bass, American shad, yellow perch (*Perca flavescens*), and white perch showed higher mortality rates with TSS levels of 500 mg / L or lower for up to four days (Wilber and Clarke 2001). Feeding rates of several species that use the project area (Atlantic silverside and Atlantic croaker) are reduced in waters with higher turbidity (and therefore higher correlated TSS) conditions. Atlantic silverside and white perch are some of the most sensitive estuarine species when evaluating lethal responses to suspended sediment with up to 10% mortality at TSS concentrations below 1,000 mg / L. Turbid conditions during dredging can be controlled to minimize impacts on fish by using BMPs (Section 3.2) and completing activities during times of year when certain species are less active within the project area. Eggs, larvae, and species with limited swimming ability would be at the highest risk of impacts from dredging, as they cannot move to avoid the operations. The physical removal of bottom from the dredging area, as well as resuspended sediment, has the potential for direct loss or injury to eggs and larvae present within or adjacent to the dredging footprint. Time-of-year restrictions for dredging would reduce impacts on adult, juvenile, and larval fishes. Dredging BMPs, such as use of an environmental bucket, could also be implemented to minimize impacts related to resuspended sediment. During dredging, the impacts on adult and juvenile fish would be short-term and temporary. Based on sediment plume studies in similar environments (Burton 1993; Wilber and Clarke 2001), it is anticipated that the resuspended sediment from the dredging operations would only be expected to affect a small portion of the total width of the Patapsco River (2,400 feet [0.4 mile] or 17.1% of the total 14,000 feet [2.6 miles] of available river width). The expected distance of movement of resuspended sediment in the embayment area is less than half the distance to the end of the southern shore of the Sparrows Point peninsula in either direction; therefore, any resuspended sediment would be expected to remain within the embayment area.

For pile driving during wharf construction, NMFS has estimated TSS concentrations associated with the disruption of bottom sediments from this activity based on a study performed in the Hudson River. Elevated TSS concentrations of approximately 5.0 to 10.0 mg / L above background levels were produced within approximately 300 feet (91 meters) of the pile being driven (Federal Highway Administration [FHWA] 2012).

Resuspended sediment can affect all life stages of fish, though egg and larval stages can be particularly vulnerable (Auld and Schubel 1978; Nelson and Wheeler 1997; Burton 1993; Wenger et al. 2018). In addition, the extent of the resuspended sediment along with its character (i.e., suspended contaminants), timing, and duration should also be considered when analyzing effects on fish. Based on the nature and extent of the turbidity and the availability of unaffected areas, a seasonal restriction on dredging in certain parts of the dredging footprint may be necessary to limit the delivery of contaminants to the estuarine food web and / or protect anadromous fish migrations. Any time-of-year restrictions on dredging activities to reduce impacts on eggs, larvae, and less mobile species would be determined through consultation with NMFS and MDNR.

Habitat Alteration from Dredging and Wharf Construction

Removal of the river bottom sediments from dredging to deepen and widen the channel would create deeper water habitat within and adjacent to the existing Sparrows Point Channel. Wharf construction would also cause shading of some existing open water habitat. The river bottom in the action area is a soft-bottom environment, comprised mainly of silt and clay and deeper sand in the north portion of the channel; no SAV is present. The physical removal of sediments from the dredging area, as well as resuspended sediment, has the potential for direct loss or injury to eggs and larvae present within or adjacent to the dredging footprint. Dredging would also result in a loss of the benthic community currently within the area, reducing foraging opportunities for juvenile and adult fish species. With deepening of the channel, the potential for water column stratification would increase, resulting in lower dissolved oxygen concentrations in deep bottom water, particularly in the summer months. This could also affect fish usage of bottom waters, as they will avoid waters that do not contain enough oxygen. This would also reduce potential prey sources for fish that consume benthic organisms.

Dredging the channel to attain the preferred alignment for the wharf would include removal of existing shoreline, resulting in the creation of approximately 6.3 acres of new open water habitat. Construction of the wharf would result in shading approximately 8.9 acres of open water habitat — 3.3 acres of existing open water and 5.6 acres of new open water habitat. Shading of these areas would impact benthic and water column primary productivity. Installation of the mooring dolphins and wharf pilings would result in the permanent loss of 0.2 acres of bottom habitat. These habitat changes would cause localized impacts on benthic organisms and prey thus impacting fish in the area.

Water Quality Impacts

Planned paving and construction of buildings on Coke Point for the proposed terminal would result in approximately 95% of Coke Point being converted to impervious surface, thus increasing stormwater runoff. The terminal would be developed with a gentle grade to direct sheet flow to trench drain collectors, and stormwater would be routed by way of lateral drains to pipe culverts for discharge. This runoff could carry pollutants into the Patapsco River. In shallow water areas, where dilution and mixing are limited, these contaminants can accumulate, degrading water quality and impacting aquatic life. Increased runoff also increases turbidity, reduces light penetration, and can disrupt habitats critical for fish and other aquatic life. See Section 4.6 for additional information on impacts on surface water.

Vessel Traffic

Vessel traffic in the Patapsco River can impact fish populations by causing underwater noise and physical disturbances. Noise from engines and propellers can disrupt fish behaviors, such as feeding and spawning, and interfere with their communication, affecting reproduction and social interactions. Physical disturbances from propeller wash and vessel presence can include damage to habitats and fish injury.

The SPCT project area is located within the Port, which is in the top 20 ports in the United States by tonnage and number of vessels handled annually (US Department of Transportation [USDOT] 2024a), including a variety of ship types (e.g., bulk carriers, general cargo ships, tankers, container ships). More than 2,500 vessels called on the Port in 2021 (USDOT 2024b). During construction, there will be a small increase in construction-related vessel activity, likely not more than 10 vessels operating at any one time, which is not expected to alter vessel traffic in the area. Once constructed, operation of the SPCT would increase vessel traffic by approximately 500 vessels per year, averaging 3 vessels per week. While impacts on fish are possible if they need to move away from the traffic, no physical injury to fish is anticipated.

4.8.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

All fish present in the High Head Industrial Basin would be lost to burial by placement of SPCT dredged material. This area would be upland following completion of the DMCF.

Coal Pier Channel DMCF at Sparrows Point

Turbidity from Material Placement

Dredging of overburden material on the dike alignment and placement of material to build the sand dike for the Coal Pier Channel DMCF could cause temporary turbidity in surrounding waters. The alignment of the dike across the opening of the Coal Pier Channel is approximately 660 linear feet. Once the perimeter dike is completed (approximately 7 months), dredged material would be placed in the DMCF, filling 19.6 acres of open water. This habitat alteration impact is discussed below. Sand is a coarser-grained material that settles out of the water column faster than finer-grained material, resulting in suspended sediment remaining in the water column in a localized area for a short duration. BMPs would be used to limit the amount of suspended sediment escaping the immediate placement area. Eggs and larvae of fish species adjacent to the dike alignment (on either side) may be impacted by the suspended sediment resulting from sand placement. Eggs and larval stages would not be able to move away from the turbid conditions and mortality or physical impairment through either reduced feeding ability, reduced visibility, or clogged gills. Eggs existing adjacent to the dike alignment may be smothered when the sand settles out of the water column. Given that the dike alignment covers a limited distance of the river at the opening of the channel, it is unlikely that turbidity from the placement of sand would cause population level impacts on any fish species. Juvenile and adult individuals outside of the dike perimeter would relocate to similar nearby habitats following the start of material placement and would likely avoid suspended sediment; mobile fish individuals would experience adverse but temporary impacts from displacement. Turbidity can hinder vision and disrupt foraging behaviors of fish species, but juvenile and adult species would be more likely to avoid the area during construction.

Placement of the sand could also disturb existing sediments at the mouth of the Coal Pier Channel. The soft overburden material in the vicinity of the dike alignment will be dredged prior to the placement of sand. Therefore, the displacement or movement of the bottom sediments during placement of the sand would be expected to be minimal. Depending on site conditions, BMPs to reduce sediment resuspension (e.g., turbidity curtain) could be employed. Therefore, sediments resuspended during dike construction would be expected to be minimal. Given that the material to create the perimeter dike would be sand and the soft sediments underlying the Coal Pier Channel will be removed prior to sand placement, any impacts would be temporary and localized, having minimal impact on fish species. After the perimeter dike is completed (approximately 7-month construction duration), dredged material would be placed in the DMCF, filling 19.6 acres of open water. This habitat alteration impact is discussed below.

Habitat Alteration / Impacts on Prey Species

Construction and placement of material in the Coal Pier Channel DMCF would permanently remove the substrate condition and fish habitat type within the DMCF footprint. The Coal Pier Channel provides sheltered habitat and the DMCF in this location would result in a loss of fish habitat. The DMCF would also bury the benthic organisms within its footprint, removing the benthic communities as a possible food source for fish. It is important to note that only one benthic invertebrate species was collected in the Coal Pier Channel. Sediment sampling results along the western shoreline of Coke Point indicate that historical contamination is present in the sediment and the benthic community assessment indicates most of this area has a degraded benthic community (see Section 4.7.1); therefore, the area where the DMCF would be constructed does not represent high-quality habitat for benthic organisms or fish species. The areas immediately surrounding the DMCF and elsewhere within the vicinity of the Patapsco River and lower Bear Creek would provide suitable forage areas for fish, both during construction and after the project is complete.

Vessel Traffic

During construction of the perimeter dikes, barges would be transiting from a nearby location along the Patapsco River to the DMCF footprint to deliver sand for construction of the dike. This would temporarily increase vessel traffic in the area. Fish would have ample space within the surrounding river area to avoid vessels and use other adjacent habitats. A temporary increase in the number of vessels in the area would not increase the risk that any vessel in the area would strike an individual or would increase it to such a small extent that the effect of the action (i.e., any increase in risk of a strike caused by the project) cannot be meaningfully measured or detected. Therefore, the increase in vessel traffic would not have an adverse impact on the fish community.

Existing Nearshore MPA DMCFs

No new impacts on fish would occur because the MPA DMCFs are existing upland placement sites.

Existing Ocean Disposal Site

No new impacts on fish would occur because NODS is an existing USEPA-designated ocean placement site.

4.9 Essential Fish Habitat

4.9.1 Affected Environment

Regulatory Background

The Magnuson-Stevens Fisheries Conservation and Management Act of 1976 (MSA; Public Law 94-265) establishes guidelines to prevent overfishing, rebuild overfished stocks, increase long-term economic benefits, ensure a safe and sustainable supply of seafood, and protect habitat that fish need to spawn, breed, grow, and feed to reach maturity (NMFS 2024c). EFH is designated for certain species by NMFS, pursuant to the MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-27). The Sustainable Fisheries Act requires that EFH be identified for those species actively managed under federal fishery management plans. This includes species managed by the eight regional Fishery Management Councils (FMCs) established under the MSA, as well as those managed by the NMFS under fishery management plans developed by the Secretary of Commerce (NMFS 1996).

> **Essential fish habitat or EFH** typically encompasses a broad range of habitats used by managed species and is focused on the habitat needs of individual species.

As described by the MSA, one of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. The MSA promotes the conservation of EFH in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. The MSA requires federal agencies to consult with the Secretary of Commerce, through NMFS, concerning "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under this Act" (16 USC § 1855(b)(2)). As such, federal agencies must prepare an EFH assessment that describes the proposed project and the EFH present in the project area and fully evaluates the potential adverse effects on federally managed fish, their habitats, prey species, and other area resources (50 CFR 600.905). The MSA includes provisions for managing prey species, emphasizing the role they play in supporting sustainable fisheries and healthy marine ecosystems. Identifying, conserving, and managing EFH includes considering the habitat needs of prey species essential for the growth, survival, and reproduction of predator fish. An adverse effect to EFH is defined as, "any impact, which reduces quality and / or quantity of EFH…" and may include direct, indirect, site-specific, or habitat impacts, including individual, cumulative, or synergistic consequences of actions.

EFH in the SPCT Project Area

Under the MSA, EFH is specifically defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." To interpret the definition of EFH:

- "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate.
- "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.
- "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem.
- "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

An EFH assessment was prepared and submitted to NMFS as part of the NEPA and permitting processes. This section describes the designated EFH and species potentially present within the project area. The full EFH assessment is included in Appendix E.

The Mid-Atlantic FMC manages more than 65 species in federal coastal waters and in the exclusive economic zone (extending from 3 to 200 miles off the coast) of New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia (Mid-Atlantic FMC 2024). The Patapsco River at its confluence with the mainstem Chesapeake Bay is designated as EFH for a variety of federally managed fish species. The NMFS EFH mapper tool identified nine EFH species and one habitat area of particular concern (HAPC) as potentially present within the SPCT project area.

> **Habitat areas of particular concern or HAPCs** are a subset of areas within EFH that have extremely important ecological functions or are especially vulnerable to anthropogenic degradation and impact. An HAPC can be a specific location (e.g., spawning location on a nearshore shelf) or a specific type of habitat (e.g., SAV beds).

During public scoping in February 2024, NMFS recommended that the EFH assessment focus on six of the nine EFH species (Table 23; NMFS 2024d), as the EFH descriptions match the conditions observed in the project area. Based on this screening analysis, scup (*Stenotomus chrysops*), red hake (*Urophycis chuss*), and Atlantic herring (*Clupea harengus*) are not evaluated further as part of the

Draft EIS or the EFH assessment. Although the EFH mapper identified the summer flounder (*Paralichthys dentatus*) SAV HAPC as potentially occurring in the project area, the NMFS scoping letter did not identify the SAV beds that comprise this HAPC as being present within the project area. Further site-specific surveys have confirmed the absence of SAV within the direct project area (EA 2024i), although some SAV has been documented in the lower portion of Bear Creek and Jones Creek, north of Old Road Bay (Virginia Institute of Marine Science [VIMS] 2024). However, three individual summer flounder were captured in the summer 2023 fish surveys, indicating some usage of the project area by this EFH species. As such, summer flounder HAPC is included in the analysis. Summer flounder HAPC is defined as “all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH” (Packer et al. 1999).

Coordination with NMFS also indicated that several prey species, such as bay anchovy, spot, and white perch use the waters in the navigation channel as feeding, resting, and winter refugia habitat. The benthic habitats in the project area support a variety of invertebrate prey species, including polychaete worms, bivalves, and crustaceans (see Section 4.7). During the SPCT fish surveys, these prey species were documented in the project area (EA 2024a, 2024d, 2024e, 2024f).

Following internal agency review of the Draft EIS with the project team, several conference calls were held in October and November 2024 with NMFS to discuss impacts of the action on EFH species. A Draft Essential Fish Habitat Assessment was prepared and submitted to NMFS in December 2024 and is included in Appendix F. Consultation on project impacts and potential mitigation is ongoing with NMFS.

Table 23 describes the species for which EFH has been designated in the project area, identified by early coordination with NMFS. As part of the seasonal aquatic surveys conducted to collect baseline ecological information within the SPCT project area, fish sampling was conducted using a variety of methods, as described above in Section 4.8.1. Summer flounder and bluefish were captured in the project area during the summer fish surveys (three individuals of each species) and prey species including bay anchovy, white perch, and spot were also captured (EA 2024a).

Table 23. EFH Species Potentially Present in the SPCT Project Area

EFH Species	Life Stage				EFH Characteristics for Life Stages Potentially Present in the Project Area
	Eggs	Larvae	Juvenile	Adults	
Windowpane flounder *Scophthalamus aquosus*			✓	✓	Juveniles – Sandy and muddy bottoms of bays and estuaries from the shoreline up to 197 feet of water depth Adults – intertidal and subtidal benthic habitats, particularly mud and sand substrates of the intertidal zone up to 230 feet
Summer flounder *Paralichthys dentatus*		✓	✓	✓	Larvae – Nearshore waters at water depths greater than 30 feet Juveniles – Estuarine and open bay areas, as well as marshy creek areas with water temperatures greater than 37°F and salinities from 10 to 30 ppt Adults – Sandy seafloor areas of shallow coastal waters and estuaries in the late spring and early summer.

EFH Species	Life Stage				EFH Characteristics for Life Stages Potentially Present in the Project Area
	Eggs	Larvae	Juvenile	Adults	
Bluefish *Pomatomus saltarix*			✓	✓	Juveniles – Chesapeake Bay estuary, May to October in zones of mixed salinity Adults – Chesapeake Bay estuary, April to October with distribution varying by the size of the individuals within the schools
Atlantic butterfish *Peprilus triacanthus*	✓	✓	✓	✓	Eggs – Inshore estuaries and bays (in the upper 656 feet), water temperatures between 43.7 and 69.8°F Larvae – Inshore estuaries, bays, and areas, bottom depths between 134 and 1,148 feet, and water temperatures between 47.3 to 70.7°F Juvenile – Estuaries, bays, and areas with depths between 33 and 919 feet and temperatures between 47.3 and 70.7°F and salinity above 5 ppt Adult – Water depths of 108 to 2,690 feet with salinity above 5 ppt and 15 ppt for spawning
Black sea bass *Centropristis striata*			✓	✓	Juvenile – Estuaries with warmer waters (greater than 43°F), salinity greater than 18 ppt, and rough bottom habitat or shellfish and eelgrass beds Adult – Inshore estuaries from May to October, particularly areas with hard bottom and temperatures greater than 43°F (for adults)
Clearnose skate *Raja eglanteria*			✓	✓	Juvenile – Bottom habitat with sand, gravel, or mud substrate from the shoreline to 1,312 feet water depth with water temperatures between 39.2 and 60.8°F Adult – Bottom habitat with sand, gravel, or mud substrate from the shoreline to 1,312 feet water depth with water temperatures between 41 and 59°F
Summer Flounder HAPC	-	-	-	-	All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH

Sources: Mid-Atlantic FMC 1988, 1996a, 1996b, 1998a, 1998b, 2011; Nelson et al. 2017; NMFS 2018, 2023a, 2024e, 2024f, 2024g, 2024h

Notes:

EFH has been designated for a given species and life stage.

°F = degrees Fahrenheit; ppt = parts per thousand

4.9.2 Environmental Consequences

The NMFS guidelines for completing an EFH assessment (NMFS 2021) were used to identify the stressors associated with the project activities. These stressors and their effects are described below for both of the project alternatives.

4.9.2.1 No-action Alternative

EFH would be subject to existing conditions in and around the SPCT project area, which include impacts from routine maintenance dredging as permitted by the appropriate regulatory agencies and the presence of existing contaminated sediments offshore of Coke Point. Future development of Coke Point would not involve in-water work and would not change the aquatic habitat in the project area, and therefore, would have no additional impact on EFH. The High Head Industrial Basin does not contain EFH; therefore, the No-action Alternative would have no impact if the basin were to be filled in and the area repurposed.

4.9.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Underwater Noise from Pile Driving

Underwater noise impacts on EFH from construction activities would be the same as the noise impacts described for all fish species (both managed and non-managed) and are described in Section 4.8.2.2.

Turbidity and Bottom Alteration from Channel Dredging and Wharf Construction

The impacts associated with dredging, bottom alteration, and channel deepening and wharf construction are described in detail in Section 4.8.2.2.

The sediment released to the water column during dredging operations would affect a small portion of the total width of the Patapsco River (2,400 feet [0.4 mile] or 17.1 % of the total 14,000 feet [2.6 miles] of available river width) (Burton 1993; Wilber and Clarke 2001), leaving similar pelagic or demersal habitat for juveniles and adults outside of the direct dredging area. There is also similar available habitat outside of the work area within the river from the former Key Bridge to Rock Point (approximately 22,000 feet or 4 miles of available similar habitat). The silty or muddy bottoms of bays / estuaries that are required for most life cycles of the EFH species are abundant in the Patapsco River. EFH species that use more protected embayment areas similar to where the dredging and west side DMCF(s) is proposed would have other areas in the vicinity of the SPCT project area, including coves and inlets, that could be used during dredging operations when turbidity increases.

Specific to EFH species, dredging impacts on habitat used by juveniles and adults would be short-term and temporary. The removal of bottom sediment from the dredging area, as well as any resuspended sediment, has the potential to impact EFH eggs and larvae (for summer flounder and Atlantic butterfish) if they are present within or adjacent to the dredging footprint. Overall, the turbidity and removal of bottom sediment resulting from channel dredging would impact demersal EFH species (skates and flounders) more than pelagic species, as eggs and larvae of demersal species are likely present in the vicinity of dredging and would have limited ability to move away from impacts. In addition, juveniles and adult demersal EFH species may have less opportunity to relocate to other suitable habitats before dredging. Both summer flounder and bluefish were captured during the fish surveys; however, both EFH species were only found at the upstream and downstream sampling locations (Gillnet 1 and Gillnet 5,

Figure 30). It is therefore anticipated that the potential for impact on these species from channel dredging would be low. As noted in Section 4.8.2.2, time-of-year restrictions on dredging may be required by regulatory agencies and would be determined through agency consultation. Deepening of the channel through dredging would decrease dissolved oxygen concentrations in bottom water as described in Section 4.8.2.2. Since the Sparrows Point Channel would be dredged to maintain the depth, the more hypoxic conditions created by deepening the channel would permanently degrade EFH.

Dredging the channel to attain the preferred alignment for the wharf would include removal of existing shoreline, resulting in the creation of new open water habitat, shading of existing and new open water, and loss of bottom foraging habitat from the installation of wharf piles. Impacts on fish habitat from these activities are described in Section 4.8.2.2.

Vessel Traffic

Impacts on EFH species from vessel traffic would be the same as described for fish in Section 4.8.2.2.

Habitat Alteration / Impacts on Prey Species

4.9.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

No impacts on EFH would occur because the High Head Industrial Basin does not contain EFH.

Coal Pier Channel DMCF at Sparrows Point

Turbidity from Material Placement

Impacts of constructing a sand dike for the Coal Pier Channel DMCF would occur both outside and within the footprint. Impacts from turbidity from placement of the sand to create the dike and would be the same as discussed in Section 4.8.2.2. Juvenile and adult EFH individuals outside of the dike perimeter would relocate to similar nearby habitats following the start of material placement and would likely avoid suspended sediment; mobile EFH individuals would experience adverse but temporary impacts from displacement. Turbidity can hinder vision and disrupt foraging behaviors of EFH species, but juvenile and adult species would avoid the area during construction. Eggs or larvae may be trapped and destroyed as the material is placed, and any individual adults and juveniles within the dike footprint could be trapped by the placed material as well. Turbidity following construction of the dike would eventually return to concentrations suitable for EFH species. Therefore, the impacts from construction would not result in a meaningful change to EFH species populations. Any turbidity related to offloading of dredged material would be contained within the dike and would not impact the surrounding habitat for EFH species.

Habitat Alteration / Impacts on Prey Species

Placement of material in the Coal Pier Channel DMCF would result in a permanent loss of sheltered aquatic habitat, removing potential foraging, refuge, and spawning habitats for EFH and their prey species. The impacts on EFH species would be the same as described for fish in Section 4.8.2.2. Eggs and larvae of EFH species within the DMCF footprint would be buried by material placement. Juvenile or adult pelagic and demersal individuals can move away from construction and therefore impacts would be less than those on eggs or larvae. EFH food sources within the DMCF footprint would also be lost by habitat conversion. Sediment, benthic, and fish studies in the DMCF area indicate that the sediment in the

DMCF footprint is impacted by elevated concentrations of metals, PAHs, and sheens / odors, and the area is being used by fish and benthic resources. The footprint of the DMCF represents only a portion of bottom habitat available in the project area to EFH species that require this habitat during their life cycle. In addition, the areas immediately surrounding the DMCF and elsewhere within the vicinity of the Patapsco River or Lower Bear Creek would provide comparable forage areas for EFH species to use both during construction and after the project is complete. For juvenile and adult pelagic species, impacts from habitat alteration are unlikely, as individuals would not be present within the DMCF footprint.

Vessel Traffic

Impacts on EFH species from vessel traffic would be the same as those described for all fish species in Section 4.8.2.2.

Existing Nearshore MPA DMCFs

No new impacts on EFH would occur because the MPA DMCFs are existing upland placement sites.

Existing Ocean Disposal Site

No new impacts on EFH would occur because NODS is an existing USEPA-designated ocean placement site.

4.10 Aquatic Special Status Species

4.10.1 Affected Environment

The Endangered Species Act of 1973 (ESA) is intended to conserve endangered and threatened species and habitats that are critical to their survival. Endangered species are in danger of extinction throughout all or a significant portion of their range. Threatened species are likely to become endangered in the foreseeable future throughout all or a significant portion of their range. *Special status species* is a collective term for species that are listed as threatened, endangered, or of special concern by a federal or state regulatory agency.

4.10.1.1 Special Status Species in the Project Area

Federally Listed Species

Federal special status species can fall under the jurisdiction of USFWS, (terrestrial and freshwater species) or NMFS (marine and anadromous species). Under Section 7(a)(2) of the ESA, federal agencies must consult with USFWS and NMFS when any project or action they take might affect an ESA-listed species or designated critical habitat. For this project, no aquatic species under USFWS jurisdiction are potentially present in the project area. Terrestrial special status species potentially present in the project area were dismissed from full analysis (see Appendix C).

Consultation with NMFS pursuant to the ESA was initiated in 2023 and will continue throughout the NEPA and project permitting processes. Following internal agency review of the Draft EIS with the project team, several conference calls were held in October and November 2024 with NMFS to discuss impacts of the action on ESA listed species. A Draft Biological Assessment was prepared and submitted to NMFS in December 2024 and is included in Appendix F. Consultation on project impacts and potential mitigation is ongoing with NMFS.

The applicant consulted NMFS's ESA Section 7 Mapper (NMFS 2022e), an online mapping tool, which indicated that Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) may be present in the SPCT project area. In a letter dated February 16, 2024, NMFS identified the two sturgeon species plus four federally listed sea turtle species under its jurisdiction that may occur in the waters in or adjacent to the SPCT project area (NMFS 2024d; Table 24); the project area does not contain any designated critical habitat.

Table 24. ESA Species under NMFS Jurisdiction Potentially Present in the SPCT Project Area

Species	Life Stage			
	Larvae	Juvenile	Sub-adult	Adults
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)		✓	✓	✓
Shortnose Sturgeon (*Acipenser brevirostrum*)				✓
Green sea turtle (*Chelonia mydas*)		✓		✓
Loggerhead sea turtle (*Caretta caretta*)		✓		✓
Kemp's ridley sea turtle (*Lepidochelys kempii*)		✓		✓
Leatherback sea turtle (*Dermochelys coriacea*)		✓		✓

The following paragraphs describe the six species identified by NMFS during consultation that could occur in the project area. No special status species were observed during the seasonal aquatic surveys conducted to collect baseline ecological information within the project area (see Section 4.8.1).

Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*). Atlantic sturgeon are present in the waters of the Chesapeake Bay and its adjacent bays and tributaries. Atlantic sturgeon are born in freshwater, move to estuarine waters to grow and mature, migrate to the sea, and return to freshwater areas to spawn (NMFS 2023b). Spawning within the Chesapeake Bay occurs largely in Virginia tributaries, outside of the project area and larger Baltimore Harbor area. Due to the habitat and salinity in the Chesapeake Bay, spawning and early life stages are not expected to occur within the project area (NMFS 2024d). Juveniles and adults may be transient in the project area, but typically stay near their natal rivers. Only subadult and adult Atlantic sturgeon could occur within the Patapsco River area. Atlantic sturgeon consume prey found on the seafloor, including crustaceans, worms, mollusks, and smaller bottom fish (NMFS 2023b; USFWS 2024).

This species had historically large populations throughout the Chesapeake Bay; however, their populations have declined largely due to heavy fishing and degradation of spawning and nursery habitat (VIMS 2009). The New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments (DPSs) of Atlantic sturgeon are endangered; the Gulf of Maine DPS is threatened. Atlantic sturgeon are also listed as endangered by MDNR.

Shortnose Sturgeon (*Acipenser brevirostrum*). Shortnose sturgeon is federally listed as endangered throughout its range and listed as endangered by MDNR. NMFS implemented a recovery plan for shortnose sturgeon in 1998 (NMFS 1998). Unfavorable water conditions, such as low oxygen, pollution, and habitat alteration, have caused significant declines in the Chesapeake Bay population. Transient adult shortnose sturgeon could be present in the waters of the Chesapeake Bay and adjacent bays and tributaries to opportunistically forage; however, recent studies have indicated that shortnose sturgeon in the Chesapeake Bay are rare with only one individual observed in the lower Chesapeake Bay and just over 70 in the upper Chesapeake Bay over 10 years (1996 through 2006) (Balazik 2017). The most recent report of a shortnose sturgeon in the lower Chesapeake Bay and tributaries was a catch in the Potomac River near the Chain Bridge in April 2021 (Blankenship 2021).

Adult shortnose sturgeon use low-salinity bottom waters of estuaries for much of the year. They feed on a variety of benthic organisms including mollusks, crustaceans, and worms. Individuals in the Chesapeake Bay spend most of the year in the lower part of the river in which they were born, migrating to deeper waters in winter (CBP 2024b). Due to the habitat and salinity in the Chesapeake Bay, spawning and early life stages are not expected to occur within the project area (NMFS 2024d).

Sea Turtles. Four species of ESA-listed threatened or endangered sea turtles under NMFS jurisdiction are seasonally present in Chesapeake Bay —Northwest Atlantic Ocean DPS of loggerhead sea turtle (*Caretta caretta*; threatened), North Atlantic DPS of green sea turtle (*Lepidochelys kempii*; threatened), Kemp's ridley sea turtle (*Lepidochelys kempii*; endangered), and leatherback sea turtle (*Dermochelys coriacea*; endangered) (NMFS 2024d).

Sea turtle species share similar habitats and are widely distributed throughout their range occupying vast open ocean habitat and inshore areas. Juvenile sea turtles live a pelagic existence before returning inshore as they mature. The primary diet of sea turtles can vary by species and includes marine vegetation, benthic invertebrates, and other small marine animals (NMFS 2023c). Although some sea turtle individuals have been observed as far north as Maine, the Chesapeake Bay is typically the northernmost limit for their range (Funk 2020).

The Chesapeake Bay is an important developmental and foraging habitat for sea turtles in the summer months (Evans et al. 1997; Litwiler and Insley 2014), but loggerhead, green, Kemp's ridley, and leatherback sea turtles are not likely to be as far north in the Chesapeake Bay as the SPCT project area. Loggerheads, leatherback, and green sea turtles are typically found in the Chesapeake Bay in Maryland in the southern portions of the state near Worcester County (MDNR 2016, 2024c, 2024d, 2024e. 2024f). Kemp's ridley turtles use eelgrass beds in the lower portions of the Chesapeake Bay during summer months (CBP 2024c). In the project area (and larger Baltimore Harbor), suitable vegetation and salinity for sea turtles is not available. For this reason, only those impacts on sea turtles associated with increased vessel traffic in the Lower Chesapeake Bay (where barges and other vessels may be transiting to the project area) and from the SPCT project area to the NODS are the impacts evaluated as part of this Draft EIS.

State-listed Species

The Nongame and Endangered Species Conservation Act of 1975 (Annotated Code of Maryland 10-2A-01) governs the legal listing of threatened and endangered species in Maryland. The Act is supported by regulations (Code of Maryland Regulations [COMAR] 08.03.08) that define listing criteria for endangered, threatened, in need of conservation, and endangered extirpated species; lists the species included in each category; establishes the purpose and intent of research and collection permits; and lists prohibited activities.

The protection of state-listed species is under the jurisdiction of the MDNR. The applicant reviewed MDNR's List of Rare, Threatened, and Endangered Species of Baltimore County (MDNR 2021) and identified four aquatic species (mussels) that could potentially be present within the SPCT project area. Table 25 lists these mussel species with a description of the required habitat for each. Based on the species habitat requirements, these four species are unlikely to be present in the project area; therefore, these species were dismissed from full analysis.

MDNR also maintains a list of fish species that are endangered, threatened, or in need of conservation for the state of Maryland (MDNR 2024g). This list was reviewed, and the majority of species require higher salinity waters than are present within the SPCT project area and would not likely be found using these waters. In addition to Atlantic and shortnose sturgeon discussed above under federally listed species, Table 25 lists five fish species that could potentially use the habitat within the project area.

Table 25. Potential for Presence of State-listed Aquatic Species and Aquatic Species in Need of Conservation in Baltimore County in the SPCT Project Area

Species	State Status or Rank	Required Habitat	Potentially Present in SPCT Project Area?
Northern map turtle (*Graptemys geographica*)	S1, E	Found in deep or shallow waters of the lower Susquehanna River only.	No, the project area is not within the habitat distribution for this species.
Brook floater (*Alasmidonta varicosa*)	S1	Larger streams and rivers with moderate flow: often found near river islands with depositional substrate.	No, this is a freshwater species, and waters of the project area are brackish.
Eastern lampmussel (*Lampsilis radiata*)	SU	Generally restricted to tidal freshwater with sandy shoals or shorelines with moderate tidal fluctuation and wave action.	No, this is a freshwater species, and waters of the project area are brackish.
Triangle floater (*Alasmidonta undulata*)	S1S2, T	Prefers smaller headwaters of streams with slow-moving water and coarse or fine gravel substrate; avoids larger rivers and streams.	No, the aquatic habitat within the dredging and Coal Pier Channel DMCF footprints are within a larger river environment without suitable habitat for this species.
American shad (*Alosa sapidissima*)	In need of conservation	Spawn in freshwater tributaries of Chesapeake Bay.	Yes; suitable habitat for foraging is available.
Atlantic menhaden (*Brevoortia tyrannus*)	In need of conservation	Found in all salinity zones within the Chesapeake Bay.	Yes; found in project area fish surveys.
Hickory Shad (*Alosa mediocris*)	In need of conservation	Spawn in freshwater tributaries of estuaries and bays.	Yes; suitable habitat for foraging is available.
Striped bass (*Morone saxatilis*)	In need of conservation	Found in fresh or salt water in estuaries and bays.	Yes; found in project area fish surveys.
Yellow Perch (*Perca flavescens*)	In need of conservation	Found in brackish waters of Chesapeake Bay.	Yes; suitable habitat is available.

Sources: MDNR 2016; MDOT 2016; MDNR 2024g

Notes:

S1 = highly state rare; S2 = State rare; SU = possibly rare; T = threatened; E = endangered

Bottlenose Dolphin

The bottlenose dolphin (*Tursiops truncatus*) is not protected under the ESA but is protected under the Marine Mammal Protection Act. Bottlenose dolphins thrive in temperate or tropical marine waters and estuaries of temperate waters (NMFS 2024i) and are able to use the lower reaches of rivers (CBP 2024d). Bottlenose dolphins are abundant along the Virginia coast and within the Chesapeake Bay. They consume fish, squid, and small crustaceans. There are various North Atlantic Stocks, many of which are designated as depleted under the Marine Mammal Protection Act.

According to consultation with NMFS PRD in November 2024, Bottlenose dolphins have the potential to be present as transient individuals in the lower Patapsco River of the Action Area and the transit route from SPCT to MPA DMCFs. They have a higher likelihood of occurrence along the southern and lower Chesapeake Bay transit route to the NODS in the Atlantic Ocean. Bottlenose dolphins primarily use the lower Chesapeake Bay in the summer with most usage near the James and Elizabeth Rivers in Virginia. They are seen annually in Virginia from April through November with approximately 65 strandings occurring each year (Barco and Swingle 2014, Engelhaupt 2016). Dolphins are commonly sighted in areas far south of the SPCT area including the mouths of the Potomac and Rappahannock Rivers (Bay Journal 2021). The most robust sighting data near the mouth of the Patapsco River and within the entire Chesapeake Bay is based on citizen science, where reports are logged via the Dolphin Watch app supported by University of Maryland, Center for Environmental Science. These data are available from 2017 through 2022. Annual sightings have increased. The increase in annual sightings could be a result of an increase in dolphin movements within the region and / or an increase in public awareness and use of the app to log sightings. The highest recorded number of dolphin sightings within the entire Chesapeake Bay was 500 individuals in July 2022. There have been only 1 to 2 sightings per summer month in the Patuxent River between 2017 and 2022; however, this is likely an underestimate as data are dependent upon citizen reporting. Sightings are less frequent farther north in the Patapsco River and Baltimore Harbor areas and typically occur when these waters have higher than normal salinity in the summer months. Recent observations near the project area include a single dolphin using waters in the Inner Harbor (9 miles north of SPCT; ABC Baltimore 2023) and at the mouth of the Patapsco River (approximately 5 miles south of SPCT; The Washington Post 2018).

4.10.2 Environmental Consequences

A Biological Assessment (BA) was prepared and submitted to NMFS as part of the Draft EIS and permitting processes. The BA is included in Appendix F. This section describes the potential impacts on special states species (both federally and state listed) from implementation of the alternatives. The two sturgeon species are similar with respect to habitat requirements and life history information. Therefore, this impacts analysis is integrated to cover both sturgeon species, as well as the other special status species described in Section 4.10.1. As described in Section 4.10.1, bottlenose dolphin individuals are infrequently documented in the Patapsco River as far north as the SPCT area are expected to be only transient, this analysis includes impacts on dolphins from underwater noise only.

4.10.2.1 No-action Alternative

Under the No-action Alternative, sturgeon would be subject to existing conditions in and around the SPCT project area. Existing impacts include maintenance dredging of the Sparrows Point Channel (e.g., potential take within a mechanical dredge bucket, deposition of suspended sediment from dredging on potential spawning and foraging areas, loss of benthic feeding area) (NMFS 2010). There are also existing impacts on species from the contaminated sediments offshore of Coke Point; under the No-action Alternative, these sediments and habitat would remain available to sturgeon in a contaminated state, which could contribute to the uptake of contaminants into the food chain. Implementation of the No-action Alternative would not involve in-water work and therefore would have no additional impact on special status species beyond those found under existing conditions. The High Head Industrial Basin does not support special status species; therefore, the No-action Alternative would have no impact if the basin were to be filled in and the area repurposed.

4.10.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Underwater Noise from Pile Driving

Fish

Underwater noise impacts from anthropogenic sources (e.g., construction activities) have the potential to impact special status fish species that rely on hearing underwater to forage, communicate, detect predators, and navigate (NMFS 2022a). Noise impacts on special status species from construction activities would be the same as the noise impacts described for fish species (both managed and non-managed) and are described in Section 4.8.2.2.

Bottlenose Dolphins

The NMFS Multi-Species Tool for modeling underwater noise impacts was used to estimate the impacts of construction activities on bottlenose dolphins (mid-frequency cetaceans) that could be in the project area. Table 26 shows guidance to onset to noise levels for the onset of physical injury and behavioral disturbance in marine mammals (including dolphins). Thresholds for behavioral disturbance were available only for all marine mammals in the Multi-Species Tool, while physical injury thresholds were available for mid-frequency cetaceans which include dolphins. Other noise modeling assumptions and proxy values utilized are described for fish in Section 4.8.2.2.

Table 26. Fish and Marine Mammal Impact Pile Driving Injury Guidance

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing 2 grams or less	183 dB	206 dB	150 dB
Mid-frequency cetaceans	185 dB	230 dB	--
All marine mammals	--	--	160 dB

Assuming an 11 dB reduction in sound mitigation provided by use of the wood cushion block for impact pile driving the anticipated zones of impact for injury and behavior disturbance are found in Table 27. Figure 35 and Figure 36 present a visual representation of the noise modeling results.

The maximum distance to onset of behavioral disturbance for marine mammals from an impact hammer (with a cushion block for sound attenuation reduction) is 7,068 feet (1.3 miles) from the installation of 30-inch wharf piles. The maximum distance to onset of physical injury from impact driving occurs at 0.3 feet from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation.

Distances of behavioral effects from vibratory pile driving are largest from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation (152,283 feet or 28 miles) and for physical injury from vibratory driving, distances are largest during water-based demolition activities (270 feet).

Turbidity and Bottom Alteration from Channel Dredging and Wharf Construction

The impacts associated with dredging to widen and deepen the existing Sparrows Point Channel are described in detail in Section 4.8.2.2. Turbidity would also be generated during some construction activities, such as pile driving, but this would be expected to be less than would be generated during dredging activities.

Studies of the effects of turbid water on fish suggest that concentrations of suspended solids can reach thousands of mg / L before an acute toxic reaction is expected (Burton 1993). Minor temporary increases in turbidity and TSS levels from dredging with a clamshell bucket would be minimized to the extent possible. When considered in addition to baseline conditions, the increases in TSS levels would not have a measurable or detectable increase in turbidity or TSS levels. Studies have shown that sturgeon may alter their normal movements due to suspended sediments, but juvenile and adult sturgeon are anticipated to swim through sediment plumes to avoid the area (NMFS 2023d). In addition, turbidity may temporarily impact the availability of prey species (including those that are listed in Need of Conservation), but it is anticipated that areas of high turbidity would quickly recolonize following sediment settlement (NMFS 2023d).

Effects of dredging on special status species are expected to be short-term and temporary. Specific to sturgeon, eggs and larval stages would not be present in the Patapsco River, as this is not a spawning river for either species. Habitat conditions do not support this life stage. The sediment suspended in the water from the dredging operations would be only a portion (approximately 2,400 feet or 0.5 mile or 17.1%) (Burton 1993, Wilber and Clark 2001) of the total width of the river at the project location (approximately 14,000 feet or 2.6 miles), providing ample habitat for special status fish species to escape adverse conditions during dredging activities.

Table 27. Maximum Distances to Mid-Frequency Cetacean Sound Thresholds from Impulsive Sources

Activity (with wood cushion block for impact hammers)	Pile Count and Size / Type	Distance to Onset of Behavioral Disturbance for All Marine Mammals (feet)		Distance to Onset of Physical Injury for Mid-Frequency Cetacean (feet)		
		Impact Hammer 160 dB RMS	Vibratory Hammer 120 dB RMS	Impact Hammer 230 dB SPL_{peak}	Impact Hammer 185 dB PTS SEL_{cum}	Vibratory Hammer 198 dB PTS SEL_{cum}
Wharf piling	150, 24-inch steel pipe piles	2,414	5,200	0.2	24	3
Wharf piling	600, 30-inch steel pipe piles	7,068	96,084	2	126	56
Wharf piling	600, 36-inch steel pipe piles	2,070	152,283	0.3	66	117
Mooring dolphin piling	60, 24-inch steel pipe piles	1,120	5,200	0.2	15	2
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	2,414	152,283	0.3	80	142
Water-based demolition	Varied	NA	328,084	NA	NA	270

Notes:

1 – For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period and the average daily pile installation rate for mooring dolphin activity is 3 piles per day, therefore, a total of 9 piles per day.

dB = decibel; RMS = root mean square; SEL_{cum} = cumulative sound exposure level over the duration of a noise event; SPL_{peak} = maximum instantaneous sound pressure over the duration of a noise event; NA = not applicable

Figure 35. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Northern Point with -11db Sound Attenuation (Dolphins)

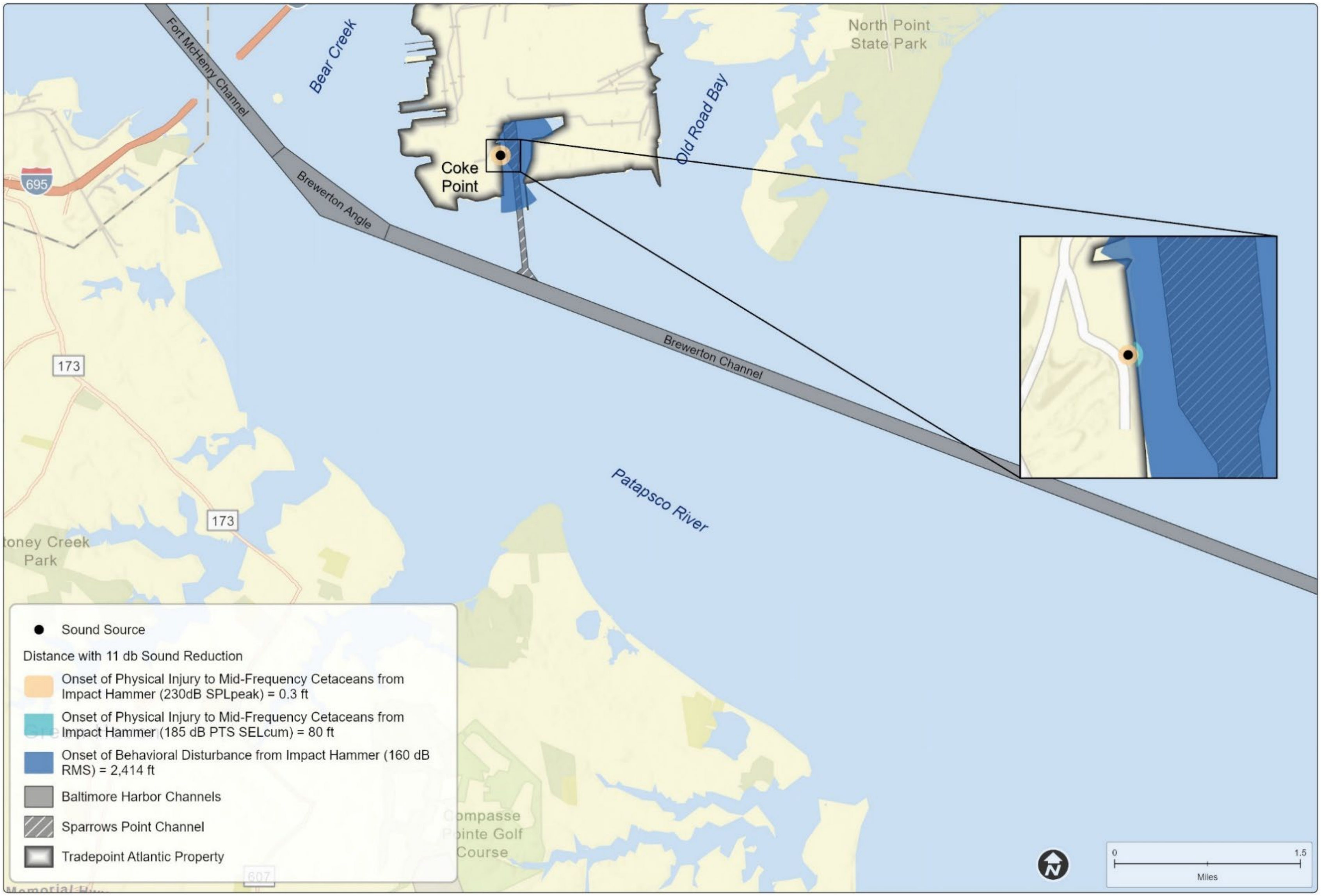
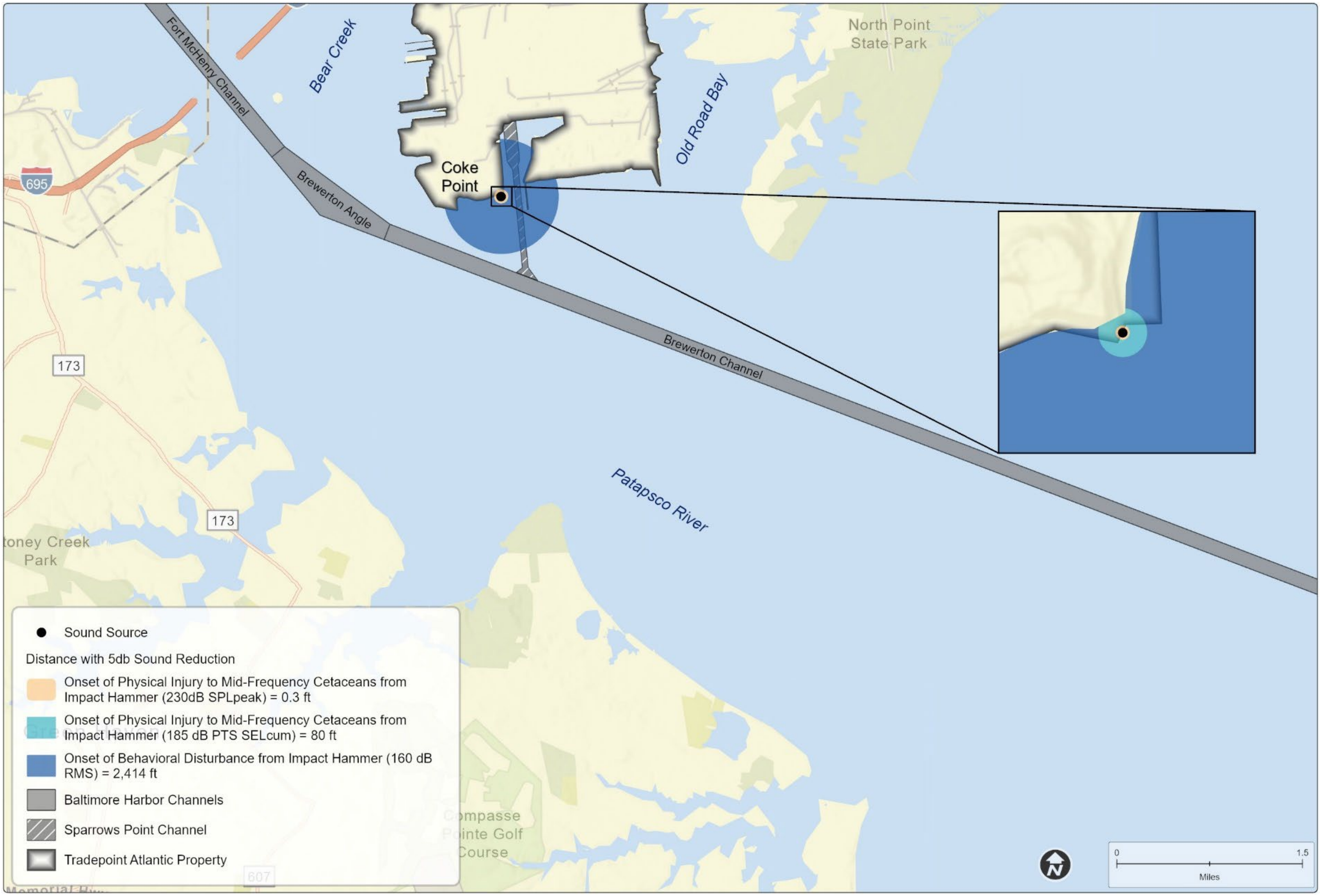


Figure 36. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point with -11db Sound Attenuation (Dolphins)



Vessel Traffic

Vessel traffic would increase slightly during construction of the terminal and dredging of the channel causing a minor increase in the risk of striking special status species. Operation of the proposed terminal would result in a slight increase in vessel traffic with up to 500 more vessels annually (see Section 4.8.2.2). Although the increase in vessel traffic would be relatively small in an area that is already highly trafficked, due to their size, sturgeon (particularly Atlantic sturgeon, which are often larger than shortnose) are frequently impacted by vessel strikes especially in large ports and could be more vulnerable to vessel impacts (NMFS 2010). For sea turtles, impacts from vessel traffic would be limited to transit routes for barges and other vessels traveling to the project area from the lower Chesapeake Bay and NODS. Vessel traffic to and from the NODS will be conducted in compliance with the NOAA Fisheries Right Whale Ship Strike Reduction Rule (50 CFR 224.105), which limits vessels greater than 65 ft to speeds less than 10 knots during migration and calving periods.

4.10.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

No impacts would occur; no special status species are present within the High Head Industrial Basin.

Coal Pier Channel DMCF at Sparrows Point

Turbidity from Material Placement

Placement of material to build the sand dike for the Coal Pier Channel DMCF could cause temporary turbidity in surrounding waters. Impacts from turbidity would occur from placement of the sand to create the dike (see Section 4.8.2.2). Special status species may exhibit behavioral and physiological effects when exposed to increased turbidity levels of 1,000 mg / L above ambient conditions for more than two weeks (NMFS 2023d). However, the mobile life stages of Atlantic sturgeon (juvenile, subadult, and adult) and shortnose sturgeon (adult) and other special status fish species potentially present in the area would be able to move away from the construction area to avoid these impacts from turbidity and decreased dissolved oxygen. It is unlikely that impacts on sturgeon would rise above minor and short term from the minor changes to the water column. Any turbidity resulting from pumping the dredged material into the DMCF would be contained within the dike and would not impact the surrounding habitat for special status species.

Two fish species in need of conservation (striped bass and Atlantic menhaden) comprised a large portion of the summer fish community. Striped bass comprised 70% of the fish captured in summer 2023 surveys and would potentially be impacted by material placement within the DMCF footprint dependent upon timing of the placement. Atlantic menhaden were found in much smaller numbers, but as they have been documented using the project area, they could be affected by the construction of the sand dike.

Placement of the sand could also disturb existing sediments at the mouth of Coal Pier Channel. The movement of the bottom sediments during placement of the sand would be limited due to the shallow sediment depth, the small size of the dike, and the proximity to the shoreline. Depending on site conditions, BMPs to reduce sediment resuspension (e.g., turbidity curtain) could be employed. Therefore, sediments resuspended during dike construction would be expected to be minimal. Given that the material to create the perimeter dike would be sand and the soft sediments underlying the Coal Pier Channel are shallow, the impacts would be limited to temporary and localized effects on the water column during construction, having minimal impact on special status species.

Habitat Alteration / Impacts on Prey Species

Placement of material in the Coal Pier Channel DMCF would cause a complete loss of the substrate and sheltered habitat type within the channel. Once the material placement is complete, the DMCF would be at an elevation that is considered upland habitat. Benthic organisms within the footprint would be lost, removing the communities as a possible food source for special status fish species. However, as previously stated, sediments in the Coal Pier Channel are degraded from historical contamination and the benthic communities are also degraded. Special status fish species typically forage on benthic invertebrates and small bottom-dwelling fishes and could be marginally impacted by the loss of this bottom area. The areas immediately surrounding the DMCF and elsewhere in the Patapsco River would provide forage area for sturgeon and state-listed special status fish species to use both during construction and after the project is complete.

Vessel Traffic

Vessel traffic would increase slightly during construction of the perimeter dike, as barges would be transiting from the Sparrows Point Channel to the DMCF to deliver sand. Atlantic and shortnose sturgeon and state-listed fish species would be expected to have ample space within the surrounding river area to avoid vessels and use other adjacent habitats. The increase in vessel traffic would not have a meaningful impact on federally or state-listed species. The baseline risk of a vessel strike with special status fish species in the vicinity of the SPCT project area is unknown; however, given that the addition of vessels would be limited to the direct project area and considering the heavy vessel traffic that already exists in the area, this alternative would not likely increase the risk of vessel strikes to Special status fish species.

Existing Nearshore MPA DMCFs

No new impacts would occur because the MPA DMCFs are existing upland placement sites.

Existing Ocean Disposal Site

Any impacts on special status species would be limited to potential for strikes from barge transit from the SPCT project area to the NODS. The type of vessel traffic impact is expected to be similar to those already present in this highly trafficked route.

4.11 Vegetation / Habitat

4.11.1 Affected Environment

A habitat field survey of the SPCT project area was conducted on July 31 and August 4, 2023 (EA 2024j, 2024h). Five separate habitat units were identified in the two areas of review (AOR), approximating 401 acres in total (Figure 37). The habitat survey was completed on foot using a timed meander search procedure. Observed plant species within each habitat were recorded on a field data sheet as they were encountered. No federal or state-listed plant species were found within these areas.

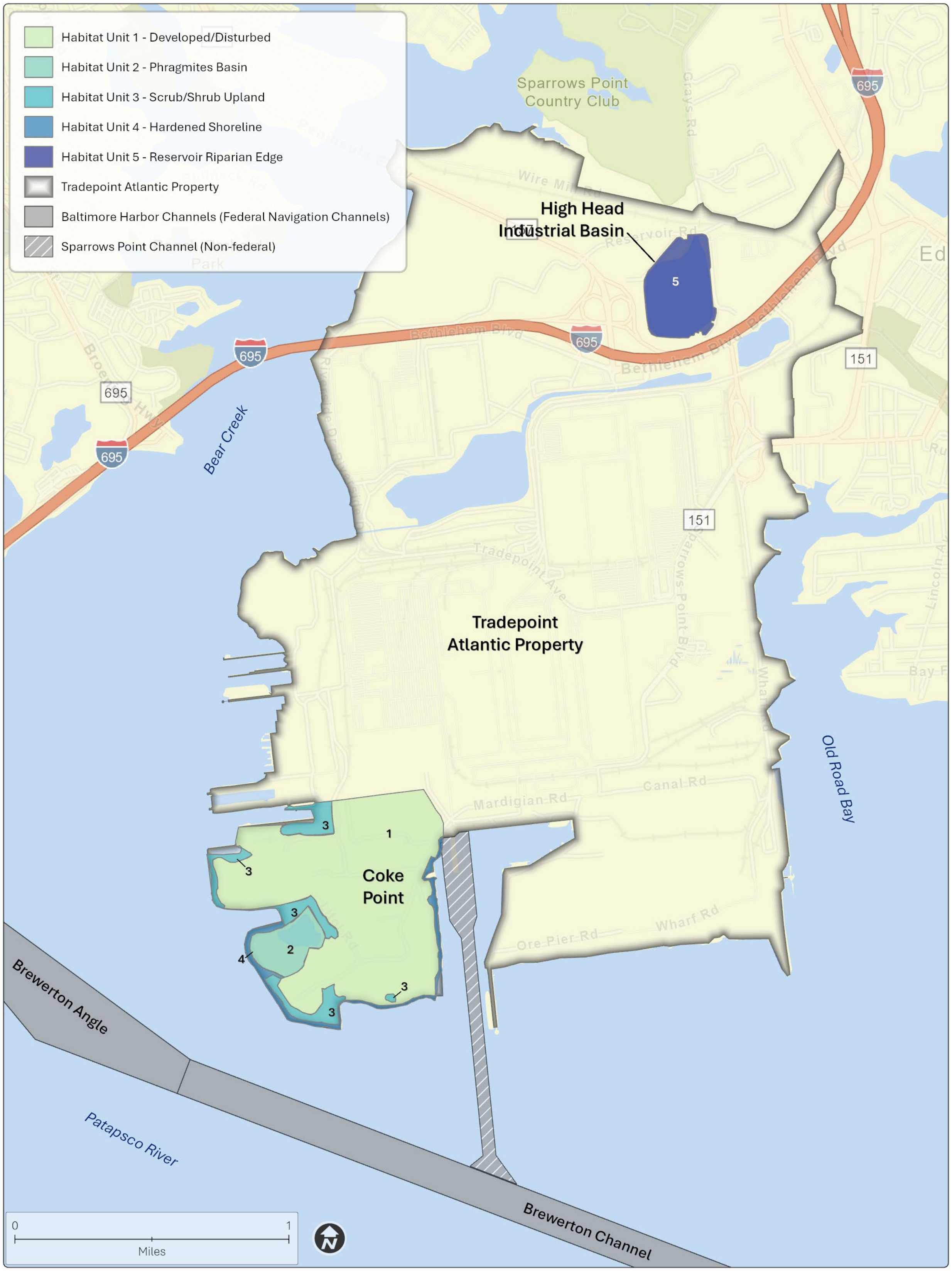
The southern AOR contained four distinct habitat units. The following text describes the habitat units at the time of the survey:

- *Habitat Unit 1* – This habitat was defined as developed / disturbed, as it predominantly consisted of compact gravel, paved roads, and barren patches interspersed with sporadic vegetation. The habitat unit supported minimal biodiversity.
- *Habitat Unit 2* – At the time of the summer 2023 surveys, this area was characterized as a *Phragmites* basin, consisting of a large depressional basin in the southwest region of the southern AOR. This basin was artificially constructed to house dredged material during industrial operations. Though characterized by a dense monoculture of common reed, the unit lacked wetland soils or hydrology. Despite its resemblance to wetland ecosystems, no regulated wetlands were documented. Since the 2023 summer surveys, the common reed has been removed, and the former DMCF is being filled.
- *Habitat Unit 3* – This area is identified as scrub-shrub upland and is found adjacent to the shoreline. This habitat unit featured a mixture of short-statured tree species and dense shrub cover. Dominant plants identified within this habitat unit include staghorn sumac, winged elm (*Ulmus alata*), poison ivy (*Toxicodendron radicans*), green foxtail (*Setaria viridis*), white sweet clover (*Melilotus albus*), common mugwort (*Artemisia vulgaris*), Asian bittersweet (*Celastrus orbiculatus*), late boneset (*Eupatorium serotinum*), and nodding spurge (*Euphorbia nutans*). The unit presented a transitional zone between terrestrial and aquatic environments.
- *Habitat Unit 4* – This area of hardened shoreline encircled the southern AOR. This habitat unit was comprised primarily of shrubs and herbaceous vegetation along rocky bars. Although visually distinct, it supported limited biodiversity.

The northern AOR contained one habitat unit:

- *Habitat Unit 5* – This habitat was classified as a reservoir riparian edge, which encompassed a human-made reservoir bordered by forest and shrub vegetation. Species diversity was notably higher. Dominant plant species included black willow (*Salix nigr*a), willow oak (*Quercus phellos*) sweetgum (*Liquidambar styraciflua*), trumpet creeper (*Campsis radicans*), staghorn sumac, fleabane daisy (*Erigeron annuus*), Queen Anne's lace (*Daucus carota*), common reed, Indian hemp (*Apocynum cannabinum*), winged sumac (*Rhus copallinum*), blue wild indigo (*Baptisia australis*) and Japanese honeysuckle (*Lonicera japonica*).

Figure 37. Habitat Types in the Project Area



4.11.2 Environmental Consequences

4.11.2.1 No-action Alternative

Impacts on vegetation and habitats would continue under existing conditions. The specific future development of Coke Point is unknown, but the entire area could be developed, resulting in the loss of the vegetation and habitats in this area. That would include the scrub-shrub habitat adjacent to the shoreline and the sparse shrub and herbaceous vegetation present along the hardened shoreline and throughout the developed area. Although this vegetation provides limited biodiversity, it still provides habitat for some wildlife species, including eastern cottontail (*Sylvilagus floridanus*) and a variety of birds (see Section 4.12). If the High Head Industrial Basin were filled in, riparian habitat along the shoreline would be lost and potentially some shrub and forested habitat as well. Removal of the vegetation at Coke Point and the High Head Industrial Basin would result in adverse impacts on vegetation and habitat, but the impacts would be minimal.

4.11.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Development of the terminal would require removal of all terrestrial vegetation in the Coke Point portion of the project area, similar to the No-action Alternative. Removal of the vegetation would result in adverse impacts, but the impacts would be minimal.

4.11.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

As one of the main natural areas and habitats in the project area, the forested area at the northern end of the High Head Industrial Basin, as well as the riparian and shrub habitats surrounding the basin, would be adversely impacted by construction of the DMCF. The DMCF would require expansion of the existing basin and installation of a storm drain diversion system along each side of the basin. Construction activities would remove riparian, shrub, and forested habitat (total of approximately 11.2 acres of vegetation), resulting in an adverse impact on vegetation, as well as wildlife that use these habitats, such as small mammals (e.g., eastern cottontail), reptiles (e.g., painted turtle (*Chrysemys picta*), northern water snake (*Nerodia sipedon*), black rat snake (*Pantherophis obsoletus*)), and bird. (See Section 4.12 for a full discussion of impacts on birds.) Following completion of the dredged material placement, the site would be closed, and the area could be revegetated with native species. Although this would provide new upland habitat (e.g., grasses, shrubs, forest) for upland wildlife species, it would represent a permanent loss of riparian habitat and for the wildlife that uses it.

Coal Pier Channel DMCF at Sparrows Point

No additional impacts on vegetation / habitat would occur from construction of the Coal Pier Channel DMCF at Sparrows Point.

Existing Nearshore MPA DMCFs

No new impacts on vegetation / habitat would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

No new impacts on vegetation / habitat would occur because NODS is an existing USEPA-designated ocean placement site.

4.12 Birds

4.12.1 Affected Environment

A fauna survey was conducted on June 13, 2024, using several visual encounter methods to record observations of birds and other wildlife along the shoreline of Coke Point and at High Head Industrial Basin (EA 2024j, 2024k). A total of 41 species of birds were observed (visually or audibly) with 39 species at High Head Industrial Basin and 16 at Coke Point (see Table 28)

Table 28. Bird Species Observed During the June 2024 Survey

Common Name	Scientific Name	Coke Point	High Head Industrial Basin
American crow	*Corvus brachyrhynchos*	✓[1]	✓
American goldfinch	*Spinus tristis*		✓
American robin	*Turdus migratorius*		✓
Bald eagle	*Haliaeetus leucocephalus*	✓[1]	✓[1]
Bank swallow	*Riparia riparia*		✓[1]
Barn swallow	*Hirundo rustica*		✓[1]
Belted kingfisher	*Megaceryle alcyon*		✓
Black-crowned night-heron	*Nycticorax nycticorax*		✓
Blue jay	*Cyanocitta cristata*		✓
Brown-headed cowbird	*Molothrus ater*		✓[1]
Canada goose	*Branta canadensis*	✓	✓
Carolina wren	*Thryothorus ludovicianus*		✓
Cedar waxwing	*Bombycilla cedrorum*		✓
Common grackle	*Quiscalus quiscula*	✓	✓
Common raven	*Corvus corax*	✓[1]	✓[1]
Double-crested cormorant	*Phalacrocorax auritus*	✓	✓
Downy woodpecker	*Picoides pubescens*		✓
Eastern wood-peewee	*Contopus virens*		✓
European starling	*Sturnus vulgaris*	✓	✓
Gray catbird	*Dumetella carolinensis*		✓
Great blue heron	*Ardea herodias*		✓
Great egret	*Ardea alba*		✓
Green heron	*Butorides virescens*		✓[1]
Herring gull	*Larus argentatus*	✓[1]	
House finch	*Haemorhous mexicanus*		✓

Common Name	Scientific Name	Coke Point	High Head Industrial Basin
House sparrow	*Passer domesticus*		✓
House wren	*Troglodytes aedon*		✓
Killdeer	*Charadrius vociferus*	✓	
Least tern	*Sternula antillarum*		✓
Mallard	*Anas platyrhynchos*	✓	✓
Mourning dove	*Zenaida macroura*	✓	✓
Northern cardinal	*Cardinalis cardinalis*	✓	✓
Northern mockingbird	*Mimus polyglottos*	✓	✓
Northern rough-winged swallow	*Stelgidopteryx serripennis*		✓
Orchard oriole	*Icterus spurius*		✓
Osprey	*Pandion haliaetus*	✓	✓
Red-winged blackbird	*Agelaius phoeniceus*	✓	✓
Ruddy duck	*Oxyura jamaicensis*		✓
Song sparrow	*Melospiza melodia*		✓
Turkey vulture	*Cathartes aura*	✓ [1]	✓
Yellow warbler	*Setophaga petechia*		✓

Notes:

1 – Birds that were observed flying over the site, not using habitats within surveyed areas during the fauna survey.

Due to the primarily developed nature of Coke Point, natural habitat is scarce, limited to sparsely vegetated areas along the hardened shoreline (see Section 4.11.1). Of the 16 species observed at Coke Point, five were observed flying over the site only, not using the habitat. Ospreys (*Pandion haliaetus*) have built nests on powerline structures and were observed sitting on or flying near nests, bringing food, and protecting the nests. No state or federally listed species were observed at Coke Point. The western, southern, and eastern boundaries of Sparrows Point are encompassed by MDNR-designated waterfowl areas. Several other waterfowl areas are present near the site along other portions of the Patapsco River shoreline and Back River. However, waterfowl activity directly adjacent to the project area at Coke Point was low at the time of the survey.

A variety of waterfowl, wading birds, shore / water birds, raptors, perching birds, and woodpeckers were observed using the High Head Industrial Basin and the habitat surrounding it. Waterfowl (e.g., mallard (*Anas platyrhynchos*) ruddy duck (*Oxyura jamaicensis*)) and wading birds (e.g., great egret (*Ardea alba*), great blue heron (*Ardea herodias*)) were observed foraging from the basin. The basin lacks a constant sandy shore and instead has a consistent fringe of phragmites along the shoreline. Red-winged blackbirds (*Agelaius phoeniceus*) were prevalent, and likely nesting, along the shoreline. Nearly all of the perching birds and woodpeckers were observed in the small, forested area to the north of the basin. Numerous least terns (*Sternula antillarum*), which are state listed as threatened, were observed foraging at the basin. Activity near the basin suggests that least terns may be nesting on the roof of a nearby industrial building.

The Migratory Bird Treaty Act of 1918 (MBTA) protects migratory birds that are native to the United States or US territories and their nests with eggs or young. The MBTA prohibits the take (i.e., disturbing nests, killing, capturing, selling, trading, and transporting) of protected migratory bird species without prior authorization by the USFWS. Similarly, the Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 USC §§ 668-668c) prohibits the take, transport, sale, barter, trade, import and export, and possession of eagles, making it illegal for anyone to collect eagles and eagle parts, nests, or eggs without a permit.

The USFWS online Information for Planning and Consultation tool provided an informal listing of 39 migratory bird species that have the potential to occur within the TPA property; however, this list does not include all migratory birds that could be found in or near the project area. Two migratory species listed in the Information for Planning and Consultation search were observed — bald eagle (*Haliaeetus leucocephalus*) and double-crested cormorants (*Phalacrocorax auritus*). Bald eagles were observed during the fauna survey at High Head Industrial Basin and Coke Point, flying over and circling, primarily to the north. No nesting activity was observed. A bald eagle nest has been documented at Sparrows Point, but this nest is located approximately 0.9 mile from High Head Industrial Basin and 1.4 miles from Coke Point, well outside of the buffer zone protective of nesting bald eagles. Multiple double-crested cormorants were observed at both locations as well, loafing on the water, flying over, and resting on powerlines. Although cormorants are not birds of conservation concern in this area, bald eagles prey on them and can compete with them for nesting sites. All species observed during the fauna survey except two nonnative species (European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*)) are protected under the MBTA.

4.12.2 Environmental Consequences

4.12.2.1 No-action Alternative

Bird populations would be subject to existing conditions at the site. Vessel traffic is highly prevalent at and near the site, which likely causes a minor level of disturbance to bird populations by flushing birds and introducing noise to the environment. Additionally, existing operations including demolition and razing activities, Port operations, trucking, and warehousing at the site increase ambient noise and present risks to birds that may fly into the demolition zone. However, with the lack of natural areas onsite, birds would be at minimal risk for collisions. The No-action Alternative would likely result in a yet-to-be-determined commercial development of Coke Point that is not included as part of this project. If the High Head Industrial Basin were to be filled in a large area of aquatic and riparian habitat and potentially some shrub and forested areas around the basin would be lost, reducing nesting, foraging, and resting habitat for birds. Although bird populations would be subject to existing conditions under the No-action Alternative, future impacts could arise as part of the potential development of Coke Point and the High Head Industrial Basin, and any activities in these areas would continue to cause noise impacts and disrupt behaviors.

4.12.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Buildings and structures would permanently alter the environment and could increase the risk of bird collisions. Additional lighting in the project area would increase light pollution, which could affect bird behavior by causing disorientation, confusion, and exhaustion. However, the additional lighting would likely not be noticeable given the existing high nighttime light intensities (see Section 4.13.2 for detailed information on lighting changes). The construction of the marginal wharf would introduce additional impervious structures into bird habitat, and all terrestrial vegetation in the project area, though sparse, would be removed, resulting in a loss of habitat.

Temporary impacts on birds would occur because of dredging and increased vessel traffic, both during construction and during terminal operations and periodic maintenance dredging. Dredging at the project area would increase turbidity and could impact the foraging ability and behavior of sea birds. BMPs will be used to minimize release of sediment and increased turbidity during dredging, and any elevated turbidity would be localized to the immediate vicinity of the dredging operations. The vessel traffic necessary for construction and dredging could flush birds that are stationary on the water; however, this traffic would not be substantially higher than the existing vessel traffic in the Patapsco River. The presence of additional vessels and equipment in the project area would also increase noise, which could disturb birds, likely causing them to avoid portions of the project area for the duration of the work. This would effectively result in a loss of habitat for birds during times of exclusion. However, the lack of landside natural areas at the site, expansive open water adjacent to the site, and the small number of birds observed on the water during the June 2024 bird survey suggest that impacts on birds and their habitat would be minimal.

4.12.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Construction of the High Head Industrial Basin DMCF would remove approximately 11.2 acres of upland habitats (forested and shrub), 40 acres of aquatic habitat, and 1 mile of riparian habitat along the edge of the basin. Vegetation clearing, construction of the DMCF, and placement of dredged material would likely cause birds to avoid the project area for approximately 3 years. Following completion of the dredged material placement, the site would be closed, and the area could be revegetated with native species. Although this would provide new upland habitat (e.g., grasses, shrubs, forest) for upland bird species, this would represent a permanent loss of riparian and aquatic habitats and for the birds that use them. Nine species observed during the June 2024 fauna survey would no longer be supported at the High Head Industrial Basin, including least tern, a state-listed threatened species. The remaining species may be dispersed, but these species and others could return following dredged material placement.

Coal Pier Channel DMCF at Sparrows Point

The construction of the Coal Pier Channel DMCF would reduce the area of water available to birds for loafing and foraging; however, the June 2024 fauna survey did not indicate that birds heavily used the channel. The DMCF would permanently impact the project area but would not cause a substantial impact on birds due to the expansive open water area adjacent to the site.

Existing Nearshore MPA DMCFs

No new impacts on birds would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

NODS is an existing USEPA-designated ocean placement site; no new impacts on birds would occur.

4.13 Aesthetics / Viewshed

4.13.1 Affected Environment

Aesthetic resources are all the visual features of a landscape, including built and natural elements, that collectively shape the visual character of the landscape and create a sensory experience.

> **Visual character** of a landscape is the distinct pattern of elements that make one landscape different from another. Character is created by the combined effect of natural and built elements. The elements that contribute to visual character include landforms, topography, vegetation (structure and diversity), water, coastal edges, viewscapes, architecture, land use patterns, urban design elements, and cultural landmarks, among other features. Details within land use and land cover, such as presence of transportation networks, wildlife, trash, air pollution, or visual clutter also influence character.

Visual Character

The area being evaluated for visual impacts, the area of visual effect (AVE), includes the region encompassing the project footprint, adjacent areas, and any areas with potential line of sight to any project element up to 3 miles away across waterbodies. The 3-mile limit is based on the distance that someone with normal vision, viewing at 5 feet above sea level, can see before the curvature of the earth causes the surface to drop below the horizon. Viewers at elevation can see farther but were not included because of the highly diminished effect on views at greater distances. Additionally, the AVE lies within the Atlantic Coastal Plain, which features relatively flat topography. Bordered by Bear Creek to the west, the Patapsco River to the south, and Old Road Bay to the east, Sparrows Point is within the viewshed of residential neighborhoods, commercial areas, roads, and parks. The areas with potential views of the project are located in Baltimore County, Baltimore City, and Anne Arundel County, including neighborhoods in Dundalk, Sparrows Point, Turner Station, Watersedge, Inverness, Edgemere, Fort Howard, Stoney Beach, and Riviera Beach (Figure 38).

Dominant land uses in the AVE are industrial, commercial, medium- and high-density residential, institutional, and recreational (Figure 39 and Table 29). The area is home to historic buildings and parks that reflect activities during multiple war efforts and past steelmaking activities. Residential areas across the surrounding waterways are primarily single-family or smaller, multi-family dwellings on small lots interspersed with waterfront parks and some commercial establishments, including restaurants and marinas. In these areas, water is a dominant visual element in the landscape.

Figure 38. Area of Visual Effect

The yellow line represents the maximum extent of view, a buffer of 3 miles around all elements of the project. The project would not be in view of all areas within the AVE.

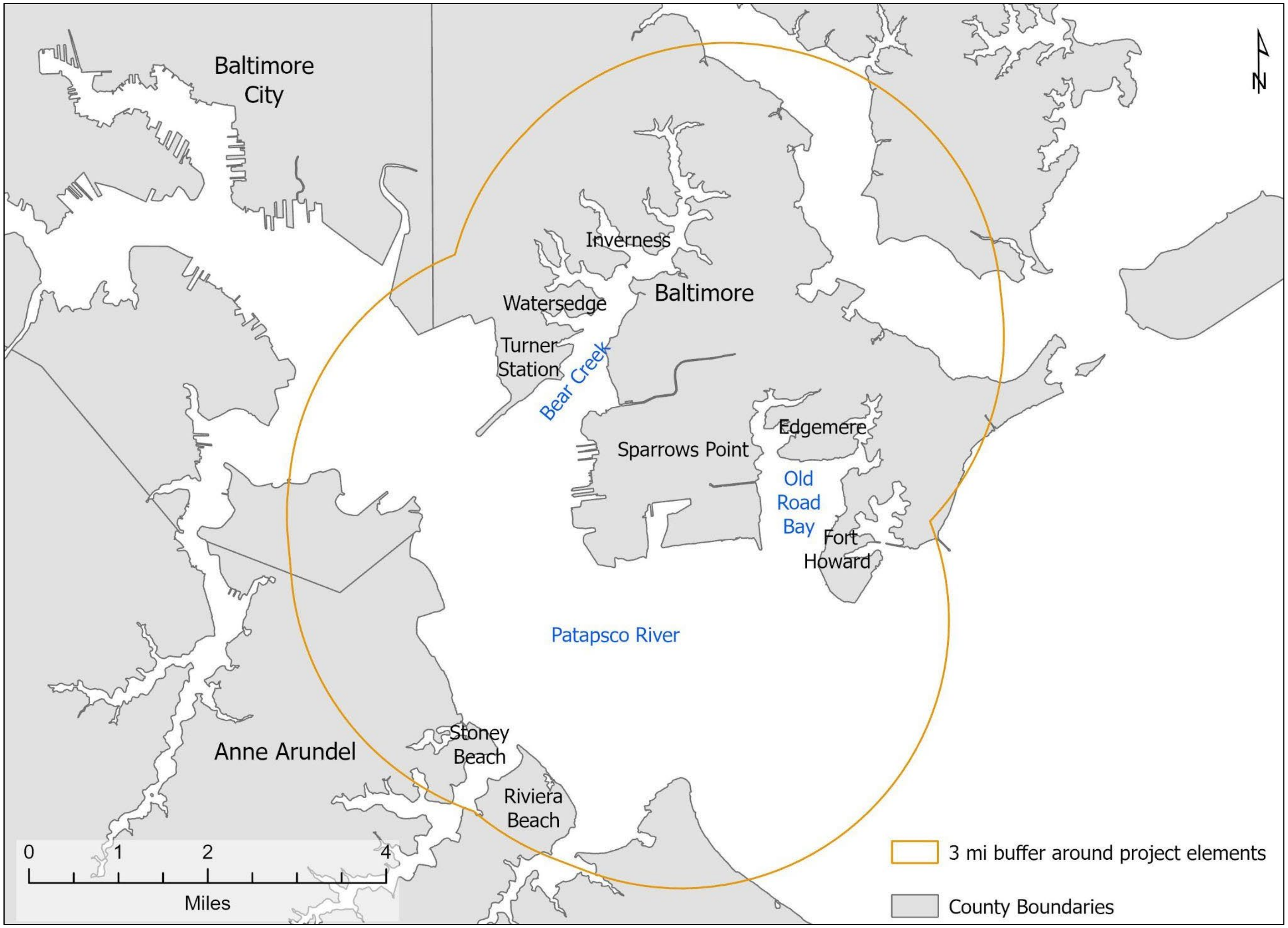


Figure 39. Land Uses within the AVE

Source: Maryland Department of Planning 2010b

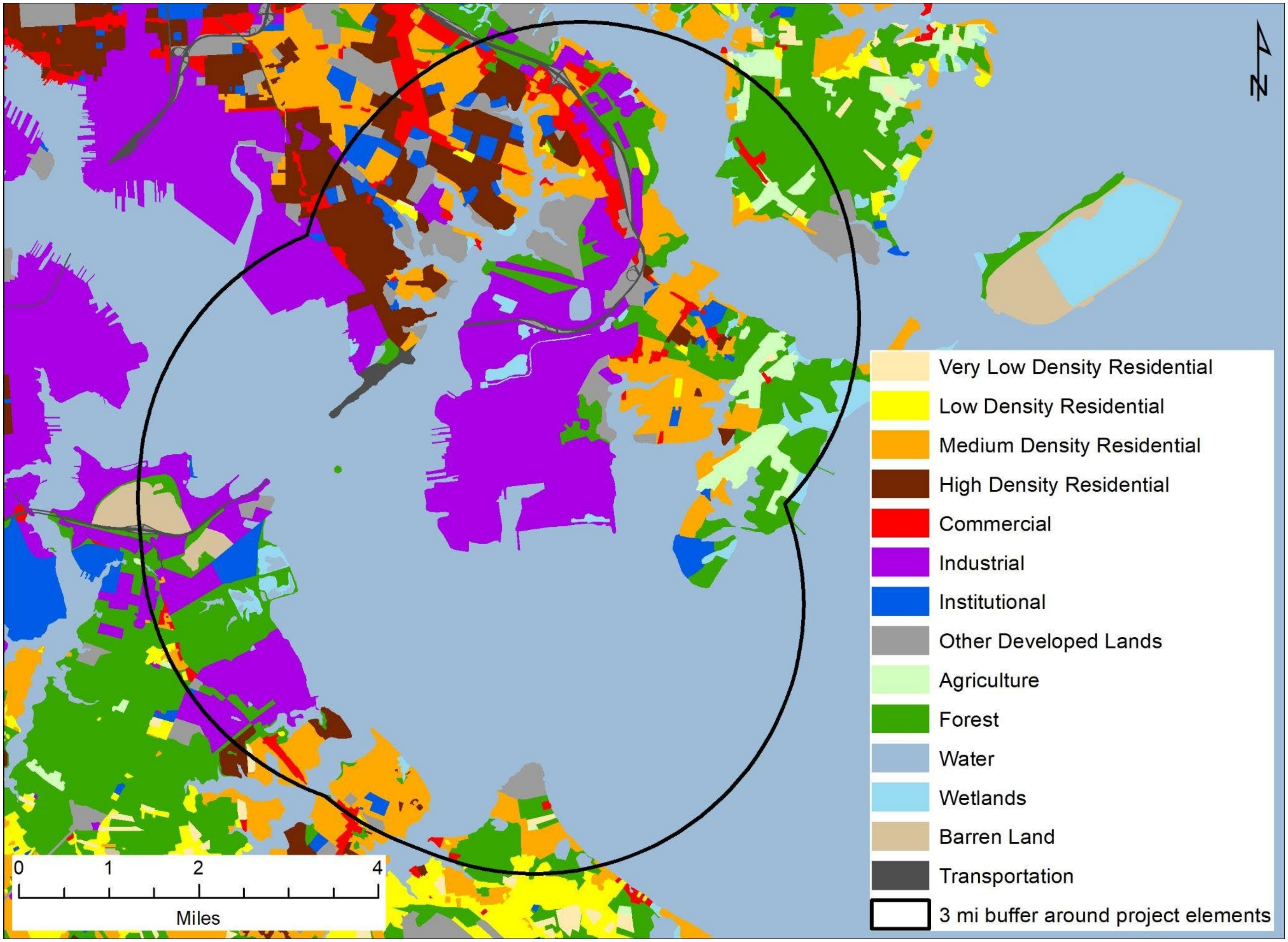


Table 29. Land Uses within the AVE

Land Use	Defining Features
Industrial	Manufacturing and industrial parks, including warehouses, storage yards and parking areas. Includes onsite roads and rail lines; varied visual elements common in industrial sites including buildings, piles of raw or recycled materials, and grass / shrubs growing haphazardly; trees are often growing between industrial and other users
Commercial	Retail and wholesale services, including associated yards and parking lots
High density residential	Row houses, garden apartments, high-rise apartments, and mobile home parks; more than eight dwelling units per acre
Medium density residential	Detached homes (single family or duplex) or rowhouses; two to eight dwelling units per acre
Institutional	Schools, military installations, churches, hospitals, and government offices
Forest	Scattered dense parcels of forests, thin buffer strips of permanent vegetation, wetlands
Open urban	Parks, recreation areas, golf courses, community centers, and cemeteries; small- to medium-sized parks dominated by grass, forest land cover, and recreational infrastructure; some parks include historic buildings, large, paved areas, and equipment (e.g., cannons); small parks are integrated into neighborhoods while medium-sized parks are isolated parcels, reached by a dedicated road
Transportation	Major highways, rail, and shipping

Notes: The information in this table was derived from Maryland Department of Planning 2010a.

The AVE contains pockets of natural vegetation, including parks and green spaces scattered throughout the area. Some green spaces are characterized by permanent vegetation, including trees, shrubs, and grasses and attract wildlife, such as birds, deer, and small mammals. Recreational and commercial vessels traverse the nearby waters, which also include parts of the Captain John Smith Chesapeake National Historic Trail, Star-Spangled Banner National Historic Trail, and the Chesapeake Gateways Network.

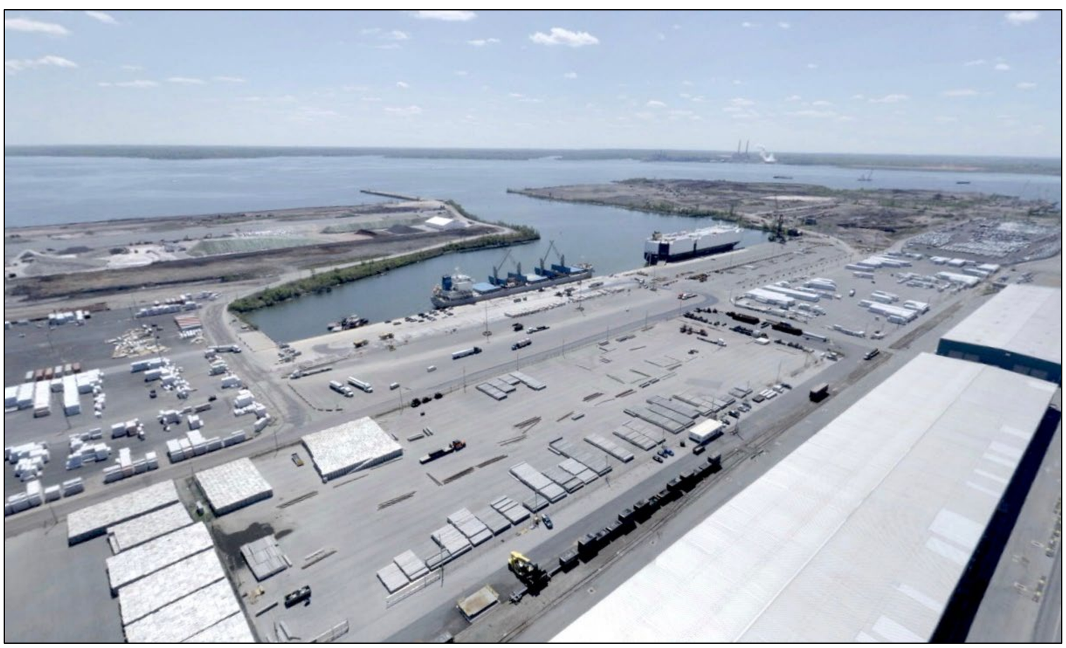
TPA Property in Sparrows Point. The visual character of the TPA property at Sparrows Point, Maryland reflects its industrial heritage with a majority of land for industrial, commercial, and transportation uses (Photograph 1). The land within the TPA property is characterized by warehouses and industrial complexes traversed by roads and rail lines with limited greenery (Photograph 2). Linear features are visually dominant, and new warehouse buildings provide clean lines and functional appeal. The landscape has historically featured heavy steel structures (e.g., Photograph 1), piles of raw materials, storage tanks, and conveyances, although most of those features have been removed from the campus. Multiple modern warehouses, some dozens of acres in size, and large car lots create an ordered and repetitive visual environment (see Photograph 2). The overall impression is of a massive-scale industrial / commercial aesthetic with a few tall and large structures, including concrete silos (150 feet) and cranes of 161 feet tall, creating some vertical scale contrast. Existing lighting around warehouses and in parking lots contributes to a persistent nighttime glow.

Photograph 1. Historic Photograph of Sparrows Point

Source: Center for Land Use Interpretation

Photograph 2. Current View of Sparrows Point

This photograph was taken from a vantage point similar to Photograph 1. Source: TPA



South of the Project. Areas to the south of the project include several waterfront neighborhoods in northern Anne Arundel County where the Patapsco River is a dominant, scenic element in the landscape. The communities of Stoney Beach and Riviera Beach lie about 2 miles south of the project area across the Patapsco River. The waterfront areas of Stoney Beach are dominated by townhomes and industrial areas, and Riviera Beach is mostly made up of detached single-family homes, many with private docks

(Photograph 3 and Photograph 4). Most of the waterfront is hardened with riprap revetment or wooden bulkheads, and little natural shoreline remains. Just north of Stoney Beach is an industrial area that includes the Herbert A. Wagner and Brandon Shores generating stations with tall stacks (Photograph 5). Fort Smallwood Park is about 2.5 miles due south of the project, and it includes a fishing pier, playground, walking trails, and beaches (Photograph 6).

Photograph 3. Boardwalk over Bulkhead in Stoney Beach Featuring Waterfront Townhouses

Photograph 4. Typical Residential Street in Riviera Beach

Photograph 5. Herbert A. Wagner Generating Station Taken from Stoney Beach.

Photograph 6. View of Sparrows Point across the Patapsco River from Fort Smallwood Park.

Mobile and permanent cranes and warehouse buildings are visible, as well as a cargo vessel at the marine terminal.

West of the Project. The area west of the project has varied land uses. The Cox Creek DMCF is approximately 1.6 miles across the Patapsco River from Coke Point. Just south of Cox Creek is the Swan Creek natural area with acres of intact forest, wetlands, and natural shoreline. Just north of Cox Creek is Fort Armistead Park, which contains little green space but provides access to the water with a fishing pier and boat launch (Photograph 7). I-695 is approximately 1 mile west of Coke Point. Across Bear Creek from the project area are residential communities including Turner Station, Watersedge, and Inverness. These communities are characterized by medium- and high-density residential development interspersed with waterfront parks (Photograph 8). Community parks, such as Fleming Park, Peach Orchard Park, and Inverness Park, are found along Bear Creek and provide recreational opportunities (e.g., basketball courts, baseball diamonds) and access to the water via fishing piers and boat launches. Long water views are common but may include foreground views of I-695 and other infrastructure support structures (Photograph 9).

Photograph 7. Fort Armistead Park toward Coke Point

Photograph 8. Fleming Park with Basketball Courts in the Foreground and Typical Residences in the Background

Photograph 9. View of Sparrows Point from Fleming Park with I-695 in the Foreground

North of Project. Areas north of the TPA property include residential, commercial, recreational, and institutional land uses. These residential areas are generally characterized by detached single-family homes on small lots, and waterfront homes often have piers (Photograph 10). There are also waterfront commercial establishments, such as marinas, dockyards, and restaurants (Photograph 11). Mid-length to long views with open water as a dominant element are common. Directly north of the TPA property is the Sparrows Point Country Club, which is bounded by Grays Road to the east, rail lines to the south, and Bear Creek to the west. In the area to the north of the SPCT project area, industrial and commercial areas are present and characterized by warehouses, piles of wood, recycling, and other industrial products and truck traffic (Photograph 12).

Photograph 10. Residential Area along Bear Creek, North of Project Area

Photograph 11. Marina, Restaurant, and Charter Boat Business along Bear Creek

Photograph 12. Key Brewing and Surrounding Area

East of the Project. The areas east of the TPA property are primarily residential and park lands. The communities of Edgemere and Fort Howard lie across Old Road Bay from the TPA property and are dominated by medium-density residential development with waterfront businesses like marinas (Photograph 13). Many of the waterfront homes in these communities have private docks, and much of the shoreline is hardened with riprap revetment or wooden bulkheads. Fort Howard Veterans Park allows limited public access but has significant areas of forest, as well as an abandoned multi-story veteran's hospital and support buildings. Just to the east of Fort Howard Veterans Park, Fort Howard Park is forested with historic elements and signage (e.g., several batteries, artillery) (Photograph 14), walking trails, and playground equipment.

Photograph 13. Marina in Edgemere

Photograph 14. Battery and Artillery at Fort Howard Park

Light

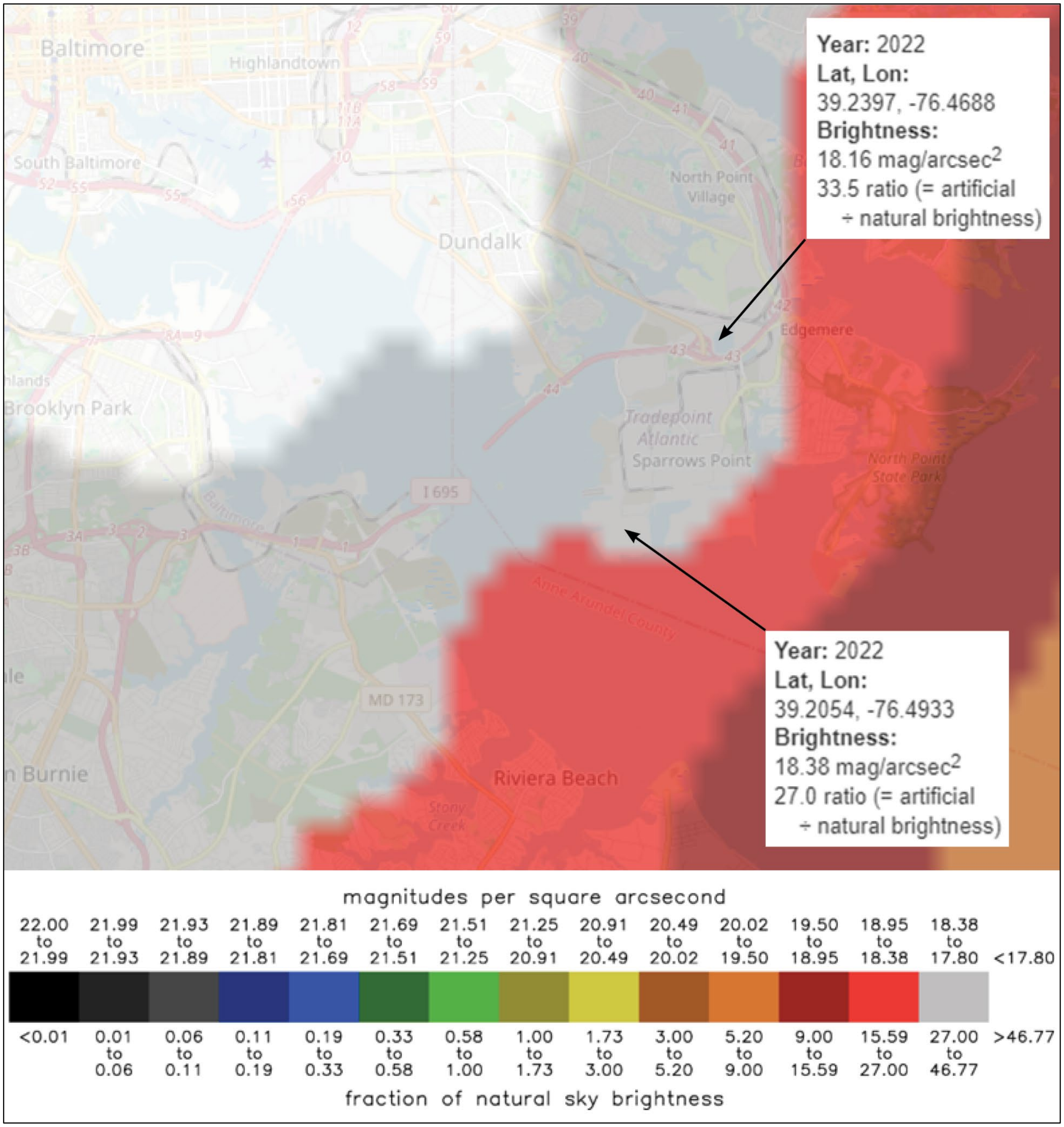
The AVE has a substantial amount of nighttime light. Areas within the AVE are close to downtown Baltimore, which is well-lit, and the existing light sources from warehouses, roads, and parking lots within the TPA property and nearby Port facilities, all of which contribute to the existing nighttime light environment. Although light levels vary somewhat across the site, light at Sparrows Point is currently 27 times the brightness of a natural sky (Lorenz 2022). Currently, there are about 500 lit acres at Sparrows Point, which includes 196 acres immediately north and east of the proposed terminal lit by 45 high-mast lights, and 40 acres adjacent to the current berths that are lit at all times with pole-mounted lighting (typically at an elevation of approximately 35 feet). The mast lights are directed downward, but the existing pole-mounted lights adjacent to the berth are floodlights. There are also about 275 acres of warehouse truck courts and support lots that are lit, generally with downward-directed lighting. Figure 40 identifies the night sky brightness by color. The brightest night sky (white) includes Baltimore and nearby areas. The TPA property, including the SPCT project area (gray), is slightly darker than downtown Baltimore, and south of the SPCT project area, the night sky is slightly darker (red).

> **Light** is defined in terms of day and night illumination levels and is an important element of visual character. The height and angle of lighting (with and without shielding) determines the levels and spatial extent of artificial illumination. Light that radiates upward into the night sky can brighten the night sky and create an ambient glow.
>
> **Glare** is directed or reflective light, and its intensity is a function of the intensity of the light source, the reflectivity of the surface, and the angle of the light source hitting the reflective surface.

Figure 40. Nighttime Light in the AVE

Inset boxes show details for Coke Point and the High Head Industrial Basin.

Source: Lorenz 2022



Characterization of Viewers

Viewer sensitivity is a function of the activities being undertaken, the type of view, the duration of the view (including whether views are static or dynamic), and perception of the landscape aesthetics. In general, the more that someone is focusing on the view versus directing their attention to other activities, the more sensitive they would be. Also, viewers tend to be more sensitive when the view is more expansive, and the duration of the view is longer. Viewers would also tend to be more sensitive to changes in landscapes that are considered scenic or highly aesthetically pleasing, although local preferences can vary.

The most sensitive viewer groups within the AVE would be those using sensitive viewing areas, which include waterfront parks or recreational areas, waterfront or water-adjacent residences, and waterfront and water-adjacent businesses, such as retail and commercial establishments. Recreators at local nature and historic parks include family and other groups, walkers, anglers, and birdwatchers. Restaurant diners may be sensitive to views. Marinas have transient and resident boaters who may spend substantial time on the waterfront. Other potentially sensitive viewers of Sparrows Point include recreational boaters who would have dynamic views of Sparrows Point as they traverse the project area. Other potentially less sensitive viewers include institutional workers and visitors, commuters, travelers on local roadways and waterways, and operators of freight rail lines.

Regulatory Review

The Baltimore County Code of Ordinances (Baltimore County 2024) has visual aesthetic objectives primarily for residential areas but not manufacturing and industrial zones.

The project area at Sparrows Point is zoned as *manufacturing, heavy in an industrial, major district*, which has limited restrictions on building heights and setbacks. In a *manufacturing, heavy* zone, the maximum building height is unlimited, but height is restricted to three stories or 40 feet if a structure falls within 100 feet of a business or residential zone (Baltimore County 2015). In *manufacturing, heavy* zones, the minimum front setback is 25 feet (front of the structure to centerline of street is 50 feet), and the minimum rear and side setbacks are 30 feet. Within 150 feet of an interstate highway, any residential zone or street right-of-way abutting a residential zone, there is a minimum 75-foot front setback, 50-foot rear setback, and 50-foot side setback.

> **Setback** is the minimum distance a house, building or other structure must be from the property line.

The project area zoning of *manufacturing, heavy in an industrial, major district* does not list any lighting restrictions. However, within Baltimore County zoning regulations, the section on off-street parking and loading (§ 409) states that any fixture used to illuminate any parking facility should reflect the light away from residential lots and public streets (Baltimore County 2023). The same regulations for manufacturing, restricted and manufacturing, light, restricted zones (§ 243.6 and § 250.6) add to this restriction that lights shall not exceed the height of the highest building (Baltimore County 2023).

4.13.2 Environmental Consequences

The visual impact assessment covers the construction and operational phases of the proposed alternatives. The analytic methods applied here are based on the FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015). The FHWA Guidelines call for analyzing the visual aesthetic quality by incorporating preferences for natural and cultural environments (i.e., built environments) and then assessing how changes in visual quality and the sensitivity of viewers combine to create impacts of proposed changes.

> **Visual quality** reflects how people perceive and appreciate landscapes based on their distinctive visual characteristics. People value a sense of order and coherence in a landscape and the unique qualities that make landscapes culturally significant. Visual quality is assessed in terms of the presence of preferred elements and public sensitivities and concerns.

Visual Impact Assessment

To assess the impacts on visual quality due to the alternatives, the FHWA guidelines were supplemented with evidence from visual preference research and by rating project renderings, as viewed from key observation points (KOPs). Visual preference research suggests commonalities of preferences across viewer groups but effects of changes in industrial and commercial landscapes, as are present in Sparrows Point, are less studied than natural or residential / mixed-use landscapes. To represent local concerns, public comments were incorporated into KOP selection and assessment of landscape changes from KOPs. For the KOPs, views of the landscape with and without the project were simulated using computer-aided design renderings overlaid on photographs taken from KOPs.

Viewer sensitivity or level of concern was evaluated by considering the visibility of the project, the proximity of viewers, the relative number of viewers, the duration of views, and the type of viewer and associated expectations (e.g., recreationist, commuter, resident). The magnitude of aesthetic changes due to the project was assessed first by evaluating landform, vegetation, water, and human-built features in terms of natural and cultural harmony and typical viewer preferences. The compatibility of the most visually dominant elements for each KOP was then assessed in terms of *spatial dominance, scale contrast, and compatibility*, as defined in Smardon et al. (1988) (Table 30). The compatibility ratings are then modified by viewer sensitivity and use of distance zones to describe the expected relative importance of such changes to the viewer. Specifically, the view was divided into foreground (up to 0.5 mile from viewer), middleground (0.5 to 2 miles from the observer), and background (2 miles to horizon from viewer). Changes were given decreasing weight with increasing distance zone because changes that occur farther from the viewer are generally less apparent and intrusive.

Table 30. Rating System Used to Assess Visual Impact

Modifier	Definition	Rating
Spatial dominance	The prevalent occupation of a space in a landscape by an object(s) or landscape element; can be described in terms of being dominant, co-dominant, or subordinate.	Dominant – The modification is the major object or area in a confined setting and occupies a large part of the setting. Co-dominant – The modification is one of the major objects or areas in a confined setting, and its features are of equal visual importance. Subordinate – The modification is minimal and occupies a minor part of the setting.

Modifier	Definition	Rating
Scale contrast	The difference in absolute or relative scale in relation to other distance objects or areas in the landscape; can be described in terms of being severe, moderate, or minimal.	Severe – The modification is much larger than the surrounding objects. Moderate – The modification is slightly larger than the surrounding objects. Minimal – The modification is much smaller than the surrounding objects.
Compatibility	The degree to which landscape elements and characteristics are still unified within their setting; can be described in terms of being compatible, somewhat compatible, or not compatible.	Compatible – The modification is harmonious within the setting. Somewhat Compatible – The modification is more or less harmonious within the setting. Not compatible – The modification is not harmonious within the setting.

Source: Smardon et al. 1988

Light and Glare

Light and glare levels were assessed for temporary and permanent lighting by evaluating the relative change in the intensity of light levels and glare, given existing conditions. Daytime glare and nighttime light and glare conditions were assessed for changes in intensity.

Analysis of Impacts

The degree of change from the existing visual quality without the proposed project to the visual quality with the proposed project is used to determine the level, or intensity, of visual impacts. The discussions of impacts consider the overall viewer sensitivity level, the visual dominance of the features, and the project's combined impact on viewers from the most affected viewing locations depicted in KOPs.

Section Organization

The rest of the section presents steps 2 through 6 of the aesthetic analysis:

1. Assess existing landscape character and visual resources (see Section 4.13.1)
2. Identify the AVE, visual sensitivity of viewers, and KOPs
3. Assess baseline visual quality of the project location
4. Simulate landscape with the proposed project
5. Evaluate change in view, light, and glare characteristics with the proposed project
6. Describe overall impact of the proposed project on visual resources

Assess the AVE, Visual Sensitivity of Viewers, and KOPs

For this analysis, a region including a 3-mile buffer around all project elements was evaluated to encompass locations with potential viewers (details in Section 4.13.1). This AVE was refined through site visits and geographic information system (GIS) viewshed analysis to determine which areas had views of project elements given vegetation, structures, and topography. Proposed project elements located on or near the waterfront would be visible to viewers on the water, but some potentially sensitive areas close to the inland High Head Industrial Basin, including the new Sparrows Point Park and nearby adjacent homes, would not have a physical line of sight to the proposed High Head DMCF based on a “bald earth” viewshed analysis that only includes topographic features and not trees or structures (Figure 41).

Viewer Types and Sensitivities

The most sensitive viewer groups within the AVE would be those using waterfront parks or community recreational areas, waterfront or water-adjacent residences, and waterfront and water-adjacent businesses, such as retail and commercial establishments (Table 31). Recreationists at local nature and historic parks would include families and other groups, walkers, anglers, and birdwatchers. Viewers in these locations would be most likely to be taking in the view for extended periods and be sensitive to changes. However, sensitivity to project elements diminishes with distance from the project, and viewer sensitivity is reduced when existing visual quality is low or moderate. Commercial business users are potentially sensitive to the views, including waterfront restaurant diners, marina users, and transient and resident boaters traversing Sparrows Point. These viewers may spend substantial time on the waterfront, and boaters would potentially have foreground but dynamic (i.e., transitory) views of project elements. The transitory nature of boater views tends to make them somewhat less sensitive than stationary viewers. Low-sensitivity viewers would include those with instantaneous views of the project from I-695 or other roads and those engaged in activities that require dedicated attention, such as sports.

Table 31. Sensitive Viewer Types

Viewer Type (Activity)	Distance of Views	Number of Viewers	Duration	Sensitivity
Recreational boaters	Foreground	Many [1]	Transitory	Moderate
Waterfront park users	Middleground Background	Varies by park	Transitory or Long	Low-High
Waterfront business users (marinas, restaurants)	Background	Many	Transitory	Moderate-High
Residents with views	Middleground Background	Many	Long	Moderate-High

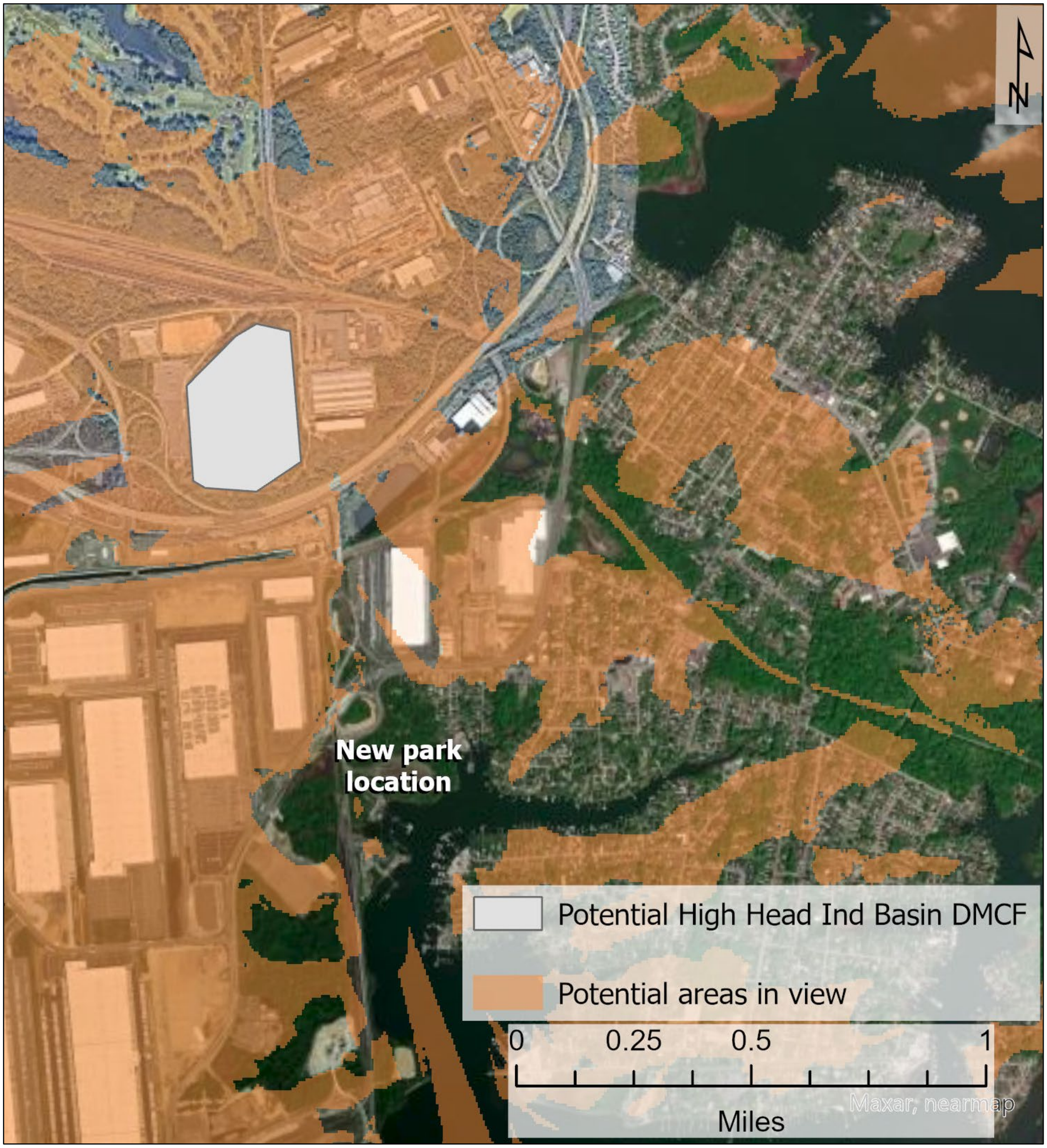
Notes:

1 – The relative number of boaters in this area is not known, but 182 boats were recorded in the vicinity on a holiday weekend, and 93% of weekend boaters were likely recreational.

Public comments received about the project reflect how residents in the AVE tend to have a sense of ownership over nearby visual resources and generally desire to maintain the existing landscape. This attitude is typical and tends to reflect how visual resources contribute to sense of place and home-buying choices. Residents expressed concern about the height of the offshore DMCF and the effects that it would have on views, particularly on water views for boaters near North Point and all views of Sparrows Point residences. Further, the community was interested in the aesthetics of the end use of the DMCF. Other concerns included the visibility of containers and any increases in ship traffic and litter.

Figure 41. Bald Earth Viewshed Analysis of High Head Industrial Basin

This viewshed analysis uses a bald earth model that includes only topographic features — not trees or structures — to delineate potential views of High Head Industrial Basin. The orange overlay depicts areas with potential views, based only on topography, and greatly overestimates areas with views. The areas without orange overlay are useful for showing areas that would not have views of the DMCF, including public use areas to the east of the project. Views of the DMCF from the west and other residential neighborhoods would be blocked by structures and landscape features that are not included in this viewshed analysis.



Selection of Key Observation Points

Candidate KOPs (cKOPs) were identified to represent potential viewing locations of all major project elements, regardless of the visual prominence of the elements (Figure 42). In the field, cKOP locations were visited and photographed (before leaf out) to document the presence or absence of views of the project sites. Potential project views from roads were similarly documented. KOP photographs from land were taken with a 50-megapixel camera with 42-millimeter equivalent focal length, and photographs from water were taken with a 12-megapixel camera with 45-millimeter equivalent focal length. Both configurations approximate the average view cone and magnification of the human eye. Photographs from land were taken from a 5-foot height, and photographs from water were taken from a 10-foot height, reflecting a viewer on a recreational boat. The direction of view in a photograph was chosen in the field to represent the approximate center of project elements.

The list of sites with views was refined by identifying particularly sensitive viewers, as informed by public comments, expected number of viewers, and types of use. The KOPs selected were determined to be most representative of locations where the project elements had potential to change views for sensitive viewing areas. The chosen locations covered accessible waterfront locations and designated recreational trails. Although specific residences were not represented, public or community gathering sites near homes were meant to represent nearby residences with views of the project. They incorporate viewers of the major project elements, including the High Head Industrial Basin DMCF, any offshore or nearshore DMCFs, and the marine terminal. The water trail represented by the shipping channel in the vicinity of Sparrows Point (Captain John Smith Chesapeake National Historic Trail, Star-Spangled Banner National Historic Trail, and the Chesapeake Gateways Network) was the only designated historic element with views of the proposed project. An in-water KOP was selected to the south of Sparrows Point to represent these boating viewers (Figure 42).

Baseline Visual Assessment

According to FHWA guidelines (2015), “Baseline visual quality is the value viewers place on the existing visual character of the affected environment based on their visual preferences. It is defined by the status of natural harmony, cultural order, and project coherence within the AVE.”

The views of the project area from residential neighborhoods vary in quality by location and from the KOPs, they are generally of moderately low visual quality due to multiple factors (Table 32). Naturalness is a key contributor to landscape aesthetic preferences and the percentage of area in forest area and permanent vegetation is often low from the selected KOPs. Further, some natural areas characterized by thin forest patches are of lesser quality than natural elements with larger patches that are common to the region. From a cultural landscape perspective, the high proportion of industrial area in the views tends to be a strong predictor of low public landscape preferences (Sklenicka and Zouhar 2018). Alternatively, maintaining historic integrity of the views is another common preference, but it is difficult to apply in the Sparrows Point area, which may be more accurately classified as a post-industrial reuse site without historic precedence due to the relatively recent removal of steel plant equipment. The water area that is prevalent in many views counteracts these negative effects to some degree, creating a more harmonious view than would otherwise be present.

Figure 42. Candidate KOPs and KOPs Selected for Evaluation

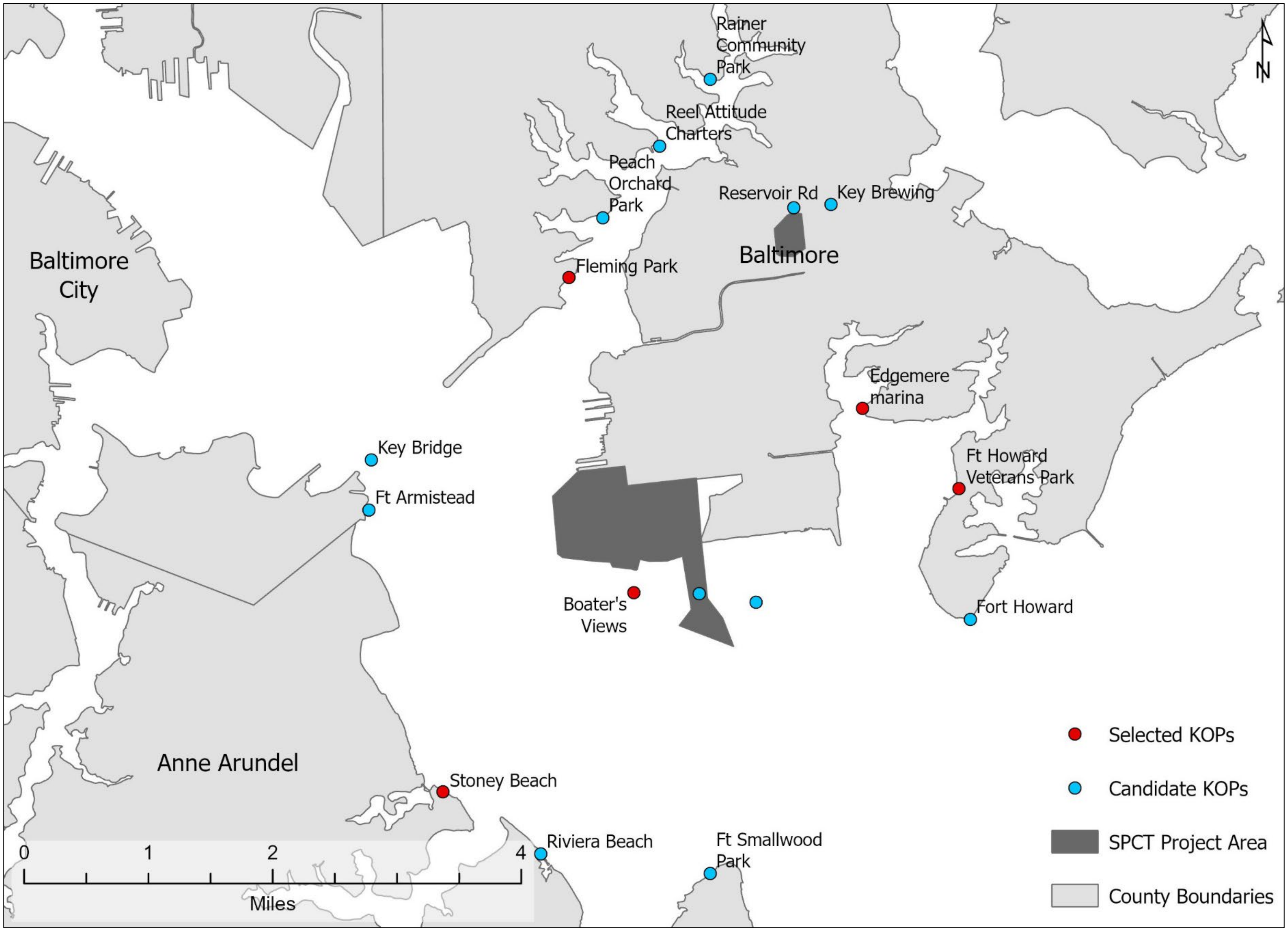


Table 32. Visual Ratings Based on Preference Research

Quality Level	Environment Type	Description
Very Low	Natural	Little to no natural vegetation, highly altered landscape
Very Low	Cultural	Disordered conditions, lack of design cohesion, perceived as blight (e.g., active landfills, abandoned industrial areas)
Moderate	Natural	A blend of natural and human-built elements; vegetation has average qualities for the region
Moderate	Cultural	Orderly and familiar design elements typical of the region
Very High	Natural	Pristine or unmodified from natural state; harmonious and / or distinct views marked by elevation variation and forests or other permanent vegetation
Very High	Cultural	Visually appealing developed areas or superior design cohesion that blend with natural elements (e.g., historic districts)

Although the landscape in the AVE does not conform to traditional metrics of visual quality in terms of having high-quality natural elements or highly cohesive and attractive cultural elements, the public comments suggest that changes in cultural elements and open water views remain important to some viewers. Research and comments suggest that viewers place particular value on water views, which could increase viewer sensitivity in this context.

Impacts on Visual Quality

The magnitude of aesthetic changes due to the proposed project was assessed first by evaluating landform, vegetation, water, and human-built features in terms of natural and cultural harmony and typical viewer preferences. Given the existing conditions, the project elements are generally consistent with the existing landscape in that they would be introducing human-built features similar to those that already exist in the project area and are not converting much natural vegetation to developed uses, although some patches of vegetation would be removed. The compatibility of scale and elevation are assessed for each alternative in terms of changes, as viewed from KOPs.

A total of seven KOP views were analyzed for visual impacts (Table 33). The project visual impact ratings are provided per KOP under the action alternative when elements are potentially visible. The Coal Pier Channel DMCF proposed under the Combined Options Alternative was not visually rendered, but a 100-acre DMCF was analyzed and is provided to evaluate the maximum possible impact of any offshore DMCF. The 100-acre DMCF was an option that was considered during this NEPA process but has been eliminated from analysis (see Section 2.2.2 for more details). Refer to Table 30 for definitions of visual impact rating terms.

Table 33. List of KOPs and View Types for Visually Important Project Elements

KOP	View Types of Visually Important Project Elements
1. Stoney Beach	Background view of terminal, portions of Coal Pier Channel DMCF, and other elements on Sparrows Point
2a. Edgemere Marina	Middleground view of terminal (1.6 miles to wharf); no view of Coal Pier Channel DMCF due to land and structures between marina and DMCF
2b. Edgemere Marina	Middleground view of High Head Industrial Basin (1.4 miles to DMCF)

KOP	View Types of Visually Important Project Elements
3. Fleming Park	Background view of terminal and middleground view of Coal Pier Channel DMCF (1.7 miles to DMCF) (No-action Alternative and Combined Options Alternative)
4a. Boaters' view	Foreground view of terminal
4b. Boaters' view	Foreground view of Coal Pier Channel DMCF
5. Fort Howard Veterans Park	Background view of terminal

4.13.2.1 No-action Alternative

Visual Quality

No significant aesthetic impacts are anticipated because all changes would be consistent with existing conditions. Buildings would be co-dominant with minimal scale contrast resulting in high compatibility. Because the specific location and design of buildings cannot be defined at this time, the exact visual character and design of redevelopment are not depicted nor analyzed.

Light

No significant light or glare impacts are expected because the projections for additional lights would not noticeably increase existing light levels and therefore would not adversely affect daytime or nighttime viewers in the AVE. Construction activities, maintenance dredging, and directional lighting are likely to be consistent with current conditions and activities and would have little to no impact.

4.13.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Visual Quality

Table 34 presents the permanent elements that are relevant to assessing aesthetics associated with construction of a terminal and shipping channel improvements, and temporary elements deployed during the construction phase are shown in Table 35.

Table 34. Permanent Terminal Features of Aesthetic Importance

Feature	Description	Height	Visual changes
Wharf and berth equipment	– Supports multiple types of equipment and up to nine STS cranes	– Wharf deck has a 14-foot elevation – Active crane is 330 feet above deck – Stored crane has 484 feet above deck (to top of boom)	– Wharf creates a newly developed and ordered shoreline – Added cranes would be about twice as tall as existing shipyard cranes (based on active position)
Railyard	– Rail cars stacked two containers high with RMG cranes above	– Rail cars about 20 feet high – Gantry crane height is 93 feet	– Increase in footprint of rail activity increases transportation footprint (far from shoreline)

Feature	Description	Height	Visual changes
Shipping container yard	– Contains blocks of containers stacked up to six containers high; storage capacity of approximately 50,000 containers total	– Maximum of about 50 feet above deck	– Increase in shipping container storage area near shoreline adds more linear and ordered features
Terminal area	– 5 buildings – 42 high mast lights – Mixed pavement types	– Building height of up to 42 feet above grade or lower – Mast lights 120 feet above grade	– Buildings add more linear and ordered features – Mast lights increase onsite light but are shielded to minimize spill light and glare
Vessel traffic	– Additional 500 container vessels per year	– Maximum container vessel heights of 186 feet but would vary due to cargo	– Vessels in transit and at berth would temporarily add tall built features to the landscape – Some vessel heights would be consistent with existing vessel traffic

Table 35. Temporary Construction Elements of Aesthetic Importance

Element	Description	Duration	Visual changes
Dredging	Performed mechanically using water-borne equipment and a clamshell bucket and using landside equipment where possible and practical	3 years with expected 8-month dredging period in each	Equipment would be periodically positioned in water close to historic boat trails
Construction lighting	Light plants would be used to illuminate work zones near dawn and dusk to enable a full workday. Lighting may be directional for short periods	2.5 years	Light plants could create light spillover and glare into sensitive areas, depending on whether trees or buildings are present between construction site and receptors
Construction equipment	Heavy equipment (e.g., mobile cranes, pile drivers) would be used during various phases of terminal construction	2.5 years	Equipment may be positioned near the water at times and be visible to nearby boaters

The majority of operational project elements of the wharf, buildings, shipping container yard, and railyard are similar in scale and form to existing features on Sparrows Point. In general, visual impacts of common elements would have minimal impacts due to the low or moderate visual impact ratings for sensitive viewers. Most project elements would have similar spatial dominance (be co-dominant), low scale contrast, and be largely compatible with existing structures. Many visual changes would be in the background view for many viewers or are compatible with existing low-moderate visual quality in the AVE.

The largest visual impact of the common elements would result from the STS cranes that would be positioned at the wharf. They would create minimal or moderate scale contrast with existing structures and equipment for most views and have severe scale contrast for boaters. The cranes are about twice the height of existing cranes during operation, which are among the tallest features in the landscape. Additionally, up to nine cranes would be grouped at the wharf, creating the potential for spatial dominance. These cranes would be within the foreground view for boaters, the middleground view of some residential areas in Baltimore County, and in the background views for shore viewers in Anne Arundel County and from Fort Howard Park to the east of the project site. The KOP analysis that follows provides details on visual impact ratings of the STS cranes.

The shipping container yard would be close to the shoreline but would be co-dominant with existing land uses because, at an estimated 153 acres, it would be similar in size to the roll-on / roll-off (Ro-Ro) parking just north of the proposed container yard. Both elements create large patches of uniform land usage consistent with this large industrial site. The shipping container yard would have shoreline frontage of around 2,000 feet and a maximum height of 60 feet of stacked containers. This height would be slightly higher than existing buildings and structures, including a currently leased warehouse on the west side of the peninsula (50-feet high) that is similarly close to shore and industrial facilities (Photograph 15). The land uses adjacent to the shore would also be consistent and compatible with existing structures (Photograph 16).

Boaters transiting within a half mile of the shoreline in the southern part of Sparrows Point would have a foreground view of multiple proposed project elements but would have low sensitivity to the transient views they encounter. Given the land uses and patterns that would be encountered by boaters traversing waters near Sparrows Point, the proposed project elements are compatible with existing uses. The existing shoreline of Sparrows Point is a patchwork of natural vegetation (primarily thin strips of trees and shrubs), bulkheads, a wharf, industrial facilities of varying heights, and other features. The proposed shipping container yard would convert a part of the shoreline from a thin strand of trees to an ordered and developed use. The scale contrast of the STS cranes for boaters would be severe but impacts are projected to be minimal given the transient nature of the view from boats and existing low visual quality.

Photograph 15. Existing Elements on Sparrows Point

These two photographs show height variability as viewed from a boat. The top photograph shows a 50-foot-high warehouse, and the bottom photograph shows an industrial facility with silos that are about 150 feet in height.

Photograph 16. Existing Shoreline Conditions on the South Side of Sparrows Point

These photographs show the southern shoreline conditions as seen from a boat. The top photograph shows a broad view of the southern shoreline. The bottom photograph shows the view toward the entrance of the proposed terminal.

KOP Visual Impact Assessment

The visual impact ratings of the common elements (Table 36) suggest that most project elements would have low visual impact (Figure 43 through Figure 46). The most notable visible change is the addition of the STS cranes, which have low-moderate scale contrast from all views except the transient boater view (KOP 4a), which has a severe scale contrast but low viewer sensitivity (Figure 45, Table 36). For the Stoney Beach view (KOP 1), the cranes would be spatially dominant and create a moderate scale contrast, given that they are taller than existing features. The viewers from Stoney Beach are considered to have moderate sensitivity due to the unobstructed long water view of Sparrows Point. However, given that the full landscape view incorporates many industrial elements such as the Herbert A. Wagner and Brandon Shores generating stations with tall stacks (see Photograph 5 in Section 4.13.1), all common elements, including STS cranes, were deemed somewhat compatible. Edgemere Marina is considered to have moderate sensitivity due to substantial use by recreationists. The STS cranes would be visible from the marina but would be compatible with the existing visual character (Figure 44). Fleming Park was judged to have low to moderate sensitivity because the view towards visually prominent project elements (terminal and DMCF) is dominated by a foreground view of I-695 support structures. Boaters traveling near the terminal may experience severe scale contrast due to the height of the STS cranes in their foreground view, but their sensitivity would be low to moderate due to the typical transitory nature of the views and the character of the full length of the shoreline being traversed that includes many industrial and commercial structures (Figure 45). From the Fort Howard Veterans Park view (KOP 5), the STS cranes are equal in height to an existing structure (Figure 46) but increase the percentage of the view with tall built structures, creating moderate scale contrast.

Table 36. Visual Impact Ratings from KOPs with Views of Common Elements

KOP	View Type	Spatial Dominance	Scale Contrast	Compatibility	Viewer Sensitivity
1. Stoney Beach	Background	Dominant (STS cranes) Co-dominant (all other elements)	Moderate	Somewhat compatible (All elements)	Moderate
2a. Edgemere Marina – towards terminal	Middleground	Subordinate	Minimal	Compatible	Moderate
3. Fleming Park	Background – terminal	Co-dominant	Moderate	Compatible	Low to moderate
4a. Boater view – terminal	Foreground	Co-dominant (for dynamic view)	Severe (STS cranes)	Somewhat compatible	Low to moderate
5. Fort Howard Veterans Park	Background	Co-dominant	Moderate	Compatible	Moderate

Figure 43. Views from Stoney Beach (KOP 1) toward Sparrows Point Showing Existing Conditions and Proposed Project Conditions

A 100-acre offshore DMCF is depicted in the image showing proposed project conditions to estimate maximum possible impacts of the proposed Coal Pier Channel DMCF.

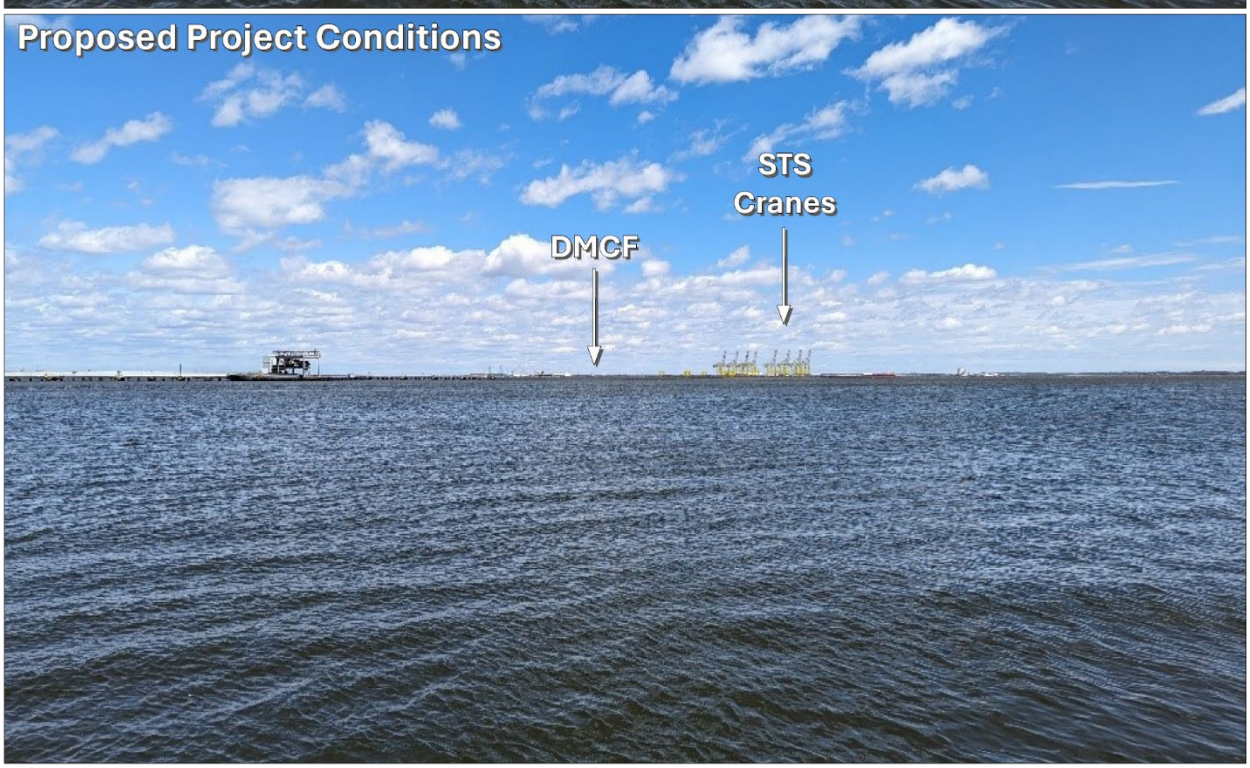


Figure 44. View from Edgemere Marina (KOP 2a) toward Sparrows Point Showing Existing Conditions and Proposed Project Conditions

Figure 45. Boater's View (KOP 4a) toward Sparrows Point Showing Existing Conditions and Proposed Project Conditions

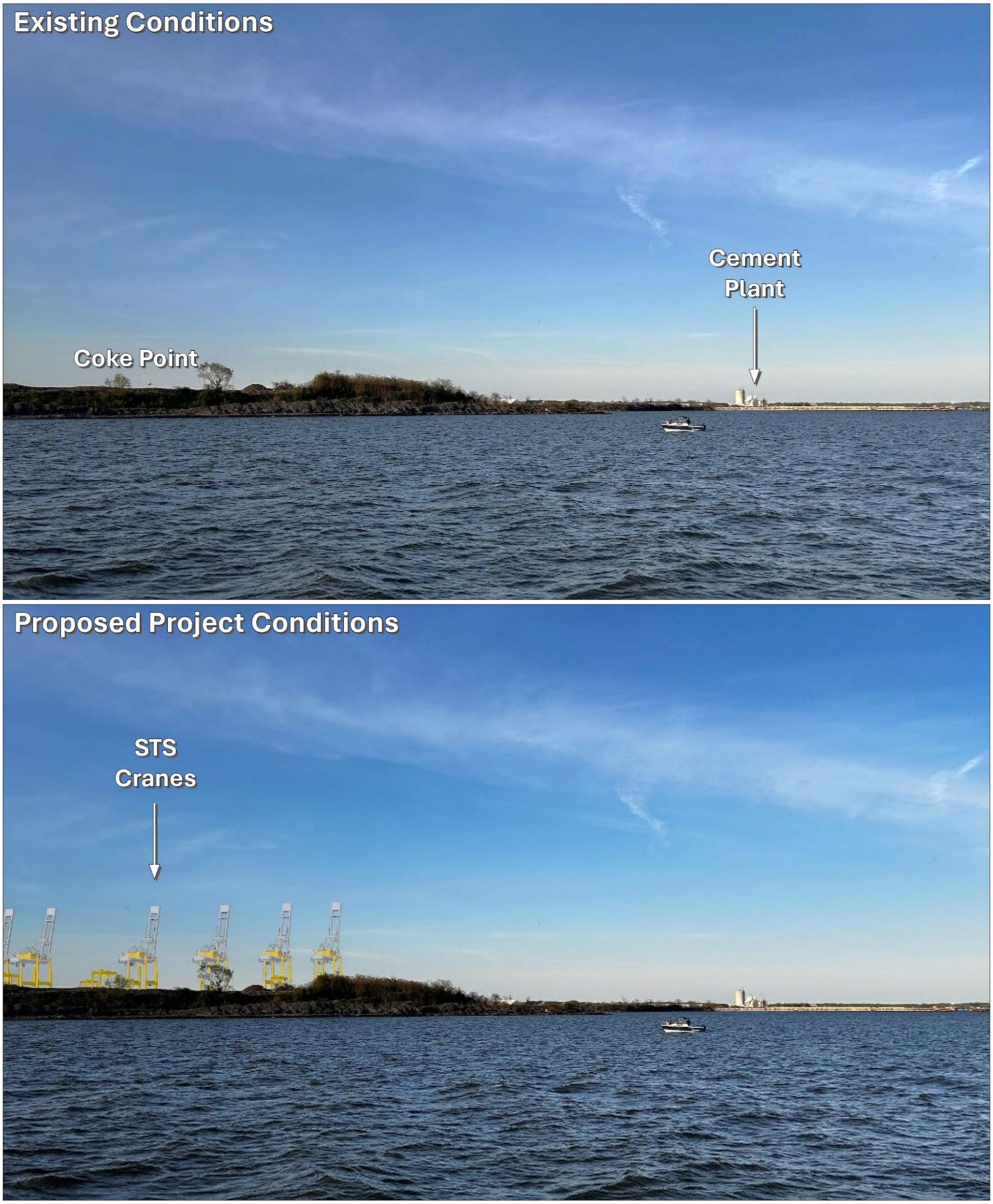
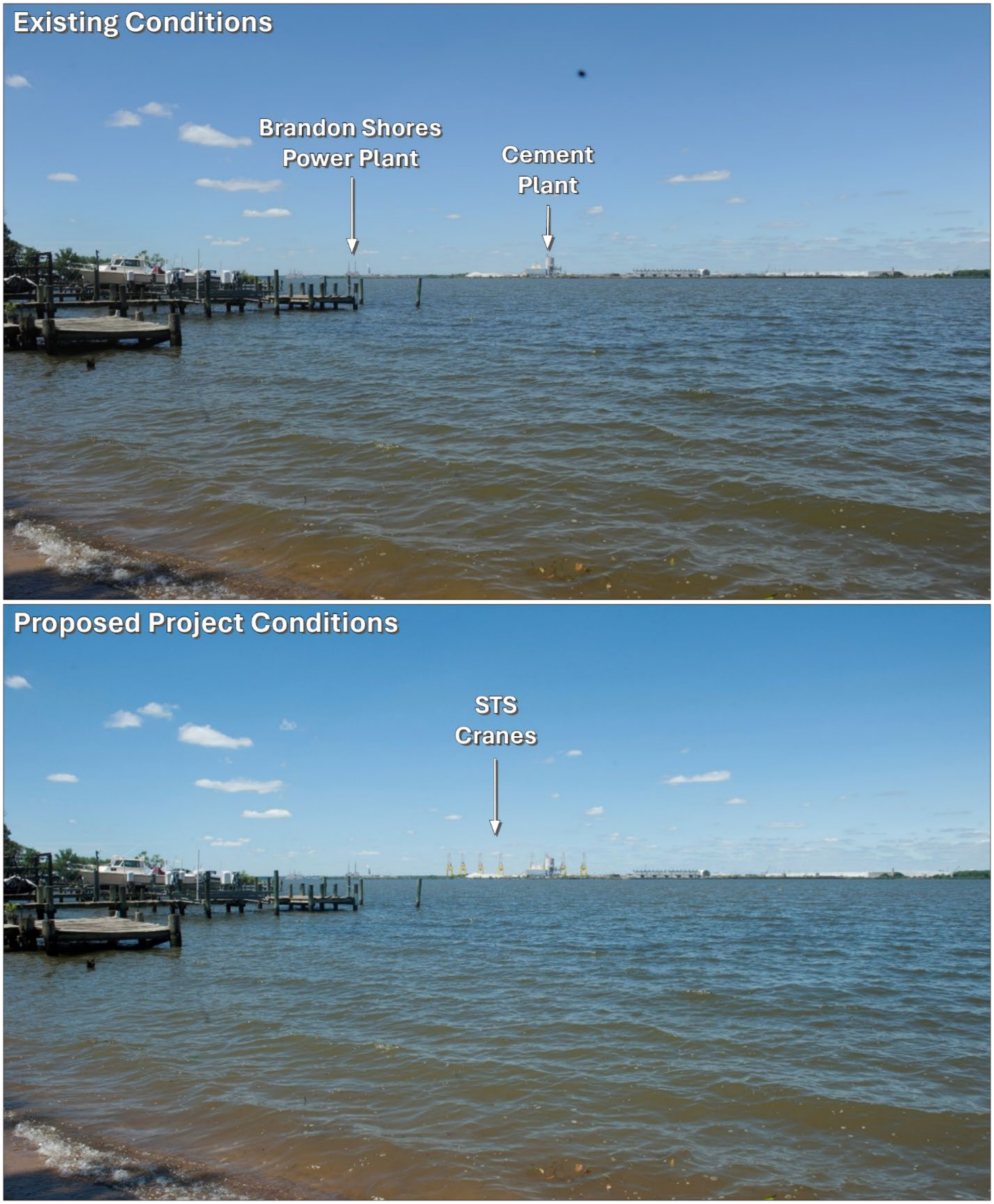


Figure 46. Fort Howard Veterans Park (KOP 5) View toward Sparrows Point Showing Existing Conditions and Proposed Project Conditions



Light

The proposed common elements would create new sources of light in the AVE, but the additive effect would be minimal given existing conditions. The existing very high level of brightness would tend to mask effects of increased light, and buildings, vegetation, and landforms would block light to some residential and commercial areas. The 42 new mast lights on about 150 acres would almost double the number of high mast lights and represent 23% more acreage of lit area on Sparrows Point. Even though this new lighted area represents a proportionally large increase, it would not necessarily be noticeable given the existing high nighttime light intensities that are already 27 times the brightness of a natural sky (see Figure 40 in Section 4.13.1). Similar lighting would also be expected for the expansion of warehouses and Ro-Ro facilities under the No-action Alternative.

The daytime glare is currently moderate due to light-colored pavements and buildings and adjacent water bodies providing natural sources of glare. The effect of new buildings and infrastructure on daytime glare would be minimal due to these existing sources of glare. In the project area, there is little vegetative cover to mitigate reflectance from lightly colored buildings and land / road surfaces, and the common elements would have little effect on this screening. Additionally, building windows would be minimal. Vehicle windows on site would be likely to produce glare if sunlight or artificial light reflects off surfaces. Nighttime glare would be moderate from existing lighting particularly where floodlights are used. The additional lighting would generate some effects on nighttime glare because it would be masked by existing sources of glare and minimized through the use of downward-directed lights and matte finishes on buildings and equipment.

4.13.2.3 Combined Options Alternative – Dredged Material Placement

Visual Quality

The impacts from these activities are minimal given the low visual impact ratings from the KOPs (Table 37).

Table 37. Visual Impact Ratings from KOPs with Views of Onshore and Offshore DMCFs

KOP	View Type	Spatial Dominance	Scale Contrast	Compatibility	Viewer Sensitivity [1]
1. Stoney Beach	Background (Coal Pier Channel DMCF)	Co-dominant	Minimal	Somewhat compatible	Moderate
2b. Edgemere Marina	Middleground (High Head Industrial Basin DMCF)	Co-dominant	Moderate	Somewhat compatible	Moderate
3. Fleming Park	Middleground (Coal Pier Channel DMCF)	Co-dominant	Minimal	Somewhat compatible	Low to moderate
4b. Boater View	Foreground (Coal Pier Channel DMCF)	Co-dominant	Minimal	Somewhat compatible	Low to moderate

Notes:

1 – See Section 4.13.2.2 for explanation of viewer sensitivities

High Head Industrial Basin DMCF

Although a DMCF at the High Head Industrial Basin has some potential for spatial dominance given the increase in elevation, the site has limited visibility to sensitive viewers due to the existence of trees, buildings, trainyards, landfills, and other development that would block views. From the Fleming Park KOP, the proposed High Head Industrial Basin DMCF site would be about 1.7 miles away, but views would be blocked by Greys Landfill and the I-695 bridge structure over Bear Creek. Further, a building close to the High Head Industrial Basin DMCF has a height of 50 feet, suggesting the DMCF would be spatially co-dominant with minimal scale contrast, and therefore, does not exhibit scale incompatibility. Buildings and trees would limit views from Edgemere Marina. Viewers on I-695 would be able to see the site but given the short duration of viewing and the dominance of industrial and transportation land uses along the highway (Photograph 17), vehicle drivers and passengers are not considered sensitive.

Photograph 17. View toward High Head Industrial Basin from Westbound I-695

Coal Pier Channel DMCF at Sparrows Point

For the Coal Pier Channel DMCF, visual impacts would be minimal. The 15-foot height of the facility would not have high height contrast with other elements on Sparrows Point, such as existing warehouses that are generally 42 feet. The external side of the perimeter sand dike that surrounds the DMCF would be covered with armoring stone, which would be a new type of shoreline in this part of Coke Point, changing the color and form of the shoreline. Therefore, the dike around the site would differ from much of the existing shoreline that contains slag, large stone, and concrete shoreline stabilizing fill, small trees, and scrubby vegetation. The effect on views from Stoney Beach (KOP 1) would have minimal scale contrast (see Figure 43). The effect on Fleming Park views (KOP 3) is likely to be nominal given the partially obstructed view in this direction due to I-695 in the foreground of this view. Boaters (KOP 4) would have transient foreground views of the DMCF.

Existing Nearshore MPA DMCFs

No new visual impacts would occur from the use of the existing MPA DMCFs due to consistency with existing conditions.

Existing Ocean Disposal Site

No new visual impacts would occur from the use of the NODS due to consistency with existing conditions.

KOP Visual Impact Assessment

Visual impacts were found to be minimal (Table 37). From Stoney Beach (KOP 1), the Coal Pier Chanel DMCF would be somewhat compatible with the existing landscape (Figure 43). The Coal Pier Channel DMCF would be visible from Fleming Park (KOP 3) but would be co-dominant with existing landscape features (Figure 47). Boaters traversing the waters around Sparrows Point (KOP 4) would have a foreground view of the Coal Pier Channel DMCF but would have minimal scale contrast with existing features (Figure 48). The Coal Pier Channel DMCF would not be visible from KOPs 2 or 5. At Edgemere Marina (KOP 2), the High Head Industrial Basin DMCF may be visible but would be somewhat compatible with the existing landscape elements in the area (Figure 49).

Light

Temporary lighting added during construction and material placement in the DMCFs would add light sources that would be directional and could create increases in nighttime light and glare, particularly during dawn, dusk, and early evening hours. The Turner Station neighborhood is at a middleground distance from the proposed offshore DMCFs and the High Head Industrial Basin DMCF.

High Head Industrial Basin DMCF

For the High Head Industrial Basin DMCF, light and glare are likely to be blocked by trees and buildings, leading to no impact.

Coal Pier Channel DMCF at Sparrows Point

Temporary lighting added during construction and material placement in the Coal Pier Channel DMCF would add light sources that would be directional and could create increases in nighttime light and glare, particularly during dawn, dusk, and early evening hours. The temporary periods of additional nighttime light and glare could be noticeable by boaters, but given the existing sources of floodlights on Sparrows Point, the effect would not be significant. Similarly, the Turner Station neighborhood, with middleground views, may notice the directional lights but at a distance of over 1.7 miles from the closest edge of the project, the effects are anticipated to be minimal. Light to the Edgemere neighborhood would be blocked by structures and vegetation on land. Given the distance of sensitive viewers and existing light levels, effects are not anticipated to be significant.

Figure 47. View from Fleming Park (KOP 3) toward Sparrows Point Showing Existing Conditions and Proposed Project Conditions

A 100-acre offshore DMCF is depicted in the image showing the proposed project conditions to estimate the maximum possible impacts of an offshore DMCF.

Figure 48. Representative Boater's View (KOP 4b) toward Coke Point Showing Existing Conditions and Proposed Project Conditions

A 100-acre offshore DMCF is depicted in the image showing the proposed project conditions to estimate the maximum possible impacts of an offshore DMCF.

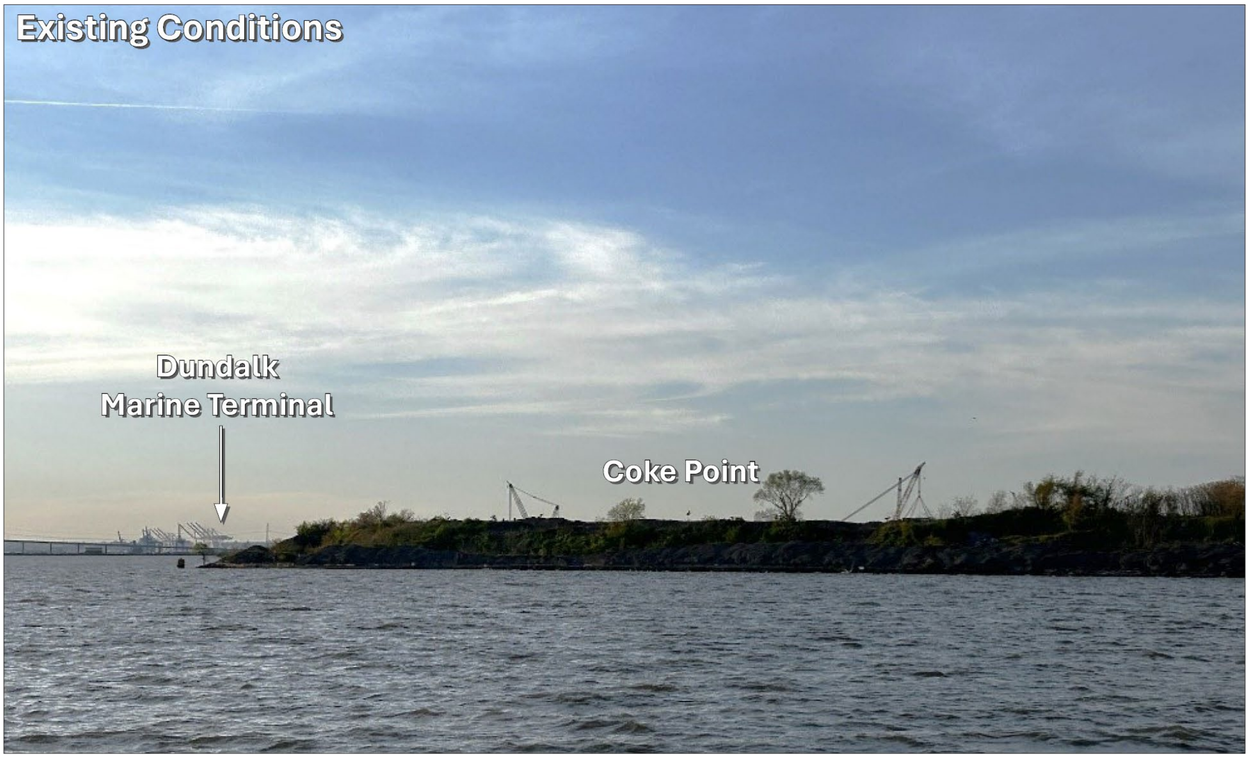


Figure 49. View from Edgemere Marina toward High Head Industrial Basin (KOP 2b) Showing Existing Conditions and Proposed Project Conditions

Existing Nearshore MPA DMCFs

No new impacts from light would occur from the use of the existing MPA DMCFs due to consistency with existing conditions.

Existing Ocean Disposal Site

No new impacts from light would occur from the use of the NODS due to consistency with existing conditions.

4.14 Recreation

4.14.1 Affected Environment

The areas surrounding the project area support a rich array of water-based recreational activities including boating, kayaking, paddling, and fishing. A 2023 vessel traffic survey (EA 2023) classified the boating activity near the project area during one summer weekend day, holiday weekend day, and weekday. The survey indicated that recreational boaters commonly use the Patapsco River and Bear Creek. Although most of the boats observed near the project area were primarily in transit between different locations, some could be observed fishing or sailing throughout the Patapsco River and Bear Creek. Recreational boats observed included both pleasure boats and personal watercraft. Several commercial charter boats, tugboats, and Coast Guard boats were also observed traveling through the Patapsco River during the survey.

There are several high-traffic boating destinations in the general vicinity of the project area including Fort Howard Park, North Point State Park, and Hart-Miller Island State Park, which is accessible exclusively by private boat. Hart-Miller Island State Park is split into the north cell and the south cell. No recreation activities occur in the north cell. Instead, this portion of the island is managed as natural habitat, including wetlands, grasslands, and shallow water habitats that support a variety of wildlife. The south cell has been developed to support a variety of recreational opportunities and wildlife. Hart-Miller Island State Park offers both day-use and camping opportunities for visitors. Common activities at the park include hunting in lottery-assigned waterfowl blinds, fishing, hiking, and wildlife viewing. Visitors can launch boats from Rocky Point Park or the various boat ramps located throughout the area to access the island.

Other county and municipal local parks offer waterfront access for boats, paddle craft, or both including Fleming Community Center and Park, Turner Station Park, Watersedge Park, Concrete Homes Park, Merritt Point Park, and Fort Armistead. Additionally, the Canton Kayak Club, located at Anchor Bay Marina, offers kayak rentals and classes less than one mile from the project area. County and municipal parks near the project area provide the public with green spaces along the water and water access in the form of ramps, jetties, and fishing piers.

Three National Park Service water trails have been identified near the project area (Figure 50). The Patapsco River from Fort McHenry National Monument and Historic Shrine to Fort Howard is designated as a High Potential Route along the Star-Spangled Banner National Historic Trail. The trail as a whole tells the story of the War of 1812 in the Chesapeake Bay Region, and Fort Howard marks the location of the British troop landing during their invasion of Baltimore during the War of 1812.

The Captain John Smith Chesapeake National Historic Trail is the nation's first national historic water trail and interprets the past and present natural history of the Chesapeake Bay. The trail includes the entire Chesapeake Bay and many of its tributaries. The trail follows routes through the Patapsco River and Old Road Bay.

The Chesapeake Gateway Trails Network is a network of partners and places that provide visitors with opportunities to enjoy, learn about, and help protect the Chesapeake Bay watershed. There are several sites along the network located throughout the Chesapeake Bay and its tributaries. The Patapsco River leads to several network locations in Baltimore. The network also includes North Point State Park to the east of the project area.

Subsistence fishing is carried out primarily for personal or community consumption, rather than recreational or commercial purposes. Subsistence fishing can be an essential source of protein for individuals, families, or communities and support cultural practices. Subsistence fishing likely occurs in Maryland, but subsistence fishing is not distinguished from recreational fishing by natural resource managers, making it difficult to identify those who may be dependent upon fish for a portion of the household food supply. A study of subsistence fishing on the Anacostia and Potomac Rivers in the Washington, DC metropolitan area determined that people who partake in subsistence fishing may be from food insecure homes, but the primary reasons for fishing were to enjoying the outdoors, relaxing, and being among other fishers (Fisk and Calloway 2020). Fish caught recreationally were commonly shared with others, including food insecure households, in the community. A similar study has not been performed to investigate subsistence fishing on the Patapsco River, but it is assumed that fishers in the Baltimore area fish for similar reasons.

Generally, subsistence fishing in Maryland requires a fishing license, the same as recreational fishing (Baker and Tracy 2023); however, Maryland also has areas where fishing is permitted year-round without a fishing license (MDNR 2024h). Figure 50 shows the four license-free fishing areas near the project area, one location in Baltimore County and three locations in the Baltimore Harbor in Baltimore City; these locations are approximately 19.5 and 10.0 nautical miles from the project area, respectively. Although people could engage in subsistence fishing anywhere fishing is permitted, these license-free areas are the most likely locations.

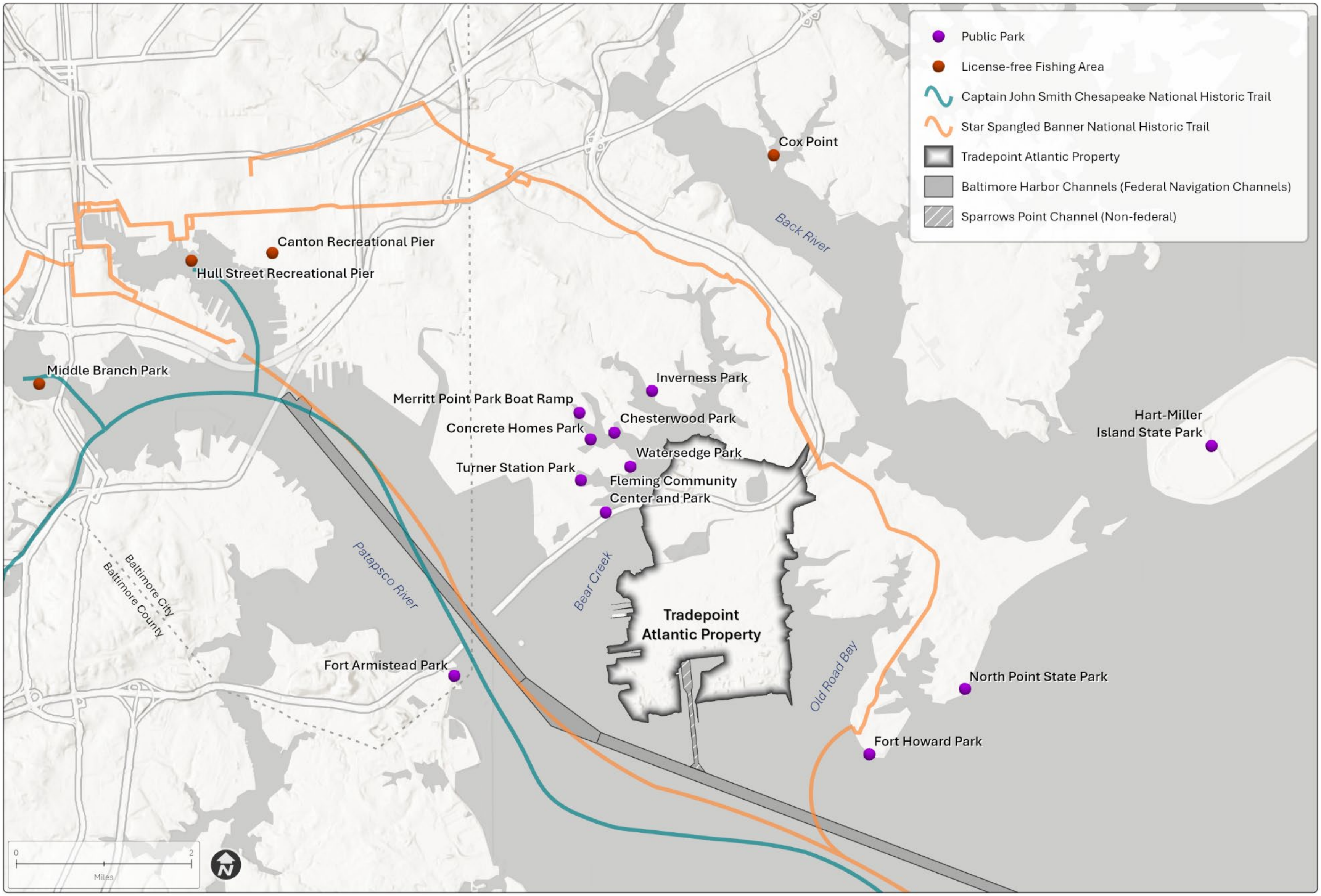
4.14.2 Environmental Consequences

This discussion of impacts on recreation is limited to the ability of the public to engage in water-based recreational activities including boating, kayaking, paddling, and fishing. The potential impacts on recreation from changes to the scenery and noise associated with the SPCT project are discussed in Sections 4.13 and 4.16.

4.14.2.1 No-action Alternative

Recreation activities would continue — boat traffic would proceed as normal, and the surrounding parks, boat landings, water trails, and fishing locations would continue to be used by the public. Boating activities would continue to be affected by commercial operations and maintenance dredging of the Sparrows Point Channel; however, these impacts on recreation would be temporary. Potential future development and associated construction at Coke Point would likely not include in-water work and would therefore not have an impact on water-based recreation.

Figure 50. Parks Near the Project Area with Water Access



4.14.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Recreational activities would be affected during construction and initial dredging activities, as well as during periodic maintenance dredging. Exclusion zones would be established during construction and dredging activities. Private vessels would need to navigate the Patapsco River accordingly, which could temporarily alter their ability to visit certain recreational sites. Exclusion zones would only be in place as long as necessary to ensure public safety. In-water activities would also increase turbidity in the water and could create additional boat wake, which could impact recreational activities such as fishing. Additional dredging activities associated with the project would increase the vessel traffic in the Patapsco River and force recreational boaters to navigate the channel more diligently. The channel currently experiences heavy vessel traffic with more than 2,500 vessel calls documented at the Port in 2021 (USDOT 2024b). Once constructed, operation of the SPCT would increase container vessel traffic by approximately 500 vessels per year.

Subsistence fishing at license-free fishing areas would not be directly affected by construction of the terminal or dredging of Sparrows Point Channel. Indirect impacts on fish from noise would also not interrupt subsistence fishing due to the distance of the fishing areas to the project area, as well as physical barriers (development) that would block the underwater transmission of noise (see Figure 31 through Figure 34). Subsistence fishing that occurs closer to the project area could be affected by construction and dredging activities (including noise), but these impacts would likely be minimal.

4.14.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

The High Head Industrial Basin is not located near recreational areas and work in this location would not affect water-based recreation. Any impacts at the basin would be limited to undesirable views and noise caused by construction equipment, and those impacts are discussed in Sections 4.13 and 4.16.

Coal Pier Channel DMCF at Sparrows Point

The Coal Pier Channel is not currently used for recreational boating and the dike for the DMCF would be nearly flush with the existing shoreline; therefore, the DMCF would not reduce the area available for recreational boating. The majority of the river channel would remain available for boating. An exclusion zone would exist during construction and boats would need to navigate the Patapsco River accordingly, which could temporarily alter their ability to visit certain recreational sites along the western shore of Coke Point. Exclusion zones would only be in place as long as necessary to ensure public safety.

Existing Nearshore MPA DMCFs

No new impacts on recreation would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

No new impacts on recreation would occur because NODS is an existing USEPA-designated ocean placement site.

4.15 Air Quality

4.15.1 Affected Environment

4.15.1.1 Regulatory Review

Under the Clean Air Act (42 USC 7401-7671q), the USEPA establishes the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for six pollutants of concern, called criteria pollutants — carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than or equal to 10 micrometers (PM_{10}), particulate matter less than or equal to 2.5 micrometers ($PM_{2.5}$), and lead (Pb). NAAQS represents the maximum background levels of pollutants that are considered safe with an adequate margin of safety to protect public health, including sensitive populations, such as children and the elderly, and human welfare.

The **Clean Air Act** is a comprehensive federal law enacted in the United States in 1970 (and amended in 1977 and 1990) to regulate air pollution and protect air quality. It authorizes the USEPA to establish national standards for air quality, limit emissions of hazardous air pollutants from industrial sources, and enforce compliance to safeguard public health and the environment.

The **National Ambient Air Quality Standards (NAAQS)** are pollution thresholds set by the USEPA under the Clean Air Act to protect public health and the environment. These standards specify allowable concentrations of certain pollutants in outdoor air, focusing on primary standards (protective of human health, especially vulnerable populations) and secondary standards (protect of public welfare, including ecosystems, visibility, crops, and buildings). NAAQS apply to six common pollutants known as criteria pollutants.

Criteria pollutants are a group of six common air pollutants regulated under the NAAQS due to their potential to harm human health and the environment. The criteria pollutants are particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb).

Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly adding to the pollutant concentrations measured in the ambient air or through transformation of precursor pollutants in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, nitrogen oxides (NO_x), SO_2, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3 and fine particulate matter ($PM_{2.5}$), are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. Suspended PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes. However, $PM_{2.5}$ can also be formed as a secondary pollutant through chemical reactions or by gaseous pollutants that condense into fine aerosols. In general, emissions of pollutants that are considered “precursors” to secondary pollutants in the atmosphere (such as VOCs and NO_x, which are considered precursors for O_3) are regulated to control the level of the secondary pollutants in ambient air.

Areas that meet the NAAQS for a criteria pollutant are designated “attainment” areas, and those where a criteria pollutant level exceeds the NAAQS are “nonattainment” for that pollutant. A “maintenance” area is one that has been re-designated from nonattainment status after submitting a clean ambient monitoring data set to USEPA and has an approved maintenance plan under Section 175 of the Clean Air Act. Each state has the authority to adopt standards stricter than those established under the federal program. Maryland has adopted the Federal NAAQS (Table 38).

Table 38. National Ambient Air Quality Standards

Pollutant	Primary / Secondary	Averaging Time	Level	Form
CO	primary	8 hours	9 ppm	Not to be exceeded more than once per year
CO	primary	1 hour	35 ppm	Not to be exceeded more than once per year
Pb	primary and secondary	Rolling 3-month average	0.15 µg / m^3 [a]	Not to be exceeded
NO_2	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
NO_2	primary and secondary	1 year	53 ppb [b]	Annual Mean
O_3	primary and secondary	8 hours	0.070 ppm [c]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
$PM_{2.5}$	primary	1 year	12.0 µg / m^3	annual mean, averaged over 3 years
$PM_{2.5}$	secondary	1 year	15.0 µg / m^3	annual mean, averaged over 3 years
$PM_{2.5}$	primary and secondary	24 hours	35 µg / m^3	98th percentile, averaged over 3 years
PM_{10}	primary and secondary	24 hours	150 µg / m^3	Not to be exceeded more than once per year on average over 3 years
SO_2	primary	1 hour	75 ppb [d]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
SO_2	secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2024d

Notes:

a – In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg / m^3 as a calendar quarter average) also remain in effect.

b – The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

c – Final rule signed 1 October 2015 and effective 28 December 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

d – The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

CO = carbon monoxide; Pb = lead; NO_2 = nitrogen dioxide; O_3 = ozone; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; PM_{10}= particulate matter less than or equal to 10 micrometers; SO_2 = sulfur dioxide

µg / m^3 = microgram(s) per cubic meter; ppb = part(s) per billion; ppm = part(s) per million

The SPCT project site is located within the Metropolitan Baltimore Intrastate Air Quality Control Region (AQCR). The AQCR includes areas of Baltimore City and the surrounding Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties. The AQCR is designated as moderate nonattainment under the 2008 ozone NAAQS (75 ppb). The region achieved a clean data determination based on three consecutive years of monitored ambient air data below the standard, but as of the time of this Draft EIS, Maryland has not submitted a State Implementation Plan (SIP) update and a request to redesignate the AQCR to maintenance under the 2008 standard. Under the 2015 ozone NAAQS (70 ppb), the AQCR is currently designated as serious nonattainment[3], which has lowered General Conformity regulatory applicability thresholds for ozone precursor pollutants (VOC and NO_X).

Within the AQCR, portions of Anne Arundel and Baltimore Counties, adjacent to Baltimore City, are classified as nonattainment for the 2010 SO_2 NAAQS. A clean data determination was issued in December 2022 (USEPA 2024e), but the areas have not yet been designated maintenance[4]. This AQCR is designated maintenance for the 2006 24-hour $PM_{2.5}$ NAAQS (35 microgram(s) per cubic meter [$\mu g / m^3$]). In February 2024, USEPA strengthened the $PM_{2.5}$ NAAQS by lowering the annual primary standard from 12 to 9 $\mu g / m^3$. However, the Metropolitan Baltimore AQCR is not among the regions projected by USEPA to be unable to meet the 9-microgram standard. See Table 39.

Table 39. Federal Attainment Status – Baltimore County

Pollutant	Classification
O_3 8-Hour (2008)	Nonattainment (moderate, with clean data determination)
O_3 8-Hour (2015)	Nonattainment (serious – redesignated from moderate 8 / 1 / 24)
PM_{10} (1987)	Attainment
$PM_{2.5}$ (2006)	Maintenance
CO	Attainment
NO_2 (2010)	Attainment
SO_2 (2010)	Nonattainment (with clean data determination accepted by the USEPA)
Lead	Attainment

Source: USEPA 2024e

Notes:

Data is current as of March 31, 2024 for Baltimore County Air Basin.

O_3 = ozone; PM_{10} = particulate matter smaller than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter smaller than or equal to 2.5 microns in diameter; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide

Maryland currently operates 24 ambient air monitoring stations around the state that measure ground-level concentrations of criteria pollutants, air toxics, meteorological parameters, and research-oriented parameters (MDE 2023). The Ambient Air Quality Monitoring Program within the Air and Radiation Administration of MDE maintains this network of monitoring stations (MDE 2023).

[3] Effective August 1, 2024.

[4] On September 6, 2024, the USEPA proposed to determine that attainment occurred by September 12, 2021.

In areas currently designated as nonattainment or maintenance, proponents of federal actions[5] are required to determine if a proposed action would increase emissions of non-attainment or maintenance criteria pollutants by more than *de minimis* amounts under General Conformity (40 CFR 93.150–93.160). General Conformity ensures that federal actions do not cause violations of the NAAQS or interfere with a state's timely attainment of the NAAQS and conforms with the SIP. General Conformity applies to a federal action if: (1) the action is not "presumed to conform" or not previously included in SIP emission budgets, or (2) the action is not explicitly exempt in the regulation, or (3) the total direct and indirect emissions exceed *de minimis* levels. If emissions of any criteria pollutant exceed *de minimis* levels in any calendar year, a Conformity Determination is required. Under this analysis, conforming with the SIP can be demonstrated through dispersion modeling of ambient impacts from projected emissions, or emissions can be mitigated (reduced below *de minimis* levels) by adjusting project schedules, reducing emissions with controls, or using external emissions offsets, or a combination of these approaches. In addition, temporary emission increases greater than *de minimis* amounts, may be allowed if future emissions resulting from the action are below baseline (current) emissions.

Hazardous Air Pollutants and Air Toxics

The potential air toxics associated with this project, both during construction and operation, involve diesel particulate matter (DPM) from diesel-powered equipment - assuming that no naturally occurring asbestos would be disturbed by terrestrial construction activities. During construction, DPM emissions would result from activities such as earthmoving, material handling, and heavy equipment operation. For the operational phase, emissions are anticipated from on-site diesel-powered equipment, trucks, and other mobile and stationary sources required to support ongoing activities.

DPM is a subset of total particulate matter, yet there are currently no federal or Maryland state regulations specifically targeting DPM. However, steps would be taken to minimize all emissions, including diesel emissions, by electrifying equipment typically powered by diesel engines in the past. MPA has been actively working to reduce diesel emissions through the Diesel Emission Reduction Act (DERA) Program, which funds projects that replace older diesel engines and reduce community exposure to pollutants and air toxics.

Greenhouse Gas Emissions and Climate Change

Existing greenhouse gas (GHG) sources in the SPCT project area include vehicles, marine vessels, and industrial operations, with additional residential and commercial sources throughout the region. MDE has reinforced the state's commitments and cooperative efforts aimed at attaining climate-related goals and expanded on the requirements of Maryland's Greenhouse Gas Reduction Act (GGRA). The 2030 GGRA Plan outlines strategic opportunities and actions directed at implementing projects and programs that emphasize climate initiatives. These efforts encompass a range of strategies, including comprehensive emission inventories, energy efficiency promotion, securing funding for green alternatives, and implementing innovative technologies. The GGRA Plan has set clear objectives to continue implementing new emission reduction projects, and the concerted efforts are estimated to ultimately yield a total of emissions reduction of 48% (2017 baseline year), achieving the 2030 GGRA goal. The Plan also intends

[5] Defined as an activity engaged in by a department or agency of the federal government or supported in any way by the federal government (including via financial assistance, licenses, permits, or approvals).

to incorporate GHG reduction strategies well into the future, ensuring sustained progress toward emission reduction and environmental protection (MDOT 2021).

4.15.2 Environmental Consequences

De minimis emissions thresholds under General Conformity were used as reference benchmarks for evaluating potential criteria air pollutant impacts from the SPCT project. Criteria pollutant emissions were quantified using the construction and operational characteristics of the SPCT project and their potential to exceed the general conformity *de minimis* thresholds as specified in 40 CFR 93.153. GHG emissions were quantified as well and compared with the reference point of 25,000 metric tons of carbon dioxide equivalent (CO_2e) per year, which is the threshold for reporting in the USEPA *Mandatory Reporting Rule of Greenhouse Gases*.

Methods

The Air Force Air Conformity Applicability Model (ACAM) Version 5.0.17a was used to estimate direct and indirect air emissions from most elements of the SPCT project. ACAM is an air-emissions estimating model that is used to assess potential air quality impacts in accordance with Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*, the Environmental Impact Analysis Process (32 CFR 989), and the General Conformity Rule (40 CFR 93 Subpart B). This analysis was used to estimate anticipated emissions of criteria pollutants and GHGs.

4.15.2.1 No-action Alternative

Under the No-action Alternative, container vessels would continue to call at existing ports on the east coast of the United States. At these ports, there are no shore power connections available, so the vessels would continue to run their auxiliary diesel engines when at port, contributing to diesel and GHG emissions. In addition, cargo handling equipment at existing container handling terminals in the east is not electrified, further resulting in diesel and GHG emissions. It is also likely that TPA would develop Coke Point or High Head Industrial Basin or both under the No-action Alternative, as these areas represent significant undeveloped portions of the Tradepoint Atlantic property. Although emissions for these potential developments cannot be calculated at this stage, it is anticipated that there would be short-term impacts on air quality associated with construction activities.

4.15.2.2 Combined Options Alternative

This analysis calculates the total estimated emissions for the construction and operational activities associated with the Combined Options Alternative, including the terminal development and channel improvements, and compares them to reference thresholds in Table 41 through Table 44. The analysis provides an estimate of emissions, based on conservative assumptions, and is intended to capture the greatest potential for impacts of the SPCT project. These analyses of construction and operational impacts analyze the alternatives at the project level and do not provide detail by alternative element.

Construction Phase Impacts

The air quality impacts from construction were determined by estimating anticipated emissions of criteria pollutants and GHG emissions from ground-level activities. The total emissions were compared with *de minimis* thresholds for each year of the planned construction schedule.

The calculations were performed for each year of construction. Data for the estimated equipment type and hours related to the construction phase of each area, as well as estimated timelines, were incorporated into the analysis (Table 41).

The calculated construction-related emissions were estimated using ACAM by factoring in a range of inputs critical to accurate emissions calculations. These included the area and duration of land disturbance, types and operating schedules of construction equipment, estimated number of construction worker trips, transport methods, and volumes of material deliveries and waste removal. Each of these factors contributes to a realistic projection of emissions over the project's construction timeline.

Because ACAM is not designed with inputs for more specific and miscellaneous construction activities (e.g., railroad installation, pile driving), these emissions were estimated using alternative methods, relying on the anticipated construction equipment usage.

Construction Impacts

The following assumptions were used to determine impacts from construction activities:

- *Rail-Based intermodal container transfer facility* – A facility configured with six train tracks approximately 2,680 feet long, served by RMG cranes. The installation of approximately 18,000 linear feet of new railroad track.
- *Facility and maintenance buildings construction* – Construction of buildings to provide space for administrative functions, maintenance and repair capabilities, ancillary equipment, and security to support facilities and operations. The construction of the three new buildings is estimated at approximately 63,722 square feet total.
- *Electrical systems installation* – Installation of electrical systems and services to supply electricity to all electrified operating equipment.
- *High mast lighting installation* – Installation of high mast lights at approximately 120 feet above finished grade, spaced approximately 400 feet apart.
- *Impervious Pavement* – Approximately 161 total acres of impervious pavement to accommodate operations at various terminal areas, including roadways, container storage areas, gate area, maintenance and repair slabs, wharf, and parking areas.
- *Construction equipment emissions* – Estimation of expected emissions from construction equipment operations, including fugitive dust from truck traffic and emissions from workers' personal vehicles.
- *Project schedule* – Construction phases are scheduled between August 2025 and November 2028. Work schedules are estimated at 10 hours per day, 5 days per week, with some cases modeled as 6-day work weeks to closely capture a 50-hour work week.
- *Dredge material transport and placement* – Emissions from dredge material transport and placement for High Head Industrial Basin, Coal Pier Channel, and MPA DMCF locations are accounted for within ACAM. This includes activity data and operational schedules provided for marine dredging and associated activities, as incorporated into the program's inputs.
- *Dredging emissions estimation for NODS* – Emissions from diesel equipment were estimated for the bottom-dump scows (barges) used to transport dredged material to NODS. It is assumed that

four scows, each paired with a single tug, would be used. A total of 262 scow trips are expected over 291 operational days, split across two dredging seasons, with an estimated one-way trip distance of 150 miles.

During the first 3 years of construction (2025, 2026, and 2027), yearly emissions exceedances for NO_x emissions would occur relative to the General Conformity *de minimis* threshold of 50 tpy, before returning to below threshold level by 2028. Construction activities are expected to exceed the reference threshold of 25,000 metric ton (note that Table 40 is presented in short tons) reference threshold of CO_2e during the year 2026. The General Conformity thresholds would not be exceeded for any other criteria pollutants.

Table 40. Estimated Direct Emissions from Construction Phase – Proposed Alternative

Year	NO_X (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
2025	51.43	9.58	54.32	228.60	1.79	0.20	19,571.3
2026	82.55	15.03	93.27	441.42	2.92	0.30	30,263.1
2027	75.19	73.93	88.23	355.17	2.67	0.27	27,344.6
2028	15.51	2.42	14.12	191.03	0.54	0.05	5,323.0
2029 (steady state)	0.00	0.00	0.000	0.000	0.00	0.00	0.0
Reference Threshold [1]	50	50	100	100	100	100	27,500 [2]

Notes:

1 – 40 CFR 93.153 and 40 CFR 98

2 – 27,500 short tpy is equivalent to 25,000 metric tpy

NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; PM_{10}= particulate matter less than or equal to 10 micrometers; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; SO_2 = sulfur dioxide; CO_2e = carbon dioxide equivalent; tpy = tons per year

Operational Phase Impacts

Estimates of operational emissions assume the terminal would be partially electrified, using a combination of traditional diesel and gasoline powered equipment alongside electric equipment (Table 41). The total calculated emissions are based on preliminary operational data and serve as conservative assumptions regarding emissions sources and activity levels (Table 42 and Table 43).

Operational impacts combine the estimations from land-based stationary source emissions, cargo handling equipment, oceangoing vessel emission determinations within a three-mile radius, auxiliary load factors, and container volume expected annually at SPCT (Table 42). Commercial truck emissions outside of the property boundary are not accounted for in this analysis.

The air emissions estimations assume that all STS, RMG, and RTG cranes would be electric, thus emitting no air pollutants (Table 41). The air emissions in this scenario would therefore result from the operation of diesel-powered equipment, stationary sources, and facility operations. These calculations are based on typical operating conditions and average emissions values.

The cargo throughput of the Port is measured by TEUs per year. The SPCT would add approximately 500 container ships per year. Using this information to calculate the transit emissions (emissions generated by a vessel as it approaches the Port from open sea, at a distance from 3 miles from the port), NO_x, SO_2, and $PM_{2.5}$ emissions were estimated using diesel fuel emissions factors and average estimated total fuel consumption during transit. This approach aligns with commonly accepted practices in emissions modeling, where a 3-mile radius from the Port is used as a practical boundary for capturing emissions generated from vessels. Sulfur content factors were adjusted to account for a 0.1% sulfur content in marine diesel fuel to comply with International Maritime Organizations sulfur emissions control area.

Operational Phase Assumptions:

- *Electrical systems in operation* – The installed electrical distribution systems would supply electricity to all electrified operating equipment during the operational phase.
- *High mast lights in use* – High mast lighting systems would remain operational at the terminal during ongoing operations.
- *Impervious pavement use* – The paved areas of the terminal would be used for ongoing operations, including roadways, container storage areas, gate areas, maintenance and repair slabs, and parking areas.
- *Non-tailpipe emissions (operational vehicles)* – Estimation of brake, tire, and road dust emissions from trucks operating on paved surfaces within the facility during its operational phase, assuming 1 drayage truck per TEU (or 500 trips per year) mobilizing from one end of the site to the other, with a maximum vehicle weight of 40 tons per trip. SPCT employee POV emissions are not currently accounted for.
- *No pesticide application during operations* – There would be no turf or planted area on the site, therefore, no pesticide application is anticipated.
- *Refrigeration units in operation* – Refrigeration units would operate using integral systems that only draw power. Maximum cold storage is estimated to be 5% of total capacity, emissions calculations are based on potential refrigerant leaks.
- *No vessel queuing during operations* – It is assumed that no container vessels would be queuing, thereby avoiding hoteling emissions within the 3-mile radius during the operational phase.
- *Tugboat operations* – It is assumed three 65-ton diesel tugboats would be used for berthing operations. Average propulsion and auxiliary power and average engine load factors were used.

The use of shore power would significantly reduce emissions from ships at berth. By eliminating the need for ships to run auxiliary diesel engines while docked, shore power would reduce NO_x, PM_{10} and $PM_{2.5}$, sulfur oxides (SO_x), and VOCs, all of which are commonly emitted from ship engines. Additionally, shore power would reduce GHG emissions, including CO_2, as ships rely on grid-based electricity instead of burning fuel oil. Without shore power, the criteria pollutant and GHG emissions from vessel emissions while hoteling at existing east coast terminals and emissions from non-electrified cargo handling equipment is shown Table 41. The Combined Options Alternative would eliminate these emissions by providing shore power and electrified cargo handling equipment.

Table 41. Estimated Emissions – No-action Alternative

No-action Alternative	NO_X (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
500 container vessels per year	53.11	1.73	4.51	0.77	0.77	1.80	8,202

Notes:

NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; PM_{10}= particulate matter less than or equal to 10 micrometers; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; SO_2 = sulfur dioxide; CO_2e = carbon dioxide equivalent; tpy = tons per year

The operational impacts of a partially electrified terminal were analyzed by distinguishing between land-side and marine equipment and activities that are expected to operate using traditional diesel-powered equipment from the activities that are expected to be electric. Diesel-powered equipment and machinery used to support operations at the terminal are estimated based on standard operational parameters, such as fuel consumption rates and load factors, where electric equipment is assumed to produce zero emissions during operation. Marine-based emissions included categorizing transit activities from emissions generated while vessels are in transit to and from the terminal, relying on conventional diesel engines while navigating. While berthing activities and emissions generated while vessels are docked at the terminal assumes vessels would use alternative shore power when in berth.

Table 42. Partially Electrified Terminal Equipment Designations

Equipment	Fuel Type	Number of Units
STS cranes	Electric	8
RMG cranes	Electric	5
RTG cranes	Electric	30
Reach stacker	Diesel	3
Empty container handler	Diesel	14
Terminal tractor	Diesel	91
Locomotive / rail-based transportation	Diesel	1
Standby emergency generators	Diesel	4

Data provided by TPA.

Table 43. Estimated Indirect Emissions from Operational Phase Partially Electrified Terminal

Year	NO_X (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
2029 (steady state)	59.76	0.051	0.239	0.24	1.06	1.02	8,287
Reference Threshold [1]	50	50	100	100	100	100	27,500 [2]

Notes:

1 – 40 CFR 93.153 and 40 CFR 98

2 - 27,500 short tpy is equivalent to 25,000 metric tpy

NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; PM_{10}= particulate matter less than or equal to 10 micrometers; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; SO_2 = sulfur dioxide; CO_2e = carbon dioxide equivalent; tpy = tons per year

Data presented in Table 43 serves as a baseline for understanding the environmental impact of operations assuming partial electrification. Table 44 summarizes the net operational emissions after incorporating the emissions reductions associated with the No-action Alternative through the use of electrified equipment.

The results of the emissions analysis indicate that the baseline emissions from operations resulted in 59.76 tons per year (tpy) of NO_x and 8,600 tpy of CO_2e emissions. After accounting for the emissions reductions associated with the No-action Alternative through the implementation of electrified equipment, which reduced emissions by 53.11 tpy of NO_x and 8,202 tpy of CO_2e, the new net totals are significantly lower at 6.65 tpy of NO_x and 398 tpy of CO_2e.

The operational NO_x emissions from the partially electrified terminal scenario exceed the 50 tpy General Conformity *de minimis* threshold prior to applying the reductions.

Table 44. Estimated Net Operational Emissions with Electrification Offsets

Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
2029 (steady state)	59.76	0.051	0.239	0.24	1.06	1.02	8,600
Emissions reduction compared to the No-action Alternative from use of shore power and electrified cargo handling equipment	53.11	1.73	4.51	0.77	0.77	1.80	8,202
Net total	6.65	(1.68)	(4.27)	(0.53)	0.29	(0.78)	398
Reference threshold [1]	50	50	100	100	100	100	27,500 [2]

Notes:

1 - 40 CFR 93.153 and 40 CFR 98

2 - 27,500 short tpy is equivalent to 25,000 metric tpy

NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; PM_{10}= particulate matter less than or equal to 10 micrometers; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; SO_2 = sulfur dioxide; CO_2e = carbon dioxide equivalent; tpy = tons per year

4.15.2.3 Greenhouse Gases

Construction of the SPCT project would generate GHG emissions from the use of construction trucks, equipment, and construction worker vehicles. ACAM was used to calculate the potential GHG emissions during construction based on the estimated duration of construction activities and the amount and type of construction equipment to be used.

Construction would contribute directly to emissions of GHG from the combustion of fossil fuels. Demolition, construction, and associated activities would generate between 5,323 and 30,263 metric tons (5,867 to 33,359 tons) of CO_2 per year. The estimated CO_2 emissions equivalent figures exceed the stated threshold for quantification of 25,000 metric tons during the year 2026 before returning below threshold.

4.15.2.4 Climate Change

There are both direct and indirect (upstream and downstream) GHG emissions and climate effects related to construction activities. The construction period would be expected to be energy-intensive and to result in short-term but significant GHG emissions. During construction, the on-site activities would require fossil fuel-powered equipment, where exhaust and fuel combustion is expected to have a high emissions intensity.

The partially electrified terminal is projected to emit approximately 398 tons of GHG annually during its operational phase. This total assumes that SPCT would be operating at full capacity. While Future Market Insights, Inc. (2024) forecasts a 3.5% growth in the container shipping market between now and 2035, the emissions from SPCT are limited from increasing further due to the terminal's operational limits.

The project and its surrounding AQCR are projected to face ongoing and increasing impacts due to climate change, particularly in the areas of rising temperatures, changes in precipitation patterns, more frequent and sever weather events, and rising sea levels. These factors would likely contribute to a range of environmental and operational challenges that must be addressed as a part of climate resilience and mitigation efforts.

4.15.2.5 General Conformity Evaluation

Emissions of the three non-attainment / maintenance pollutants in the AQCR, NO_X, SO_2 and $PM_{2.5}$ were estimated for both construction (direct emissions) and operations (indirect emissions) phases of the project. As shown in Table 43 and Table 44, annual emissions of SO_2 and $PM_{2.5}$ are well below the *de minimis* thresholds and do not require further analysis. However, both direct and indirect NO_X emissions exceed the *de minimis* threshold of 50 tpy. NO_X emissions from this project in excess of the *de minimis* threshold have not been included in the Maryland SIP budget, leaving modeling and mitigation as the options for determining conformity with the NAAQS. As an ozone precursor pollutant, NO_X emissions must be evaluated by photochemical modeling. However, discussions with MDE and USEPA indicated that photochemical modeling of the impacts on ozone in the AQCR from this relatively small amount of additional NO_X emissions is not recommended. Hence, mitigation through emission reduction or emission offsets are being explored by the project proponent.

4.15.2.6 Summary of Environmental Consequences

The analysis indicates that NO_x emissions during certain construction periods would exceed the General Conformity *de minimis* threshold, requiring mitigation. In contrast, emissions of other criteria pollutants, including VOC, PM_{10}, $PM_{2.5}$, and SO_2, are expected to have a negligible effect on ambient air quality standards, with their impacts considered minor. The partially electrified terminal, operating at full capacity, is projected to emit approximately 398 tons of GHG annually, which remains below the reference threshold of 27,500 tpy. Under the USEPA's Mandatory Reporting Rule, the total annual GHG emissions are below the applicable reporting threshold and the project is not considered a major source of GHG emissions. The current federal estimate of the social cost of GHG is $190 per metric ton of CO_2e at a discount rate of 3%. The SPCT is projected to emit 398 tons of carbon annually during operations, this would result in a net present value of the cost of these emissions of $75,620.

4.15.2.7 Onsite Emission Reduction Measures

Construction Phase Mitigation Options

To mitigate construction-related NO_x emissions, TTT is exploring several measures aimed at reducing emissions levels. One option is to work with adjacent AQCRs in areas with similar or more severe ozone non-attainment status to secure off-site mitigation in the form of emissions offsets during construction. Since direct construction emissions slightly exceed the 50 tpy NO_x threshold, TTT can offset these emissions by working with lead agencies to evaluate the availability and cost of purchasing off-site NO_x credits from the Maryland Department of the Environment's permanent credit bank. This would be an efficient way to ensure compliance during the construction phase.

Operational Phase Mitigation Options

For long-term operations, TTT is exploring the purchase of NO_x credits from the MDE's permanent credit bank to offset operational emissions. Collaborating with the AQCR to develop off-site mitigation programs that could further enhance the project's ability to meet air quality standards during ongoing operations may be considered.

4.16 Community Noise

4.16.1 Affected Environment

The area evaluated for noise impacts includes the census tracts surrounding the SPCT project area, which fall within the range that could be impacted by noise generated by proposed construction and operation activities (Figure 51). Noise transmission from source to receiver depends on many factors including air temperature, wind and atmospheric conditions, and ground cover, with noise carrying farther over water than over land. Therefore, waterfront residences across 2 miles of open water are included in the study area, while inland residences a similar distance from some project elements may not fall within the study area.

> An **A-weighted decibel (dBA)** is a unit of sound level measurement that adjusts the decibel scale to reflect the human ear's sensitivity to different frequencies. Humans are generally more sensitive to sounds between 1,000 and 5,000 Hertz and less sensitive to very low or very high frequencies.

Regulatory Background

The Baltimore County Code of Ordinances and Zoning Regulations do not specify allowable noise levels for different land uses; however, in the absence of local ordinances, COMAR regulates the control of noise pollution (COMAR 26.02.03). In COMAR, daytime is defined as the hours between 7 am and 10 pm, and nighttime is defined as 10 pm to 7 am.

For purposes of regulation, noise is measured using a logarithmic weighted scale with a unit of A-weighted decibels or dBA. Typical sounds that humans encounter range from 0 to 140 dBA. Table 45 presents examples of typical noise sources, the decibel level of each, and how they are perceived.

Table 45. Typical Noise Levels and Subjective Impressions

Source	Decibel Level (dB)	Subjective Impression
Normal breathing	10	Very Quiet
Soft whisper	30	
Refrigerator hum	40	Quiet
Normal conversation	60	
Washing machine	70	Moderately loud
Gas-powered lawn mower	80-85	
Motorcycle	95	
Sporting events	100	Very loud
Rock concert, shouting in ear	110	

Source	Decibel Level (dB)	Subjective Impression
Standing near sirens	120	Pain threshold
Firecrackers	140	

Source: Centers for Disease Control and Prevention 2022

COMAR defines maximum allowable noise levels for the land uses receiving the noise (Table 46). Periodic noises (i.e., repetitive noise with on and off characteristics) may not exceed a level that is 5 dBA lower than the values in Table 46. There is an exception for construction or demolition site activities, which cannot exceed 90 dBA during daylight hours. Use of pile driving equipment during daytime hours of 8 am and 5 pm is also exempt.

Table 46. Maximum Allowable Noise Levels for Receiving Land Uses

Time	Industrial (dBA)	Commercial (dBA)	Residential (dBA)
Day	75	67	65
Night	75	62	55

Noise Conditions

Noise levels in the SPCT project area are consistent with an urban, industrial setting with noise levels expected to commonly be in the 60 to 80 dBA range. Individual noise sources are intermittent, but some level of persistent noise is expected during operational hours. Sources of existing noise from the project area include vessels, vehicles, and equipment necessary to operate an active marine terminal, parking for Ro-Ro cargo, and warehouses. Truck traffic from warehouses to nearby state and interstate highways occurs day and night. Large cargo vessels accessing marine terminals farther up the Patapsco River routinely pass between Sparrows Point and opposite shorelines at all times of day. Active train lines and personal / commercial vehicles within commercial and industrial areas of Sparrows Point also contribute to the existing noise environment.

The nearest sensitive noise receptors to the project area (Figure 51) are residences about 0.5 mile from the High Head Industrial Basin. A brewery with outdoor seating is also within about 0.25 mile. The area between residences and commercial areas and the High Head Industrial Basin is industrial, containing roads, active rail lines, and warehouses. The closest residences to the Coke Point area are about 1.5 miles to the north across Bear Creek.

4.16.2 Environmental Consequences

Noises associated with project alternatives were evaluated to determine likely noise levels experienced by people in the vicinity of the project. Nighttime noise, in addition to being regulated in residential zones, is generally perceived as more bothersome than daytime noise and therefore is of particular concern. To conduct the analysis, the types of equipment likely to be used during different phases of the project were characterized. The timing of equipment usage was also determined. The likely noise levels that would be associated with the equipment were evaluated, and the equipment that would tend to generate the loudest noises or be perceived as the noisiest was identified. Sensitive noise receptors including residential, recreational,

> **Noise attenuation** is the reduction in the strength of noise waves as they travel from the source to the receiver. Attenuation can occur in various ways, such as noise dissipating through the air as it is absorbed by another medium, noise reflecting against a barrier, or interference with other ambient noise.

and commercial areas in the vicinity of the proposed project were identified using the most recent tax assessment database (Maryland Department of Planning) and other sources described in Section 4.16.1. All data were incorporated in a GIS analysis to estimate the impacts of project noise on nearby residents and boaters.

> **Atmospheric inversion** is when the normal temperature gradient in the atmosphere is reversed. Instead of temperature decreasing with altitude, it increases. In an inversion, the warmer air layer above the cooler air can cause sound waves to refract or bend downward, leading to an unusual propagation of sound, including sound traveling longer distances and being heard more clearly or loudly than under normal conditions.

Although sound transmission is a function of specific conditions between the sound source and receptor, for purposes of this analysis, the techniques that were used to model sound transmission assumed typical or average conditions. Specifically, sound level attenuation between noise-generating activities and receptors was calculated using the Inverse Square Law, which roughly corresponds to an attenuation of 6 dBA with each doubling of distance from a source to a receptor (FHWA 2006). This assumption may misrepresent sound transmission under atypical conditions, which may occur frequently. For example, atmospheric inversions would occur on most calm clear nights and would have the effect of amplifying sound levels heard around dawn. However, additional attenuation due to molecular absorption as a result of its passage through air and analogous excess attenuation due to other factors (e.g., humidity or ground cover) was not factored in. Because of this, the attenuated sound estimates presented may overestimate sound transmission distance when vegetation and buildings are present between the sound source and receiver. The analysis omits sound attenuation due to ground cover to improve representation of sound transmission over water.

> **Maximum sound level (L_{max})** represents the highest measured sound during a given period. It is used to measure the peak noise event.

When considering several sources producing sound simultaneously, sound levels cannot be added arithmetically because decibels are a logarithmic measure. Instead, the additive nature of sounds is such that the sound pressure level from two sources generating the same decibel level is approximately 3 dBA greater than the sound pressure level of just one source (Table 47). This approach was used in the analysis to calculate total sound levels associated with typical project conditions, such as the simultaneous, proximate operation of several pieces of heavy machinery.

Table 47. Addition of Multiple Sound Sources

Difference between Sound Level of Two Sources	Amount Added to Higher Value
0 to 1 dBA	3
2 to 3 dBA	2
4 to 9 dBA	1
10 or more dBA	0

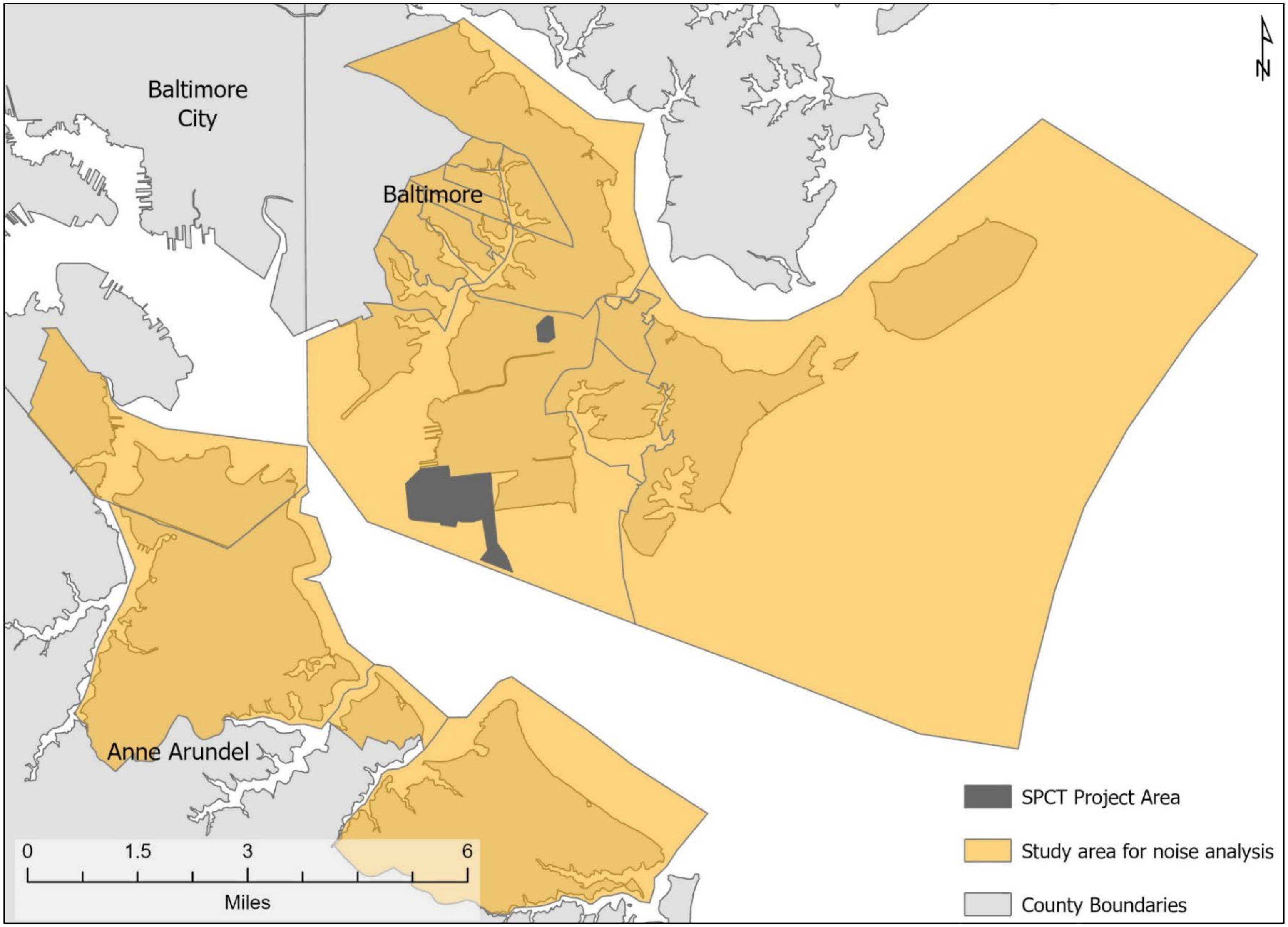
Source: FHWA 2017

Notes:

dBA = A-weighted decibel

Figure 51. Area Evaluated for Potential Noise Impacts

Noise impacts would depend on sound pressure level from equipment, distance from source to receptor, and number of pieces of equipment operating in close proximity (see Section 4.16.2)



To quantify sound levels generated by the proposed project, project phases were identified, including duration and timing of each activity (Table 48 and Table 49). For each phase, the most recent information on type and quantity of equipment that is likely to be used was identified, and expected noise levels for each piece of equipment were used to estimate maximum levels (L_{max}) for each phase of each alternative (Table 50 and Table 51). The modeling assumed that all sound sources would be operating simultaneously and that they would be the same distance from a given receptor (i.e., all co-located at the same point), yielding a conservative result. Some noise sources (e.g., excavators, dozer, cranes) would not always operate concurrently and would be spread out across the work site. Additionally, a maximum area of activities was assumed for each project phase, while the actual sound-generating area may cover a smaller area on the ground or in the water at any given time.

Table 48. Estimated Duration and Timing of Project-related Construction Noise for Elements Associated with the Terminal Development and Channel Improvements Based on Current Designs (Subject to Change)

Phase	Duration (months)	Time of Day	Periodic (Impact) Sounds?
Upland excavation	1	Day	No
Water-based demolition	1	Day	No
Land-based demolition	1	Day	No
Relieving platform construction	6	Day	Yes
Wharf construction	30	Day	Yes
Mooring dolphins	3	Day	Yes
Backland site	27	Day	No
Electrical facilities construction	34	Day	Yes
Building construction	32	Day	No
Intermodal / rail yard construction	10	Day	Yes
Dredging [1]	36	Day and night	No

Notes:

1 – Time-of-year restrictions would apply, so dredging may only occur during 24 months in the 36-month window

Table 49. Estimated Duration and Timing of Project-related Construction and Dredged Material Placement Noise for Each Alternative

Alternative	Activities	Duration (months)	Time of Year	Time of Day	Periodic (Impact) Sounds?
No-action Alternative	Potential future development of Coke Point and High Head Industrial Basin	Unknown	Presumed year-round	Presumed day only	Presumed no
Combined Options Alternative	DMCF Construction	30	Year-round	Day and night	No
	Placement of dredged material [1]	36	June through February	Day	No

Notes:

1 – Dredged material placement would occur during a seasonal window (presumed June through February) over 3 years

Table 50. Noise Levels for Construction, Dredging, and Terminal Operation Equipment

Equipment	Periodic?	L_{max} at 50 feet [1]	Source
Vibrohammer	No	101	FHWA 2006
Diesel hammer	Yes	101	FHWA 2006
Tug – 1800 horsepower	No	93	Corps 2011
Inland tug	No	87	Epsilon 2006
Assist tug	No	87	Epsilon 2006
Bulldozer	No	85	FHWA 2006
Excavator	No	85	FHWA 2006
Crawler crane	No	85	FHWA 2006
Manlift	No	85	FHWA 2006
Paver	No	85	FHWA 2006
Earth drill	No	85	FHWA 2006
Roller	No	85	FHWA 2006
Drum roller	No	85	FHWA 2006
Grader	No	85	FHWA 2006
On-highway truck	No	84	FHWA 2006
Plate compactor	No	83	FHWA 2006
Generator	No	82	FHWA 2006
Trash pump	No	81	FHWA 2006
Boom pump	No	81	FHWA 2006
Runabout 16 feet	No	81	Epsilon 2006
Survey boat	No	81	Epsilon 2006
Front-end loader	No	80	FHWA 2006
Air compressor	No	80	FHWA 2006
Clamshell dredge	No	77	Epsilon 2006
Light duty truck	No	75	FHWA 2006
Welder	No	74	FHWA 2006
Hydraulic unloader	No	70	Epsilon 2006

Notes:

1 – FHWA presents two noise levels for each equipment type: that in specifications and actual measured value. The larger value was used in this analysis.

Table 51. Noise Levels for Terminal Operation Equipment

Equipment	Type	Periodic?	L_{max} at 50 feet	Source
STS crane	Electric	No	76	Nieminen 2017
RMG crane	Electric	No	Data not available	
RMG crane	Diesel	No	Data not available	
RTG crane	Electric	No	Data not available	
RTG crane	Diesel	No	83	Nguyen and Khoo 2013
Empty container handler	Diesel	No	85	Konecranes 2017

Equipment	Type	Periodic?	L_{max} at 50 feet	Source
Terminal tractor	Diesel	No	84	FHWA 2006
Reach stacker	Diesel	No	73	Marshall Day Acoustics 2016
Container stacking	N / A	Yes	84	Marshall Day Acoustics 2016

Noise levels were evaluated from several perspectives. The analysis first used the noise limit standards defined in the COMAR (see Section 4.16.1) to determine whether sustained, periodic, and nighttime noise potentially generated by the project would attenuate to acceptable levels by the time it reaches residential areas (Table 52). In the second part of the analysis, the potential noise impacts at sensitive receptors were considered. For each project element and alternative, the likely noise levels at the nearest residences were estimated**.** Each of these calculations was made for sustained, periodic, and nighttime noises.

Table 52. Acceptable Noise Levels in Residential Land Uses

Noise Type	Acceptable Level (dBA)
Sustained	65
Periodic	60
Nighttime	55

Source: COMAR 26.02.03.02

4.16.2.1 No-action Alternative

Sustained Daytime Noise

While construction and dredging activities that occur under the No-action Alternative would generate some noise, no new impacts would occur. Sustained daytime noise associated with the use of several pieces of heavy equipment close to each other during the future development of Coke Point would peak at around 95 dBA at 50 feet (see Table 47 and Table 50). This noise level attenuates to acceptable residential levels within about 1,600 feet (Figure 52). The noises associated with dredging may reach a peak of 97 dBA, which would attenuate to residential levels within about 2,000 feet.

The No-action Alternative would not impact any sensitive receptors. The closest residences across the Patapsco River in northern Anne Arundel County are about 11,000 feet (2.1 miles) from the potential development activities under the No-action Alternative. A 95 dBA noise would attenuate to about 48 dBA across that distance. To the north, the nearest residence across Bear Creek is about 8,400 feet (1.6 miles) from the activities that may occur under the No-action Alternative. The loudest daytime noise would attenuate to 50.5 dBA across that distance, but greater attenuation may occur due to varied ground cover (i.e., land, buildings, infrastructure) between source and receptors.

Periodic Noise

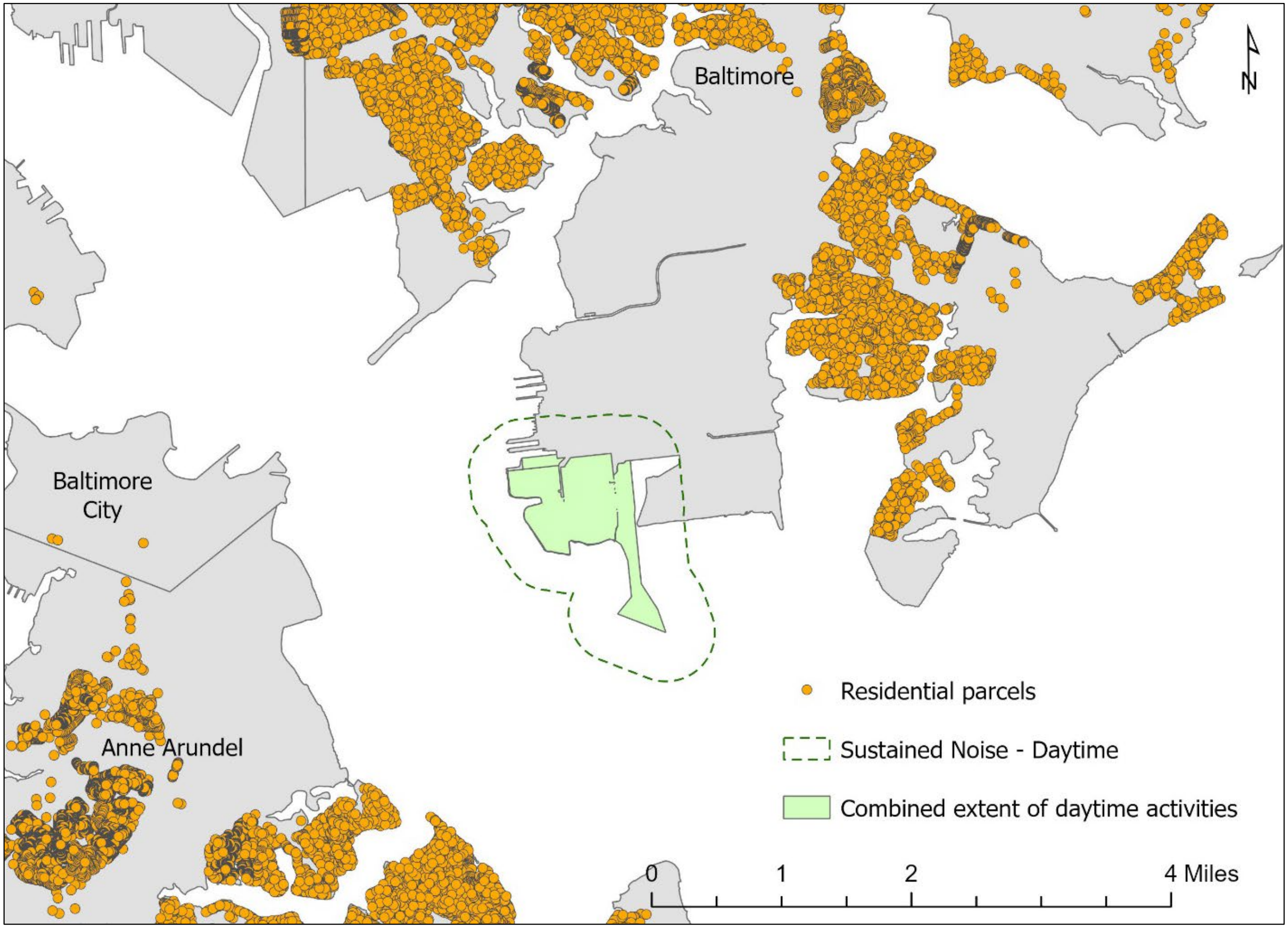
Periodic noises are not anticipated, so no impacts would occur.

Nighttime Noise

Construction activities would occur during daytime hours only; therefore, no nighttime noise impacts would occur.

Figure 52. Projected Extent of 65 dBA Sound Level for the No-action Alternative

The daytime limit (acceptable noise level) for residential areas is 65 dBA. The dashed line indicates the average attenuation of noise to acceptable residential levels, but some variability would occur due to atmospheric and weather conditions.



4.16.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

The noise impacts of terminal construction and operation phases are evaluated separately to distinguish the temporary and continuing effects.

Construction – Sustained Daytime Noise

No sustained daytime noise-related impacts would occur from the construction elements associated with the terminal development and channel improvements. Sustained noise levels generated by typical daily operations during construction of the proposed terminal vary depending on the element. Peak levels for sustained noises would be in the 90 to 101 dBA at 50-foot range (Table 50), depending on the phase of terminal development (Table 53). At the lower end of the range, this noise level represents several pieces of heavy equipment (e.g., dump trucks, dozers, compactors) working simultaneously near one another, while sustained noises of 101 dBA would occur from use of the vibratory extractor. For any given observer, the sustained, elevated noise level experienced would depend on distance from the noise-generating machinery, atmospheric conditions, and proximity of multiple pieces of machinery to each other. Many of the noises would be traveling over water with little attenuation due to ground cover, so factoring in only attenuation with distance, a 90 dBA noise is estimated to decrease to an acceptable daytime residential level of 65 dBA within about 900 feet (0.2 mile) of the noise source, and a 101 dBA noise is estimated to attenuate to 65 dBA within about 3,200 feet (0.6 mile) of the source (Figure 53). Dredging the Sparrows Point Channel would generate sustained noise of up to 97 dBA, which would attenuate to acceptable residential levels within about 2,000 feet under typical conditions.

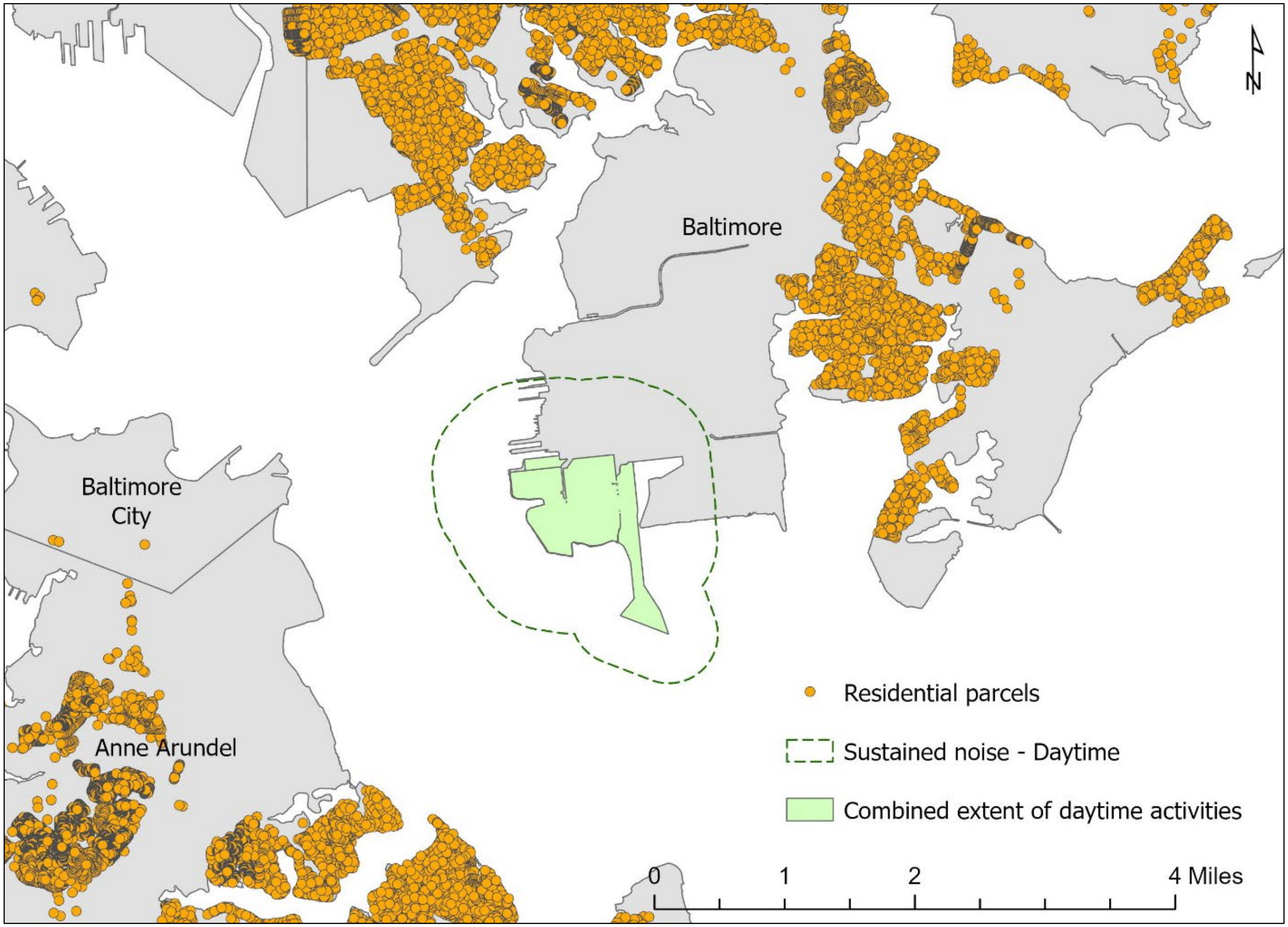
Table 53. Attenuation Distance from Source to Acceptable Residential Levels for Sustained Daytime Noise for Construction Associated with the Terminal Development and Channel Improvements

Element	L_{max} Sustained (dBA)	Distance to Acceptable Residential Level (65 dBA) (feet)	Distance to Acceptable Residential Level (65 dBA) (miles)
Water-based demolition	101	3,155	0.6
Relieving platform construction	101	3,155	0.6
Wharf construction	101	3,155	0.6
Mooring dolphins	101	3,155	0.6
Electrical	101	3,155	0.6
Intermodal / rail yard construction	101	3,155	0.6
Dredging	97	1,991	0.4
Upland site development	95	1,581	0.3
Building construction	95	1,581	0.3
Upland excavation	93	1,256	0.2
Land-based demolition	90	889	0.2

Notes:
dBA = A-weighted decibel

Figure 53. Projected Extent of 65 dBA Sound Level for Construction Elements – Terminal Development and Channel Improvements

The daytime limit (acceptable noise level) for residential areas is 65 dBA. The dashed line indicates the average attenuation of noise to acceptable residential levels, but some variability would occur due to atmospheric and weather conditions.



Under modeled conditions, sustained daytime noise at the nearest sensitive receptors would be within acceptable limits. Residences across the Patapsco River in northern Anne Arundel County are about 11,000 feet (2.1 miles) from the nearest common element. A 101 dBA noise would attenuate to about 54 dBA across that distance. Across Bear Creek, the nearest residence to the north is about 8,400 feet (1.6 miles) from the closest common element. The loudest daytime noise would attenuate to 56.5 dBA across that distance, but greater attenuation may occur due to varied ground cover between source and receptors.

Construction – Periodic Noise

Periodic noise from terminal construction would primarily come from pile driving, which is exempt from regulatory limits between 8 am and 5 pm. However, periodic noise at the nearest sensitive receptors would not exceed acceptable residential limits (i.e., 60 dBA) under typical conditions. During less typical atmospheric or weather conditions, periodic noise may reach nearby sensitive receptors.

Some elements associated with the terminal development and channel improvements would produce loud, periodic noises, which may be more noticeable to residents and visitors than sustained noises because they are not consistent with steady, uniform background noise. Noise regulations in COMAR stipulate that allowable periodic noise levels should be 5 dBA lower than allowable sustained noise levels (see Table 52); however, pile driving is exempt from this limit. Pile driving creates loud periodic noises that can reach 101 dBA at 50 feet (Table 50), but noise levels could be lower or duration shortened, depending on which pile placement methods are used. A noise at the 101 dBA level would attenuate to acceptable residential daytime levels (i.e., 60 dBA) within about 5,600 feet (1.1 miles) of the source (Figure 54). Periodic noises would not be produced during nighttime hours.

Periodic noises would attenuate to less than 60 dBA at the nearest residences, 8,400 feet (1.6 miles) away across Bear Creek in Turner Station (northwest of project), and 11,000 feet (2.1 miles) away across the Patapsco (south of project). However, less typical atmospheric conditions that promote noise propagation (i.e., due to wind) could result in noise impacts that would be noticeable along the waterfront in Turner Station and in northern Anne Arundel County. More common winds from the northwest could carry noise towards Edgemere and residences on the North Point Peninsula.

Construction – Nighttime Noise

Nighttime noise from dredging at the nearest sensitive receptors would not exceed acceptable limits under typical conditions, but the noise increases could exceed regulatory limits during less typical atmospheric or weather conditions. The only common project element that would occur day and night is dredging, which would occur during a seasonal window from June to February. The effects of the nighttime noise increase would depend on the distance between equipment and receptors, duration of activities in areas proximate to the proposed site, and proximity of multiple pieces of noise-generating equipment to each other. Noise from nighttime dredging would peak at 97 dBA at 50 feet which attenuates to acceptable residential levels within about 6,300 feet (1.2 miles) (Figure 55) under typical conditions.

Figure 54. Projected Extent of 60 dBA Sound Level for Construction Elements – Terminal Development and Channel Improvements

The daytime limit (acceptable noise level) for periodic noise in residential areas is 60 dBA. The dashed line indicates the average attenuation of noise to acceptable residential levels, but some variability would occur due to atmospheric and weather conditions.

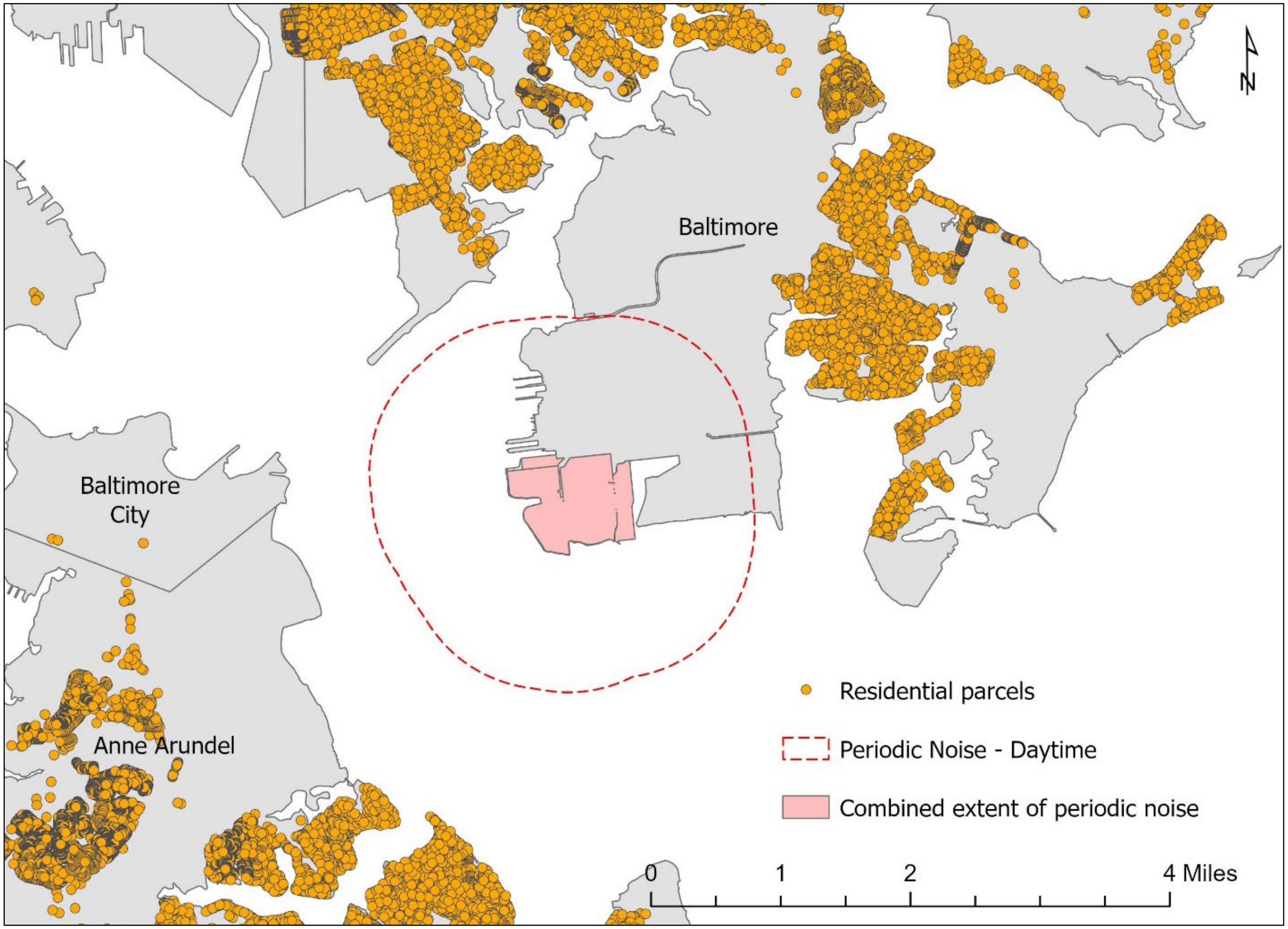
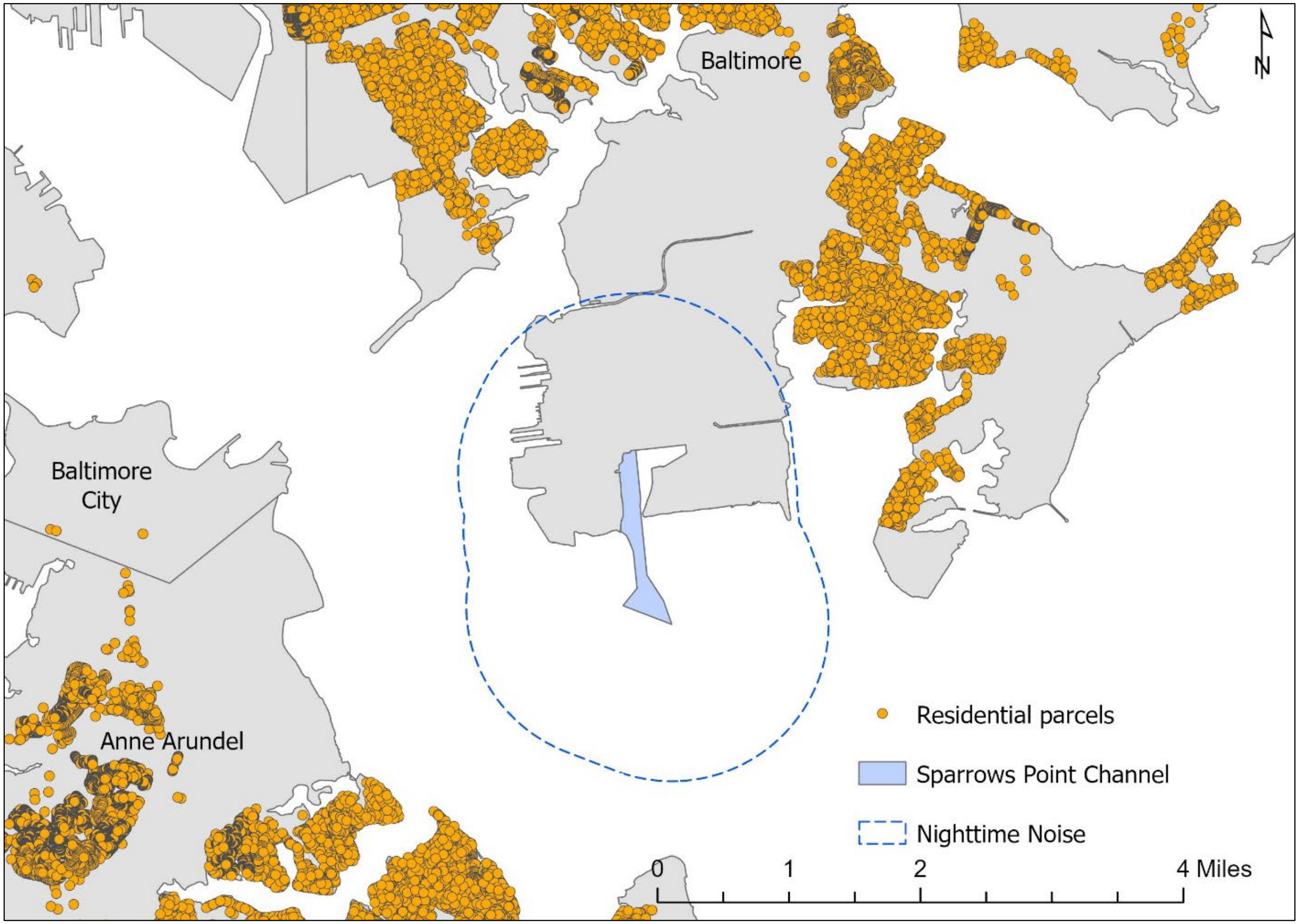


Figure 55. Projected Extent of 55 dBA Sound Level for Construction Elements – Terminal Development and Channel Improvements

The nighttime limit (acceptable noise level) for residential areas is 55 dBA. The dashed line indicates the average attenuation of noise to acceptable residential levels, but some variability would occur due to atmospheric and weather conditions.



Noise from dredging would not exceed acceptable levels of 55 dBA at sensitive receptors under typical conditions, but the communities of Stoney Beach and Riviera Beach in northern Anne Arundel County (about 11,000 feet [2.1 miles] away across the Patapsco River), Turner Station (about 8,400 feet away [1.6 miles] across Bear Creek), and Fort Howard (about 9,400 feet [1.8 miles] away across Old Road Bay) could experience occasional elevated noise. Noticeable noise impacts could occur during atmospheric inversions that sometimes occur at night and have the effect of propagating noise.

Terminal Operation – Sustained Daytime Noise

Sustained daytime noise from terminal operations would generate noticeable impacts. Operation of the terminal would involve a variety of activities and equipment use, including container ship traffic, vessel unloading to the container storage yard with STS cranes, container transfer to truck or rail, and truck and rail traffic out of the facility. Shore power would be available for container vessels, which would limit engine noise at the terminal. The site currently operates as a terminal for Ro-Ro and bulk cargo, and terminal operations would result in the continuation of current activities (i.e., vessel visits, truck, rail traffic) but with greater frequency of ship arrivals.

Several primary pieces of equipment (STS, RTG, and RMG cranes) would be electric, while empty container handlers, terminal tractors, and reach stackers would have diesel engines. The electric STS cranes generate noises of about 73 dBA at 50 feet, so even multiple cranes working close to each other would not impact sensitive receptors. Technical specifications for rubber-tired and RMG cranes did not include noise levels, but if they are electric, as planned, they would not produce disruptive noise for nearby residences, given that the noise levels would be consistent with other large, electrified equipment (e.g., STS cranes). Multiple empty container handlers and terminal tractors would be working simultaneously, but maximum noise levels from many of these pieces of equipment working in close proximity should not exceed 91 dBA at 50 feet, using data from Table 51 and effects of equipment combinations described in the introduction of Section 4.16. Noise at this level would attenuate to acceptable daytime residential levels in about 1,000 feet (0.2 mile). Noticeable ship and truck traffic increases due to terminal operations are projected, but no noise impacts would occur because the level of noise would not exceed allowable levels and trucks are using routes that are outside neighborhoods (see Section 4.19.1).

Terminal Operation – Periodic Noise

Container stacking has the potential to generate periodic noise both day and night, but l impacts on sensitive receptors would not be significant. The noise associated with containers being stacked is about 84 dBA at 50 feet (Table 51). Noises at this level should attenuate to acceptable periodic daytime noise levels (i.e., 60 dBA) within about 800 feet (0.2 mile) and acceptable periodic nighttime noise levels (i.e., 50 dBA) within about 2,500 feet (0.5 mile). There are no sensitive receptors within this area. However, under atypical atmospheric conditions that promote sound propagation, these sounds could reach the waterfront in northern Anne Arundel County, approximately 11,000 feet (2.1 miles) away to the south, across open water. Those same atmospheric conditions would not have as substantial effects on other neighborhoods to the northwest, west, and east, although noise impacts could occasionally occur. For these neighborhoods, equipment, containers, and other on-land features would attenuate noise to a greater extent than open water.

Terminal Operation – Nighttime Noise

Nighttime noise impacts from routine terminal operations would not be significant. Under typical atmospheric conditions, noise would be well within acceptable levels but potential regulatory exceedances during less typical atmospheric or weather conditions are possible. Vessels would call on the new terminal day and night, and the types of equipment described in the sustained noise section would also be used at night. Noises from the loudest pieces of equipment (terminal tractors and empty container handlers) would attenuate to acceptable nighttime levels within about 3,200 feet (0.6 mile) and would not impact sensitive receptors under typical atmospheric conditions. However, under less typical atmospheric conditions that promote sound propagation, noise impacts could become noticeable along the waterfront in northern Anne Arundel County. Those same atmospheric conditions would not have as substantial effects on other neighborhoods to the northwest, west, and east, although noise impacts could occasionally occur. For these neighborhoods, equipment, containers, and other on-land features would attenuate noise to a greater extent than open water. Over time, diesel equipment may be transitioned to electric, which would have the effect of reducing future noise levels from terminal operations.

4.16.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF

Sustained Daytime Noise

Noise from construction of the High Head Industrial Basin DMCF would attenuate to levels below acceptable daytime levels of 65 dBA at the nearest sensitive receptors, resulting in no impacts. Equipment used for inflow at the High Head Industrial Basin DMCF would include a hydraulic unloader, bulldozers, front-end loaders, and excavators (Table 50). The maximum noise levels associated with these activities would be in the range of 91 dBA at 50 feet.

The nearest sensitive receptors to the High Head Industrial Basin DMCF are residences about 2,600 feet (0.5 mile) away (Figure 56). Sustained daytime noise from High Head Industrial Basin DMCF construction and inflow activities would attenuate to about 57 dBA before reaching the nearest residences. However, greater attenuation would be likely due to ground cover (i.e., vegetation, trees, infrastructure) and barriers (i.e., warehouses and other buildings) between the source and receptors, effects not included in the model results shown. The modeled noise levels of 57 dBA at the nearest residences are within acceptable residential limits of 65 dBA.

Periodic Noise

No periodic noise impacts would occur from construction or placement of dredged material.

Nighttime Noise

No nighttime noise impacts would occur from placement of dredged material. No construction activities at the High Head Industrial Basin DMCF would occur at night.

Coal Pier Channel DMCF at Sparrows Point

Sustained Daytime Noise

Noise analysis for the 100-acre DMCF (considered during the NEPA process but ultimately dismissed from detailed analysis; see Section 2.1.1.1) was analyzed and is provided to evaluate the maximum possible impact of any offshore DMCF, including the Coal Pier Channel DMCF. A daytime noise level of 91 dBA would typically attenuate to an acceptable residential level of 65 dBA within 1,000 feet (0.2 mile) (Figure 56).

The nearest sensitive receptors to the proposed Coal Pier Channel DMCF are about 7,800 feet (1.5 miles) away across Bear Creek to the north and about 11,000 feet (2.1 miles) away across the Patapsco River in northern Anne Arundel County. Sustained daytime noise generated by the offshore DMCF and subsequent dredged material placement would attenuate to 47 dBA in Turner Station and 46 dBA in northern Anne Arundel County, below acceptable daytime residential levels.

Periodic Noise

No periodic noise impacts would occur from construction or placement of dredged material.

Nighttime Noise

No construction activities at the Coal Pier Channel DMCF would occur at night, and no nighttime noise impacts would occur from placement of dredged material.

Existing Nearshore MPA DMCFs

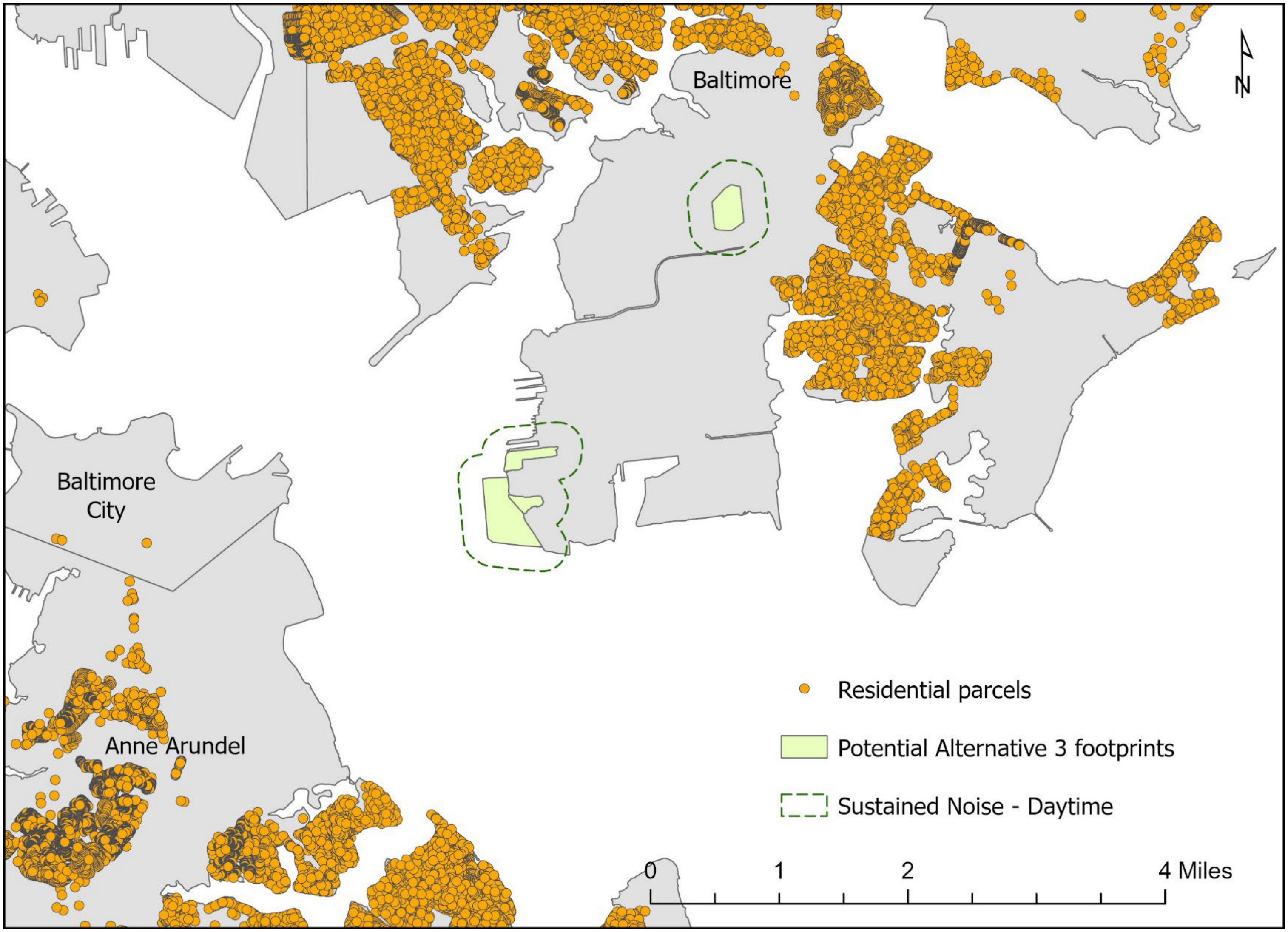
No new impacts on community noise would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

No new impacts on community noise would occur because NODS is an existing USEPA-designated ocean placement site.

Figure 56. Projected Extent of 65 dBA Sound Level for the Combined Options Alternative

The daytime limit (acceptable noise level) for residential areas is 65 dBA. The dashed line indicates the average attenuation of noise to acceptable residential levels, but some variability would occur to atmospheric and weather conditions.



4.17 Socioeconomics

4.17.1 Affected Environment

4.17.1.1 Study Area

The study area for socioeconomics includes the areas that are likely to have the most substantial social and economic effects from the proposed project. Three reporting scales are used. The first includes the 17 US Census tracts that are adjacent to proposed project activities (Figure 57). The second scale includes the two counties (Baltimore and Anne Arundel) and Baltimore City, which encompass these tracts. The third scale is the state of Maryland. All three scales are relevant to encompass the economic impacts (jobs, economic activity, tax revenues) that would occur throughout Maryland from the project. Local and state economic impacts are analyzed here as the most relevant, although there could be impacts beyond the state due to purchases that occur elsewhere.

4.17.1.2 Commercial Fishing

The waters near the study area are used by domestic and international shippers, as well as recreational and commercial boaters. Water use by recreational boaters is discussed in Section 4.14.

A **pound net** is a visible passive (stationary) gear type used for the live entrapment of fish species.

Commercial fishing and commercial crabbing are limited in the Patapsco River and most of the effort occurs east of the former Key Bridge. The volume and value of fish caught in the Patapsco River have an average annual value (based on data from 2013 to 2023) of about $78,000 for fish and $244,000 for blue crabs (Table 54) (Lewis 2024). Ten fish species were commercially harvested in the Patapsco River between 2013 and 2023 (Table 55) (Lewis 2024). Striped bass account for about 76% of the volume and 93% of the value of commercial fish caught in the Patapsco River from 2013 through 2023. Only one registered pound net is located in the Patapsco River at the northwest corner of Coke Point (Figure 58) (MDNR 2024i), though a variety of gear types are used in the river. There is no historic oyster bottom and currently no commercial shellfishing in the Patapsco River.

Table 54. Volume and Value of Commercial Fish Landings by Year in the Patapsco River

Year	Fish		Blue Crab	
	Pounds	Value	Pounds	Value
2013	48,620	$172,028	135,414	$241,112
2014	39,707	$130,609	100,038	$166,340
2015	15,372	$53,689	149,073	$209,361
2016	23,645	$53,066	204,878	$266,721
2017	10,532	$37,951	178,403	$258,202
2018	18,712	$55,159	92,694	$132,122
2019	15,269	$39,434	99,238	$142,514
2020	10,922	$20,715	125,174	$217,425
2021	7,646	$25,290	145,908	$339,006
2022	22,224	$57,349	140,960	$273,886
2023	78,402	$210,972	278,010	$436,630

Year	Fish		Blue Crab	
	Pounds	Value	Pounds	Value
Total	291,051	$856,262	1,649,790	$2,683,319
Average	26,459	$77,842	149,981	$243,938

Source: MDNR 2024

Table 55. Total Volume and Value of Commercial Landings by Species in the Patapsco River, 2013 to 2023

Species	Pounds	Dollars
Striped bass (*Morone saxatilis*)	220,326	$800,037
White perch (*Morone americana*)	23,541	$22,677
Gizzard shad (*Dorosoma cepedianum*)	15,817	$4,046
Channel catfish (*Ictalurus punctatus*)	12,823	$6,695
Atlantic menhaden (*Brevoortia tyrannus*)	7,465	$1,343
Common eel (*Anguilla anguilla*)	5,619	$14,272
Northern snakehead (*Channa argus*)	1,585	$3,568
Snapping turtle (*Chelydra serpentina*)	1,226	$1,653
Common carp (*Cyprinus carpio*)	622	$329
Catfish (general)	607	$394
Atlantic croaker (*Micropogonias undulatus*)	597	$578
Blue catfish (*Ictalurus furcatus*)	560	$222
Flathead catfish (*Pylodictis olivaris*)	200	$88
Crappie (*Pomoxis* spp.)	58	$348
Yellow perch (*Perca flavescens*)	5	$10

Source: MDNR 2024

Figure 57. Census Tracts That Comprise the Study Area for Socioeconomics and Environmental Justice

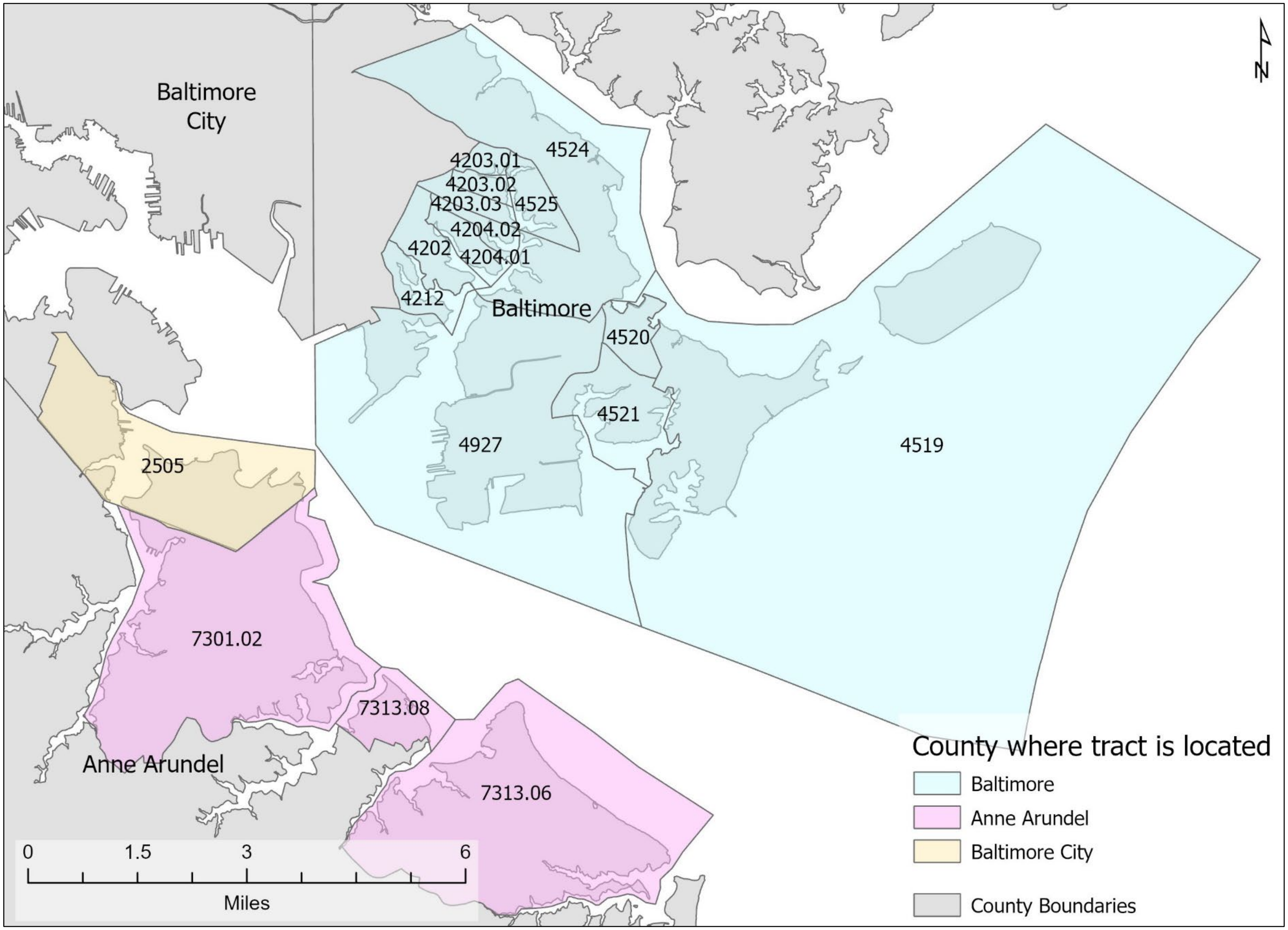
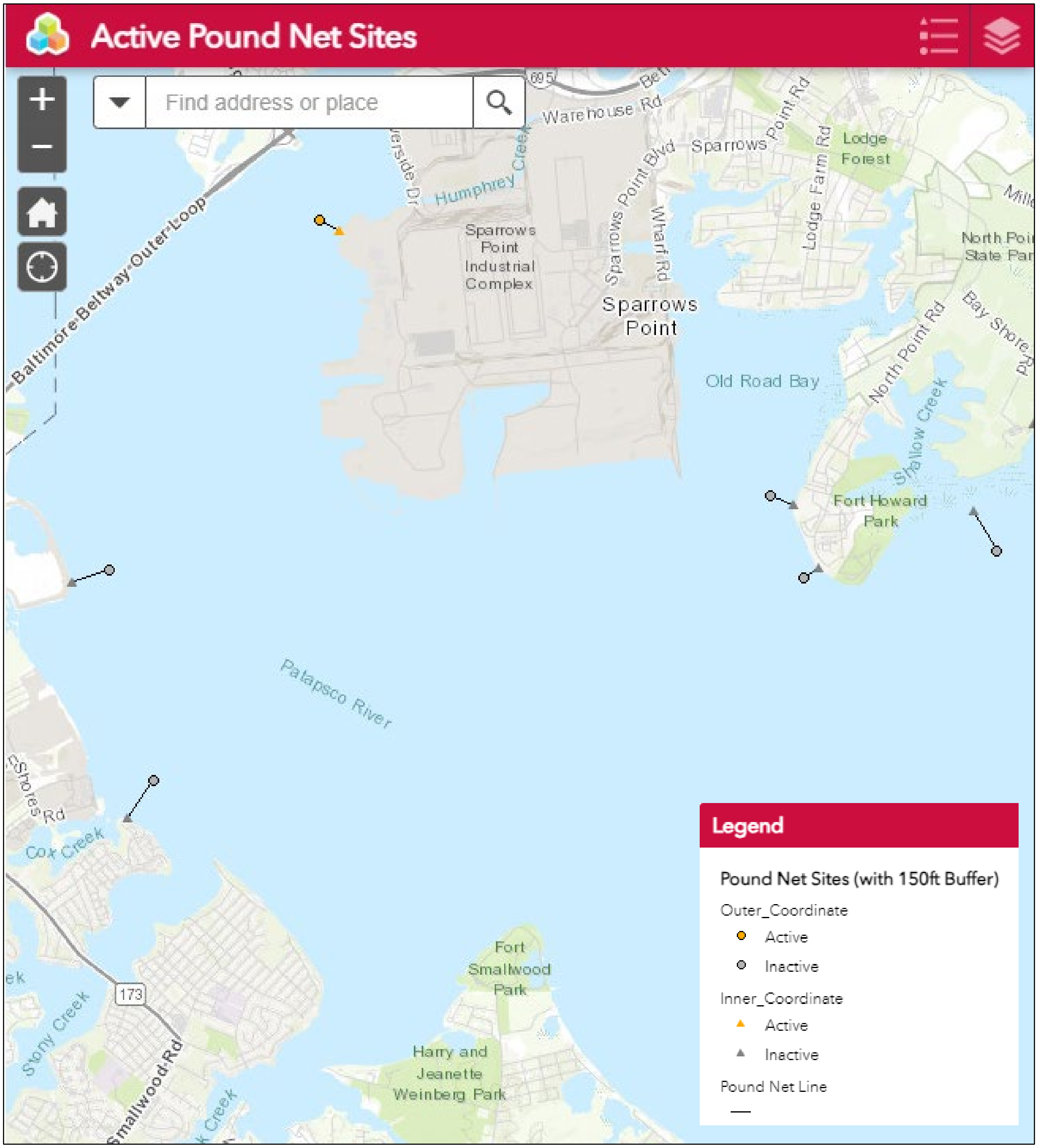


Figure 58. Pound Nets in the Socioeconomics Study Area

Source: MDNR 2024i



4.17.1.3 Cultural Context

The landscape, heritage, and recreational opportunities found in the socioeconomics study area combine to create a distinctive social and cultural environment. The Baltimore region, including the areas that surround Sparrows Point, are made up of distinct neighborhoods with individual character and history. History is woven into many Baltimore neighborhoods through its parks that were converted from prior military installations, historic streets and buildings, and legacies of past economic activities. During World War I and II, the Bethlehem Steel plant produced steel for war efforts, and in the 1950s, Sparrows Point was the site of the world's largest steel plant. Neighborhoods near Sparrows Point were developed to house the many workers employed at the plant. The waterfront setting is a major contributor to the region's culture supporting the shipping industry, a vibrant sailing community, the acclaimed National Aquarium in Baltimore, and culinary highlights of Maryland blue crab and local oysters. Baltimore has a vibrant arts community and people from Baltimore have made notable contributions to music, literature, and visual arts.

4.17.1.4 Population Characteristics

Many of the census tracts in the study area have demographic characteristics similar to the county or city average; however, tracts also reveal high spatial variability. There are 21 public and private K-12 schools in the study area, although none are in close proximity to project elements (Figure 59). Across the 17 tracts that make up the socioeconomics study area, the total population is about 66,000 people (University of Minnesota 2024) (Table 56). The age demographics of the tract containing the SPCT project area (4927) are similar to the demographics for Baltimore County as a whole (Table 56). Education levels are variable, and people (aged 25+) with a bachelor's degree or more range from 6.0 to 44.9% across the census tracts. For Baltimore County, 41% of people have this level of educational attainment, which is comparable with the state rate of 42%. Many of the tracts have percentages of owner-occupied housing units above the Baltimore County rate mean of 62.6%; however, the tract containing the SPCT project area has a much lower rate of 22.6% (Table 57). The percentage of people who are unemployed generally ranges from 0.2 to 11.9%, across tracts in the socioeconomic study area, with one tract recording much higher unemployment at 21.9%, compared to a Baltimore County average of 5.2% (University of Minnesota 2024) (Table 58).

Income levels and non-white population percentages are variable. The tract containing the SPCT project area (4927) has the largest percentage of low-income (54%) and non-white residents (68%) among the census tracts evaluated (University of Minnesota 2024). The percentage of low-income residents in this tract is well above the Baltimore County level of 23% and the non-white percentage is somewhat above the Baltimore County level of 44%. Across all tracts, the low-income population dips as low as 7.4% in Anne Arundel tract 7313.06, which is much lower than the Anne Arundel County (14%), Baltimore County (22.7%), or Baltimore City (37.6% rates). Ten tracts in the study area have >25% low-income population, and three tracts have >50% non-white population, which meets the state's definition of underserved communities (see Section 4.18). Middle Eastern / North African residents may identify as white in the current Census but will have the ability to identify as Middle Eastern / North African in future Censuses. This change in categories could shift some portions of the study area population from white to non-white, but the magnitude of the change is unknown.

Figure 59. Schools in the Socioeconomics Study Area

Source: National Center for Education Statistics 2024

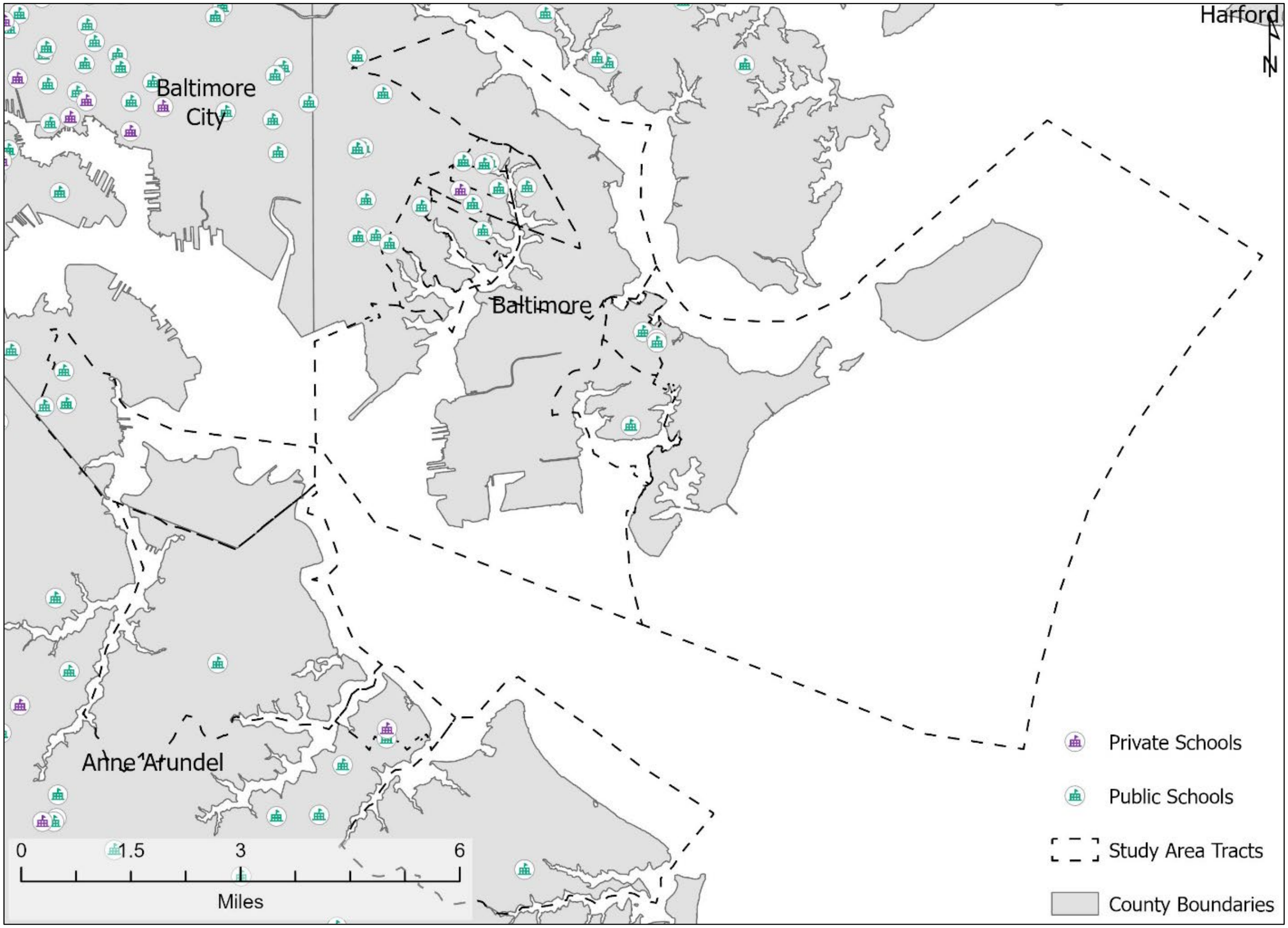


Table 56. Total Population and Age Characteristics, 2018 to 2022

County	Tract Number	Total Population	Percent Under 5	Percent Under 18	Percent 65 and older
Baltimore	County	850,737	5.7	21.6	17.6
Baltimore	42020	3,308	5.0	17.7	24.7
Baltimore	4203.01	2,335	7.2	18.0	12.2
Baltimore	4203.02	2,422	10.2	30.7	12.0
Baltimore	4203.03	1,158	5.8	16.8	20.9
Baltimore	4204.01	7,426	6.0	29.3	6.3
Baltimore	4204.02	1,931	6.5	28.6	12.0
Baltimore	4212	1,839	2.7	11.6	22.5
Baltimore	4519	2,663	9.8	24.5	17.2
Baltimore	4520	2,710	2.3	15.0	29.1
Baltimore	4521	3,353	7.2	22.1	16.5
Baltimore	4524	3,571	2.4	21.7	20.9
Baltimore	4525	4,243	7.1	34.5	10.8
Baltimore	4927 [1]	3,002	7.0	19.0	14.3
Anne Arundel	County	588,109	6.0	22.4	15.4
Anne Arundel	7301.02	11,619	7.2	23.1	5.2
Anne Arundel	7313.06	6,367	6.4	17.4	17.1
Anne Arundel	7313.08	4,194	5.5	16.5	15.2
Baltimore City	County	584,548	6.1	20.4	14.8
Baltimore City	2505	4,251	7.8	23.1	8.8

Source: University of Minnesota 2024

Notes:

1 – Tract containing the proposed project

Table 57. Race, Ethnicity, Education, and Language Characteristics, 2018 to 2022

County	Tract Number	Percent Non-white	Percent Hispanic	Percent High School Graduate	Percent with Bachelor's Degree or Beyond	Percent Households with Limited English
Baltimore	County	44.1	6.1	91.7	41.2	2.3
Baltimore	4202	18.5	8.1	91.7	9.6	1.1
Baltimore	4203.01	29.9	8.1	82.7	17.2	1.7
Baltimore	4203.02	27.7	7.3	87.4	24.1	0.0
Baltimore	4203.03	14.5	0.0	81.0	6.0	0.0
Baltimore	4204.01	53.0 [2]	11.5	81.9	14.0	5.3
Baltimore	4204.02	29.8	12.1	87.5	25.0	5.1
Baltimore	4212	18.7	6.6	92.4	13.4	3.3
Baltimore	4519	3.6	1.9	92.1	39.6	0.0
Baltimore	4520	16.8	0.0	94.3	21.3	0.0
Baltimore	4521	14.1	0.0	87.8	22.2	1.9

County	Tract Number	Percent Non-white	Percent Hispanic	Percent High School Graduate	Percent with Bachelor's Degree or Beyond	Percent Households with Limited English
Baltimore	4524	12.2	1.2	90.1	17.5	0.0
Baltimore	4525	27.0	4.9	86.1	12.9	0.0
Baltimore	4927 [1]	68.9 [2]	11.7	90.7	8.7	0.7
Anne Arundel	County	32.6	8.7	93.5	44.1	1.5
Anne Arundel	7301.02	45.4	9.2	96.4	44.9	3.4
Anne Arundel	7313.06	8.4	4.6	94.7	36.0	1.8
Anne Arundel	7313.08	8.8	4.2	92.5	17.8	0.0
Baltimore City	County	71.6 [2]	5.9	87.1	34.9	2.0
Baltimore City	2505	59.3 [2]	13.0	78.6	14.6	1.5

Source: University of Minnesota 2024

Notes:

1 – Tract containing the proposed project.

2 – Underserved community according to state of Maryland criteria (see Section 4.18).

Table 58. Income, Employment, and Housing Unit Characteristics, 2018 to 2022

County	Tract Number	Per Capita Income	Percent Low Income	Percent Unemployed	Total Housing Units	Percent Housing Units Owner-occupied
Baltimore	County	$46,603	22.7	5.2	349,471	62.6
Baltimore	4202	$41,166	20.0	1.3	1,575	77.1
Baltimore	4203.01	$26,123	43.8 [2]	11.9	1,098	34.9
Baltimore	4203.02	$27,850	29.2 [2]	5.3	1,026	47.0
Baltimore	4203.03	$37,926	27.1 [2]	21.9	528	83.9
Baltimore	4204.01	$25,642	52.1 [2]	9.3	2,248	40.1
Baltimore	4204.02	$32,109	37.4 [2]	9.6	759	72.5
Baltimore	4212	$34,374	39.3 [2]	6.0	799	82.2
Baltimore	4519	$69,606	11.0	1.9	1,180	73.1
Baltimore	4520	$36,738	20.4	2.5	1,109	79.4
Baltimore	4521	$64,042	15.1	4.6	1,451	75.1
Baltimore	4524	$40,158	25.9 [2]	6.5	1,332	84.2
Baltimore	4525	$27,833	37.0 [2]	4.4	1,395	70.7
Baltimore	4927 [1]	$26,200	54.4 [2]	6.2	1,669	22.6
Anne Arundel	County	$56,187	14.2	4.2	233,163	71.4
Anne Arundel	7301.02	$52,375	10.4	4.6	4,381	77.0
Anne Arundel	7313.06	$70,145	7.4	0.2	2,401	93.0
Anne Arundel	7313.08	$39,902	17.8	3.1	1,640	81.7

County	Tract Number	Per Capita Income	Percent Low Income	Percent Unemployed	Total Housing Units	Percent Housing Units Owner-occupied
Baltimore City	County	$37,845	37.6 [2]	6.9	293,555	40.2
Baltimore City	2505	$32,619	34.2 [2]	5.7	2,510	45.1

Source: University of Minnesota 2024

Notes:

1 – Tract containing the proposed project.

2 – Underserved community according to state of Maryland criteria (see Section 4.18).

4.17.1.5 Economy, Employment, Labor Force, and Industry

Sparrows Point is now a logistics and distribution hub. Sparrows Point is a major local employer of residents in the neighboring tracts. A third-party analysis of commuting patterns used cell phone captures to estimate the number and origin of regular daily visits. In the first four months of 2023, the analysis estimated a daily on-site population of 19,000 to 22,000, including workers and truckers. About 30% of workers are coming from nearby Dundalk, Sparrows Point, and Essex with many of the remaining workers coming from elsewhere across the Greater Baltimore area.

Employment across economic sectors in the 17 census tracts that make up the socioeconomic study area shares some similarities with but also differs from Baltimore County and the state. The employed civilian population in the census tracts is about 33,000 people, and the largest employment sector is educational services, healthcare, and social assistance (20.4%). The other large employment sectors for the neighboring census tracts are the retail trade, professional science and management, transportation, warehousing and utilities, and construction sectors (Table 59, Figure 60). Employment in the transportation, warehousing, and utilities sector is much higher in the neighboring census tracts (10.5%) than in Baltimore County (6.0%) or the state of Maryland (5.0%). Compared to the census tracts in the study area, Baltimore County and the state have higher proportions of employment in educational services, healthcare and social assistance, public administration, and professional services. The arts, entertainment, and tourism sector has similarly modest levels of employment across regions of 7 to 8%, The percentage employed in agriculture, forestry, mining, and fishing is low across all regions (less than 1%).

Table 59. Employment by Region and Economic Sector, 2018 to 2022

Employment Sectors	Maryland	Baltimore County	Socioeconomics Study Area Tracts
Employed civilian population	3,131,413	429,630	33,279
Agriculture, forestry, fishing and hunting, mining	17,490 (0.6%)	1,614 (0.4%)	95 (0.3%)
Construction	231,015 (7.4%)	24,188 (5.6%)	3,290 (9.9%)
Manufacturing	147,279 (4.7%)	24,383 (5.7%)	2,337 (7.0%)
Wholesale trade	51,837 (1.7%)	8,673 (2.0%)	989 (3.0%)
Retail trade	286,887 (9.2%)	43,956 (10.2%)	4,254 (12.8%)
Transportation and warehousing, utilities	156,937 (5.0%)	25,886 (6.0%)	3,507 (10.5%)
Information	55,833 (1.8%)	7,226 (1.7%)	453 (1.4%)

Employment Sectors	Maryland	Baltimore County	Socioeconomics Study Area Tracts
Finance and insurance, real estate, rental and leasing	186,439 (6.0%)	32,971 (7.7%)	1,543 (4.6%)
Professional, scientific and management, administrative, waste management	504,340 (16.1%)	56,492 (13.1%)	3,703 (11.1%)
Educational services, health care, social assistance	740,425 (23.6%)	116,651 (27.2%)	6,775 (20.4%)
Arts, entertainment and recreation, accommodation, and food services	242,931 (7.8%)	31,855 (7.4%)	2,379 (7.1%)
Other services	165,530 (5.3%)	21,323 (5.0%)	1,639 (4.9%)
Public administration	344,470 (11.0%)	34,412 (8.0%)	2,315 (7.0%)

Source: University of Minnesota 2024

4.17.2 Environmental Consequences

The socioeconomic effects of the proposed project would include the economic impacts on the local and regional economy from the construction and operation of new business and transportation alternatives. These effects are modeled to generate quantitative estimates. Other effects are qualitatively evaluated, and they represent potential disruptions to selected economic sectors during or after construction and changes in socio-demographics from job creation.

Economic Impacts in Maryland

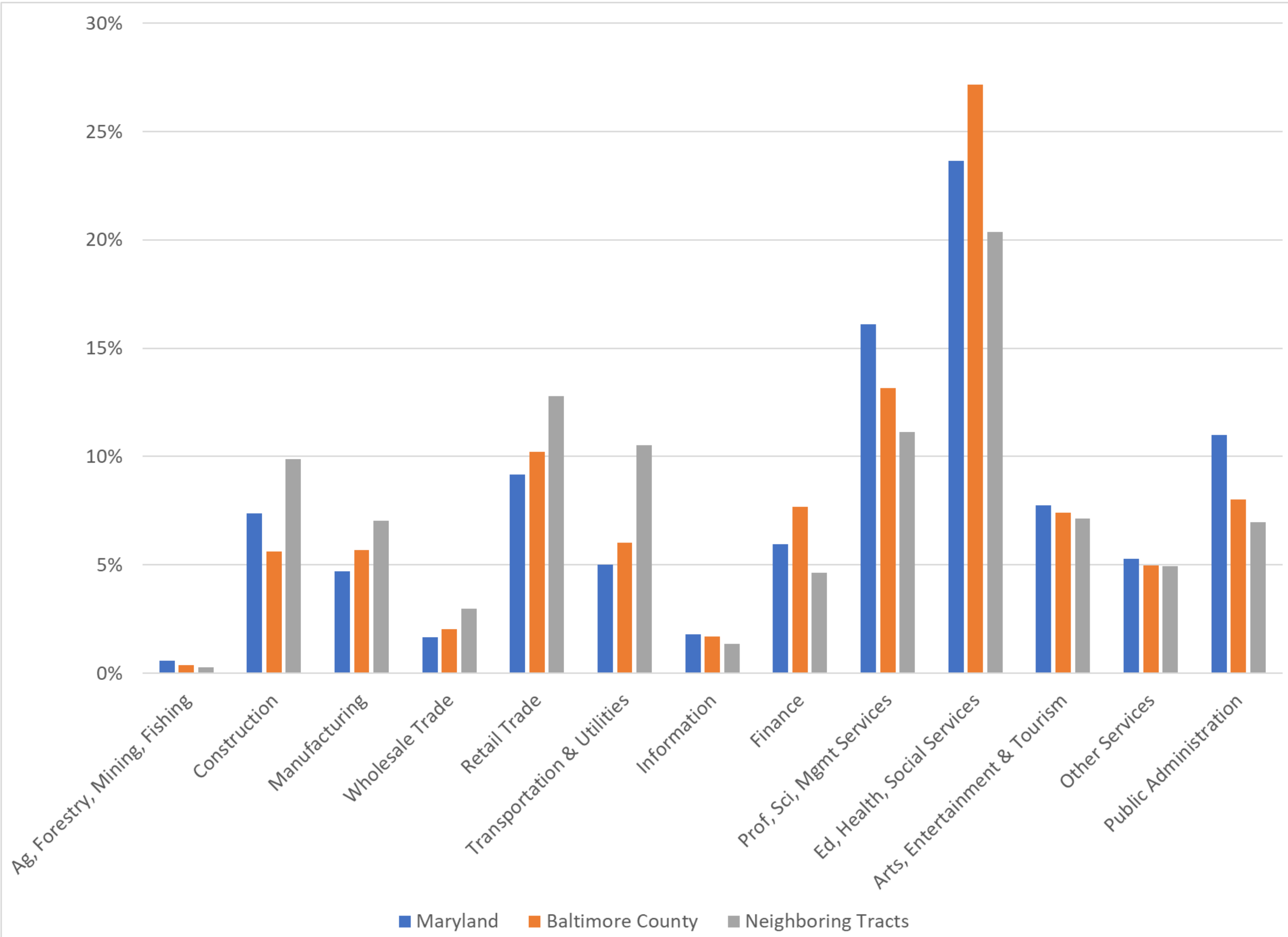
The economic impacts of a new project can be quantified in terms of multiple indicators including the jobs, incomes, business sales, and tax revenues generated by project spending. Economic impacts are generated through direct, indirect, and induced effects on economic sectors. Direct effects are those that result from purchases or job creation associated with the project development and operation. Indirect effects are associated with purchases and sales by the businesses that supply inputs to the businesses that receive direct project spending, and additional rounds of new spending that propagate through the economy. Induced effects are generated when households spend new income to purchase goods and services at businesses that are unrelated to project construction and operation. The indirect and induced effects are often referred to as multiplier effects and their magnitude is a function of the economic structure of the region used in analysis.

This section describes potential direct, indirect, and induced economic impacts that would result from each proposed alternative for construction and operation of the terminal. Impacts are assessed as multi-region effects where job creation would occur in the local region (Anne Arundel County, Baltimore County, and Baltimore City) and indirect and induced effects are assessed for the local region and the state of Maryland.

Figure 60. Employment by Economic Sector and Region

This chart presents the employment sectors for the state of Maryland, Baltimore County, and the socioeconomic study area tracts. The matching data for this chart is presented above in Table 59.

Source: University of Minnesota 2024



Methods

Assessment of the economic impacts of each stage of project development involved four steps:

1. Estimate the number and duration of jobs in various industries required to complete each phase of each alternative
2. Develop an economic input-output model for the immediate impact region and the rest of the state of Maryland
3. Use employment estimates to estimate direct, indirect, and induced impacts associated with the project
4. Estimate the average annual economic impacts and cumulative economic impacts over the project period

IMPLAN is an economic model built on data aggregated from multiple sources to represent an area's economic structure. The model uses local data on the size and type of businesses in a region and interactions (purchases, taxes, and transfers) among business (or industry) sectors, governments, and households, as the basis for modeling economic impacts. To model impacts, new spending (or new job creation) is distributed to the appropriate economic sectors (i.e., 546 industry categories), resulting in increased output (or employment). This new spending on activities, such as planning, constructing, or managing a project, increases industry-specific activity that, in turn, necessitates increased purchases of inputs from other businesses (goods and services) and households (labor). Resulting economic impacts are classified in IMPLAN as employment (jobs created), labor income (employee compensation and proprietor income), value added (contribution to Gross Domestic Product), total output (gross value of industry production), and tax revenues (income taxes, taxes on corporate profits, social insurance tax, excise and sales taxes, customs / duty). These impacts represent the various ways that economic activity is stimulated as a result of new spending or new hiring. IMPLAN is a widely used tool for economic impact analysis and was used to model economic impacts of the proposed project using data from 2022.

A multi-regional input-output model was used for the analysis. Multi-region models are used to evaluate effects within the area receiving the direct spending (or job creation) and also include the indirect and induced effects within a broader region that includes businesses and households that interact with businesses in the region of direct job creation. In this analysis, estimated direct jobs created with the construction and operation of the terminal were modeled in the local region (Anne Arundel County, Baltimore County, and Baltimore City) with indirect and induced impacts modeled for the rest of the state of Maryland. Not all indirect and induced industry and household purchases would occur in the local region, so additional impacts are captured when the rest of the state is included in the modeling. Expected employment in each phase of each alternative (Table 60) was allocated to specific industrial sectors (e.g., construction of non-residential structures, water transportation) and modeled for the local region.

Economic impacts from the model generate average annual projections that were multiplied by the varying durations of project construction and operational phases to create total impacts per project phase. Phases evaluated include the common elements related to terminal construction (e.g., wharf construction, paving, building construction), dredging, and material placement; terminal operations; and DMCF construction (Table 60). The inclusion of dredging and placement activities among the common elements differs from other impact sections that include placement impacts with DMCF construction. The socioeconomic impacts differ because economic activity associated with placement was not separable from dredging and included the same level of effort (i.e., jobs).

Jobs created by construction activity were assigned to IMPLAN sectors based on the type of structure being built (i.e., new non-residential structures, new commercial structures). Dredging jobs were assigned to the sand and gravel mining sector, following a recommendation from IMPLAN (Clouse 2020). Long-term terminal jobs were assigned to the sector of support activities for transportation, which includes Port facility operation, wharf operation, and loading and unloading services.

Assumptions and Sources of Uncertainty

Model choices described in this section are typical for this type of regional economic analysis conducted to represent effects within a fixed geographic region. As with any model, results can vary with modeling choices, model structure, data quality, and the size of the region modeled.

- The analysis is for the state of Maryland and the direct jobs were assumed to occur in the 3-county region closest to the proposed new terminal. Using a larger region for analysis tends to increase the measured economic impacts since more businesses and households will generate indirect and induced effects.
- This analysis does not include any forecasts of future growth, so as employment or output change over time, economic impacts from operations will diverge from the annual impacts generated here, which are based on expected employment levels necessary for terminal operations.
- IMPLAN is an industry standard input-output model that evaluates economic impacts based on national and local data sources. Local businesses and households may have purchasing patterns that differ from national averages and therefore model output can differ from analyses based on local data.
- The model used an estimate of the direct jobs needed to complete construction and conduct terminal operations as inputs. An alternative approach is to use spending by economic sector as input, which could yield somewhat different results.

Table 60. Direct Employment and Duration by Project Phase and Alternative

Alternative	Phase	Direct Employment (number of jobs)	Duration (months)	IMPLAN Industry [1]
No-action Alternative	N / A	Not estimated	N / A	N / A
Combined Options Alternative – Terminal Development and Channel Improvements	Electrical	24	34	56
	Upland civil (miscellaneous)	15	32	56
	Paving	24	28	56
	Gate area	12	11	56
	Utilities (water and storm)	12	4	56
	Wharf construction	125	30	56
	Building construction	27	32	55
	Rail (crane and intermodal / rail yard)	18	10	56
	Dredging and placement (seasonal)	35	24	29
	Dredging and placement (year-round) [2]	6	36	29
	Terminal operations	1,050	N / A	420

Alternative	Phase	Direct Employment (number of jobs)	Duration (months)	IMPLAN Industry [1]
Combined Options Alternative – Dredged Material Placement	Onshore and offshore DMCF construction	30	27	56

Notes:

1 – IMPLAN Industry 29 is sand and gravel mining, 55 is construction of new commercial structures, including farm structures, and 56 is construction of other new nonresidential structures

2 – Dredging activities are seasonal, but a subset of dredging employees would likely be engaged in other related tasks during the rest of the year

4.17.2.1 No-action Alternative

Economic Impacts

Impacts were not quantified for the No-action Alternative because the nature and magnitude of future activities are highly uncertain. The details of any future development of Coke Point have not been determined but would include the continued remediation of impacted soil and groundwater, as well as paving and building consistent with the rest of the TPA property. Continued periodic maintenance dredging of the Sparrows Point Channel, as well as continued operation of warehouses, handling of Ro-Ro and bulk cargo, and other current activities, would increase jobs and economic activity in the local region and state.

Commercial Fishing Impacts

No impacts on commercial fishing would occur because the No-action Alternative would not contain any in-water activities.

4.17.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Economic Impacts from Construction

The construction activities would take just under 3 years to complete. Jobs created during each phase would not necessarily be full-time equivalents because some phases would be less than a year in duration, which were accounted for when calculating job-years During this period, about 1,090 job-years of employment are expected (Table 61) with labor income of about $80 million and industry output of about $203 million (Table 62). This is equivalent to about 364 average annual jobs over the 3 years of construction and dredging. The average annual salary of all jobs would be about $74,000. Additionally, about $2.9 million in county and $6.2 million in state tax revenues are expected.

Table 61. Estimated Total Employment Impacts from Elements Associated with the Terminal Development and Channel Improvements over the 3-year Construction Period

Phase	Direct Jobs	Duration (years)	Direct Job-years	Total job-years [1]
Electrical	24	2.83	68	110
Backland civil (miscellaneous)	15	2.67	40	65
Paving	24	2.33	56	91
Gate area	12	0.92	11	18
Utilities (water and storm)	12	0.33	4	6
Wharf construction	125	2.50	313	506
Building construction	27	2.67	72	107
Rail (crane and intermodal / rail yard)	18	0.83	15	24
Dredging (seasonal) [2]	35	2.00	70	131
Dredging (year-round)	6	3.00	18	32
Total	**NA**	**NA**	**667**	**1,091**

Notes:

1 – Sum of direct, indirect, and induced jobs in the local region and the rest of the state of Maryland

2 – Seasonal jobs would last 8 months per year, so the total duration is 2 years.

Totals may not sum due to rounding

NA = not applicable

Table 62. Estimated Economic Impacts from Elements Associated with the Terminal Development and Channel Improvements over the Construction Period

Region	Employment (job-years)	Labor Income	Value Added	Output	Tax Revenues		
					City / County	State	Federal
Local region	1,022	$76,164	$103,294	$188,672	$2,454	$5,579	$16,496
Rest of Maryland	69	$4,182	$8,279	$14,319	$450	$616	$1,024
Total [1]	**1,091**	**$80,345**	**$111,574**	**$202,991**	**$2,904**	**$6,195**	**$17,520**

Notes:

1 – Values represent the sum of direct, indirect, and induced impacts in the local region and the rest of the state of Maryland.

Dollar values in $1,000s, 2024 dollars.

Economic Impacts from Terminal Operations

Once constructed, the operation of the terminal would generate jobs in the specialized transportation sector that includes Port facility operation, wharf operation, and loading and unloading services. About 800 direct jobs on the terminal and about 250 direct office jobs are anticipated. These direct jobs would generate an additional 540 indirect and induced jobs in the local region, bringing the total employment impacts (including direct, indirect, and induced) to nearly 1,600 in the local region with additional 87 jobs in the rest of the state (Table 63). These are annual values that would persist in perpetuity. The terminal operations jobs would generate about $102 million in labor income and $194 million in industry output annually. Average annual salary for all jobs would be about $61,000, compared with per capita income of about $47,000 in Baltimore County (US Census 2022). These jobs would also generate more than $3 million in annual county tax revenue and about $6.2 million in annual state tax revenues.

Table 63. Estimated Total Economic Impacts of Ongoing Terminal Operations

Region	Employment (job-years)	Labor Income	Value Added	Output	Tax Revenues		
					City / County	State	Federal
Local region	1,577	$97,013	$101,384	$177,945	$2,545	$5,496	$19,666
Rest of Maryland	87	$5,072	$9,823	$16,319	$503	$693	$1,233
Total [1]	1,664	$102,085	$111,208	$194,264	$3,048	$6,189	$20,899

Notes:

1 – Sum of direct, indirect, and induced jobs in the local region and rest of the state of Maryland

Values are per year, and jobs are ongoing.

Dollar values in $1,000s, 2024 dollars.

Cultural Context

Given the existing level of jobs and economic activity in the construction, transportation, and warehousing sectors in the local area, the project is not anticipated to significantly impact the economic structure or socio-demographics of the region. The creation of over 300 average annual jobs in the local region during the 3-year construction phase and almost 1,600 jobs for operations could reduce unemployment and increase incomes during these phases. New workers could move to or stay temporarily in the area, potentially increasing demand for housing and services. However, the new jobs would be a small percentage of total employment, so effects would not be significant.

Commercial Fishing Impacts

Commercial fishing is not known to be occurring in the Sparrows Point Channel. However, increased vessel traffic associated with terminal construction, operations and dredging has the potential to create space / use conflicts if commercial fishing vessels are also using the channel.

4.17.2.3 Combined Options Alternative – Dredged Material Placement

Economic Impacts

Construction of the High Head Industrial Basin and Coal Pier Channel DMCFs, including dredged material placement, would take about 27 months of labor activity, creating 109 job-years of employment (about 48 average annual jobs) (Table 64). This level of employment would generate about $8 million in labor income and about $19 million in industry output. These jobs would have an average annual salary of almost $74,000. Construction of the onshore and offshore DMCFs would generate almost $252,000 in county taxes and $536,000 in state taxes.

Table 64. Estimated Economic Impacts for DMCF Construction over the 27-month Construction Period

Region	Employment (job-years)	Labor Income	Value Added	Output	Tax Revenues		
					City / County	State	Federal
Local Region	103	$7,650	$9,855	$18,013	$211	$480	$1,635
Rest of Maryland	7	$391	$771	$1,336	$40	$56	$96
Total [1]	109	$8,041	$10,626	$19,349	$252	$536	$1,731

Notes:

Dollar values are in $1,000s and 2024 dollars.

1 – Sum of direct, indirect, and induced jobs in the local region and the rest of the state of Maryland

Activities related to the proposed terminal and DMCF construction and dredged material placement would generate employment and substantial economic activity. Including the elements associated with the terminal development and channel improvements, this alternative would generate a total of about 1,200 job-years of employment and $222 million in industry output. Average annual salaries across all jobs would be around $74,000. This alternative, including terminal development, would generate about $3.2 million in county tax and $6.7 million in state tax revenue during their active periods.

Commercial Fishing Impacts

High Head Industrial Basin DMCF

The construction of the High Head Industrial Basin DMCF would not have any impacts on commercial fishing.

Coal Pier Channel DMCF at Sparrows Point

The Coal Pier Channel DMCF would be located just over a mile to the south of an active pound net and would not co-occur with the existing pound net location. Although construction noise could deter fish use of the area for 2 to 3 years, construction would be unlikely to limit vessel activity. Overall effects on commercial fishing would not be significant.

Existing Nearshore MPA DMCFs

No new socioeconomic impacts would occur because the MPA DMCFs are existing placement sites.

Existing Ocean Disposal Site

No new socioeconomic impacts would occur because NODS is an existing USEPA-designated ocean placement site.

4.18 Environmental Justice

4.18.1 Affected Environment

4.18.1.1 Regulatory Background

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (1994) directed each federal agency to make achieving environmental justice part of its mission, and for agencies to address significant adverse impacts on minority and low-income communities analyzed in NEPA documents. Executive Order 14096, "Revitalizing Our Nation's Commitment to Environmental Justice for All" (2023) reiterated the federal government's commitment to environmental justice, and defined it as "the just treatment and meaningful involvement of all people regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:

- are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers;
- and have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices."

Consistent with the federal definition, the state of Maryland defines environmental justice as "equal protection from environmental and public health hazards for all people regardless of race, income, culture and social status." (Maryland Code Annotated, Environment §1-701). Further, the state defines underserved communities as "any census tract in which, according to the most recent U.S. Census Bureau survey: at least 25% of residents qualify as low-income; at least 50% of residents identify as non-white; or at least 15% of residents have limited English proficiency." Overburdened communities are those with a high proportion of exposure to pollutants or other stressors or exhibit high rates of disease burden. Maryland also defines overburdened communities as any census tract for which three or more of 21 environmental health indicators are above the 75th percentile statewide.

Additional federal guidance has been produced to consider sensitive populations and further define environmental justice approaches. For example, guidance from the CEQ includes directions to evaluate the "potential for multiple exposures or cumulative exposure to human health or environmental hazards in the affected population, as well as historical patterns of exposure to environmental hazards" and recognize the interrelated social factors that may amplify physical effects (CEQ 1997). The guidance further stresses the need to assure meaningful community representation throughout the process.

4.18.1.2 Methodology

Analysis of potential disproportionately high and adverse impacts on environmental justice communities was carried out using the following steps:

1. Identify and describe the study area
2. Identify underserved and overburdened populations, according to Maryland law, within the study area
3. Document public outreach efforts

4. Identify and summarize potential beneficial and adverse impacts on environmental justice populations under each alternative
5. Determine whether disproportionately high and adverse impacts would occur to environmental justice populations under the preferred alternative

4.18.1.3 Study Area

The study area for environmental justice analysis includes the same local area identified under socioeconomic conditions. The area includes US Census tracts adjacent to the project, encompassing counties, and the city of Baltimore (see Section 4.18.1 for detailed Census data on the study area). The area around the proposed project elements comprises 17 census tracts.

Ten of the 17 tracts meet state of Maryland criteria for underserved communities, based on 2022 census data. Ten tracts meet the criterion for low-income, nine in Baltimore County and one in Baltimore City (Figure 61). Three of those tracts are also greater than 50% non-white— two in Baltimore County and one in Baltimore City. None of the three tracts in Anne Arundel County meet the state definition of underserved communities. None of the tracts in the study area meet the criterion for linguistically isolated communities. The tracts with underserved populations include the tract that encompasses Sparrows Point and all but one of the contiguous tracts to the north. The nearest residences in the Baltimore City tract (2505) to the project are in Brooklyn, nearly 5 miles from Sparrows Point. Fort Armistead Park is also within this tract and falls within 2 miles of the site, potentially affecting park visitors.

The tracts in the study area were reviewed to determine whether any meet the State of Maryland definition of overburdened communities. MDE groups the 21 overburdened community criteria into three categories: pollution burden exposure, pollution burden environmental effects, and sensitive populations. The MDE's Environmental Justice Screening Tool (version 2.0 Beta) combines these criteria into a single score for each category, but mapping anomalies were identified where map legends and data did not match. Therefore, individual criteria were evaluated instead (Table 65 and Table 66).

All 17 tracts in the study area meet the state of Maryland's overburdened community criteria. All study area tracts are above the 75th percentile for ozone (Table 65) and wastewater discharge (Table 66), and 16 of the 17 meet the criterion for Superfund site proximity. Tract 4927 which contains Turner Station is above the 75^{th} percentile for 7 overburdened community criteria. In addition to ozone, wastewater discharge and Superfund site proximity, it also meets the criteria for the lead paint indicator and proximity to toxic release inventory facilities, risk management plan facilities and hazardous waste (Table 65 and Table 66). The Baltimore City tract (2505) is above the 75^{th} percentile for more overburdened community criteria than any other tract in the study area with 8, including ozone, wastewater discharge, Superfund site proximity, National Air Toxic Assessment (NATA) diesel PM, lead paint, and proximity to a hazardous waste landfill, risk management plan facility and hazardous waste. These two tracts (i.e., 4927 and 2505) also meet underserved community criteria because they are greater than 50% nonwhite and greater than 25% low-income. In the study area, four tracts meet only three overburdened community criteria, including the tracts containing Riviera Beach and Fort Smallwood (7313.06 and 7313.08) and the tracts containing Edgemere and Sparrows Point (4520 and 4521). None of these tracts meet underserved community criteria.

Figure 61. Environmental Justice Communities in the Study Area

None of the study area communities met the criteria for linguistically isolated.

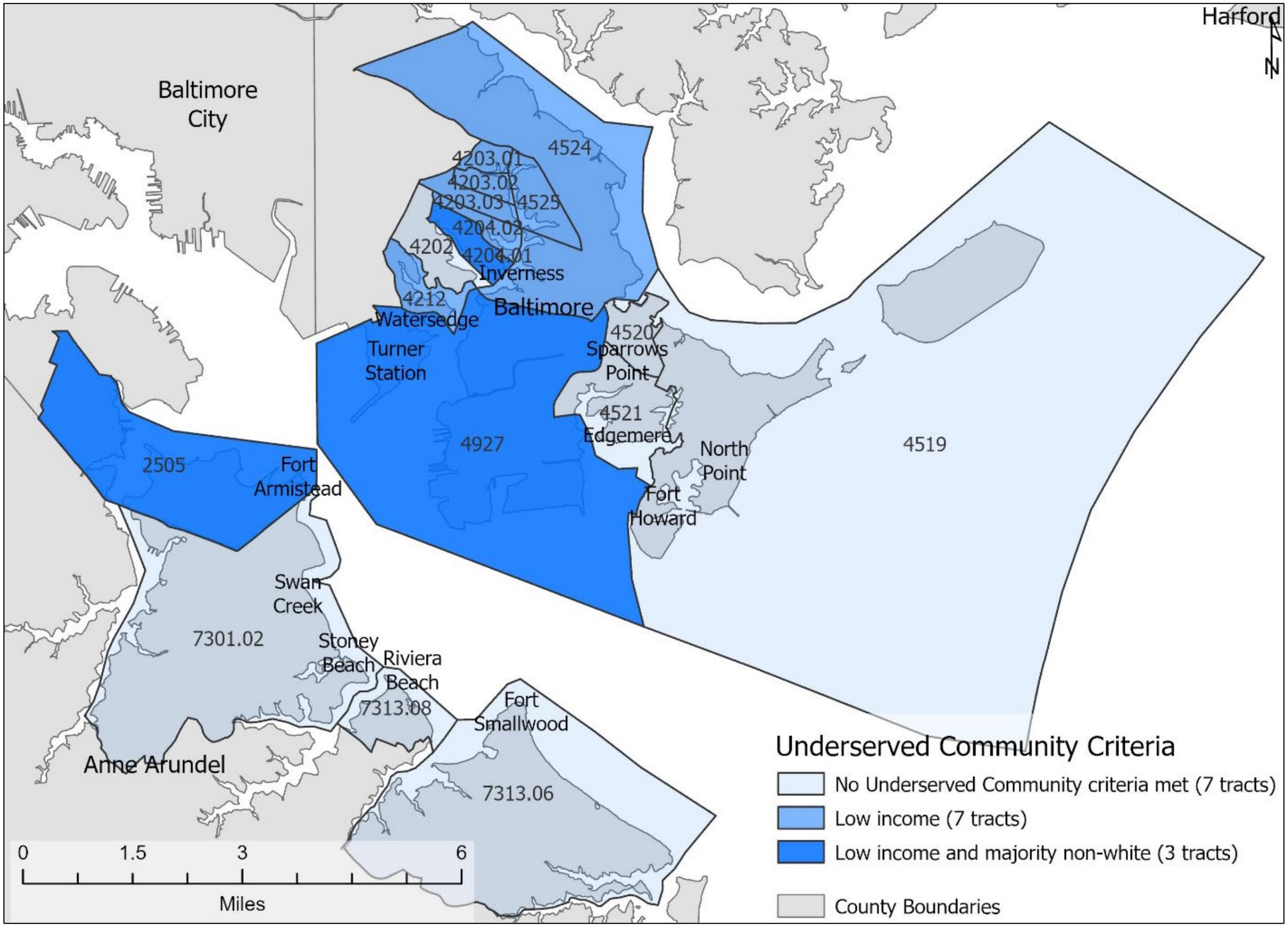


Table 65. Study Area Tracts above the 75th Percentile for Pollution Burden Exposure indicators in MDE's Environmental Justice Screening Tool

Tract	$PM_{2.5}$	Ozone	NATA Diesel PM	NATA Cancer Risk	NATA Respiratory Hazard Index	Traffic Proximity	Toxic Release Inventory Facility Proximity	Hazardous Waste Landfill Proximity	Count
7301.02		✓					✓		2
7313.06		✓					✓		2
7313.08		✓							1
2505		✓	✓					✓	3
4202		✓							1
4212		✓							1
4927		✓					✓		2
4520		✓							1
4521		✓							1
4519		✓					✓		2
4204.01		✓							1
4204.02		✓							1
4203.01		✓							1
4203.02		✓							1
4203.03		✓							1
4524		✓					✓		2
4525		✓							1

Table 66. Study Area Tracts above the 75th Percentile for Pollution Burden Environmental Effects Indicators in MDE's Environmental Justice Screening Tool

Tract	Lead Paint	Risk Management Plan Facility Proximity	Hazardous Waste Proximity	Superfund Site Proximity	Wastewater Discharge	Brownfields Proximity	Emitting Power Plant Proximity	CAFO Proximity	Mining Operations Proximity	Count
7301.02		✓	✓	✓	✓					4
7313.06					✓					1
7313.08				✓	✓					2
2505	✓	✓	✓	✓	✓					5
4202		✓	✓	✓	✓					4
4212		✓	✓	✓	✓					4
4927	✓	✓	✓	✓	✓					5
4520				✓	✓					2
4521				✓	✓					2
4519				✓	✓					2
4204.01	✓	✓	✓	✓	✓					5
4204.02		✓	✓	✓	✓					4
4203.01	✓	✓		✓	✓					4
4203.02		✓		✓	✓					3
4203.03		✓		✓	✓					3
4524		✓		✓	✓					3
4525		✓		✓	✓					3

The study area includes Sparrows Point, which was the site of a steel mill that operated from 1887 to 2013 resulting in a landscape with prominent industrial features. Historic steel making operations resulted in contamination of onsite soils and groundwater and nearby waterbodies, including the Patapsco River, Bear Creek, and Old Road Bay. Cleanup efforts are ongoing, but the legacy of this contamination persists in terms of community perceptions and concerns. As part of the evolution of Sparrows Point, industrial areas are being converted to modern warehouses and transportation infrastructure.

The study area was evaluated for subsistence fishing and the occurrence of tribal affiliation. Shore-based license-free fishing sites along the Patapsco River that may support subsistence fishing fall outside of the study area. No tribal uses within the study area are documented.

The underserved community of Turner Station has historic flooding issues that have contributed to community concerns about additional impacts from project activities, including dredging and offshore containment facilities. Potential flood impacts were analyzed (see Section 4.3.2) that found that sediment dredging and construction of a DMCF offshore of Coke Point would not affect flooding of Turner Station nor alter the hydrology of Bear Creek. In addition, a study by the Corps (Corps 2022) concluded that the lack of upgraded public stormwater infrastructure was a key factor contributing to the flooding that Turner Station experiences. The study also noted that the low-lying areas of Turner Station will be susceptible to future sea level rise and other climate change effects.

4.18.1.4 Public Outreach and Engagement

In the last 10 years, TPA has engaged in a robust annual community outreach and engagement strategy that included the efforts detailed below. Since the beginning of the SPCT project, TTT has worked with TPA to support outreach related to the project. Community concerns have been shared at the meetings and TPA representatives have shared detailed information with the community on their plans. Input from environmental justice and other neighboring communities has been used to design additional impact analyses and results have been shared and discussed with community members.

- An annual *Straight to the Point* Newsletter sent to over 3,000 hyper-local households in the zip codes of 21219, 21220, 20152, 21222, 21221, and 21224.
- Convening of a Community Advisory Board three times a year, including key stakeholders from surrounding neighborhoods, including Turner Station.
- Host a biennial (spring and fall) virtual community open house. This is live broadcast that is recorded on Facebook Live and receives thousands of views post-event.
- Thousands of hours of volunteer participation in a variety of local events, including the annual Turner Station Community Health & Resource Fair where TPA serves refreshments to hundreds of residents.
- Community donations and sponsorships totaling over $1 million.
- Annual Star of Bethlehem Steel Lighting Event, a community-centered event held at the start of the holiday season each year to light a 28-foot Star of Bethlehem Steel that once stood atop of Bethlehem Steel’s L Blast Furnace and is now atop of TPA’s Water Tower. This event honors the site’s former steelworkers and is attended by dozens of community leaders, residents, and former mill workers and their families.

- Provide community leaders and residents with a driving tour of the TPA campus to highlight current and future projects.

TPA's community outreach and engagement strategy for 2025 includes the following:

- Continue to design, print, and distribute the *Straight to the Point* Newsletter to over 3,000 hyper-local households in the zip codes of 21219, 21220, 20152, 21222, 21221 and 21224.
- Convene TPA's Community Advisory Board three times throughout the year.
- Host a biennial (spring and fall) virtual community open house. This is live broadcast that is recorded on Facebook Live.
- Volunteer within local communities including Turner Station where TPA serves hundreds of residents at their annual Turner Station Community Health & Resource Fair.
- Host the Annual Star of Bethlehem Steel Lighting Event in December.
- Provide a tour of the site to political, key stakeholders, and community leaders and residents to highlight current and future projects, including SPCT.

To support the Draft EIS publication, TTT plans a public messaging campaign using Facebook targeting following zip codes 21219, 21230, 21220, 20152, 21222, 21221, and 21224 that will seek to inform residents and key stakeholders about the wealth of environmental and community impact information at www.spctmd.com.

To support ongoing information exchange, TPA partnered with the Turner Station Conservation Teams to fund and develop a new website for the community. The recently completed website provides a modern platform for the community to share information, communicate with the outside world and helps preserve and protect the community's historic identity. TPA corporate affairs and information technology personnel structured the website to support records management and structure communications. The new website was designed with a supported back-end processes to help Turner Station Conservation Teams leadership with succession and legacy planning.

4.18.2 Environmental Consequences

This section identifies beneficial and adverse effects associated with the project alternatives. Impact analyses were screened for relevancy to environmental justice concerns.

4.18.2.1 No-action Alternative

Activities associated with the No-action Alternative would be consistent with existing conditions. There would be ongoing potential for ecological risk from sediment resuspension during dredging and ship traffic in offshore areas west and south / southeast of Coke Point. These activities could create limited potential for human health risk.

4.18.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Groundwater

The project would address legacy environmental contamination through sediment removal and encapsulation. Specifically, the paving associated with terminal construction would decrease adverse effects of existing groundwater impacts by decreasing groundwater recharge and flow rates thereby reducing the movement of contaminants in the groundwater beneath the paved surfaces.

Sediment

The removal of contaminated sediments would result in net improvement in surficial sediment conditions for fish, crabs, benthic organisms, and humans. The removal of contaminated sediments may reduce uptake of these contaminants in the vicinity of the project area to fish, crabs, and benthic organisms. Therefore, this change could reduce potential exposure to contaminants by recreational fishers in the vicinity of the project area. The beneficial effects of the project to groundwater and aquatic organisms would occur consistently across the study area.

Aesthetics

New landscape features associated with terminal operation (e.g., STS cranes, stacks of containers) would be largely consistent with existing land uses. Similarly, terminal construction and operations would introduce new sources of light within the study area, but the additive effect would be minimal given high levels of existing light. Impacts from terminal operations would occur consistently to residents in seven of the 17 census tracts, including the Stoney Beach, Riviera Beach, Turner Station, Fort Howard and Edgemere communities. Two of these seven meet underserved community criteria, including Turner Station.

Recreation

Temporary exclusion zones during terminal construction and periodic dredging would affect recreational fishing and boating; data on demographics of area boaters are not available.

Air Quality

The study area includes tracts with a relatively high proportion of susceptible populations (2.4 to 10.2% under age 5 and 5.2 to 29.1% over age 65; Table 56) and includes 21 public and private K-12 schools (see Figure 59 in Section 4.17.1). All 17 tracts in the study area fall above the 75th percentile for ozone concentrations (Figure 62).

The region is currently in attainment with air quality standards for NO_2, one of the constituents of NO_x, but in serious nonattainment for the 2015 ozone standard and moderate nonattainment for the 2008 ozone standard. NO_2 concentrations are well below the threshold of 53 ppb in all 17 study area tracts (Figure 63). NO_2 emissions have the potential to irritate the human respiratory system and may contribute to the development of asthma (USEPA 2016a). Young children and the elderly are generally more susceptible to NO_2-related health effects (USEPA 2016a).

The air impacts analysis identified NO_x emissions above the *de minimis* threshold during terminal construction and operations. In the short-term, NO_x emissions would exceed the General Conformity *de* *minimis* threshold of 50 tpy during the first 3 years of terminal construction (2025 to 2027), before returning to below threshold level by 2028 (See Section 4.15.2.2, Table 40). Baseline estimates of NO_x emissions from terminal operations would be approximately 60 tpy, which would be greater than the established *de minimis* threshold on an annual basis. However, the use of electrified equipment for terminal operations is estimated to reduce these emissions by 53 tpy. This mitigation would help meet MDE permit conditions and is estimated to reduce emissions to levels far below the federal threshold.

Finally, some aspects of the air quality analysis were performed at a regional scale because federal Clean Air Act standards recognize that certain pollutants, such as $PM_{2.5}$, disperse over broad areas due largely to atmospheric conditions. This environmental justice analysis also recognizes that localized air quality concerns may be related to $PM_{2.5}$ and diesel particulate matter from mobile sources, such as vehicles. All tracts in the study area fall below the 75th percentile statewide for $PM_{2.5}$ (Figure 64) and diesel particulate matter (Figure 65), except diesel particulate matter in Tract 2505. The study traffic analysis considered the potential increase in vehicular traffic due to project operations. That analysis indicates that any localized diesel emissions would likely not occur in this tract but would potentially be focused in the industrial portion of Tract 4927 and not near the residences in that tract.

Given the planned mitigation to offset NO_x exceedances through equipment electrification, the low ambient levels of NO_2, and the lack of localized $PM_{2.5}$ and diesel particulate matter in identified underserved or overburdened communities within the study area, the project is not expected to produce disproportionate and adverse impacts on environmental justice populations.

Community Noise

Periodic and nighttime noise effects would occur from terminal construction and dredging. Under typical conditions, these activities would not result in noise that exceeds acceptable limits at the nearest sensitive receptors, but regulatory exceedances could occur during less typical atmospheric conditions. Occasional elevated noise during terminal construction and dredging could occur in six of the 17 study area tracts, including the Stoney Beach, Riviera Beach, Turner Station and / or Fort Howard communities. Two of these tracts include underserved communities, including Turner Station and the tract containing Fort Armistead. Similarly, under typical conditions during terminal operations, daytime, periodic, and nighttime noise levels would be within regulatory limits, but under less typical conditions, elevated noise could reach nearby communities in the three tracts in northern Anne Arundel County (i.e., Stoney Beach and Riviera Beach), and none of these are underserved communities.

Figure 62. Ground Level Ozone in the Study Area

Quartiles of data for the state of Maryland are shown. Source: MDE 2024

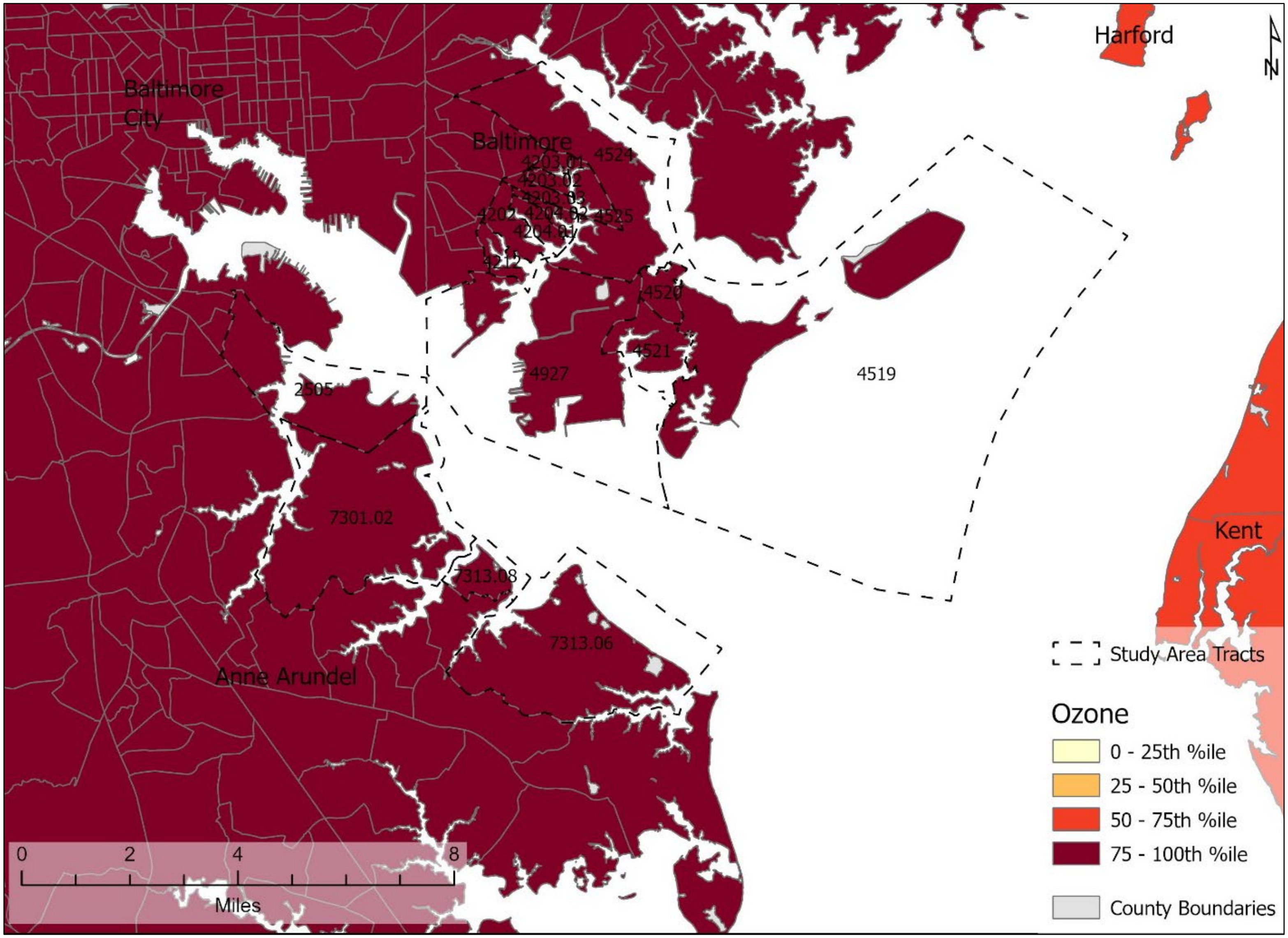


Figure 63. Average Annual Concentration of NO_2 (ppb) in the Study Area

Quartiles of data for the state of Maryland are shown. Source: USEPA 2024f

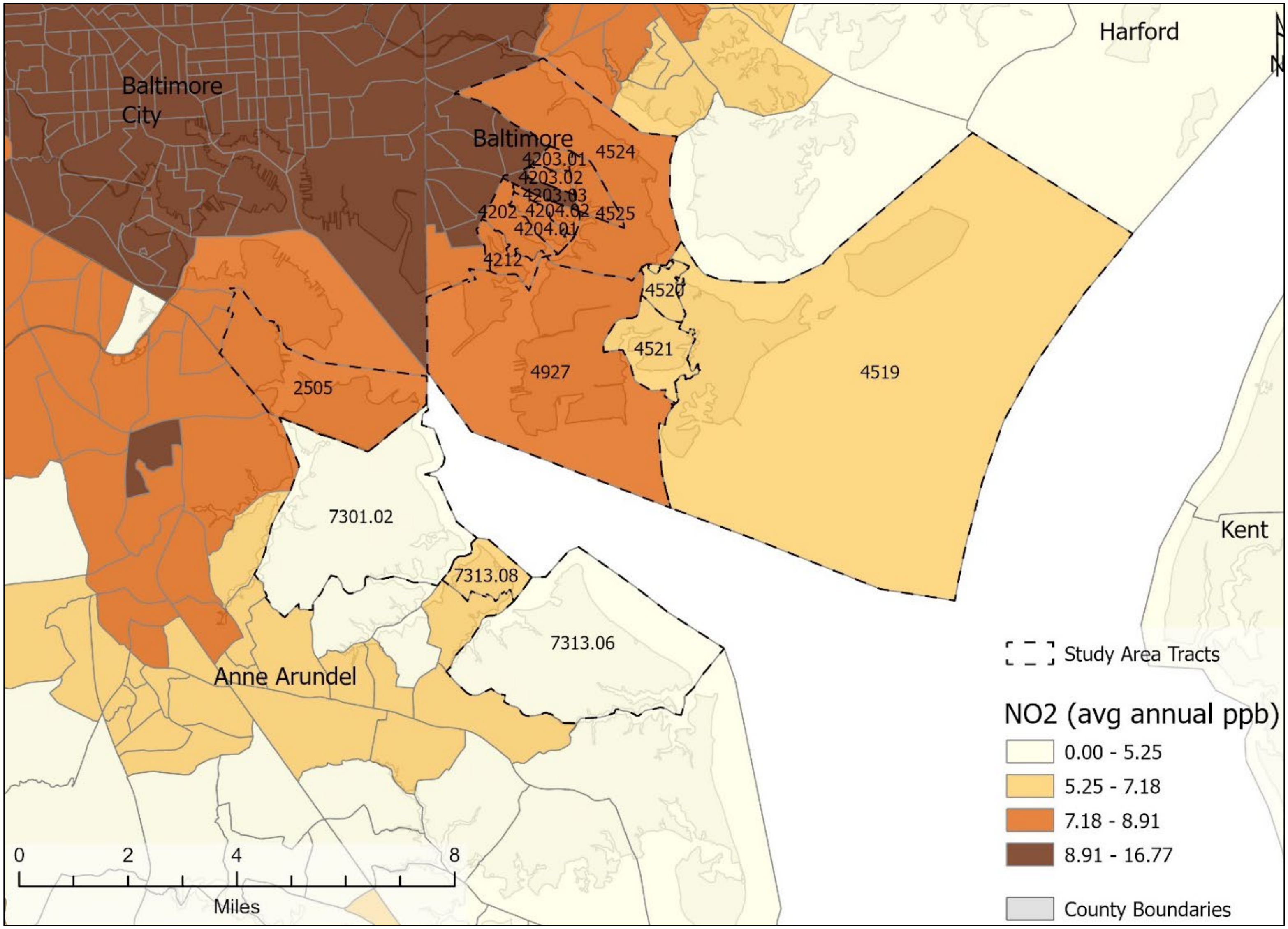


Figure 64. PM$_{2.5}$ in the Study Area

Quartiles of data for the state of Maryland are shown. Source: MDE 2024

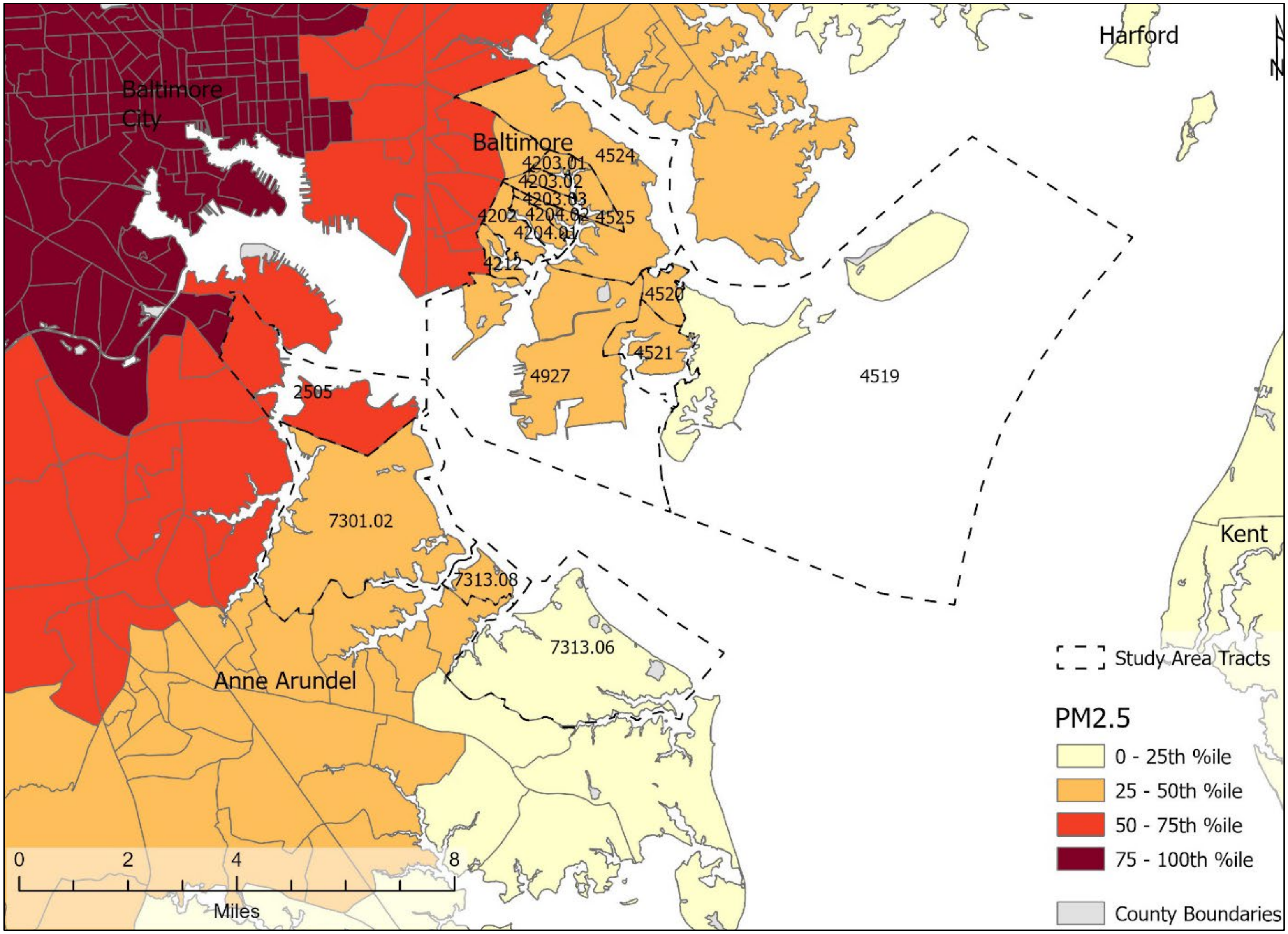
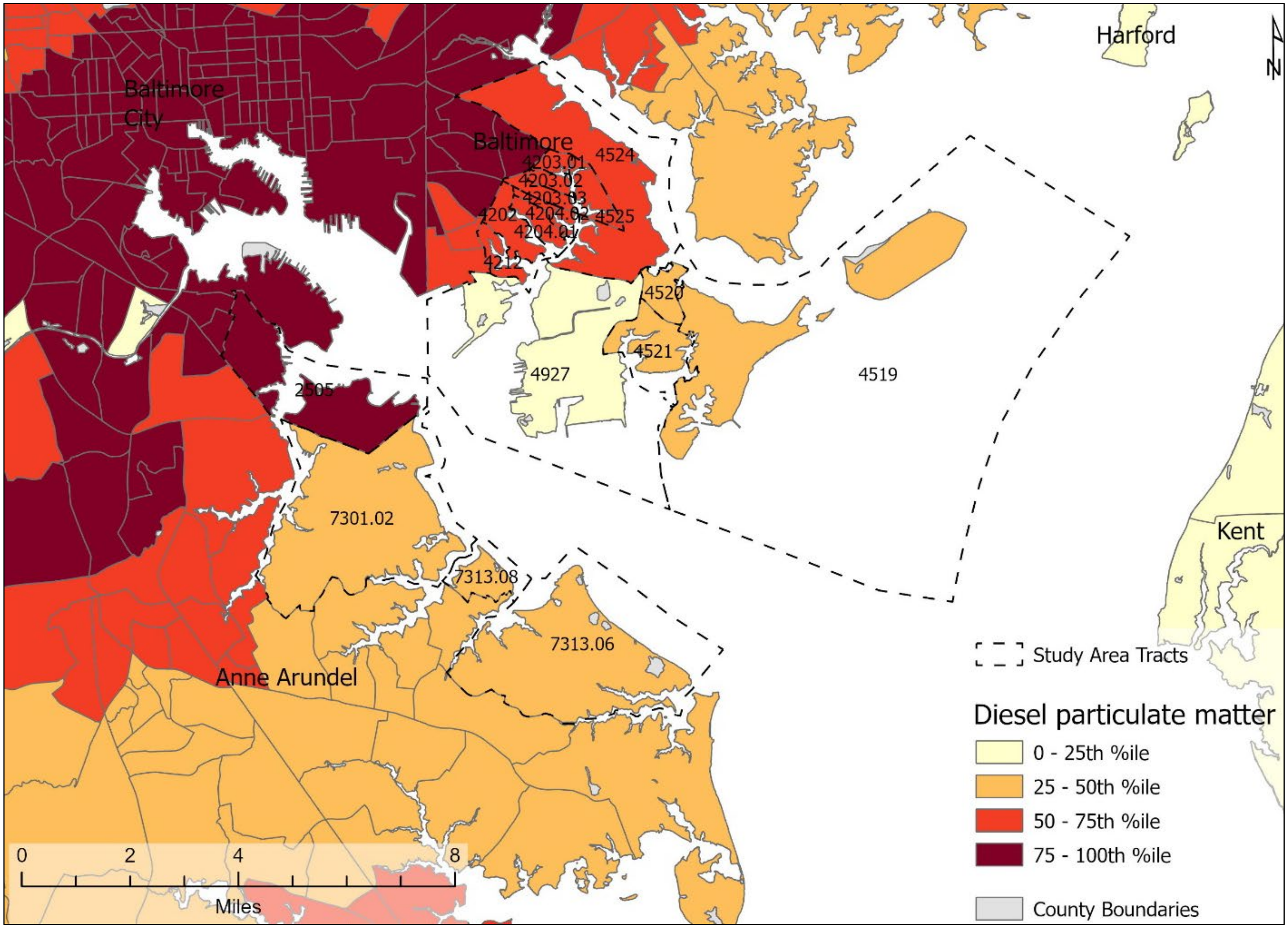


Figure 65. Diesel Particulate Matter in the Study Area

Quartiles of data for the state of Maryland are shown. Source: MDE 2024



Socioeconomics

Terminal construction and operation would create socio-economic benefits for the region, including environmental justice communities. Construction of the terminal would create a total of about 1,000 jobs over 3 years, $76 million in labor income and $189 million in industry output in the local region (Anne Arundel, Baltimore, Baltimore City). Ongoing terminal operations would generate almost 1,600 jobs, $97 million in labor income, and $178 million in industry output annually in the local region. Employment benefits include the entire study area, including environmental justice communities. A recent study showed that about 30% of workers are drawn from nearby Dundalk, Sparrows Point, and Essex with many of the remaining workers coming from elsewhere across the Greater Baltimore area (see Section 4.17.1). The beneficial effects of the project to the local economy would occur consistently across the study area.

Traffic

During terminal construction and operation increases in traffic on Bethlehem Boulevard, Sparrows Point Boulevard, and Peninsula Expressway would occur; however, any increases would be below the designed capacity of these roads. All traffic from the terminal is expected to use Shipyard Road and Bethlehem Boulevard to connect directly with I-695. Traffic impacts would occur in Tract 4927, which meets underserved community criteria, but this increase in traffic would occur in an industrial portion of this tract, not near residential neighborhoods.

4.18.2.3 Combined Options Alternative – Dredged Material Placement

High Head Industrial Basin DMCF and Coal Pier Channel DMCF

Groundwater

Placement of dredged material in the High Head Industrial Basin DMCF and the associated compaction of underlying sediment would decrease the mobility of contaminants thereby having a potential beneficial effect on groundwater. The beneficial effects of the project would occur consistently across the study area.

Filling of the Coal Pier Channel would encapsulate sediments containing elevated concentrations of contaminants and would eliminate exposure pathways for chemicals to aquatic organisms and humans consistently throughout the study area. In the long-term, paving of the DMCF would decrease the upward migration of groundwater and chemicals through underlying sediment to surface water.

Sediment

The majority of dredged sediments placed at both the High Head Industrial Basin and Coal Pier Channel DMCFs would be classified as MDE Category 1 (Residential Unrestricted Use Soil and Fill Material) or Category 2 (Non-Residential Restricted Use Soil and Fill Material). Any Category 3 (Restricted Use Soil and Fill Material, Cap Required) material would be capped to mitigate any human health risks.

Aesthetics

The construction of the High Head Industrial Basin DMCF would have the potential for spatial dominance in views from two of the 17 tracts, including Edgemere and Sparrows Point, but the site has limited visibility to sensitive viewers. Neither potentially impacted tract is an underserved community.

The view of the Coal Pier Channel DMCF would likely be largely obstructed from Stoney Beach (KOP 1) and Fleming Park in Turner Station (KOP 3). During construction and material placement, directional light sources would increase nighttime light and glare, but given existing light levels, effects would be minor.

Recreation

A temporary exclusion zone that would be established during construction of the Coal Pier Channel DMCF would affect recreational boaters and fishers; data on demographics of area boaters are not available.

Community Noise

During construction of the High Head Industrial Basin DMCF, 15 parcels fall within an area that would exceed acceptable levels of nighttime noise; however, exceedances would not occur during the entire construction period. The potentially affected parcels are in Tract 4521, which is not an underserved community.

During construction of the Coal Pier Basin DMCF, nighttime noise would not exceed regulatory limits under typical conditions, but occasional exceedances could occur along the waterfront in four of the 17 census tracts, including Turner Station, Fort Armistead, Stoney Beach, and Riviera Beach under certain atmospheric conditions. Two of these four tracts are underserved communities (Turner Station and Fort Armistead).

Socioeconomics

Construction of the High Head Industrial Basin and Coal Pier Channel DMCFs would generate about 109 job-years of employment, almost $8 million in labor income and $18 million in industry output in the local region. These economic impact estimates comprise construction of and would accrue consistently across the study area.

Existing Nearshore MPA DMCFs

No new impacts were identified for existing MPA DMCFs from the analysis of any resource topic.

Existing Ocean Disposal Site

No new impacts were identified for the ocean disposal site from the analysis of any resource topic.

4.19 Traffic

4.19.1 Affected Environment

The project area is served by a major interstate (I-695) (Figure 66). I-695 is the main interstate that encircles Baltimore. During the planning for this project, the Key Bridge collapsed on March 24, 2024, after being hit by a cargo vessel. The collapse of the Key Bridge immediately altered traffic conditions in the Baltimore region as the Key Bridge serves as a vital element of I-695. Two interstates, I-895 and I-95, provide alternate routes but these are inadequate to handle the daily traffic. Additionally, both interstates have tunnels so that these roads are closed to tractor trailers with hazardous materials. State and federal agencies immediately began planning for the reconstruction of the Key Bridge and it is anticipated that the bridge will reopen in 2028. The analysis in this Draft EIS assumes that the Key Bridge will be operational about the same time as the SPCT project construction is completed and becomes operational and therefore the Key Bridge availability is assumed for this traffic analysis.

I-695 and three major surface roads connect the TPA property to I-695 (Bethlehem Boulevard, Sparrows Point Boulevard, and Peninsula Parkway Expressway) (Figure 66). Bethlehem Boulevard is a two-lane major collector that provides access between the TPA property and I-695. Sparrows Point Boulevard is a four-lane divided roadway also providing access between the TPA property and I-695. Peninsula Expressway is a four-lane divided highway leading north from the intersection with Bethlehem Boulevard and providing access to I-695. The proximity of these major surface roads to the TPA property focuses traffic in the immediate vicinity of the TPA campus.

Traffic at TPA has been studied as part of TPA's Master Plan process since 2015 to understand how TPA's development of Sparrows Point would impact local traffic. The traffic study was last formally updated in 2021 based on the development of the site that had been completed at that time, as well as the projected future development based on the quantity and types of buildings and operators that are anticipated (The Traffic Group 2024a). The 2021 study assessed the future Average Daily Traffic (ADT) on the main access roads into the TPA property assuming full buildout of the TPA Master Plan (Table 67).

Table 67. Average Daily Traffic on Main Access Roads into the TPA Property

Road	ADT Inbound	ADT Outbound
Bethlehem Boulevard	5030	5030
Sparrows Point Boulevard	9040	9040
Peninsula Expressway	6050	6050

The results of the 2021 traffic study, projecting full buildout of the TPA property, informed the improvements required to various roadways and intersections to ensure that the level of service of the roadways and intersections was appropriate for the projected traffic volumes (The Traffic Group 2024a). This includes roadway improvements recently completed by TPA at Bethlehem Boulevard and Wharf Road.

Figure 66. Major Roads Near the Project Area and Traffic Count Locations

As part of the ongoing traffic analysis for the TPA property, traffic counts of actual traffic volume were conducted in 2023 to compare actual traffic volumes to the engineering projections (The Traffic Group 2024b). Comparing these actual traffic counts to the projected traffic volume from the 2021 Traffic Study, 2023 actual traffic counts were 37% less during than projected for morning peak hour and 49% less than projected during the evening peak hour for all the traffic coming in and out of TPA. The methodology for the 2021 study over-projected the anticipated volume of traffic based on the amount of development completed to date (The Traffic Group 2024b). The 2021 study identified potential impacts on specific roadways. Since that study, TPA made upgrades to infrastructure based on the assumptions and projected impacts. In 2024, a new study was done to understand current conditions based on development completed to date. The study also updated development plans, including adding SPCT, and developed new projected future impacts. Key findings of the 2024 study show that current traffic based on the amount of completed development is lower than what the traffic study projected in 2021. All traffic from the terminal is expected to drive on Shipyard Road and Bethlehem Boulevard to connect directly to I-695. Based on this volume and traffic pattern, all roadways and intersections impacted are well within capacity metrics.

4.19.2 Environmental Consequences

Traffic projections used in this analysis include construction (terminal development and channel improvements), dredged material placement (DMCF construction and material placement actions), and operation of the terminal after construction (The Traffic Group 2024c).

4.19.2.1 No-action Alternative

Traffic conditions would continue as described in Section 4.19.1. The Coke Point area of the TPA property would likely be developed in a yet-to-be-determined manner in the future, which would impact traffic during construction phases and after construction is completed, depending on the extent and type of development. For the purposes of traffic projections, in the 2021 study, development was assumed to be an additional 4,752,000 square feet of warehouse space. Once completed, future development of Coke Point would result in a projected additional 7,554 daily trips (The Traffic Group 2021). Peak hours would be substantially impacted by the warehousing and manufacturing plan at the TPA property. Along both Bethlehem Boulevard North and West, approximately 596 additional morning peak hour trips would be generated as part of the No-action Alternative. Approximately 598 trips would be generated during the evening peak hour.

4.19.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Based on the TPA Master Plan and the location of the SPCT within the TPA property, inbound traffic to the terminal for construction and operation would be directed from I-695 to westbound Bethlehem Boulevard, then south on Shipyard Road to the terminal. Similarly, outbound traffic from the terminal for construction and operation would be directed north on Shipyard Road, then east on Bethlehem Boulevard to access I-695. Traffic would increase on Bethlehem Boulevard due to construction workers accessing the site and the additional personnel that would be required to operate the site post-construction.

During construction activities, traffic would increase on Bethlehem Boulevard (North and West), which are the major roads providing access to the site. Traffic impacts would vary by construction phase with the maximum number of additional workers on site daily estimated to be 339, during many phases of construction the number of workers would be less (The Traffic Group 2024c). These workers would be expected to arrive at or before 6 a.m. and to depart around 4 p.m. Peak traffic hours for these roads typically occur from 6 a.m. to 7 a.m. and from 5:15 p.m. to 6:15 p.m., meaning that many of the construction workers will be arriving and departing outside of peak traffic hours for the affected roads. Using the 2021 analysis, traffic levels were modeled for the years of construction (2025 to 2028) considering construction traffic and expected growth in the area and within the TPA property. Results indicate that roads would still be at between 25 and 58% of capacity (The Traffic Group 2024c).

Once the terminal is operational, approximately 3,814 additional daily trips attributed to the terminal are expected along both Bethlehem Boulevard North and South. Along both roads, approximately 3,180 of the daily trips would be attributed to the trucks accessing the site, and 634 of the daily trips would be taken by employees at the site (The Traffic Group 2024c). Peak traffic hours (6 a.m. to 7 a.m. and from 5:15 p.m. to 6:15 p.m.) would experience increases in traffic. The combined daily trips generated by SPCT activities on Bethlehem Boulevard North and West for the morning peak hour would be approximately 517 trips. The combined daily trips generated on Bethlehem Boulevard North and West for the evening peak hour would also be approximately 517. Two hundred trips would be taken by trucks accessing SPCT while employees would take the remaining 317 trips (The Traffic Group 2024c).

To understand how the new terminal operations would impact traffic flow local roads, The Traffic Group performed additional analysis to determine the impact that the changes to the TPA Master Plan would have on the traffic flow (Table 68). The traffic study was updated based on the current TPA master plan and the types and quantities of development anticipated, as well as based on the truck and employee traffic volume anticipated at SPCT. For SPCT, based on the volume of activity anticipated in the first year of operation (2028), the ADT was 4390 with 72% being tractor trailers, and the peak hour traffic was 1034 with 39% being tractor trailers.

This updated analysis projects that all impacted intersections would operate at a minimum Level of Service "C," and that all the roads studied with long-term growth projections are well within capacity and service metrics. Therefore, while local long-term impacts on traffic would be expected they would be well within the capacity of the existing roadways and would not impact the level of service local drivers would experience. The updated 2024 study shows that the volume of traffic at TPA is 37 to 49% lower than projections based on the current stage of development (The Traffic Group 2024b).

Table 68. Updated Modeled Traffic Volumes including SPCT and Future Growth at Tradepoint for Key Local Roads, Sparrows Point

Road	ADT Inbound				ADT Outbound			
	2021 Counts	2024 Study	2024 Counts	% Change from 2021	2021 Counts	2024 Study	2024 Counts	% Change from 2021
Bethlehem Blvd.	5,030	5,200	N / A	3%	5,030	5,200	N / A	3%
Bethlehem Blvd.	5,030	N / A	3,485	-31%	5,030	N / A	3338	-34%
Sparrows Point Blvd.	9,040	10,000	N / A	11%	9,040	10,000	N / A	11%
Peninsula Expressway	6,050	7,100	N / A	17%	6,050	7,100	N / A	17%

4.19.2.3 Combined Options Alternative – Dredged Material Placement

A **Ro-Ro carrier** is a roll-on / roll-off cargo ship designed to carry wheeled cargo (e.g., cars, trucks, motorcycles, semi-trailer trucks, buses, trailers, railroad cars, tractors, and farm equipment) that can be driven on and off the ship on their own wheels.

Traffic impacts for dredged material placement options are all focused on construction related impacts. Once the dredged material is placed and construction is complete, the DMCFs would be closed and there would be no traffic associated with long-term operation.

High Head Industrial Basin DMCF

Construction activities at High Head Industrial Basin would not have a noticeable impact on traffic as peak employment is expected to be between 25 and 30 construction workers, with an average of 15 to 20 construction workers over a 97-month period. This small increase in local traffic would not be noticeable given the traffic volume on local roads.

Coal Pier Channel DMCF at Sparrows Point

Construction of the Coal Pier Channel DMCF and placement of dredged material would be completed from work vessels, so traffic changes would be limited to the areas from which the different vessels depart. Traffic in the vicinity of the SPCT project would not be impacted.

Existing Nearshore MPA DMCFs

No new impacts on traffic would occur, as dredged material would be transported to the MPA DMCFs via vessel.

Existing Ocean Disposal Site

No new impacts on traffic would occur, as dredged material would be transported to NODS via vessel.

4.20 Navigation

4.20.1 Affected Environment

4.20.1.1 Existing and Future Navigation Conditions

The navigation study area includes the Sparrows Point Channel, a non-federal channel, and the intersection of Sparrows Point Channel with the federal Brewerton Channel, including the portion of the federal channel that is used as a turning basin by Ro-Ro vessels. For purposes of this analysis, the impacts assessment focuses on the Sparrows Point Channel, a non-federal channel, and the federal Brewerton Channel, which would involve the greatest increase in the amount of vessel movements.

Ships reach the Sparrows Point Channel by traveling one of two routes along the Chesapeake Bay navigational channel system. Smaller vessels have the ability to travel south through the Chesapeake and Delaware Canal, which links the Delaware River with the northern end of the Chesapeake Bay. The Chesapeake and Delaware Canal, owned and operated by the Corps Philadelphia District, is maintained to a depth of -35 feet MLLW, limiting the size of vessels able to use this channel but making it suitable for Ro-Ro carriers. The Chesapeake and Delaware Canal is used regularly by Ro-Ro carriers and general cargo and bulk cargo vessels. The majority of vessels that come to Sparrows Point arrive from the south using the -50-foot MLLW federal navigation channel, which extends 150 nautical miles from the mouth of the Chesapeake Bay to the Port. These two options provide flexibility to arrange trade routes that minimize distances between ports of call.

> A vessel may stop at an intermediate port between its port of origin and its destination port. This stop is termed the **port of call** and may be needed for a variety of reasons, such as cargo operations, stocking up on supplies, crew change, or bad weather conditions.

According to the Waterborne Commerce Statistics Center, in 2019, Baltimore was the 15th largest US container port in terms of TEU throughput. Container cargo comes to the Port from Europe, Asia, South America, and the Mediterranean. Containers received at the new terminal would be delivered to customers throughout the Midwest and East Coast via rail or truck. The TPA property is served by two Class I railroads, CSX Transportation and Norfolk Southern, and TPA operates a short-line railroad, Tradepoint Rail, which would provide connectivity between these Class I railroads. The new terminal would be located within 700 miles of major cities and population centers in the Northeast and Midwest.

4.20.1.2 Existing Navigation Features and Operational Behaviors

Vessels that require more than 35 feet of water depth to safely navigate must enter the Baltimore Harbor via the mouth of the Chesapeake Bay, transiting the 150 nautical miles from the bay to Sparrows Point using the 50-foot federal navigation channel system. The Maryland Approach Channels and Harbor Channels, which allow vessel passage from the Chesapeake Bay Bridge into Baltimore Harbor, are constructed and maintained to widths ranging from 600 to 700 feet. Broad-beamed vessels must wait at the Annapolis Anchorage, south of the Chesapeake Bay Bridge to allow other wide-beam vessels to clear the channels before approaching the Port.

The Sparrows Point Channel is accessed from the -50-foot MLLW Brewerton Channel, a federal navigation channel. At the junction of the federal navigation channel, the Sparrows Point Channel flares to a width of approximately 960 feet wide to provide a turning basin that allows Ro-Ro vessels to turn within the Brewerton Channel and narrows to the nominal channel width of 250 feet. The outer portion of the existing Sparrows Point Channel to the existing finger pier is permitted to -47 feet mean low water (MLW). The inner portion of the channel is permitted to -42 feet MLW and includes a space to allow the vessels to turn for docking and egress.

Larger Ro-Ro vessels perform the turning evolution in the turning basin on the inbound transit so the vessel can berth starboard side to berth. In 2023, 125 Ro-Ro vessels visited Sparrows Point, entering the channel either by rotating in the turning basin and backing down the Sparrows Point Channel or rotating inside the Sparrows Point Channel, adjacent to the west berth. Vessels need approximately 20 minutes to rotate before they move completely out of the Brewerton Channel and into the Sparrows Point Channel to berth. The method selected is based on pilot preference, wind direction and conditions. The larger Ro-Ro vessels perform the turning evolution on the inbound transit so the vessel can berth starboard side to berth.

Existing Terminal Facilities

The Sparrows Point Channel currently services a total of four berths. Two of the berths are located at the inner basin and service Ro-Ro, general cargo, and bulk carriers. In 2023, 125 Ro-Ro vessels, 42 general cargo vessels, and 34 bulk cargo vessels visited Sparrows Point using the Sparrows Point Channel. The existing bulkhead has a total length of 2,200 feet and is maintained to a depth of -42-foot MLW. The additional two berths are located on the finger pier, which is 1,150 feet long and is maintained to a depth of -47 feet MLW. The finger pier is able to service vessels on both sides of the pier. The typical vessel calls at this pier are bulk carriers.

4.20.2 Environmental Consequences

4.20.2.1 No-action Alternative

Under the No-action Alternative, vessel traffic within the Chesapeake Bay navigational channel system approaching the Port as described in Section 4.20.1 would continue. Ro-Ro operations, which currently use 157 acres of landside area for parking and logistics, would likely be expanded onto 170 acres on the eastern half of Coke Point. Doubling the size of the landside area would increase the number of Ro-Ro vessels using the Brewerton Channel and Sparrows Point Channel from 125 in 2023 to approximately 225 to 275 vessels by 2030. Maintenance dredging of the Sparrows Point Channel would continue with no change.

4.20.2.2 Combined Options Alternative – Terminal Development and Channel Improvements

Dredging of the Sparrows Point Channel would only impact the Brewerton Channel during dredging for the proposed turning basin at the southern portion of the existing non-federal channel, where the two channels meet (Figure 67). This would require coordination with the Corps and the USCG to alert vessels and avoid impacts on navigation in this area. Dredging would occur within this area over 1 construction year lasting approximately 7 months. During this time, there would be a small increase in construction-related vessel activity near the channels' intersection, with likely not more than 10 vessels operating over the course of a week, which would not materially alter vessel traffic in the area. Coordination with the Corps and the USCG would occur in compliance with the required dredging permit conditions and stipulations included in the Section 408 permission, if granted. Dredging the remainder of the Sparrows Point Channel (areas north of the turning basin) would not impact navigation in the Brewerton Channel.

> The SPCT project would require review and permission under the Corps' **Section 408** program, which was established under Section 14 of the Rivers and Harbors Act of 1899. This program allows for alterations or modifications to USACE Civil Works projects by non-USACE entities. Specifically, it requires prior approval from the Chief of Engineers for any work or alteration that might impact the intended use, structural integrity, or public interest of federally authorized projects, such as navigation channels. The Section 408 permission, if granted, would include conditions that would ensure that the Sparrows Point Channel improvements and intended use would not impair the usefulness of the federal project nor be injurious to the public interest and would not adversely impact the existing use or continued maintenance of the Brewerton Channel (a federally authorized and maintained channel). These impacts would include safety, use by existing shipping traffic, maintenance dredging cycles and volume of material, and future dredged material placement capacity for the existing the federal Civil Works project.

Following construction, the SPCT would increase the vessel traffic to the Port, which received over 2,500 vessels in 2021 (USDOT 2024b). TTT anticipates approximately 500 vessels calling the terminal as a result of 10 regular weekly services from the vessel lines. Of these vessels, approximately 150 vessels would be resulting from new weekly services to the

Port of Baltimore. As a result, on average, an additional 3 vessels per week would be navigating the Brewerton Channel to enter the Sparrows Point Channel, an increase of 6% compared to the 2021 vessel volumes. The initial vessel traffic assumptions are based on the current size of container vessels which call the ports on the East Coast of the United States. Once larger vessels begin to call the Port of Baltimore, each vessel would be able to move a larger quantity of containers. This would lead to an expected corresponding decrease in overall vessel calls over time.

Inbound vessels to the Port would navigate northbound along the Brewerton Channel. At the mouth of the Sparrows Point Channel, inbound vessels would rotate within the enlarged turning basin within the Brewerton Channel so the vessels can berth starboard side to the berth. Container vessels would represent a new vessel type using this area but would navigate through the Brewerton Channel, turning basin, and Sparrows Point Channel in the same way as the existing Ro-Ro vessels currently maneuver and operate. TTT would be responsible for the operations and maintenance of the expanded Sparrows Point Channel. TTT would also be responsible for the operations and maintenance associated with shoaling at the edge of the Sparrows Point Channel turning basin and Brewerton Channel.

4.20.2.3 Combined Options Alternative – Dredged Material Placement

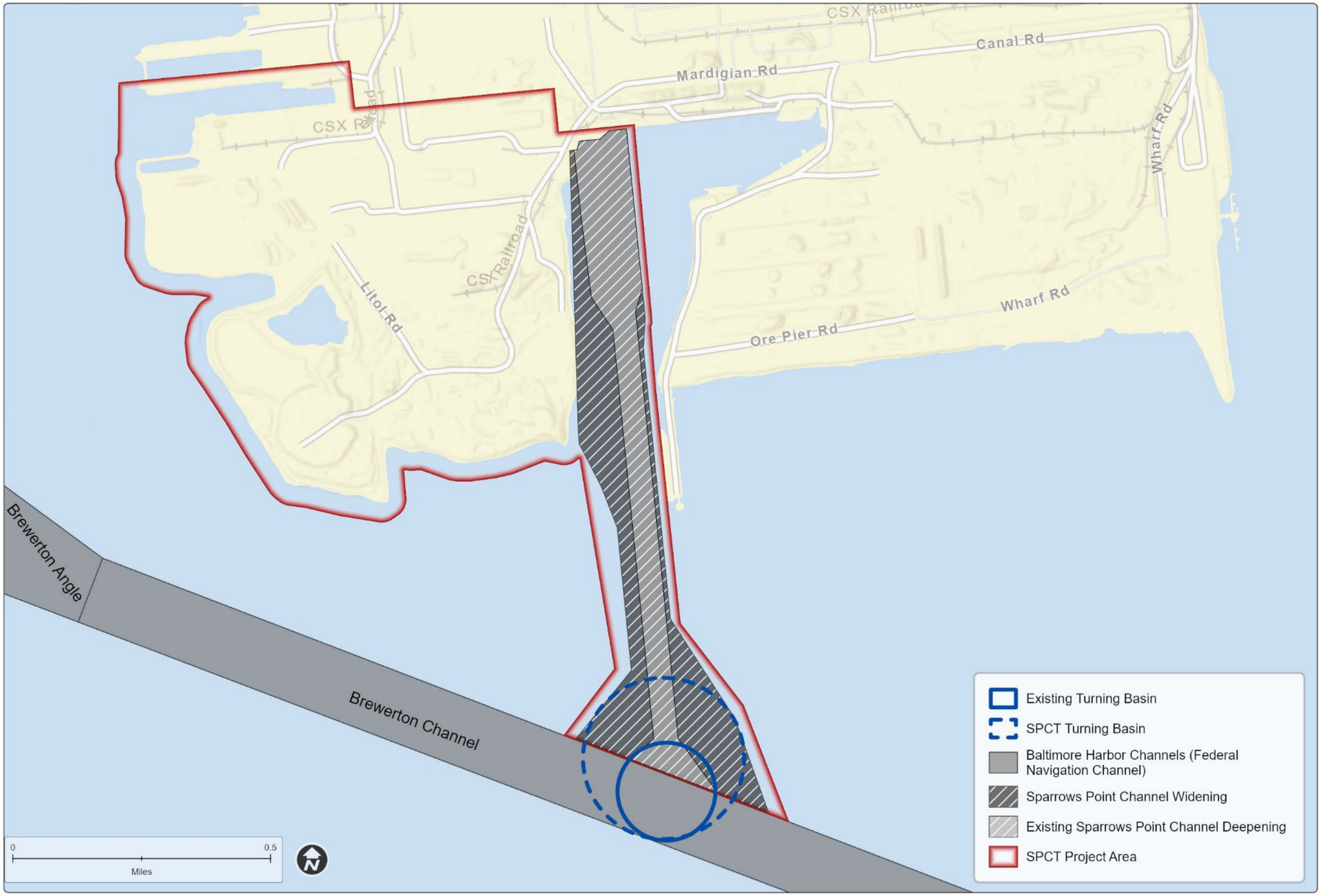
High Head Industrial Basin DMCF

Construction of the High Head Industrial Basin DMCF would occur in an upland area and would have no impact on navigation in the federal channel. Placement of dredged material at this DMCF would require transport of dredged material from the Sparrows Point Channel to the west side of Sparrows Point where the material would be slurried and hydraulically pumped to the DMCF. This transport would occur outside of the Brewerton Channel and would not impact vessel traffic in the federal navigation channel. Placement of the dredged material at High Head Industrial Basin DMCF would occur over 3 construction years.

Coal Pier Channel DMCF at Sparrows Point

Increased vessel traffic supporting construction of the Coal Pier Channel DMCF would occur, but this would be temporary and outside of the Brewerton Channel. An exclusion zone in the vicinity of the DMCF dike construction would exist outside of the federal channel near the mouth of Bear Creek. Vessels using areas outside the federal channel would need to navigate to avoid the exclusion zone, which could temporarily alter their routes along the western shore of Coke Point. Exclusion zones would only be in place as long as necessary to ensure public safety during dike construction. Following completion of the DMCF construction, transport of dredged material from the Sparrows Point Channel to the DMCF would occur outside the Brewerton Channel and would have no impact on navigation. Transport to the DMCF would occur over 2 to 3 construction years.

Figure 67. Proposed Modifications of the Turning Basin Adjacent to the Brewerton Channel



Existing Nearshore MPA DMCFs

Impacts on navigation would be limited to transport of the dredged material to the existing MPA DMCFs. Transport from the Sparrows Point Channel to the MPA DMCFs would require dredged material barges and scows with tugs to cross the Brewerton Channel. Dredging activities would occur over a 3-year period. Transits of dredged material would be coordinated with the harbor pilots, the Corps and the USCG to avoid impacts on scheduled shipping traffic within the federal channel.

Existing Ocean Disposal Site

Impacts on navigation would be limited to transport of the dredged material to NODS, an existing USEPA-designated ocean placement site. Transport from the Sparrows Point Channel to NODS would require transport vessels to use the Chesapeake Bay navigational channel system, approximately 152 nautical miles. These barges and tugs would not require a 50-ft deep channel for transits and would only use the federal channel system if / as necessary for transit efficiency and safety. Dredging, transport, and placement activities would occur over 2 construction years. Although there could be some impact on navigation, it would be temporary and limited through coordination with the Corps and the USCG.

5. Cumulative Impacts

Cumulative impacts are defined as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.1(g)(3)).

5.1 Planned Actions and Environmental Trends

To determine potential cumulative impacts, past, present, and reasonably foreseeable future actions and environmental trends were identified in or near the project area. Cumulative impacts are considered for the alternatives by evaluating the incremental impacts of the proposed alternative with the impacts of the identified planned actions and environmental trends. The projects considered in the cumulative impact analysis are presented below.

5.1.1 Key Bridge Collapse and Debris Removal

On March 26, 2024, the 1.7-mile Key Bridge collapsed when the container ship Dali struck one of the piers of the bridge after losing power and steering while leaving the Port of Baltimore. The Key Bridge carried I-695 across the Patapsco River between Dundalk in Baltimore County and Hawkins Point in Baltimore City. The collapse closed the Port of Baltimore for 11 weeks, diverting marine shipping to other ports and slowing the movement of trains and trucks at the Port.

The impact caused the collapse of the main spans of the Key Bridge, sending large sections of the bridge deck and truss structure into the water, some of which settled into the sediments at the bottom of the Patapsco River. Debris removal efforts to clear the collapsed structure and other remnants of collapse and vessel collision are complete. The Corps has reestablished the adjacent federal channel (Fort McHenry Channel) to its maintained dimensions (50 feet deep and 700 feet wide) (Corps 2024a). Removal efforts also included the removal of bridge debris outside the Fort McHenry Channel and the removal of the Dali vessel. MDTA used areas within the TPA property as the temporary sorting and processing facility for large debris (Corps 2024a).

5.1.2 Key Bridge Reconstruction

The Key Bridge served as a critical component of regional and interstate transportation in the Baltimore region with an annual daily traffic load of approximately 33,200 vehicles per day (MDTA 2024b). It also served as the primary interstate route for hazardous materials through the Baltimore area. As part of the proposed reconstruction of the Bridge, MDTA and the Maryland SHA will replace the Key Bridge within the collapsed structure's right-of-way extending from Quarantine Road in Hawkins Point, Baltimore City, through a small portion of Anne Arundel County and across to Broening Highway in Dundalk, Baltimore County. The proposed reconstruction does not include an increase of vehicle capacity compared to capacity of the former bridge and will be built to meet all current roadway, bridge design, and safety standards (MDTA 2024b). The bridge will be reconstructed to meet current and future vessel clearance requirements with a preliminary navigational clearance from the USCG as minimum vertical clearance of 230 feet above MHW and a horizontal clearance of 1,100 feet in the main navigational span of the bridge (MDTA 2024b). This vertical clearance is 45 feet higher than the original Key Bridge and accounts for the clearance of larger vessels. To obtain this higher vertical clearance, the bridge length will be 2.4 miles, as opposed to the original span, which was 1.7 miles (MDTA 2024b).

The reconstruction of the Key Bridge will also require the removal and demolition of the existing piers, girders, and span structures of the existing bridge, including the removal of piers below the mud line. Removal of bridge components both on land and in the water will be accomplished using explosives. The reconstruction of the Key Bridge is anticipated to begin in 2025 and be completed by 2028.

The **mud line** is the boundary or interface where the water and sediment meet, below which the riverbed or river bottom exists. For pier removal, equipment is used to cut the structure at or just below the mud line, allowing the visible portion of the pier to be removed while leaving the portion below the mud line undisturbed. This method can reduce environmental impacts by minimizing disturbance and resuspension of bottom sediments.

5.1.3 Corps and MPA Maintenance Dredging Activities

The Corps completes routine maintenance dredging to maintain authorized channel depths in the federal Baltimore Harbor Channels to support safe, reliable, and efficient waterborne transportation and commerce. Due to sedimentation, the Baltimore Harbor Channels typically require maintenance dredging every 2 to 5 years to maintain authorized channel depths (Corps 2017b). The channels closest to the SPCT project area are the Brewerton Channel and Brewerton Angle. The Brewerton Angle connects to the Fort McHenry Channel. The Brewerton Channel is approximately 3 nautical miles long with an authorized width of 700 feet wide, and an authorized depth of -50 feet MLLW. The Brewerton Angle is approximately 0.8 nautical miles long and has an authorized width of 700 feet and a depth of -50 feet MLLW (Corps 2017b). The watershed that contains the SPCT project area (hydrologic unit code [HUC] 12 020600031204) includes portions of the Brewerton Channel, Brewerton Angle, Fort McHenry Channel, and the Cox Creek DMCF. Between 2014 and 2024, all Corps-permitted dredging activities in this watershed resulted in the removal of 94,057 CY of dredged material.

The Baltimore Harbor Channels are typically dredged mechanically using a clamshell dredge. By state law, dredged material originating from channels within Baltimore Harbor (west of the North Point-Rock Point line at the mouth of the Patapsco River) must be placed in a confined manner. Maintenance dredged material from the federal Baltimore Harbor Channels and has been placed in either the Cox Creek DMCF or the Masonville DMCF since 2012 (Corps 2017b). Dredged material is transported from the federal channels via barges to either the Cox Creek or Masonville DMCF where it is hydraulically offloaded into the DMCF. The sediments dredged from Baltimore Harbor have historically contained contaminants from industrial, municipal, and non-point sources, including heavy metals (Corps 2017b). However, due to the frequency of dredging of shoaled material from the federal channels, the quality of maintenance material from the federal channels is representative of watershed-based contaminant inputs from agriculture and stormwater, and not from historical industrial practices.

5.1.4 Bear Creek Sediments, Superfund Project

The Bear Creek Sediments Superfund Site (Bear Creek Site) is located within Bear Creek, a tidal surface water body west of the Sparrows Point peninsula. The Bear Creek Site is relevant in that the Superfund project involves changes to sediment in an estuary of the Patapsco River.

The sediments in Bear Creek were impacted by past industrial activities, such as steelmaking and ship building, and the USEPA is proposing to clean up sediment to prevent exposure of the food chain and people to contaminated sediment and reduce the possibility that the contaminated sediment will move to other areas in Bear Creek. Concentrations of some metals, PCBs, and oil and grease in the Bear Creek Site are generally higher than those around Coke Point. The USEPA is seeking to clean up these substances (including PCBs and metals) and oil and grease in an approximate 60-acre area at the Bear Creek Site using a combination of dredging and capping technologies (TetraTech 2024). The USEPA proposes to dredge 30 acres with the highest concentrations and place an underwater cap over the 60 acres that comprise the Bear Creek Site. The EPA estimates approximately 86,000 cubic yards are to be dredged. The dewatering site will be placed on the northern yard of the Sparrows Point shipyard. Dredged sediments will be staged and dewatered and then disposed of at an offsite disposal facility. Dredging and capping is expected to take approximately 18 months with dredging anticipated to begin after the pre-design investigations and the remedial design are completed. Long-term impacts of the Superfund project are expected to be a net improvement for fish, aquatic organisms, wildlife, and people in and around the area. It is also expected to decrease contributions of contaminants in sediment from Bear Creek to other parts of the estuary, including the area around Coke Point.

5.1.5 Curtis Creek Navigation Channel Maintenance Dredging

The Corps completes routine maintenance dredging to maintain authorized channel depths in the Curtis Creek federal channel to support safe, reliable, and efficient waterborne transportation and commerce. The Curtis Creek Channel is scheduled for maintenance dredging to remove accumulated sedimentation in 2025. The Curtis Creek Channel is approximately 2 nautical miles long with an authorized width of 200 feet, and an authorized depth of 35 feet MLLW (Corps 2024b). The Curtis Creek Channel is not adjacent to SPCT but is located on the west side of the Patapsco River and is also within the Patapsco River watershed in Anne Arundel County. Curtis Creek channel is located in HUC 12 021309031008. Approximately 53 acres of the federal channel, turning basin, and vessel berths will be dredged to -28.75 feet MLW via mechanical clamshell dredging. It is anticipated that approximately 180,389 CY of dredged material will be removed from the channel, 273,508 CY removed from the turning basin, and 15,926 CY will be removed from the berths. Approximately 1.3 acres of the shiplift area are to be hydraulically dredged to -35.50 feet MLW. It is anticipated that approximately 9,294 CY of dredged material will be removed from the shiplift. All dredged material will be transported to and deposited at the Masonville or Cox Creek DMCF. It is anticipated that approximately a total of 479,117 CY of dredged are to be removed from Curtis Creek Channel (Corps 2023). It is anticipated that any contaminants in the sediment from the Curtis Creek Channel would be expected to be similar to those discussed in Section 5.1.3.

The maintenance dredging of Curtis Creek will improve navigation access specifically for the nearby USCG facility. The Corps anticipates that any environmental consequences and impacts associated with the maintenance dredging of Curtis Creek Channel are not significant. Beneficial effects are expected to be more than minimal and permanent. The cumulative effect of the maintenance dredging is considered by the Corps to be limited due to the scope of the proposed project. Impacts associated include displacement of the benthic community, and a temporary change in water quality during construction. It is not expected that the maintenance dredging of Curtis Creek would adversely affect tidal wetlands. There is no anticipated compensatory mitigation to be required within the geographic area and Patapsco River due to the temporary and insignificant impacts and consequences (Corps 2023).

5.1.6 Climate Change

Climate change in the Baltimore Harbor area is affecting sea level, the severity and frequency of precipitation events, and the probability of extreme heat. Global Mean Sea Level scenarios are projections used to estimate potential future sea level rise based on different GHG emission pathways, climate sensitivities, and ice sheet dynamics. The five scenarios are categorized as *low*, *intermediate-low*, *intermediate*, *high*, and *extreme*. By 2100, regional sea level is expected to rise by 3.9 feet under the *intermediate* scenario, and by 5.2 under the *intermediate high* scenario, whereas the global sea level is expected to rise 3.3 and 4.9 feet, respectively (Sweet et al. 2022). The Coastal Vulnerability Index is a tool used to assess the vulnerability of coastal areas to the effects of sea level rise and other coastal hazards. It integrates multiple physical and environmental factors (e.g., geomorphology, tide range, wave height, relative sea level rise) to provide a relative measure of risk for different sections of the coastline. Although the project area is subject to sea level rise, coastal vulnerability in the Sparrows Point area is considered low (USGS 2024).

The Intergovernmental Panel on Climate Change developed a set of scenarios, Representative Concentration Pathways (RCPs), that represent different possible trajectories of GHG concentrations in the atmosphere. RCP8.5 is a high-emissions scenario that is frequently referred to as “business as usual,” suggesting that is a likely outcome if society does not make concerted efforts to cut GHG emissions. By midcentury (2035 to 2064) under the RCP 8.5 warming scenario, no part of the project area is projected to be inundated by sea level rise. However, storm surge in addition to the projected sea level rise may increasingly impact structures designed without taking climate change into account; storm surge barriers are recommended to be designed for a 0.2% flood elevation in addition to a 3-foot sea level change allowance in the North Atlantic Coastal Region (Corps 2015). Total annual, frequency, and precipitation intensity in Baltimore County are projected to increase by mid-century in the RCP 8.5 warming scenario (Climate Mapping for Resilience and Adaptation [CMRA] 2024). Extreme heat is expected to increase under this scenario, with the number of annual days with a maximum temperature above 100 °F reaching 8.1 days, 7.7 days more than occurred on average between 1976 and 2005 (CMRA 2024).

5.2 Cumulative Effects

Cumulative impacts refer to the incremental effects of an action when considered with other past, present, and reasonably foreseeable future actions. A single project might not have a significant impact on its own, but when considered with other planned actions and environmental trends, it could lead to substantial environmental impacts. The following sections describe the incremental impacts of the SPCT project on the resource topic when considered with other planned actions and trends.

5.2.1 Sediment

The planned actions and environmental trends described in Section 5.1 that would have an impact on sediment include those that would result in temporary and long-term changes to the physical and chemical quality of the sediment.

- The Corps (2024a) stated that the collapse and removal of collapsed portions of the Key Bridge that became embedded in the sediments caused disruption to the river bottom. Given the river depth where these activities occurred, it is unlikely that the embedded bridge components caused any change to the existing physical or chemical characteristics of the in-place sediment. The Fort McHenry Channel was dredged to its maintained dimensions following removal of all collapsed portions of the Key Bridge. The primary impact from these actions was localized displacement of sediment from the collapsed bridge components and possibly settling or deposit of resuspended sediments adjacent to the dredging and demolition removal areas.

- The reconstruction of the Key Bridge will involve removal of remaining in-place bridge components and installation of new bridge components and footings. These in-water activities would disturb bottom sediments and aquatic habitat in an area within a limited footprint. The new bridge will remain within the footprint of the former bridge and will not be expanded. Therefore, it is expected that there would not be a significant loss of bottom or open water aquatic habitat from the new bridge construction.
- Maintenance dredging of the federal navigation channels within the Patapsco River causes periodic bottom disturbances similar to those evaluated for the improvements to the Sparrows Point Channel. The maintained depth of the federal navigation channels where dredging occurs limits the presence and diversity of benthic organisms and continued impacts from maintenance dredging would be periodic and temporary. Future maintenance dredging activities of the existing navigation channels, including the Curtis Creek Channel and the improved Sparrows Point Channel would not be anticipated to cause any change to the physical or chemical quality of sediments regionally in the lower Patapsco River. Following completion of the dredging to deepen and widen the Sparrows Point Channel, future maintenance dredging events would be expected to cause only localized and minor disturbance to remove shoaled sediment within the channel.
- The proposed remedial dredging and capping at the Bear Creek Superfund Site would result in a net decrease in the volume and surface area of impacted sediment that is available for exposure to aquatic and other receptors within the system and would contribute to an overall improvement sediment quality in the area. The dredging and capping would change water depth and aquatic habitat type in the immediate project area; however, the remedial cleanup would result in long-term beneficial impacts on the chemical composition of the sediment and reduce the potential for transfer of constituents of concern exceeding recommended levels into the aquatic food web.
- Climate change will cause increases in storm frequency and intensity, precipitation amount, storm surge, temperatures, and wave action, which could impact sediment. These changes to physical processes and conditions may change the quantity and quality of sediment available in aquatic habitats and areas through increased sediment erosion deposition, redistribution, or resuspension during storm events.

Deepening and widening of the Sparrows Point Channel for the SPCT would result in a net improved condition of the post-dredging surface sediment within the project area and regionally within the lower area of the Patapsco River. The greatest beneficial impact would be the removal of the impacted sediments east of Coke Point and placement of the material containing contaminants in upland DMCFs. Dredging of material for the channel improvements would remove 4.2 MCY of sediments, a portion of which include legacy contaminants from historical industrial activities. The post-dredging in-place sediment at the sediment-water interface would represent deeper native sediments with natural background concentrations of metals and other constituents. The removal of sediments impacted by metals, PAHs, PCBs, and other constituents would result in a permanent net improvement of surficial sediment conditions. In addition, construction of the Coal Pier Channel DMCF would encapsulate approximately 19.6 acres of existing impacted sediment within the DMCF footprint and eliminate an exposure pathway for chemicals to enter the aquatic food chain. Any temporary impacts associated with dredging (e.g., localized increases in turbidity) would be localized, and minimized and mitigated by BMPs as described in Section 3.2.

Overall, the SPCT project would contribute to regional long-term cumulative benefits on sediment by removing and encapsulating impacted sediments containing elevated concentrations of human-made contaminants. These benefits would contribute to long-term net improvements in the quality of aquatic habitat and the reduction in chemical exposure pathways to aquatic life in the vicinity of the project area. The localized impacts of the SPCT project would make a significant positive contribution to the incremental benefits to sediment quality from other planned actions in the Patapsco River.

5.2.2 Floodplain and Flood Hazard

The planned actions and environmental trends described in Section 5.1 that would have an impact on floodplain and flood hazard include those that would result in temporary and long-term changes to the floodplain and flood hazard.

- The collapse and removal of collapsed portions of the Key Bridge posed a temporary hazard in the floodplain. Given the river depth where these activities occurred, it is unlikely that floodplain function was altered. However, the presence of debris in the Fort McHenry Channel posed a hazard to vessel traffic. The remaining in-place bridge components continue to pose a hazard to small craft, but these components are located outside the navigational channel and are highly visible to boaters in the area. The primary hazard was eliminated with the removal of the collapsed portions of the Key Bridge.
- The reconstruction of the Key Bridge will involve removal of remaining in-place bridge components and installation of new bridge components and footings. These in-water activities would cause a temporary hazard to navigation in the area. This hazard will be managed through coordination with the Corps and the USCG and through the use of exclusion zones as needed during construction. Therefore, it is expected that impacts from the new bridge construction on the floodplain and flood hazard would be temporary.
- As described in Section 5.1, climate change will continue to cause increases in storm frequency and intensity, precipitation amount, storm surge, temperatures, and wave action, all of which will impact floodplain functions. Similarly, flooding events are expected to increase in frequency, intensity, and duration. Sea level rise will also continue to alter the floodplain, further exacerbating these impacts on floodplain function and hazards.

The SPCT project would have minimal impacts on floodplains or flood hazards. The Coal Pier Channel DMCF would have the potential to affect floodplain and flood hazard; however, changes in water flow or pattern would be limited to areas within approximately 0.25 mile of the DMCF. The Coal Pier Channel DMCF would not impact the flood vulnerability of the surrounding communities. The addition of the DMCF would cause waves in the immediate vicinity of the DMCF to ramp up or wash up against the dike of the DMCF due to increased wave setup and wave runup caused by the dike. This phenomenon would be minimal and limited to the footprint of the proposed dike area. Therefore, the SPCT project would not contribute to cumulative impacts on floodplains or flood hazards from the planned actions and environmental trends described in Section 5.1.

5.2.3 Hydrodynamics

The planned actions and environmental trends described in Section 5.1 that would have an impact on hydrodynamics include those that would allow for removal or addition of structures to the Patapsco River.

- The Key Bridge debris removal and reconstruction projects would include removal of existing piers and placement of new piers and pier protection in the Patapsco River. All project activities will require permits that would include stipulations protective of nontidal and tidal resources. Temporary and permanent impacts will be reduced through avoidance, minimization, and mitigation measures and implementation of BMPs. Therefore, the rebuild of the Key Bridge will not have significant impacts on water resources, which includes hydrodynamics of the river.

The SPCT project would not have significant impacts on the hydrodynamics of the Patapsco River. The proposed dredging to expand the Sparrows Point Channel would expand the channel area, increasing the area with reduced current speeds from 300 feet (existing channel width) to 450 feet (proposed channel width. Currents outside of the channel footprint would be unchanged. The Coal Pier Channel DMCF would create a new shoreline closing off the inlet located at the mouth of the channel on the west side of Coke Point. Existing currents within the Coal Pier Channel are negligible (0 to 0.02 knots) and little water exchange and mixing. The exterior boundary / dike of the Coal Pier Channel DMCF would be nearly flush to the existing Coke Point shoreline. Filling the Coal Pier Channel to create a DMCF would have a negligible impact outside of the channel footprint – both flood and ebb tidal currents along the west shoreline of Coke Point would continue unimpeded. The Coal Pier Channel DMCF would not impact the hydrodynamics of the Patapsco River.

The proposed SPCT project would not significantly impact hydrodynamics of the Patapsco River; therefore, the SPCT project would not contribute substantially to cumulative impacts on the hydrodynamics of the Patapsco River.

5.2.4 Groundwater

Paving and construction of the terminal would result in making approximately 95% of Coke Point impervious to infiltration, which when combined with stormwater management, would greatly decrease infiltration of precipitation to groundwater. Paving along with construction of and placement of dredged material within the Coal Pier Channel and High Head Industrial Basin DMCFs would reduce the risk of contaminants from historical industrial uses moving through the groundwater into surface water. The planned actions described in Section 5.1 are all water-based projects that would have minimal and localized impacts on groundwater. The incremental impacts of the SPCT project would not contribute to the impacts on groundwater from other planned actions.

5.2.5 Surface Water

The planned actions and environmental trends described in Section 5.1 that would have an impact on surface water include those that would result in temporary and long-term changes to the physical and chemical quality of surface waters.

- The Corps (2024a) stated that the collapse and removal of collapsed portions of the Key Bridge that became embedded in the sediments caused disruption to the river bottom, and dredging was performed to return The Fort McHenry channel to its maintained dimensions. The primary impact from these actions was localized displacement of sediment and dredging. These changes may have produced short-term changes in water quality that are no longer ongoing.

- The reconstruction of the Key Bridge will involve removal of remaining in-place bridge components and installation of new bridge components and footings. These in-water activities would disturb bottom sediment and produce short-term impacts on surface water quality that are expected to be minimal, temporary, localized, and controlled.
- Maintenance dredging of the federal navigation channels within the Patapsco River causes periodic bottom disturbances similar to those evaluated for the improvements to the Sparrows Point Channel. In-term maintenance dredging of the Curtis Creek Channel and future maintenance dredging events for the federal channels would be expected to only cause localized and minor disturbance to shoaled sediment within each channel; this is expected to produce minimal, temporary, and localized impacts on surface water which would be consistent with past, ongoing, and future maintenance dredging events.
- The proposed remedial dredging and capping at the Bear Creek Superfund Site would result in a net decrease in the volume of impacted sediment that is available at the sediment-water interface to aquatic organism and other receptors within the system and would contribute to an overall improvement sediment quality and contaminants released from sediments to surface waters in the area. The dredging and capping operations are expected to include BMP to protect surface waters and would be expected to produce minimal, temporary, localized, and controlled changes to water quality immediately in the vicinity of dredging and capping operations; however, the overall site cleanup would result in long-term beneficial impacts on surface water quality in the project area by reducing or eliminating transfer of chemicals from sediment into surface water.
- Climate change will cause increases in storm frequency and intensity, precipitation amount, water flow rate and volume, storm surge, temperatures, and wave action, which could impact surface waters. These changes to physical processes and conditions may change the frequency of disturbance of bedded sediments through increased erosion, deposition, redistribution, or resuspension during storm events, which may in turn resuspend or release chemicals to surface water at higher rates or frequency than experienced in the past.

Dredging of the Sparrows Point Channel and construction of the terminal for the SPCT would result in short-term, localized minor impacts on surface water quality immediately within the vicinity of the dredging operations, and long-term beneficial impacts via net improvements to water quality within the project area and regionally within the lower area of the Patapsco River.

Short-term impacts would be associated with dredging, and in-water construction activities for the terminal. Based on site-specific studies and the planned use of BMPs described in Section 3.2, adverse impacts on surface waters from dredging and in-water construction would be expected to be minimal, temporary, localized, and controlled. Changes to stormwater inputs during construction would be managed to meet requirements of stormwater discharge permits and thus result in minimal impact. Water produced as sediments dewater in DMCFs would be managed to meet NPDES discharge requirements.

The greatest long-term beneficial impact would be the removal of the impacted sediments east of the peninsula to widen and deepen the channel and construct the terminal wharf and revetment structure and placement of the impacted material in a contained DMCF. The removal of sediments impacted by metals, PAHs, PCBs, and other constituents would result in a permanent reduction in the potential contributions of contaminants from surficial sediment to surface water. The same applies to construction of an onsite DMCF at the Coal Pier Channel, which would encapsulate existing impacted sediment within the DMCF footprint and eliminate exposure and release pathways for chemicals to enter surface water.

Long-term impacts also include the construction of a paved terminal and filling of the High Head Industrial Basin. These actions would change how stormwater is conveyed to surface water but would not produce adverse impacts because stormwater discharges would be managed according to permit requirements that are protective to surface water quality. TPA plans to construct a regional stormwater management wet pond facility by 2026; this system would provide capacity and credits that are compatible with the overall management of stormwater from the terminal. In addition, construction of the terminal and DMCFs and the dredging for channel improvements would be compatible with ongoing groundwater remediation activities by TPA.

Overall, the SPCT project would contribute to regional long-term cumulative benefits on surface water by removing and encapsulating impacted sediments containing elevated concentrations of contaminants that may serve as a long-term source of contaminants to surface waters in the vicinity of Coke Point and the lower Patapsco River. These benefits would contribute to long-term improvements in the quality of aquatic habitat and the reduction in chemical exposure pathways to aquatic life in the vicinity of the project area. The localized impacts of the SPCT project would make a significant positive contribution to the overall impacts on surface water quality from other planned actions.

5.2.6 Benthic Fauna

The planned actions and environmental trends described in Section 5.1 that would have an impact on benthic fauna include those that would result in temporary and long-term changes to benthic habitats.

- The Corps (2024a) did not specifically address the impacts of the demolition and reconstruction of the Key Bridge on benthic organisms. The types of activities needed to remove the remaining structures of the Key Bridge are expected to cause temporary disturbances to the river bottom. However, the river depth where activities will occur likely limits the presence and diversity of benthic organisms. Impacts on benthic organisms would be expected to be minimal.
- Maintenance dredging, including for Curtis Creek, causes bottom disturbances similar to those evaluated for the deepening of the Sparrows Point Channel, resulting in impacts on benthic organisms present. The depth of the channels where dredging occurs likely limits the presence and diversity of benthic organisms and impacts would be temporary.
- The clean-up at Bear Creek, including dredging and capping, will result in a net decrease in the amount of impacted sediment that is available to the system, thus decreasing chemical impacts from sediment to surface water and to other areas of the Patapsco River via erosion. The dredging and capping will make some areas shallower and others deeper; however, the cleanup will result in long-term beneficial impacts on benthic fauna from the reduction of contaminants in the immediate surficial sediments and in the aquatic system.
- Climate change will cause increases in storm frequency and intensity, precipitation amount, storm surge, temperatures, and wave action, which could impact benthic resources. These changes are expected to create a variety of secondary effects, some of which would have an effect on benthic organisms and communities, including an increase in salinity variability, hypoxia, and harmful

algae (Najjar et al. 2010). These changes can result in degradation of habitat, and thus, degrade the health and sustainability of benthic communities (Du et al. 2018).

Deepening and widening of the Sparrows Point Channel for the SPCT project would result in adverse impacts on benthic fauna including mortality, conversion to deepwater habitat, changes in the types of and numbers of species present in the channel after dredging. Construction of and placement of dredged material into the High Head Industrial Basin or the Coal Pier Channel DMCFs would result in the mortality of any benthic organisms and removal / elimination of benthic habitat in those footprints. Sediments resuspended during dike construction for the Coal Pier Channel DMCF would be localized, and the implementation of appropriate BMPs would reduce the potential for burial of benthic organisms outside the dike alignment.

The SPCT project would contribute to adverse impacts on benthic fauna from dredging to widen and deepen the Sparrows Point Channel and from the in-water construction and placement of dredged material in the DMCFs. The localized and incremental impacts of the SPCT project would not make a substantial contribution to the impacts on benthic fauna from other planned actions.

5.2.7 Fish

The planned actions and environmental trends described in Section 5.1 that would have an impact on fish communities include those that would result in temporary and long-term changes to aquatic habitats.

- The demolition and reconstruction of the Key Bridge would have temporary impacts on the fish communities of the Patapsco River. The project will include measures to protect anadromous species, especially during low flow periods (Corps 2024a). Habitat within the project area has been previously disturbed from previous construction and vessel traffic.
- Ongoing maintenance dredging activities, including at Curtis Creek, cause similar temporary impacts to those described for the SPCT project dredging activities. These impacts are localized and temporary, and BMPs are implemented to avoid and minimize impacts.
- Projected climate trends are expected to create a variety of secondary effects, including sea level rise, extreme weather, ocean acidification, and changes in habitats and wildlife. Marine heat waves have been recorded in the Chesapeake Bay and have the potential for impacts on fish communities. These heat waves cause an increase in water temperatures, worsening hypoxia, and an increase in harmful algal blooms. As climate change progresses, the frequency and severity of marine heat waves in the Chesapeake Bay are expected to increase (Mazzini and Pinaca 2022).

Dredging operations could result in fish in the vicinity of the project area being affected by direct removal or burial, entrainment, turbidity / siltation effects, shifts in the extent of low dissolved oxygen following dredging operations, visual and noise disturbances, and alteration of habitat. Underwater noise from pile driving, increased vessel traffic, and other construction and dredging activities could impact fish through physical damage and behavioral disturbance. Dredging impacts would be both temporary (resuspended sediment) and long-term (habitat alteration), and though dredging would affect individual fish, eggs, and larvae, impacts would be localized.

Although BMPs would be implemented to reduce impacts, the SPCT project would contribute adverse impacts on fish communities from dredging the Sparrows Point Channel, constructing the Coal Pier Channel DMCF, and placing dredged material in either the High Head Industrial Basin or the Coal Pier

Channel DMCF. The localized and incremental impacts of the SPCT project would not make a substantial contribution to the impacts on fish communities from other planned actions and environmental trends.

5.2.8 Essential Fish Habitat

The impacts on EFH would be the same as those described for fish in Section 5.2.7 with both temporary and long-term impacts from both the SPCT project and other planned actions. The localized and incremental impacts on EFH of the SPCT project would not make a substantial contribution to the impacts on EFH from other planned actions.

5.2.9 Aquatic Special Status Species

The impacts on aquatic special status species would be the same as those described for fish in Section 5.2.7 with both temporary and long-term impacts from both the SPCT project and other planned actions. The localized and incremental impacts on aquatic special status species of the SPCT project would not make a substantial incremental contribution to the impacts on aquatic special status species from other planned actions.

5.2.10 Vegetation / Habitat

The planned actions and environmental trends described in Section 5.1 that would have an impact on vegetation and habitat include those that would result in removal of or changes to native vegetation.

- The reconstruction of the Key Bridge will result in some loss of terrestrial vegetation and habitat. Approximately 8 acres of forested habitat occur within the project area. The Corps (2024a) did not provide specific acreage estimates for impacts but noted that habitat within the project area is generally of low quality. The project will consult with the MDNR Critical Area Commission regarding loss of habitat within the Critical Areas. While the project will have impacts on vegetation and habitat, the impacts would be minimized and would not impact available habitat within the region.
- Increasing temperatures and altered precipitation patterns are significant issues to native vegetation in Maryland. Climate change is expected to increase temperatures in Maryland and increase precipitation intensity and variability with both floods and droughts becoming more severe (USEPA 2016b). Warmer temperatures may affect soil moisture levels, gradually altering the abundance and distribution of terrestrial vegetation and species using terrestrial habitats. Ecological disturbances, such as wildfires and insect outbreaks, may also drive vegetation changes. The spread of nonnative plant species could increase competition, further challenging the regeneration of native vegetation.

The construction of the SPCT would require the removal of all terrestrial vegetation within Coke Point. Removal of the vegetation would result in adverse but minimal impacts, as the habitat quality is low. Construction of the High Head Industrial Basin DMCF would result in the loss of approximately 11.2 acres of riparian, shrub, and forested habitat. After construction of the High Head Industrial Basin DMCF, the area would be closed, resulting in a permanent loss of the riparian habitat. The area could be revegetated with native species, which would provide new upland habitat.

The proposed SPCT project would not significantly impact vegetation in the project area; therefore, the SPCT project would not make a substantial contribution to cumulative impacts on the vegetation in the region.

5.2.11 Birds

The planned actions and environmental trends described in Section 5.1 that would have an impact on birds include those that would result in removal of habitat or other disturbances to birds.

- The demolition and reconstruction of the Key Bridge will have impacts on birds in the project area from construction noise. A bald eagle nest is located within 660 feet of the bridge project area (Corps 2024a). Time-of-year restrictions and biological monitoring will be implemented as required by the USFWS to minimize impacts on the bald eagle nest. No birds of conservation concern were identified within the project area. Coordination with USFWS will be ongoing through final design and construction to discuss potential impacts of the project on protected species.
- Ongoing maintenance dredging activities, including those in Curtis Creek, cause similar temporary impacts to those described for the SPCT project dredging activities. Similarly, the work at the Bear Creek Superfund Site would temporarily affect birds using the coastal habitat in the project area during dredging and capping activities, and the impacts on birds would be similar to those described for construction of the Coal Pier Channel DMCF. These impacts are localized and temporary, and BMPs would be implemented to avoid and minimize impacts.
- Climate change could significantly impact bird populations in Maryland through potentially altered migration patterns, habitat loss, and changes in food, water, and shelter availability. Warmer temperatures may cause birds to migrate earlier or shift their ranges, leading to competition with new species and disrupting food resources like insects and fruits. Forest composition changes and extreme weather events could reduce nesting and feeding habitats. Additionally, changes in timing between food availability and bird arrival or breeding could reduce reproductive success (Wilsey et al. 2019).

The SPCT project would cause temporary impacts on birds from dredging and increased vessel traffic, both during construction and operations, as well as removal of low-quality habitat on and adjacent to Coke Point. The lack of landside natural areas at the site, expansive open water adjacent to the site, and the small number of birds observed on the water during the June 2024 bird survey suggest that impacts from dredging, construction, and operation of the terminal on birds and their habitat would be minimal.

Construction of the High Head Industrial Basin DMCF would remove upland, aquatic, and riparian habitat. Birds would likely avoid the project area during construction of the DMCF and placement of dredged material. Nine species observed during the June 2024 fauna survey would no longer be supported at the High Head Industrial Basin, including least tern, a state-listed threatened species. The remaining species may be dispersed to nearby adjacent habitat, but these species and others could return following closure of the DMCF. The area could be revegetated with native species, which would provide new upland habitat.

The proposed SPCT project would not significantly impact birds in the project area; therefore, the SPCT project would not make a substantial incremental contribution to cumulative impacts on the bird populations in the region.

5.2.12 Aesthetics / Light

The planned actions and environmental trends described in Section 5.1 that would have an impact on aesthetics and light include those that would result in changes to the landscape or addition of artificial light.

- Activities associated with Key Bridge debris removal and reconstruction may have substantial effects on residential communities to the west of Sparrows Point (e.g., Turner Station, Watersedge) due to the close proximity of these neighborhoods to the Key Bridge.
- Ongoing maintenance dredging activities, including those in Curtis Creek, cause similar temporary impacts to those described for the SPCT project dredging activities. Dredging equipment could be periodically positioned in water close to historic boat trails or be visible from certain neighborhoods, depending on the location of the dredging; however, these impacts are localized and temporary.
- Similar to the SPCT project, impacts from the Bear Creek Superfund Site activities would not result in significant impacts on aesthetics or light. Some temporary impacts may occur to sensitive viewers, but no new permanent structures would be constructed or installed; therefore, there would be no long-term impacts on aesthetics or light.

The SPCT project would not result in significant aesthetic or light impacts. Sensitive viewers, including residents, waterfront businesses and patrons, waterfront park users and boaters were considered. New terminal and DMCF construction would result in new, permanent structures that would be largely compatible with current aesthetic conditions and would result in less than significant impacts. Terminal and DMCF construction and terminal operations would add new light sources, but given existing conditions, the incremental effect would be minimal.

The proposed SPCT project would not significantly impact aesthetics or light in the project area; therefore, the SPCT project would not make a substantial contribution to cumulative impacts on aesthetics.

5.2.13 Recreation

The planned actions and environmental trends described in Section 5.1 that would have an impact on recreation include those that would result in changes to recreation opportunities.

- The demolition and reconstruction of the Key Bridge will result in closure of the construction area to recreational boating and fishing. The Corps (2024a) noted that “safe boating access through the work zone will be maintained during”, except for period short-term closures.
- Impacts from the maintenance dredging, including those at Curtis Creek, would only have short-term impacts excluding recreational boating and fishing in the area during maintenance dredging activities.
- Activities for dredging and capping at the Bear Creek Superfund Site would similarly only have short-term impacts excluding recreational boating and fishing in the area during construction.
- Trends in climate change will likely change the fish communities as described in Section 5.2.7, which could affect recreational and subsistence fishing by changing the abundance and species composition.

Impacts on recreational boating and fishing and subsistence fishing from the SPCT project would be temporary and localized during dredging and construction, as well as during maintenance dredging. Exclusion zones and increased vessel traffic during construction would temporarily alter the ability of recreational and subsistence vessels to visit specific areas in the vicinity of the project footprint. Increased turbidity during construction and dredging could also impact fishing. Recreational boating and fishing and subsistence fishing at license-free fishing areas would not be permanently affected by the SPCT project.

The proposed SPCT project would not significantly impact recreation or subsistence fishing in the project area; therefore, the SPCT project would not make a substantial contribution to cumulative impacts on the recreation or subsistence fishing in the region.

5.2.14 Air Quality

The planned actions and environmental trends described in Section 5.1 that would have an impact on air quality include those that would result in the generation of temporary and long-term emissions.

- Air quality impacts from the Key Bridge collapse and debris removal. activities primarily included particulate matter ($PM_{2.5}$ and PM_{10}) emissions due to demolition activities, engine exhaust from equipment used, and dust from the temporary sorting and processing facility. GHG emissions were limited due to the temporary nature of the project. Since debris removal has been completed, the long-term air quality impact is negligible, as no continued emissions sources are associated with the cleared site.
- The demolition and reconstruction phases of the Key Bridge reconstruction will contribute to short-term emissions of criteria pollutants such as NO_x, SO_2, CO and PM from demolition, transportation, and construction activities. These operations will also produce temporary increases in GHG emissions due to fuel combustion of heavy machinery and vehicle traffic. After construction of the new bridge is completed, the long-term impact on air quality is expected to be minimal.
- The Corps and MPA maintenance dredging activities may contribute to short-term localized increases in PM, NO_x, and GHGs due to the use of diesel-powered dredging equipment. However, dredging activities are temporary and the impacts are expected to not exceed regulatory thresholds.
- The cleanup activities at Bear Creek, which include dredging, capping, and de-watering of contaminated sediments, will generate short-term emissions from heavy equipment operation, dredging, and sediment handling. Pollutants such as PM, NO_x, and CO, along with GHGs, are anticipated during the 18-month cleanup period. Once the cleanup activities are complete, the long-term impacts are expected to be minimal.
- The maintenance dredging at Curtis Creek will generate short-term emissions from dredging and dredged material transport. Pollutants such as PM, NOx, and CO, along with GHGs are anticipated. Once the dredging activities are complete, the long-term impacts are expected to be minimal.
- The project and its surrounding AQCR are projected to face ongoing and increasing impacts due to climate change, particularly in the areas of rising temperatures, changes in precipitation patterns, more frequent and sever weather events, and rising sea levels.

The cumulative air quality impacts from these projects are not expected to result in significant or long-term emissions. The primary emission sources, including construction equipment, transport vehicles and vessels, and demolition operations, are concentrated within the construction and cleanup phases and are considered temporary. GHG emissions from these activities contribute minimally to regional totals and are limited to the periods of active construction timelines. Given the intermittent and phased nature of these activities, long-term cumulative air quality impacts are expected to be minimal.

The proposed SPCT project would have concentrated impacts on air quality during the construction and cleanup phases (e.g., use of construction equipment and vehicles, demolition operations, transport of dredged material to placement sites). The construction period would be expected to be energy-intensive and to result in short-term but significant GHG emissions. During operation, the terminal would be partially electrified, and the use of shore power would significantly reduce emissions from ships at berth when compared to current conditions. Terminal operations would result in minimal long-term adverse air quality and climate impacts and would not contribute substantially to cumulative impacts on air quality.

5.2.15 Community Noise

The planned actions and environmental trends described in Section 5.1 that would have an impact on community noise include those that would result in changes to the soundscape.

- Activities associated with Key Bridge debris removal and reconstruction will have temporary and localized effects on community noise, especially for those residential communities to the west of Sparrows Point (e.g., Turner Station, Watersedge) due to the close proximity of these neighborhoods to the Key Bridge.
- Ongoing maintenance dredging activities, including those in Curtis Creek, cause similar temporary impacts to those described for the SPCT project dredging activities. Dredging would generate sustained noise that would attenuate to acceptable residential levels within about 2,000 feet under typical conditions.
- Similar to the SPCT project, impacts from the Bear Creek Superfund Site activities may result in temporary and localized impacts on community noise.

The SPCT project would not result in significant noise impacts. Construction and operation of the terminal would not result in sustained daytime noise impacts; noise would attenuate to acceptable residential levels before reaching neighboring communities. Periodic and nighttime noise during construction and operation of the terminal and dredging activities could reach sensitive receptors under atypical atmospheric or weather conditions that promote sound propagation. Sustained daytime noise from constructing the Coal Pier Channel and High Head Industrial Basin DMCFs would attenuate to acceptable levels, and there would be no periodic daytime or nighttime noise impacts from construction or dredged material placement.

The proposed SPCT project would not significantly impact community noise in the project area; therefore, the SPCT project would not make a substantial contribution to cumulative impacts on community noise.

5.2.16 Socioeconomics

The planned actions and environmental trends described in Section 5.1 that would have an impact on socioeconomics include those that would affect jobs and economic activity.

- The Key Bridge debris removal and reconstruction projects will generate jobs and economic activity and re-open a critical transportation corridor in the region. Similarly, the Bear Creek Superfund Site will generate short-term job opportunities. These three projects could have short-term localized impacts on commercial fishing, as areas would be closed during construction, but no long-term impacts on commercial fishing are anticipated.
- Ongoing maintenance dredging activities, including those for Curtis Creek, cause similar temporary impacts to those described for the SPCT project dredging activities. Dredging could contribute to localized and temporary commercial fishing impacts.

Economic impacts associated with the SPCT project would be beneficial. Terminal and DMCF construction would generate employment and economic activity in the region during the period of construction. Terminal operations would generate jobs and economic activity in perpetuity. Any commercial fishing impacts from the SPCT project would be less than significant. The construction of the Coal Pier Channel DMCF would temporarily deter fish from the area, but overall impacts on commercial fishing operation would not be significant.

The proposed SPCT project would not significantly impact socioeconomics in the project area; therefore, the SPCT project would not make a substantial contribution to cumulative impacts on socioeconomics in the region.

5.2.17 Environmental Justice

The planned actions and environmental trends described in Section 5.1 include resource changes that would generate proportionate and disproportionate effects on environmental justice communities.

- The Key Bridge collapse and debris removal may have had air quality, aesthetic, community noise and traffic impacts on the adjacent communities of Turners Station and Watersedge due to their close proximity. These are environmental justice communities suggesting that there were potentially disproportionate impacts, however, the impacts were short-term and are no longer ongoing.
- The Key Bridge reconstruction will generate beneficial economic impacts by creating jobs and will have minor and temporary impacts that will affect waterfront communities in Anne Arundel and Baltimore counties and water users. Proportional adverse impacts on environmental justice communities are expected due to temporary increases in light and air emissions primarily affecting Dundalk, Turner Station, and Watersedge. Temporary and localized impacts on community noise are potentially disproportionate to environmental justice communities. Short-term and localized impacts from fishery closures are expected.
- The Corps and MPA maintenance dredging activities, including those for Curtis Creek, occur periodically and take place throughout the Patapsco River and its tributaries, near all types of communities. Therefore, any impacts from maintenance dredging would not generate disproportionate impacts on environmental justice communities.
- The proposed remedial dredging and capping at the Bear Creek Superfund Project has the potential to improve surface water quality and aquatic habitat and reduce bioaccumulation of contaminants in fish species that are caught and consumed in the region. Some temporary and localized impacts on community noise may occur and would affect Turner Station and Watersedge.

- Climate change has the potential to disproportionately impact environmental justice communities, which contain socially vulnerable populations and that may also have conditions that contribute to heat island effects, elevated flood risk, and other risks. The environmental justice community of Turner Station has historically had below average green cover but efforts are underway to increase it. Temperature increases are expected to elevate and prolong the urban heat island effect, creating excessive demand for cooling power (increasing the likelihood of brownouts and blackouts) (Baltimore Office of Sustainability 2013). Flooding is a concern in this community but has been associated with insufficient stormwater management, which will not be affected by the projects. Flashy precipitation events create more stormwater runoff from impervious surfaces, carrying pollutants into waterways. These environmental effects of climate change are contributing to related public health trends. Exposure to extreme heat and precipitation events significantly increased the risk of hospitalization for asthma in the state (Maryland Department of Health and Mental Hygiene 2016; Baltimore Office of Sustainability 2013). The study area tracts include some populations with elevated levels of asthma and could experience adverse cumulative impacts of air pollution and climate change. Exposure to extreme precipitation also significantly increased the risk of motor vehicle accidents (Maryland Department of Health and Mental Hygiene 2016) and changes in seasonality may also affect food accessibility and affordability (MDNR 2024j).

Impacts associated with the combined construction and dredging activities would be temporary and / or minor and would not disproportionately impact environmental justice communities. Minor impacts would be generally localized onsite and, with the exception of some bridge reconstruction activities, are not in close proximity to environmental justice communities or overburdened communities. Proportional beneficial impacts on environmental justice communities in the construction phase would be expected, including job creation and potential improvements in surface water quality and safety of fish consumption, resulting from removing or encapsulating contaminated sediments and reducing groundwater movement.

Over the long term, the SPCT project would generate economic growth that would increase regional development pressure, car and truck traffic, and ship traffic that would be expected to create some proportional beneficial and adverse effects to environmental justice communities. Increased truck traffic and emissions of mobile air pollutants from SPCT will largely be on roads within industrial areas and not adjacent to residences. The combined air emissions from all ongoing projects in the region may temporarily increase concentrations of pollutants but regulatory exceedances would be mitigated. Indirect effects of worker travel patterns could reduce the level of service on many local roads, but effects are expected to be minor. Increased economic opportunities are expected as a result of the SPCT project. About 1,600 permanent jobs are expected to be created in the local region with nearly 90 additional jobs in the rest of Maryland. These jobs represent about a 13% increase in current employment at Tradepoint Atlantic and therefore are not expected to dramatically change the character of the area or displace current residents. Continued gradual job growth over time is also expected.

The communities surrounding Sparrows Point have historically experienced substantial pollution burdens, but the transition of on-site activities from heavy industry to transportation-related activities has reduced many pollution sources. The adverse impacts on surface waters from construction are expected to be minimal, temporary, localized, and controlled. The beneficial impacts from encapsulating sediments will be permanent. The waters that are most affected will be in close proximity to Sparrows Point suggesting no disproportionate impacts on environmental justice communities.

The cumulative impacts from the proposed project and the additional projects described in Section 5.1 are not expected to result in significant or long-term adverse or disproportionate impacts on environmental justice (underserved) communities. Some proportionate benefits are also expected.

5.2.18 Traffic

The planned actions and environmental trends described in Section 5.1 that would have an impact on traffic include those that would increase or decrease traffic loads.

- The purpose of the Key Bridge Construction project is to replace “a critical link in the regional and interstate transportation network,” lost in the 2024 collapse of the Key Bridge. Debris removal and reconstruction of the Key Bridge will have temporary impacts on localized traffic but long-term the project will alleviate current traffic congestion caused by the loss of the Key Bridge.

Construction of the terminal and DMCFs would temporarily increase traffic, and operation of the terminal would result in long-term increases to traffic on local roads. An analysis of projected increases associated with the construction and operation of the SPCT project indicated that total traffic on local roads would be significantly impacted.

The proposed SPCT project would not significantly impact traffic over the long term; therefore, the SPCT project would not make a substantial contribution to the overall beneficial cumulative impacts on traffic in the region.

5.2.19 Navigation

The planned actions and environmental trends described in Section 5.1 that would have an impact on navigation include those that would increase or decrease vessel traffic.

- Key Bridge debris removal and reconstruction activities will have temporary impacts on navigation but will have long-term beneficial effects on navigation. The collapse of the Key Bridge temporarily closed the Port of Baltimore to vessel traffic until the federal channel could be cleared of debris and re-opened. The new bridge will increase the vertical clearance of the bridge by 45 feet when compared to the original bridge, providing clearance for larger vessels. While the demolition and reconstruction of the Key Bridge will have temporary impacts on navigation, the project will have significant, long-term beneficial impacts on navigation safety.
- Maintenance dredging activities, including those for Curtis Creek, can have temporary impacts on navigation when federal channels are dredged, but overall maintenance dredging has beneficial impacts on navigation. Maintenance dredging is required to keep the federal channels open and accessible and to allow safe passage to commercial and other vessels.
- Dredging and capping at the Bear Creek Superfund Site will have similar impacts on navigation as the SPCT project. The impacts on navigation will be short-term and localized to the immediate vicinity of the project site, which is outside federal navigation channels.

The SPCT project would have short-term localized impacts on navigation associated with the expansion of the Sparrows Point Channel (a non-federal channel) and the construction of the Coal Pier Channel DMCF. Both activities would occur outside federal navigation channels except where the Sparrows Point Channel meets the federal Brewerton Channel (a federal channel). The improvements to the Sparrows Point Channel would require Section 408 approval by the Corps. Dredging in close proximity to the federal channel would require coordination with the Corps and the USCG for the duration of the dredging (approximately 7 months). Transport of dredged material to Masonville or Cox Creek DMCFs or to the NODS could impact navigation. Transport to any of these facilities would require crossing and use of federal navigation channels. These impacts would be limited in duration and would be minimal in consideration of the vessel traffic using these channels.

The proposed SPCT project would not significantly impact navigation over the long term; therefore, the incremental impact of the SPCT project on navigation would not change the overall beneficial cumulative impacts on navigation in the region.

6. Irretrievable or Irreversible Commitments of Resources Involved in the Implementation of the Recommended Plan

Irreversible commitments of resources are those resulting from impacts on resources so they cannot be completely restored to their original condition. The labor, capital, and material resources expended in the planning and construction of this project would be irreversible and irretrievable commitments of human, economic, and natural resources.

Terminal construction and channel expansion (widening and deepening) would impact approximately 112 acres of open water / bottom habitat through excavation. Approximately 4.25 MCY of material would be dredged. Of this, approximately 330,000 CY is slag that would be reused onsite during construction of the project. Approximately 1.57 MCY of the dredged material, from the southern portion of the Sparrows Point Channel, would be placed at the NODS. Therefore, of the total 4.25 MCY of material to be dredged, approximately 1.9 MCY would be placed back into the aquatic environment and / or reused, and 2.35 MCY of sediment would be placed into DMCFs. Construction of the Coal Pier Channel DMCF would permanently impact 19.6 acres of open water / bottom habitat through construction of the dike and placement of dredged material in the DMCF. This irretrievable loss of bottom habitat would be confined to an existing industrial channel off the Patapsco River. Some of these resource impacts during construction are irreversible. However, placing dredged material in DMCFs would result in the permanent removal of contaminated sediments from the Sparrows Point Channel and the aquatic system, and construction of the Coal Pier Channel DMCF would encapsulate contaminated sediments in the DMCF footprint and prevent movement into the river environment, thereby providing benefit to some resources in the project area.

Construction and operation of the SPCT would consume fossil fuels, a non-renewable resource to generate energy for vehicles during construction, and to operate the terminal for the life of the project. Construction activities would require equipment that would use fuel to operate. The estimated total volume of fossil fuels expended during the 4 years of the construction phase is approximately 8.08 million gallons of diesel fuel, based on direct CO_2e emissions (82,502 tons). This estimate assumes that all equipment and vehicles used would consume diesel fuel. Irreversible and irretrievable commitments of resources during construction would be unavoidable (i.e., resulting emissions would contribute to overall air quality of the region), but this level of use would be short-term.

Operation of the SPCT would require a combination of traditional fossil fuel-powered equipment alongside electric equipment. Diesel-powered equipment and machinery used to support operations at the terminal would include reach stackers, empty container handlers, terminal tractors, locomotive / rail-based transportation, and emergency generators. Vessels would rely on conventional diesel engines while navigating but would use alternative shore power while berthing and docked. Shore power would reduce fossil fuel use and GHG emissions, as ships would rely on grid-based electricity instead of burning fuel oil. Additionally, the terminal would be partially electrified with electric-powered STS, RMG, and RTG cranes, and the terminal design would provide infrastructure for future electrical equipment. Overall, the SPCT would use an estimated 38,981 gallons of diesel fuel, annually, based on the direct CO_2e net total emissions of 398 tons per year. Although the amount of fossil fuels used would be negligible in relation to local capacity, it would be irreversibly and irretrievably committed.

7. Consultation and Coordination

7.1 Consultation and Coordination

The Corps involved the public through public meetings and other outreach throughout the project. A proactive approach was taken to inform and involve the public, resource agencies, local government, and other interested parties about the project and to identify any public concerns.

7.2 Early Agency Coordination

Several collaborative efforts were accomplished early in the process. MDE coordinates monthly JE Meetings "to provide a potential applicant on large, complicated or non-standard projects with informal regulatory feedback." Participating agencies include MDE, the Corps, Baltimore District, USEPA, USFWS, NOAA, MDNR, MHT, CAC, BPW, and Baltimore County. TTT attended the June 28, 2023, JE Meeting to introduce the proposed project to these agencies, and the agencies provided initial input on the initial proposed project. TTT continued engagement with agencies through JE Meetings and meetings with specific agencies to discuss proposed field and desktop studies.

At the August 30, 2023, JE Meeting, TTT presented an update on study plan development in consultation with agencies and an analysis of potential alternatives to their initial proposed action in response to comments from the June 28, 2023, meeting. Participating agencies provided feedback on the proposed alternatives. TTT continued meeting with the Corps and other federal and state agencies to complete study plan development, review updates to changes to alternatives, and discuss study results as studies progressed. TTT continued to engage with the agencies to discuss updates on study results and changes to the proposed action at JE Meetings on November 29, 2023, February 28, 2024, June 26, 2024, and August 28, 2024.

In addition to the JE Meetings, TTT coordinated frequently throughout 2023 and 2024 with the Federal and state agencies regarding study plans for aquatic resource surveys (benthos, plankton, water quality and fish), sediment evaluations, wetland delineation and habitat surveys, bird surveys, recreation surveys, air quality impact analysis, and other needed studies.

7.3 FAST-41 Agency Coordination

TTT requested that the project be included in the FAST-41 program and on September 25, 2023, the Corps notified the Federal Permitting Improvement Steering Council, the agency that leads the FAST-41 program, that the Corps had determined the project is covered under FAST-41.

By email on October 16, 2023, the Corps invited five federal agencies to be cooperating agencies under NEPA, all of whom accepted. Cooperating agencies include the USEPA, USFWS, NOAA NMFS, USCG, and the Corps Civil Works Division. Seven state / local agencies agreed to be participating agencies in the NEPA process: MDE, MDNR, MHT, CAC, MPA, BPW, and Baltimore County. Four federally recognized tribes were invited to participate (Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, and Pamunkey Tribe); however, the Corps did not receive responses from the Tribes. The official FAST-41 kick-off meeting for the project occurred November 8, 2023.

7.4 Public Scoping

The Corps initiated public scoping with the publication of the Notice of Intent to prepare an EIS in the Federal Register, dated December 18, 2023. The Corps conducted two public scoping meetings, January 23, 2024 (in-person) and January 25, 2024 (virtual) to inform participants about the proposed project and to solicit comments for consideration in the development of the Draft EIS. Federal and state agencies, Tribes, public and private organizations, and members of the public that have a potential interest in the proposed action, including minority, low-income, and / or disadvantaged communities, were invited to participate in the US Army's NEPA and decision-making processes.

The Corps accepted written comments at the in-person meeting and via conventional mail and email. A total of 18 correspondences (letters, emails, and comment cards submitted at the in-person public meeting) were received. Of these, five letters were received from regulatory agencies, the remaining letters were from individuals and organizations.

Letters were received from the following regulatory agencies: USEPA, USFWS Chesapeake Bay Field Office, NOAA NMFS, National Park Service, and MDE. These agencies noted the need to fully examine the impacts on the resources in the project area from the range of alternatives that will be considered. Resources identified include aquatic ecosystems (including biological, physical, and chemical aspects), air quality (including impacts on climate change from GHGs), special status species, socioeconomics, environmental justice, cultural resources, and recreational resources.

The Corps received letters from the following organizations: Chesapeake Bay Association, Inc., Greater Baltimore Committee, World Trade Center Institute, Maryland Chamber of Commerce, Association of Maryland Pilots, Baltimore Port Alliance, International Union of Operating Engineers – Local 37, Essex Middle River Civic Council, and Maryland Economic Development Corporation. These organizations generally support the proposed project.

The North Point Peninsula Council, Inc. and several individuals submitted letters with questions and comments about the proposed project. Commenters asked questions regarding the proposed design of the offshore DMCF and who will regulate the design and construction, especially regarding the safety of the DMCF. Comments noted the historical uses at Coke Point and previous studies documenting water and sediment characteristics related to those historic activities. Commenters raised questions about the potential impacts on aquatic resources and human health related to dredging and about monitoring during and after dredging and other construction activities. Other comments discussed the potential impacts on recreational boating and commercial shipping in the project area and in the federal channel leading into the Port of Baltimore. Commenters inquired about measures to avoid impacts on other ships using the Brewerton Channel and about the cargo coming to the new terminal. These questions and comments were considered in the development of the Draft EIS to ensure that substantive questions raised during scoping were addressed within the scope of the analysis in the Draft EIS.

7.5 Required Coordination

The Draft EIS is being circulated to known Federal, State, and local agencies. Interested organizations and individuals are also being sent notice of availability. A list of those who are being sent a copy of this document, along with a request to review and provide comments, is provided in Appendix G.

Coordination under the Magnuson–Stevens Fishery Conservation and Management Act, the Endangered Species Act, and the Coastal Zone Management Act has been ongoing since the project began. Draft documents supporting compliance with these acts have been sent to the lead agency respectively for each law:

- Essential Fish Habitat Assessment (Appendix E)
- Biological Assessment (Appendix F)
- Coastal Zone Management Act Federal Consistency Determination (Appendix H)

8. List of Preparers

The Draft SPCT EIS was prepared collaboratively among the following agencies and organizations.

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10. Glossary

Aesthetics – Perception of beauty, art, and taste. Refers to the visual and sensory appeal of an object, environment, or experience.

Atmospheric inversion – Weather phenomenon where a layer of cooler air is trapped near the ground by a layer of warmer air above it. Also known as a temperature inversion, it prevents air from rising and dispersing, which can lead to the accumulation of pollutants and poor air quality in the lower atmosphere.

A-weighted decibel (dBA) – Unit of sound level measurement that adjusts the decibel scale to reflect the human ear's sensitivity to different frequencies. Humans are generally more sensitive to sounds between 1,000 and 5,000 Hertz and less sensitive to very low or very high frequencies.

Base Flood Elevation (BFE) – Computed elevation to which floodwater is expected to rise during a base flood (a flood with a 1% annual chance of occurring, also called a 100-year flood); used to determine areas at risk of flooding.

Beach seine – Long net that is set from the shore at one end and then circled about a school of fish and drawn ashore.

Berth face – Vertical side of a wharf structure that supports mooring devices and energy-absorbing fender systems, which accommodate vessels at berth. The design and construction of the berth face are crucial for ensuring the safety and stability of ships during their stay at the port.

Berth pocket – Dredged or excavated area adjacent to a dock where a ship can moor. It provides the necessary depth for vessels to berth safely, allowing for loading and unloading of cargo or passengers.

Best Management Practice (BMP) – Strategy, technique, or measure implemented to prevent or reduce pollution, manage resources sustainably, or enhance environmental quality. BMPs are used to minimize negative impacts on the environment.

Bioaccumulation studies – Tests that measure the extent to which organisms absorb and accumulate contaminants from their environment, particularly from ingestion of sediments or water. In laboratory tests, organisms are exposed to sediments from the dredging area, and following a defined exposure period, their tissues are analyzed to quantify contaminant levels. These studies provide information regarding the potential for chemicals found in sediment to move through the food chain.

Bottom trawl – Fishing method in which a large, weighted net is dragged along the seafloor to herd and capture bottom-dwelling fish or other marine species.

Brownfield – Land that was previously used for industrial purposes and has the potential presence of hazardous substances, pollutants, or contaminants. It is typically an abandoned or underused industrial or commercial facility where redevelopment is complicated by environmental contamination.

Bulkhead – Vertical retaining wall designed to prevent land from eroding or collapsing into the water. It retains soil and protects the shoreline or waterfront property from wave action and tidal forces.

Channel widener – Portion of a waterway that is dredged or expanded to increase its width, allowing for easier navigation and passage of larger ships; used to improve the efficiency and safety of shipping routes.

Clamshell bucket – Excavating or dredging tool with two hinged, clam-like jaws that close to scoop up loose materials, such as soil, sand, or sediment.

Clean Air Act – Comprehensive federal law enacted in the United States in 1970 (and amended in 1977 and 1990) to regulate air pollution and protect air quality. It authorizes the US Environmental Protection Agency (USEPA) to establish national standards for air quality, limit emissions of hazardous air pollutants from industrial sources, and enforce compliance to safeguard public health and the environment.

Coking – Process in which coal is heated to very high temperatures in the absence of oxygen, removing any impurities. The resulting coke, a porous substance that is nearly all carbon, is used to produce steel.

Computational domain – spatial area or volume over which numerical calculations are performed in modeling or simulations. It represents the physical environment being modeled, such as airflow around an object or fluid flow in a channel.

Container yard – Designated area in a port or terminal where shipping containers are stored, stacked, and organized before or after being loaded onto a ship, truck, or train.

Criteria pollutants – Group of six common air pollutants regulated under the National Ambient Air Quality Standards (NAAQS) due to their potential to harm human health and the environment. The criteria pollutants are particulate matter (PM10 and PM2.5), ground-level ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb).

Cumulative Sound Exposure Level (SEL_{cum}) – Measure used in acoustics to represent the total energy of sound exposure over a period of time. It is the cumulative sum of sound exposure levels (SELs) across multiple sound events, accounting for both the intensity and duration of noise exposure.

Cushion block – Padding or block made from various materials (e.g., wood, nylon, rubber) placed between two surfaces to absorb shock, vibration, or impact. During pile driving, cushion blocks are used to absorb and distribute the energy from the hammer blows, thus reducing the intensity of the underwater noise generated during pile driving.

Cut-off wall – Vertical barrier constructed into the ground to block or control the movement of water, often built as part of marine or waterfront structures like wharves.

Design vessel – Representative ship conceptualized and engineered according to particular criteria and specifications used for the planning and design of maritime structures, facilities, and navigational channels.

Dredged material containment facility (DMCF) – Man-made confinement structure, site, or area used for the dredged material is stored or treated; often used to contain potentially contaminated sediments and prevent them from being released into the environment.

Dredging units – Used to delineate and characterize sediments within a proposed dredging area. The sediments with each DU are sampled and tested separately for physical, chemical, and biological properties. Based on the results of the testing, the volume (cubic yards) of material from each DU can be managed separately with respect to feasible disposal options and BMPs that may be required.

Electrofishing – Technique used in fisheries management to temporarily stun fish by applying an electric field to the water, immobilizing the fish, making it easier to capture, count, or study them. Afterward, the fish typically recover and are released back into the water.

Empty container handlers or reach stackers – Industrial vehicles used in ports, terminals, and warehouses to lift, move, and stack empty shipping containers. Reach stackers are equipped with extendable arms to reach and place containers in high stacks or tight spaces.

Endangered Species Act of 1973 (ESA) – Law enacted to protect and recover species at risk of extinction and the ecosystems in which they are found. The ESA provides mechanisms for listing species as endangered or threatened, prohibits harm to these species, and designates critical habitat areas to support their recovery.

Entrainment – Unintentional capture or drawing in of small aquatic organisms (e.g., fish eggs, larvae, plankton) into industrial water intakes or by dredging equipment. This process can cause harm or death to the organisms involved.

Environmental Bucket – Specialized dredging bucket designed to minimize the environmental impact by reducing the amount of sediment resuspension and leakage during the lifting and transportation of dredged materials. It helps contain contaminants and prevent them from entering the surrounding water during material removal.

Essential fish habitat (EFH) – Areas that are necessary for fish to spawn, breed, feed, or grow to maturity. EFH is designated by Fishery Management Councils in the United States to ensure that important habitats for commercially and ecologically significant fish species are protected and conserved.

Fishery Management Councils – Regional organizations established by the Magnuson-Stevens Fishery Conservation and Management Act to manage fishery resources in federal waters of the United States. Each council is responsible for developing fishery management plans for sustainable fishing practices, habitat protection, and stock conservation in their respective regions.

Fixing America's Surface Transportation Act of 2015 (FAST-41) – Federal law aimed at improving the efficiency and timeliness of environmental reviews and permitting processes for large infrastructure projects. FAST-41 creates a coordinated framework for interagency review to streamline project approvals and reduce delays in sectors such as transportation, energy, and ports.

Flood Insurance Rate Map (FIRM) – Maps produced by the Federal Emergency Management Agency (FEMA) that show flood hazards, including flood zones, floodplain boundaries, and base flood elevations (BFEs).

Gillnet – Type of fishing net that hangs vertically in the water with floats on the top and weights on the bottom. Fish are caught when they attempt to swim through the net and become entangled by their gills.

Glare – Bright, intense light that causes discomfort or reduces visibility. Glare can occur from natural sources, like the sun, or artificial sources, such as streetlights, vehicle headlights, or reflective surfaces.

Graving dock – Type of dry dock used for shipbuilding, repair, or maintenance, where the dock is flooded to allow a vessel to enter, then drained so the ship is supported on blocks for work. Graving docks are permanent, land-based structures that provide access to the hull of the ship for cleaning, painting, or repairs.

Groundwater – Water that exists beneath the Earth's surface, filling the porous spaces in soil, sediment, and rock formations. It is stored in and slowly moves through geological formations known as aquifers. Groundwater is a crucial component of the Earth's hydrological cycle, contributing significantly to drinking water supplies, irrigation for agriculture, and maintaining river flows and ecosystems, especially during dry periods.

Habitat Areas of Particular Concern (HAPC) – Specific area within essential fish habitat that are considered especially important due to their ecological significance, sensitivity, or vulnerability (e.g., spawning or nursery grounds); they often receive additional protection to ensure the sustainability of fish populations.

Hydraulic gradient – Rate of change in water level per unit distance in an aquifer or other groundwater system. It represents the direction and rate at which groundwater flows due to differences in pressure, with water moving from areas of higher pressure to areas of lower pressure.

Hydrodynamics – In a river system refers to the study of water movement, including how it flows, transports sediments, interacts with riverbeds and banks, and responds to changes in the environment, such as seasonal water levels, topography, and human interventions. River hydrodynamics is fundamental in understanding how rivers shape landscapes, support ecosystems, and respond to environmental changes, both natural and human induced.

Ichthyoplankton – Planktonic (drifting) life stages of fish, including fish eggs and larvae, found in aquatic environments. Ichthyoplankton are an important part of the food web.

Impingement – Process by which larger aquatic organisms, such as fish or invertebrates, are trapped against the intake screens of industrial water systems. Impingement can cause injury or death to these organisms.

Infiltration – Process by which water on the ground surface enters the soil or other permeable materials. Infiltration is an important part of the hydrological cycle, contributing to groundwater recharge.

Innovative reuse – Use of dredged material in the development or manufacturing of commercial, industrial, horticultural, agricultural, or other products and includes upland uses of dredged material.

Innovative Reuse and Beneficial Use of Dredged Material Program – Initiative managed by the Maryland Department of the Environment (MDE) aimed at promoting the sustainable and productive use of dredged material from Maryland's waterways. Given the significant volume of dredged material generated annually through the maintenance of navigational channels in the Chesapeake Bay and surrounding waters, this program seeks to reduce the environmental impact of disposal while turning dredged material into valuable resources.

Intermodal / rail yard – Facility where shipping containers are transferred between different modes of transportation, such as from ship to rail or from rail to truck. These yards are designed to efficiently handle intermodal freight, which consists of cargo that is transported in standardized containers that can be easily transferred between ships, trucks, and trains without needing to unpack the cargo.

Isopleth – Line on a map or chart connecting points of equal value for a specific variable, such as temperature, pressure, or sound intensity.

Interim measure – Short-term actions taken to address immediate threats to human health or the environment caused by the release of hazardous waste. These measures are typically implemented during the corrective action process at facilities subject to Resource Conservation and Recovery Act (RCRA) before comprehensive long-term solutions can be designed and implemented.

Knot – Unit of speed equivalent to one nautical mile (or 1.15 statute miles per hour).

Light – Day and night illumination levels; an important element of visual character.

Limit of moderate wave action – Area where wave heights could exceed 1.5 feet. The limit of moderate wave action helps define areas that are at risk from not only inundation but also wave-related impacts, such as erosion, structural damage, and storm surge effects.

Magnuson-Stevens Fisheries Conservation and Management Act of 1976 (MSA) – Primary law that governs the management and conservation of marine fisheries in federal waters. Establishes Fishery Management Councils, sets limits on overfishing, promotes sustainable fisheries, and protects essential fish habitats.

Marginal wharf – Waterfront structure where ships dock directly alongside a shoreline or seawall. The defining feature of a marginal wharf is that it runs parallel to the shoreline and allows vessels to load and unload cargo or passengers without the need for the ship to enter a dock basin.

Maximum Sound Level (L_{max}) – Maximum level of sound recorded over a given time period, measured in decibels (dB). L_{max} is often used in noise monitoring to assess peak noise events and their potential impacts, such as loud traffic or industrial activities.

Mooring dolphin – Specialized structures used in ports and harbors to assist in the mooring (securing) of ships, providing a place where ships can be securely tied. Mooring dolphins keep the vessel in position and prevent it from drifting due to currents, tides, or wind. mud line is the boundary or interface where the water and sediment meet, below which the riverbed or river bottom exists. For pier removal, equipment is used to cut the structure at or just below the mud line, allowing the visible portion of the pier to be removed while leaving the portion below the mud line undisturbed. This method can reduce environmental impacts by minimizing disturbance and resuspension of bottom sediments.

Mud line – Boundary or interface where the water and sediment meet, below which the riverbed or river bottom exists.

National Ambient Air Quality Standards (NAAQS) – Pollution thresholds set by the US Environmental Protection Agency (USEPA) under the Clean Air Act to protect public health and the environment. These standards specify allowable concentrations of certain pollutants in outdoor air, focusing on primary standards (protective of human health, especially vulnerable populations) and secondary standards (protect of public welfare, including ecosystems, visibility, crops, and buildings). NAAQS apply to six common pollutants known as criteria pollutants.

National Environmental Policy Act of 1969 (NEPA) – US environmental law requiring federal agencies to consider the environmental impacts of their actions and decisions. Federal agencies are required to systematically assess the environmental impacts of their proposed actions and consider alternative ways of accomplishing their missions, which are less damaging to and protective of the environment. NEPA mandates the preparation of environmental assessments and environmental impact statements to ensure informed decision-making and public involvement in projects that may affect the environment.

National Pollutant Discharge Elimination System (NPDES) – Regulatory program established under the Clean Water Act of 1972 and administered by the US Environmental Protection Agency (USEPA) and authorized by state environmental agencies. It is a permitting system that regulates point sources (specific, identifiable, and discrete locations from which pollutants are discharged) of water pollution. The program's primary goal is to control and minimize the discharge of pollutants into surface waters to protect water quality and public health.

Nature-based solutions (NbS) – Actions that protect, sustainably manage, and restore natural or modified ecosystems to address societal challenges, such as climate change, disaster risk, and food and water security, while simultaneously providing benefits for biodiversity and human well-being. NbS emphasize working with nature rather than against it, offering a holistic approach to environmental management that enhances ecosystem health and resilience. Examples of NbS include restoring wetlands, reforestation, and green infrastructure in urban areas.

Noise attenuation – Reduction of sound intensity as it travels through a medium or is blocked by barriers. Noise attenuation can occur naturally (e.g., as sound waves dissipate over distance) or be enhanced through the use of soundproofing materials or noise barriers to minimize noise pollution.

North American Vertical Datum of 1988 (NAVD 88) – Standardized vertical datum used in North America for measuring elevations above or below mean sea level. This datum is essential for mapping, surveying, construction, floodplain management, and other applications that require accurate elevation data. By serving as a unified reference system, NAVD 88 provides consistency in elevation data across regions, which is crucial for projects involving water management and infrastructure development.

Optical character recognition (OCR) – technology used to automatically scan, recognize, and convert printed or handwritten text from images or documents into machine-readable data. In a terminal, OCR can identify and track cargo containers, vehicles, and other critical information in real-time, enhancing efficiency, and supporting better logistical management.

Overdepth allowance – Additional depth below the target dredging depth from which material may be removed due to excavation inaccuracies in the dredging process. The type of dredging equipment, the site-specific physical conditions (e.g., wind, waves, currents, tides), and design of the dredging prism influence overdepth. The depth to which sediments are characterized for physical and chemical constituents includes the overdepth allowance that is applied to the project.

Overland wave propagation – Movement of floodwaters as waves travel across the floodplain, away from the primary river or stream channels. This can occur during storm surges or heavy rainfall events where water inundates the land surface.

Peak Sound Pressure Level (SPL_{peak}) – Measure of the maximum instantaneous pressure variation in a sound wave, expressed in decibels (dB). SPL_{peak} represents the highest amplitude of a sound wave during a specific time frame and is used to quantify loud, impulsive sounds.

Perimeter dike – Embankment or barrier constructed around the perimeter of an area, such as a reservoir or dredged material containment facility, to prevent the flow of water or sediments. Perimeter dikes are often used in flood control, land reclamation, and environmental management to contain or direct water.

Pilings – Posts or columns, typically made of wood, steel, or concrete, driven into the ground or seabed to support structures, such as bridges, piers, or buildings.

Ponar grab sampler – Device used in aquatic environments to collect sediment samples from the bottom of a waterbody. It consists of two jaws that close when the sampler is lowered to the seabed, allowing for the collection of surface sediments and benthic organisms.

Port of call – Port where a ship stops during its voyage to load or unload cargo or passengers. It is a scheduled stop along the ship’s route, often serving logistical, commercial, or regulatory purposes.

Pound net – Stationary fishing net used in coastal waters that consists of vertical netting walls supported by stakes or pilings, which guide fish into a central area or enclosure (the “pound”) where they are trapped.

Probable Effects Level (PEL) – In the context of sediment quality guidelines for aquatic life, the concentration above which effects are more frequently observed. It represents a threshold where there is a higher probability that exposure to contaminants will result in adverse biological effects, such as reduced growth, reproduction issues, or mortality in aquatic organisms. Sediment contaminant concentrations above the PEL are generally considered a potential risk to aquatic life, warranting further investigation or potential remedial action.

Regional Screening Levels (RSLs) – Contaminant concentration thresholds developed by the US Environmental Protection Agency (USEPA) to assess human health concerns at contaminated sites. These screening levels provide a baseline for determining whether contaminants present in sediment, soil, or water require further investigation or remediation.

Relieving platform – Horizontal structural element designed to distribute the load of the wharf across a larger area of the underlying soil or substructure, thus "relieving" excessive pressure.

Resource Conservation and Recovery Act (RCRA) –Federal law enacted in 1976 to regulate the management and disposal of solid and in a way that protects human health and the environment. Administered by the US Environmental Protection Agency (USEPA), RCRA establishes a framework for the proper handling, treatment, and disposal of waste materials, with specific regulations aimed at reducing hazardous waste generation and encouraging recycling and resource recovery.

Revetment – Sloping structure made of stone, concrete, or other materials that is built to prevent erosion or protect shorelines, riverbanks, or embankments from wave action, flooding, or currents.

Roll-on / roll-off carrier (Ro-Ro) – Type of vessel designed to carry wheeled cargo, such as cars, trucks, trailers, or railroad cars, that can be driven on and off the ship using built-in ramps. Used primarily for the transport of vehicles across seas and oceans.

Root mean square (RMS) – Statistical measure of the magnitude of a varying quantity, calculated as the square root of the average of the squares of the values. Commonly used in engineering and physics to determine the effective value of a waveform or signal, particularly in measuring sound levels.

Sediment – Particles of rock, minerals, organic matter, or other materials that have been broken down through processes like weathering and erosion and settled to the bottom of a waterbody. Sediment can vary greatly in size and composition, from tiny clay particles to larger sand, gravel, or even boulders, and is often categorized by sizes.

Sediment Quality Guidelines (SQGs) – Standards or benchmarks used to assess the potential impact of sediment-bound contaminants on aquatic life. These guidelines help in evaluating whether concentrations of specific chemicals in sediment could be harmful to organisms living in or around aquatic environments. SQGs are typically derived from toxicity studies and field data and are expressed as concentration levels (i.e., Threshold Effects Level [TEL] and Probably Effects Level [PEL]) for various contaminants, such as heavy metals or organic compounds. SQGs help monitor sediment health, identify areas of potential risk, prioritize clean-up efforts, and establish regulatory standards for sediment quality to protect and sustain aquatic ecosystems.

Setback – Minimum distance a house, building or other structure must be from the property line.

Ship-to-shore crane – Large, specialized crane used in container ports to load and unload containers between ships and the shore. These cranes are mounted on the dock and extend over the ship to move cargo containers efficiently between the vessel and the terminal.

Slag – By-product of steel making, produced when impurities in the raw materials are separated out during the conversion from iron to steel. Slag can be used in various applications, such as construction aggregates and cement production.

SPCT project area – Includes Coke Point, the Sparrows Point Channel out to the juncture with the Brewerton Channel, the High Head Industrial Basin, and Coal Pier Channel.

Standard elutriate – Created using water / sediment mixtures to simulate the potential release of chemicals from sediment into the water column when sediment is placed in open water. The elutriate is analyzed to determine the concentration of chemical constituents that may be released into the water column, helping to predict impacts on water quality and aquatic life.

Threshold Effects Level (TEL) – In the context of sediment quality guidelines for aquatic life, the concentration below which adverse biological effects on aquatic life are rarely observed. Sediment concentrations at or below the TEL suggest a low risk of harmful effects to benthic species. The TEL serves as a conservative, protective benchmark, indicating that the likelihood of toxic effects increases as contaminant concentrations exceed this threshold.

Total Maximum Daily Load (TMDL) – Regulatory term of the Clean Water Act that represents the maximum amount of a pollutant that a waterbody (e.g., river, lake, estuary) can receive daily while still meeting water quality standards. TMDLs are established to restore impaired waters by addressing pollutants that cause water quality degradation. Once a TMDL is established, states and local agencies implement strategies to limit pollutant levels to help improve water quality and support designated uses, such as recreation, drinking water, and aquatic habitats.

Toxicity Characteristic Leaching Procedure (TCLP) – Laboratory test established by the US Environmental Protection Agency (USEPA) under the Resource Conservation and Recovery Act (RCRA) to simulate leaching of contaminants from solid materials, like sediments or industrial waste. The results of the test are used to classify waste and to determine appropriate disposal options.

Trophic structure – Hierarchical organization of feeding relationships within an ecosystem, representing how energy flows through different levels of organisms. It starts with primary producers (e.g., plants or algae) at the base, followed by primary consumers (herbivores), secondary consumers (carnivores), and higher-level predators. Trophic structure provides insight into the balance and interactions among species in an ecosystem.

Turbidity – Measure of water clarity, describing the presence of suspended particles such as silt, clay, organic matter, algae, and microorganisms in water. High turbidity levels reduce light penetration, affecting photosynthesis in aquatic plants, making it harder for predators to locate prey, clog fish gills, interfere with egg development, and transport pollutants like heavy metals or bacteria. Low turbidity is generally associated with healthier aquatic ecosystems. Turbidity can occur naturally (e.g., storm events, plankton blooms), but construction activities, such as dredging, can increase turbidity.

Turning basin – Area in a harbor or waterway where ships can safely turn around without risk of grounding or collision. It is usually a wider section of the waterway, allowing large vessels to rotate or change direction, especially when preparing to dock or depart from a port.

Twenty-foot equivalent unit (TEU) – Standard unit of measurement used in the shipping and container industry to describe the capacity of cargo containers and container ships. One TEU represents the dimensions of a standard shipping container that is 20 feet long, 8 feet wide, and 8.5 feet high. It is used as a universal reference for cargo volume, allowing for consistent tracking of container sizes and ship capacities.

Ultra large container vessel (ULCV) – Large cargo ship designed specifically to transport large quantities of shipping containers across the ocean. These vessels typically have a capacity of more than 14,000 twenty-foot equivalent units (TEUs) and can exceed 400 meters in length and 200 feet in width.

Visual character – Distinct pattern of elements that make one landscape different from another. Character is created by the combined effect of natural and built elements. The elements that contribute to visual character include landforms, topography, vegetation (structure and diversity), water, coastal edges, viewscapes, architecture, land use patterns, urban design elements, and cultural landmarks, among other features.

Visual quality – How people perceive and appreciate landscapes based on their distinctive visual characteristics. People value a sense of order and coherence in a landscape and the unique qualities that make landscapes culturally significant. Visual quality is assessed in terms of the presence of preferred elements and public sensitivities and concerns.

Waste Load Allocation (WLA) – Set the amount of specific pollutants that can be safely released into a river, lake, or other body of water from specific sources, such as factories or treatment plants, without harming the water's health or quality. WLA is an essential part of the TMDL calculation. These limits help ensure that water quality objectives are met and are essential for managing and reducing pollution in streams, rivers, lakes, and coastal waters.

Water column bioassays – Tests conducted to determine the toxicity of water or elutriate samples. In these bioassays, early life stages of aquatic organisms, such as fish, crustaceans, or bivalves are exposed to the samples, and their responses (e.g., mortality, growth inhibition) are observed to evaluate the potential for impacts on aquatic life.

Waterbody Use Classes – Define the intended uses and water quality standards needed to support those uses. By setting and enforcing standards for each class, MDE aims to manage pollution sources and preserve water quality across its diverse waterways. Each class has specific criteria to protect activities (e.g., swimming, fishing, providing habitats for aquatic life). Waterbodies are classified based on location, ecological significance, and recreational or commercial value.

Wave runup – The height to which waves run up the slope of a revetment, bank, or dike above the still water level. In a setting like the Baltimore Harbor, wave runup is generally more influenced by anthropogenic (human-made) structures and the specific design of the harbor compared to the more natural processes on an open coast.

Wave setup – The increase in the average water level due to the breaking of waves as they approach the shore. This setup occurs as the momentum from the waves is transferred to the water body, raising the water level above the expected tide level.

Whole sediment bioassays – Tests that expose benthic organisms directly to sediment samples to determine the sediment toxicity. Survival of the benthic organisms is measured following a defined exposure period. These bioassays provide information related to how sediments containing contaminants may affect sediment-dwelling organisms following placement of the material in open water.

Zooplankton – Tiny, drifting animals that float in oceans, seas, and freshwater bodies. They are an essential component of the aquatic food chain, feeding on phytoplankton (microscopic plants) and serving as food for larger animals, such as fish, whales, and other marine species. Examples of zooplankton include small crustaceans, jellyfish larvae, and the larval stages of fish.

11. Index

US Army Corps
of Engineers®

Baltimore District
2 Hopkins Plaza, Baltimore, MD 21201

Draft Environmental Impact Statement

Sparrows Point Container Terminal

Appendices

January 2025

EISX-202-00-E1R-1731946234

Appendix A: Applicable Federal Statutes and Anticipated Permits and Approvals

APPENDIX A: APPLICABLE FEDERAL STATUTES AND ANTICIPATED PERMITS AND APPROVALS

This Draft Environmental Impact Statement must operate within the constraints of various federal statutes. The US Army Corps of Engineers, in preparing this Draft Environmental Impact Statement, must conform to and meet the goals of these federal statutes. Additionally, Tradepoint TiL Terminal, LLC must obtain permits and approvals through a Joint Permit Application. These permits would contain stipulations protective of resources that must be followed during construction activities, if the Sparrows Point Container Terminal project is implemented. Table A-1 lists the federal statutes applicable to the National Environmental Policy Act (NEPA) process, and Table A-2 presents the anticipated permits and approvals.

Table A-1. Federal Statutes Applicable to the NEPA Process

Federal Statutes (as Amended)	Responsible Agency
15 CFR part 930: Federal Consistency with Approved Coastal Management Programs	NOAA
40 CFR part 6: Procedures for Implementing NEPA and Assessing the Environmental Effects Abroad of EPA Actions	USEPA
40 CFR part 93, Subpart B: General Conformity Rule	USEPA
40 CFR parts 1500–1508: Council on Environmental Quality (CEQ) Regulations on Implementing NEPA Procedures	CEQ
50 CFR part 17: Endangered and Threatened Wildlife and Plants	USFWS
50 CFR part10.13: List of Migratory Birds	USFWS
Abandoned Shipwreck Act of 1987	NPS
American Indian Religious Freedom Act of 1978	Multiple Federal Agencies
Archeological and Historic Preservation Act of 1974	NPS
Archaeological Resources Protection Act of 1979	NPS
Bald and Golden Eagle Protection Act of 1940	USFWS
Clean Air Act of 1970	USEPA
Clean Water Act of 1972	Corps
Coastal Zone Management Act of 1972	NOAA
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)	USEPA
Emergency Planning and Community Right-to-Know Act of 1986	USEPA
Endangered Species Act of 1973	USFWS
Estuary Protection Act of 1968	USDOI, Corps
Federal Noxious Weed Act of 1974	USDA
Federal Water Project Recreation Act of 1965	USFWS
Fish and Wildlife Conservation Act of 1980	USFWS
Fish and Wildlife Coordination Act of 1934	USFWS
Magnuson-Stevens Fishery Conservation and Management Act of 1976	NMFS
Marine Mammal Protection Act of 1972	NMFS, USFWS, MMC

Federal Statutes (as Amended)	Responsible Agency
Marine Protection, Research, and Sanctuaries Act of 1972	Corps, USEPA
Migratory Bird Conservation Act of 1929	USFWS
Migratory Bird Treaty Act of 1918	USFWS
National Environmental Policy Act of 1969	Multiple Federal Agencies
National Historic Preservation Act of 1966	ACHP, MHT, NPS
Native American Graves Protection and Repatriation Act of 1990	USDOI, NPS
Noise Control Act of 1972	USEPA
North American Wetlands Conservation Act of 1968	USFWS
Occupational Health and Safety Act of 1970	USEPA
Plant Protection Act of 2000	USDA
Resource Conservation and Recovery Act of 1976	USEPA
River and Harbor Act of 1954 / Flood Control Act of 1954	Corps
Rivers and Harbors Act of 1899	Corps
Solid Waste Disposal Act of 1965	USEPA
Submerged Lands Act of 1953	NOAA
Water Quality Act of 1965	USEPA
Water Resources Development Act of 1986	Corps
Watershed Protection and Flood Prevention Act of 1954	USDA-NRCS

Notes:
ACHP = Advisory Council on Historic Preservation
CEQ = Council on Environmental Quality
CFR = Code of Federal Regulations
Corps = US Army Corps of Engineers
MMC = Marine Mammal Commission
MHT = Maryland Historical Trust
NMFS = National Marine Fisheries Service
NOAA = National Oceanic and Atmospheric Administration
NPS = National Park Service
NRCS = Natural Resources Conservation Service
USDA = US Department of Agriculture
USDOI = US Department of the Interior
USEPA / EPA = US Environmental Protection Agency
USFWS = US Fish and Wildlife Service

Table A-2. Anticipated Permits and Approvals to be Obtained through the Joint Permit Application

Permit / Approval / Agreement	Agency	Permit Regulatory Action
Tidal Wetlands License	MDE / BPW	A license is required for filling of tidal open water and vegetated tidal wetlands, construction of piers and / or associated in-water structures, construction of shore erosion control structures, dredging, and marsh establishment (living shorelines).
Section 401 Water Quality Certification	MDE	A State Water Quality Certification, which ensures the protection of waters of the State, is necessary for activities requiring a Corps Section 404 permit.
Federal Coastal Zone Consistency Determination	MDE	The Coastal Zone Management Act of 1972 (CZMA) gives states with Federally approved coastal programs the lead in coordinating and strengthening coastal zone management activities of all levels of government.
Section 404 Permit	Corps	Issued by the Corps to regulate the discharge of dredged material or fill material into WOTUS.
Section 10 Permit	Corps	Regulates certain activities in or affecting “navigable” WOTUS. Regulated activities include dredging, filling, structures, and any other permanent or semi-permanent modification that may affect navigation.
Section 408 Review / Permission	Corps	Evaluates and authorizes changes to Civil Works projects with respect to proposed alterations to ensure that alterations are not injurious to public interest and do not impair the intended use.
Marine Protection Research and Sanctuaries Act (MPRSA) Section 103 Permit	Corps	Placement of dredged material at USEPA-designated ocean placement sites requires compliance with Section 103 of the MPRSA. Tiered testing of the dredged material is required to demonstrate no adverse effects to the marine environment.
Industrial Surface Water Discharge Permit / National Pollution Discharge Elimination System (NPDES) permit (Clean Water Act Section 402)	MDE	Combined Federal and State permit required under Section 402 of the Clean Water Act. Required for any project that will discharge effluent / wastewater to surface WOTUS to ensure compliance with State water quality standards.
Dam Safety Permit / Waterway Construction Permit	MDE	Required for construction of new dams and alterations to existing impoundments to verify that structures are built to appropriate standards and operated to protect public safety.
Water Appropriation or Use Permit	MDE	Required for any activity that withdraws water from the surface waters or ground waters of the State of Maryland.
General Conformity Determination	USEPA	Required for review to ensure the project conforms with the State Implementation Plan (SIP) for air quality standards in non-attainment or maintenance areas.

Permit / Approval / Agreement	Agency	Permit Regulatory Action
Minor New Source Review (NSR) Permit to Construct	MDE	Authorization to construct a stationary source with emissions that meet air quality standards, subject to conditions to minimize emissions
Maryland State Permit to Operate	MDE	Permit to operate stationary sources, ensuring compliance with air quality standards during ongoing operations.

Notes:

BPW = Maryland Board of Public Works

Corps = US Army Corps of Engineers

CZMA = Coastal Zone Management Act

MDE = Maryland Department of the Environment

MPRSA = Marine Protection Research and Sanctuaries Act

NPDES = National Pollution Discharge Elimination System

NSR = New Source Review

SIP = State Implementation Plan

USEPA = US Environmental Protection Agency

WOTUS = Waters of the United State

Appendix B: Draft Phase I Tidal Mitigation Plan

APPENDIX B: DRAFT PHASE I TIDAL MITIGATION PLAN

Introduction / Mitigation Site Description and Objectives

Description of the Impact Project

- Location: 6995 Bethlehem Boulevard, Baltimore, Maryland, 21219; latitude: 39.211222 / longitude: -76.490349
- Resource type impacted – tidal waters
- Amount impacted (square feet / acreage) – tidal waters: 19.8 acres

Proposed Mitigation Sites

The proposed mitigation for the impacts described above includes a combination of on-site in-kind, on-site out-of-kind, and off-site out-of-kind mitigation with one off-site project located within the same 8-digit watershed (02130903) and the other located within the adjacent 8-digit watershed (02139997). The on-site mitigation projects are located along the shoreline of Bear Creek adjacent to Bethlehem Boulevard, within the Patapsco River at the point on the east side of the southeast peninsula, along Old Road Bay at the Craighill Lighthouse Peninsula, along Jones Creek at the Pleasant and North Point Yacht Clubs, and within the embayment of the Sparrows Point site at the High Pier Wharf. The off-site mitigation projects are tentatively located within waters of the Middle Chesapeake Bay watershed near the mouth of the Patapsco River or near Hart-Miller Island, and at a location yet to be determined. Maps of the proposed locations are included in Figure B-1, Figure B-2, and Figure B-3. Table B-1 identifies the minimum square feet / acreage of the proposed mitigation to be provided at each site.

The proposed mitigation package includes a combination of restoration, creation, and enhancement of tidal open water, tidal wetlands, and shallow water habitat areas. It may also include remediation of historically distressed areas located on-site, as necessary. Further study is needed to determine the need and level of remedial activities and type of remediation actions best suited to address these areas.

Based on agency input, Tradepoint TiL Terminal, LLC (TTT or applicant), a joint venture between Tradepoint Atlantic (TPA) and Terminal Investment Limited (TiL), understands that tidal open water restoration, including oyster reef creation off-site and creation of tidal open water and wetlands in upland areas on-site would receive a mitigation credit ratio of 1:1, while other tidal wetland and shallow water habitat restoration and creation activities would receive a mitigation credit ratio of 2:1. Tidal wetland enhancement is anticipated to receive a mitigation credit ratio of 4:1. Removal of derelict crab traps has a mitigation credit ratio that has been defined by the Maryland Department of the Environment (MDE) for another similar project based on a comparison of crab trap value to mitigation in lieu fee charges per acre. A detailed description of the anticipated functions of each of the mitigation projects proposed to address watershed needs is included in the Proposed Mitigation Workplans below.

Figure B-1. Proposed Limits and Type of Mitigation at Bethlehem Boulevard and High Pier Wharf

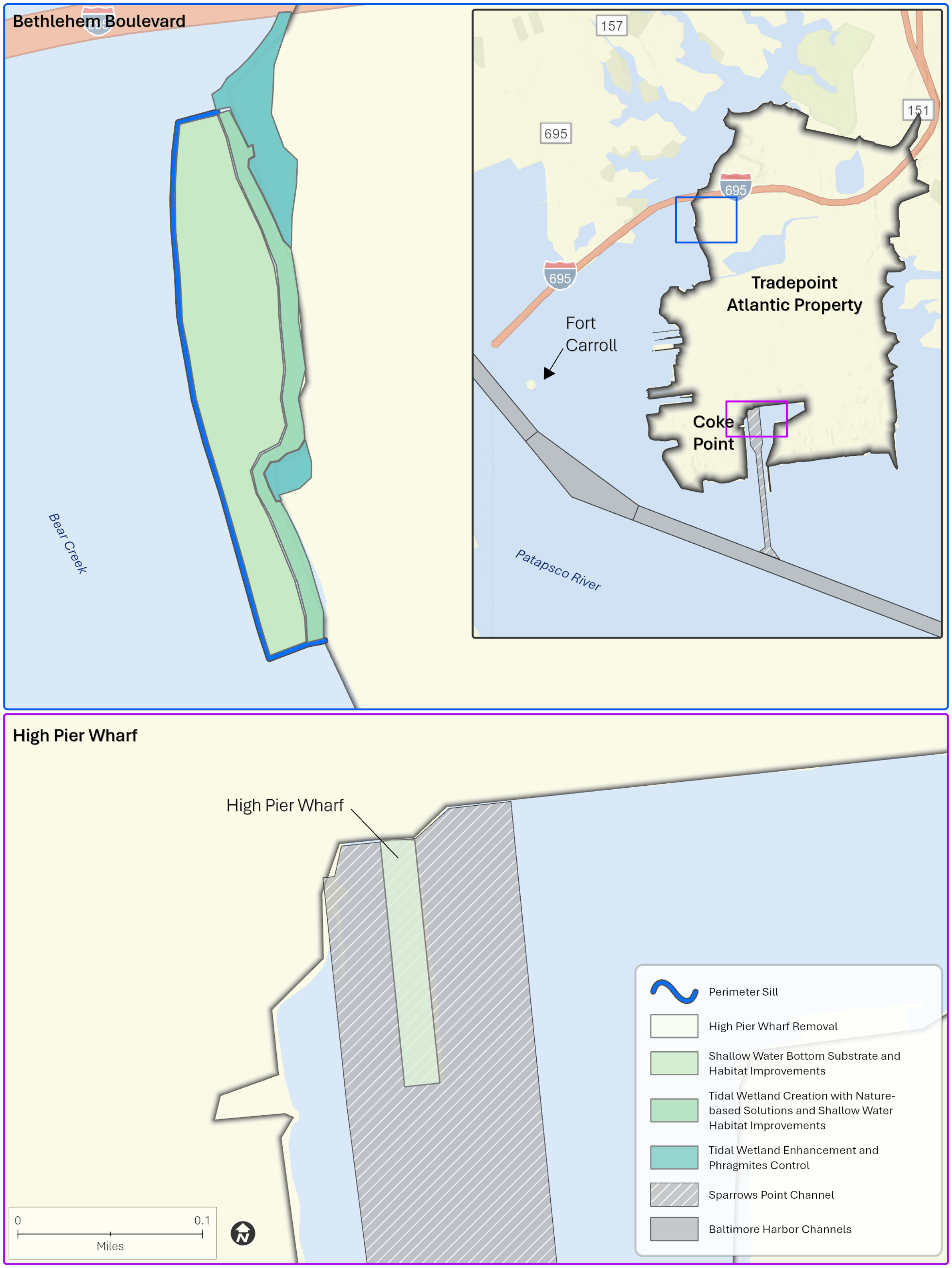


Figure B-2. Proposed Limits and Type of Mitigation at North Point and Pleasant Yacht Clubs, Craighill Lighthouse Peninsula, and the Southeast Peninsula

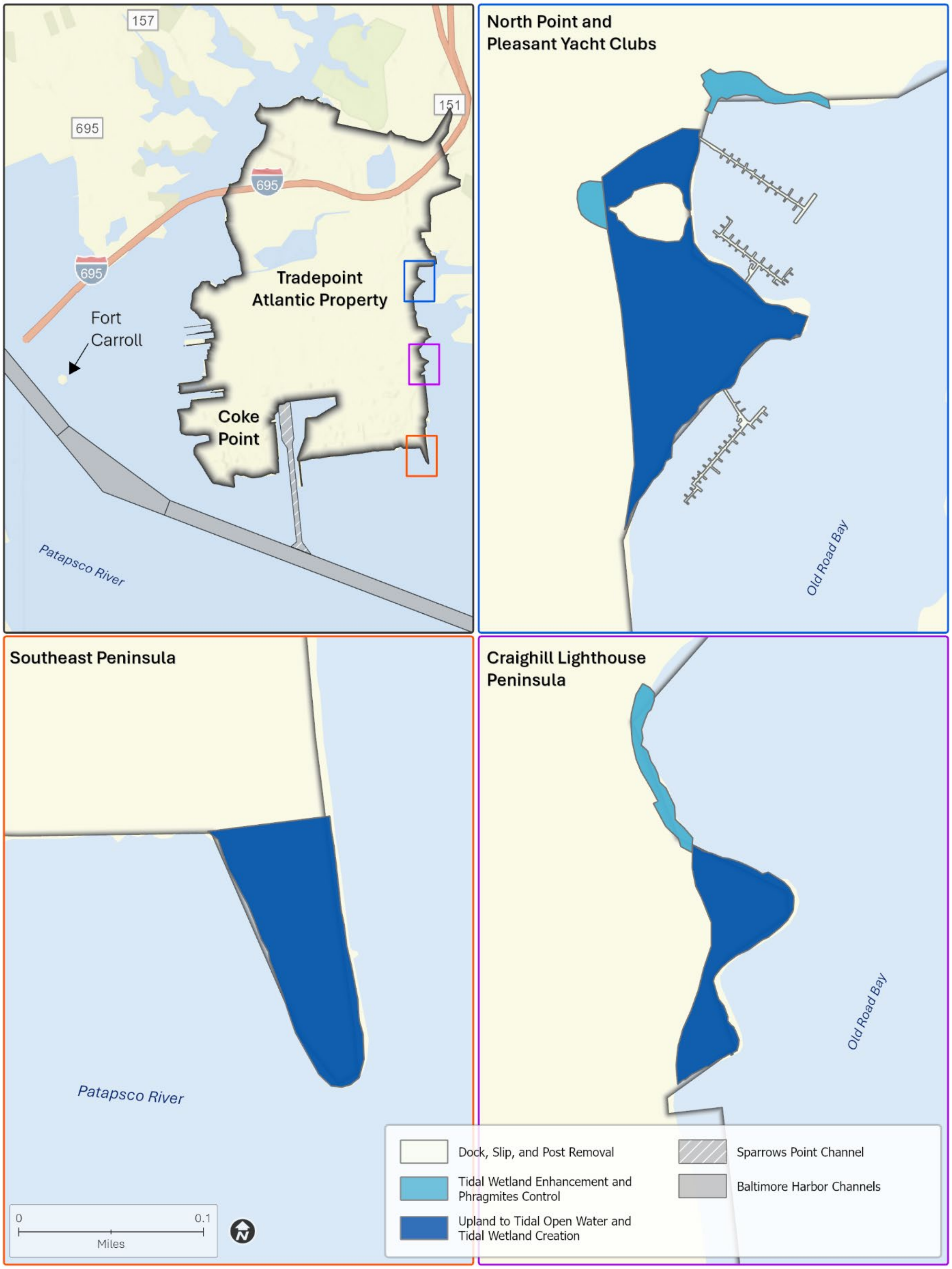


Figure B-3. Recreational Fishing Grounds in the Middle Chesapeake Bay and Potential Locations for Removal of Derelict Crab Traps

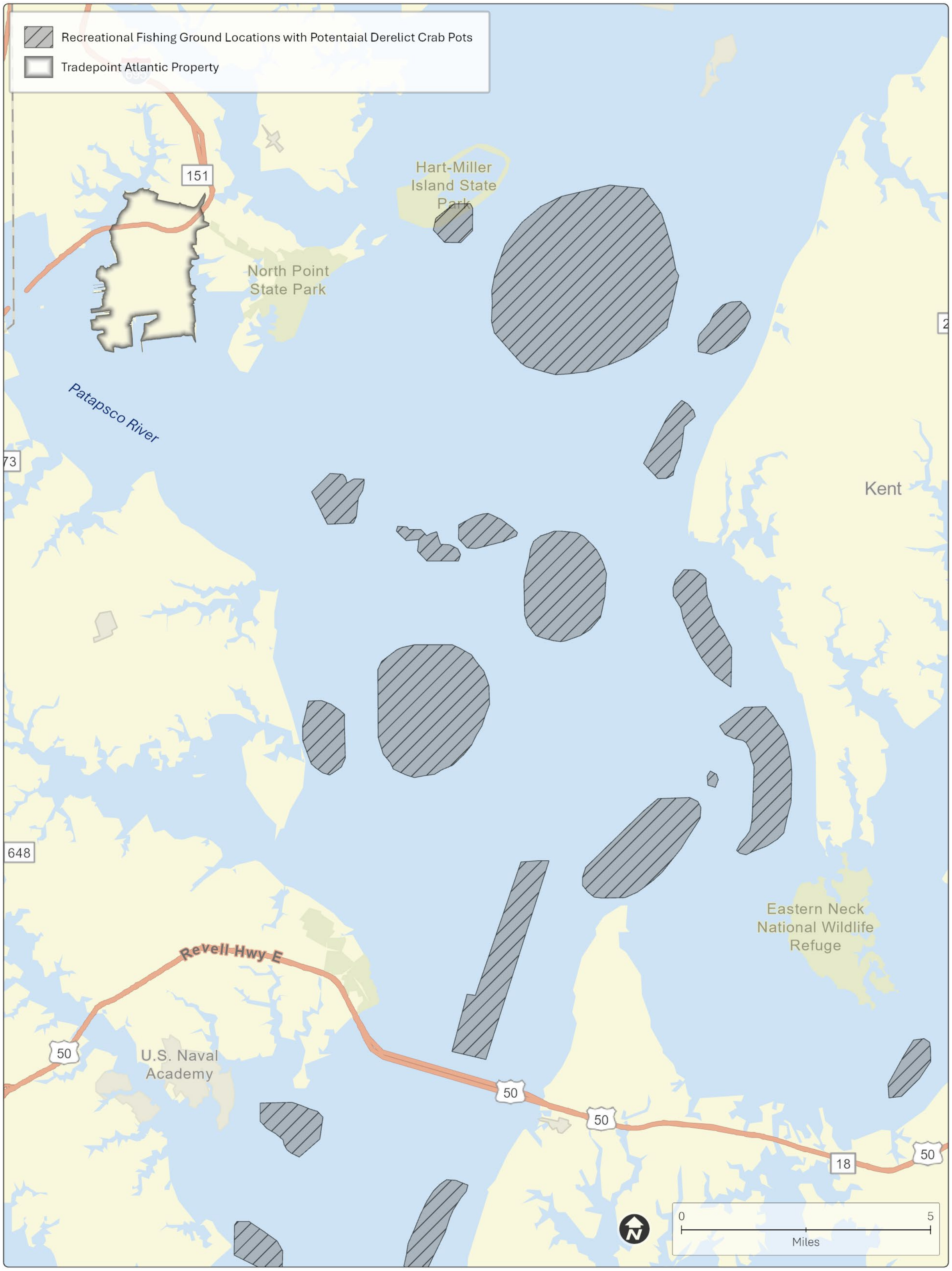


Table B-1. On-Site and Off-Site Mitigation Concepts for Recommended Sites

Mitigation Type	Mitigation Measure	Proposed Mitigation Ratio	Credit (acres)	Yacht Basins, Craighill Lighthouse Peninsula and Southeast Peninsula	High Pier Wharf	Bethlehem Boulevard
Open water restoration action [1]	Uplands conversion to tidal open water and tidal wetlands / multi-habitat restoration and creation	1:1		11.6 acres		
	Tidal open water restoration with wharf / dock and pier removal and shallow to deepwater habitat improvements	1:1		0.34 acres / 2,660 linear feet	1.62 acres	
Multi-habitat restoration and creation action [2]	Perimeter sill (natural stone sill, reef castles / balls)	2:1				0.21 acres / 1,850 linear feet (0.105 acres credit)
	Shallow water bottom substrate and habitat improvements	2:1				6.5 acres (3.25 acres credit)
	Tidal wetland creation with Nature-based Solutions and shallow water habitat improvements	2:1				1.75 acres (0.875 acres credit)
Enhancement and terrestrial action [2]	Invasive species (*Phragmites*) management	4:1		1.05 acres (0.26 acres credit)		1.8 acres (0.45 acres credit)
Derelict crab trap removal [3]	Derelict crab trap removal in middle Chesapeake Bay		1.3			
Oyster reef creation / replenishment [3]	Oyster reef restoration / seeding at location to be determined		To be determined			
Totals Credits 4	**Total credits provided = 19.8 acres**		**1.3 acres**	**12.2 acres**	**1.62 acres**	**4.68 acres**

Notes:

1 – On-Site, In-Kind Mitigation Efforts

2 – On-Site, Out-of-Kind Mitigation Efforts

3 – Off-Site, Out-of-Kind Mitigation Efforts – Acreage may be adjusted if additional mitigation acreage needed

4 – Based on mitigation ratios

Intended Outcome of the Mitigation Project

To achieve the goals of the proposed mitigation package, TTT is seeking regulatory agency concurrence for the recommended sites and projects described below. Once initial concurrence is granted, additional detailed studies for some of the project sites would be scheduled to gather additional data and information required to finalize a revised Phase I Tidal Mitigation Plan and ultimately the Phase II Tidal Mitigation Plan. The mitigation projects proposed are anticipated to replace the acreage to be impacted and improve the overall quality and functionality of the existing habitats surrounding the TPA site and nearby off-site areas.

Site Selection

Shoreline areas along TPA property were analyzed to assess the existing shoreline conditions and determine areas where there may be potential for on-site mitigation opportunities to mitigate for proposed tidal open-water wetland impacts associated with the development of the Sparrows Point Container Terminal (SPCT) by TTT. Areas investigated included nine separate shorelines areas, including four areas along Bear Creek on the north and west sides of the property, two areas along the Patapsco River on the south side of the property, and four areas along Jones Creek and Old Road Bay on the east side of the property. The shoreline limits for each area were defined by distinct landmarks and / or similar site conditions.

Desktop analysis of the on-site shoreline conditions included a review of the Maryland Department of Natural Resources (MDNR) *MERLIN – Maryland's Environmental Resource & Land Information Network* (MDNR 2024a) and *Maryland Coastal Atlas* (MDNR 2024b) interactive geographic information system (GIS) websites, and current and historic aerial imagery available on Google Earth. Measurements of each shoreline area or feature were taken using one or more of these sources. The primary GIS resource layers that were reviewed included historical shorelines and shoreline rates of change, shoreline inventory of key features (e.g., bank cover, shoreline bank height and condition, marsh and beach buffers, stabilization structures, and invasive common reed (*Phragmites australis*)), recent and historic submerged aquatic vegetation (SAV), sea level rise vulnerability, coastal resiliency assessment, living resources, and finfish habitat.

Site visits to document conditions at each of the areas were conducted on June 12, 14 and 15, 2024. Photographs of each area and some of the key features identified were taken at each site. In addition, several local successful shoreline stabilization projects that implemented a combination of nature-based solutions (NbS) and human-made solutions were visited as potential reference sites to help guide the development of potential mitigation options.

> **Nature-based solutions (NbS)** are actions that protect, sustainably manage, and restore natural or modified ecosystems to address societal challenges, such as climate change, disaster risk, and food and water security, while simultaneously providing benefits for biodiversity and human well-being. NbS emphasize working with nature rather than against it, offering a holistic approach to environmental management that enhances ecosystem health and resilience. Examples of NbS include restoring wetlands, reforestation, and green infrastructure in urban areas.

Recommended mitigation opportunities and preliminary concepts have been developed for five sites based on the initial findings from the desktop and site investigations. Although there may be multiple approaches that could be taken to create out-of-kind mitigation options for each area, the preliminary concepts described below present a range of approaches for the creation of multiple habitat types to mitigate for potential impacts on tidal open water associated with the development of a dredged material containment facility (DMCF) within the Coal Pier Channel at the proposed SPCT site.

The proposed mitigation package also includes two projects located offsite within nearby waters within the Middle Chesapeake Bay near Hart-Miller Island and / or the mouth of the Patapsco River, and at a location yet to be determined that were added to supplement the on-site mitigation. The proposed off-site and out-of-kind mitigation includes partnering, coordinating, and implementing projects that involve the removal of derelict crab traps to improve bottom habitats within portions of the Bay where the traps are prevalent, and the creation of a new oyster reef or replenishment of an existing oyster reef and. Each of the descriptions provided below presents information on the site location, site visit and desktop analysis findings, and provides a description of the mitigation opportunities and preliminary concepts. Representative site photographs of each site and of some examples of the proposed mitigation concept are included in the description.

Site Protection Instrument

The proposed on-site mitigation area at Bethlehem Boulevard is situated adjacent to the TPA property below mean high water (MHW) at the mouth of Bear Creek, which is Waters of the State of Maryland. Following excavation of the three TPA-owned upland areas at the Yacht Clubs, Craighill Peninsula, and the Southeast Peninsula to elevations below MHW in Jones Creek, Old Road Bay, and the Patapsco River, respectively, each of those on-site mitigation areas would also be in Waters of the State of Maryland. Under Maryland State Environment Article Title 16 and Code of Maryland Regulations (COMAR) 26.24, MDE is authorized to regulate activities related to filling, construction, and dredging within tidal Waters of the State; therefore, an easement or other site protection instrument is likely not required. In addition, federal, state, and local agencies, and special interest groups including non-profits and academic institutions would work together to protect these tidal waters.

If the regulatory agencies require TTT to develop an alternative form of site protection mechanism, such as a Conservation Land Use Agreement in coordination with revisions to the property Master Plan, Management Plans, etc., TTT would seek guidance on the form of the site protection mechanism and incorporate it into a revised Phase I Tidal Mitigation Plan. The agreement would include language identifying the sites that are being used for mitigation and a statement that the sites would be conserved and maintained to benefit the aquatic resources established as part of the mitigation project and specified in the Phase II Tidal Mitigation Plan. The site protection mechanism would also ensure that the regulatory agencies have access to the site for compliance and enforcement of the site protection instrument, that all incompatible uses are prohibited, and that the site protection instrument includes a clause requiring 60-day notification to the Corps and MDE when there is a proposal to amend the site protection mechanism.

Baseline Information for On-Site Mitigation Sites

Bear Creek Shoreline along Bethlehem Boulevard

Site Location and Desktop Analysis

The Bear Creek shoreline along Bethlehem Boulevard west of 6001 Bethlehem Boulevard, extending from Interstate 695 (I-695) south approximately 1,900 linear feet is sparsely vegetated with trees and shrubs including numerous invasive species, such as tree-of-heaven (*Ailanthus altissima*) and bush honeysuckles (*Lonicera* spp.). According to MERLIN (MDNR 2024a), the historic shoreline surveyed in 1975 extended up to 100 feet west of the existing shoreline from an arm of land covered in *Phragmites* that juts out into Bear Creek north to the powerline crossing. A recent aerial photograph provided by TPA of this area shows shallow areas where the shoreline has eroded, and numerous tires are visible below the water surface. Elsewhere within the area, both the 1975 and 1994 shorelines appear to be similar to the current shoreline.

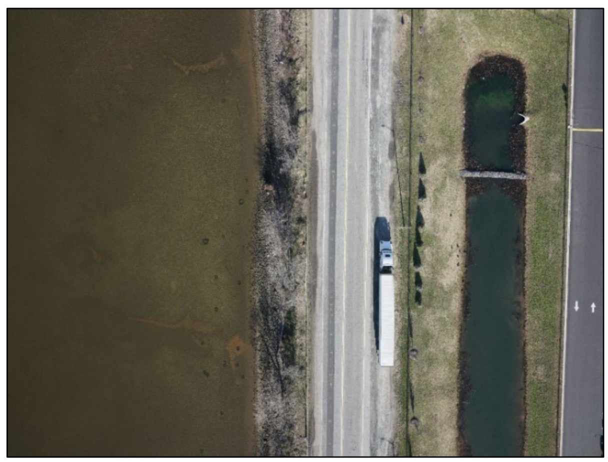
The Maryland Coastal Atlas (MDNR 2024b) indicates that 100% of the shoreline has total bank cover with a bank height and condition of 0 to 5 feet with low erosion. According to the Atlas, there are no mapped marshes or beach buffers along the shoreline, although site visits revealed otherwise. Much of the shoreline is stabilized with riprap, and although *Phragmites* is not mapped for this area, large stands of *Phragmites* are evident on recent aerial photographs for approximately 45 to 50% of the shoreline. Shoreline erosion levels mapped over the last 10 years depict approximately 940 linear feet of slight erosion in three locations and 460 linear feet of accretion in two areas along the shoreline. Based on sea level rise vulnerability of up to 5 feet of inundation, none of the infrastructure in this area appears to be at risk. There are no current or historic SAV beds mapped within this portion of Bear Creek. Finfish habitat in this portion of Bear Creek includes white perch (*Morone americana*) spawning habitat, herring juvenile habitat, and tidal finfish adult habitat. Wave hazards in the northern portion of the area are rated as moderate and in the southern portion are rated as low.

Google Earth historic aerial imagery from April 7, 1994, appears to indicate that the shoreline was sandy at one time. Newer aerials (2002, 2008, 2014, 2018, 2019, and 2022) that were likely taken during low tide conditions appear to indicate that there are sandy shoals and sand movement immediately offshore in the northern portion of the area (Google Earth 2024).

Site Visit Findings

The shoreline along Bethlehem Boulevard is dominated by a thick stand of *Phragmites* in the northern area near Riverside Drive and an overhead utility crossing. The shoreline narrows to the south for 1,000 feet encroaching to within 50 feet of Bethlehem Boulevard. Trees and shrubs within the narrow roadway slope and buffer are dominated by staghorn sumac (*Rhus typhina*) and invasive tree-of-heaven.

The buffer expands to 250 to 300 feet wide at the south end of the area. Trees within the buffer are generally species that grow in poor soil, including sumac, tree-of-heaven, mulberry (*Morus* spp.), and black locust (*Robinia pseudoacacia*). The shoreline is dominated by *Phragmites*. Much of the shoreline in this area is rocky rather than sandy at the base of the slope, with a mix of cobble to gravel size rocks and a considerable amount of rubble and construction debris (most of which is slag). Tires can be seen in shallow waters off the narrow area in a recent aerial photograph shown below.



Jones Creek Shoreline at Pleasant and North Point Yacht Clubs

Site Location and Desktop Analysis

The Pleasant and North Point Yacht Clubs are located along Wharf Road on the eastern shoreline of the TPA site along Jones Creek, south of Sparrows Point Boulevard (MD 151) with Pleasant Yacht Club to the immediate north of the North Point Yacht Club. TPA plans to keep a functioning boat ramp and parking area for the community to be able to use and put boats into Jones Creek for pleasure boating.

The shoreline along Jones Creek at the Pleasant Yacht Club to the north and the North Point Yacht Club to the south measures approximately 1,700 linear feet. Much of the shoreline area is developed with infrastructure to support the boating activities at each yacht club, but there is also a tidal pond with a narrow buffer separating the two clubs, and several patches of forest buffer along the North Point Yacht Club peninsula. According to MERLIN (MDNR 2024a), the historic shorelines surveyed in 1975 and 1994 were relatively similar to the current conditions, with the exception of in 1994, the shoreline mapping included the entire tidal pond.

The Maryland Coastal Atlas (MDNR 2024b) indicates that 100% of the shoreline has total bank cover with a bank height and condition of 0 to 5 feet with low erosion. There are no marsh or beach buffers mapped in the area, although site visits revealed otherwise, and the shoreline has been in the same relative location since 1930. Stabilization structures along most of the shoreline are designated as marina with less than 50 slips, and there is no *Phragmites* areas mapped along the shoreline, although recent aerials indicate a signature similar to other mapped *Phragmites* stands in several locations. Shoreline erosion levels mapped over the last 10 years indicate no erosion areas and approximately 220 linear feet of accretion along the south shoreline of the North Point Yacht Club. Based on sea level rise vulnerability of up to 5 feet of inundation, a significant portion of the Pleasant Yacht Club is as risk of being flooded and areas near the boat ramp at the North Point Yacht Club are at risk of being flooded, while Wharf Road does not appear to be at risk.

The entire shoreline along the Pleasant Yacht Club, within the tidal pond, and along the north side of the North Point Yacht Club are mapped as having SAV in 2022. The Pleasant Yacht Club shoreline and tidal pond also exhibited SAV beds in 2019, 2020, and 2021, while SAV beds in 2019 were along the south shore of the North Point Yacht Club. In 2021, SAV beds were found along both the north and south shorelines at the North Point Yacht Club between the shore and the docks. Offshore areas within this portion of Jones Creek are mapped as waterfowl concentration and staging areas. Finfish habitat in this portion of Jones Creek includes white perch juvenile habitat, herring juvenile habitat, and tidal finfish adult habitat. Wave hazards along the yacht clubs are rated as low.

Google Earth historic aerial imagery shows a narrow approximately 80-foot-long beach near the southern dock at the North Point Yacht Club, but the aerials do not appear to indicate any significant sand movement or beach formation anywhere else along the shoreline in this area (Google Earth 2024).

Site Visit Findings

The Pleasant Yacht Club includes a main boat dock with slips and a smaller dock and boat ramp for placing boats into the water. The shoreline to the north is covered in *Phragmites* but a narrow fringe of native marsh grasses is found along the toe of the riprap reinforced bank between the docks. South of the main dock the shoreline is grass leading to rock reinforcement with some salt tolerant shrub species that appear to be cut back. There is a tidal pond within the cove separating the two yacht clubs that is surrounded by *Phragmites* and groundsel tree (*Baccharis halimifolia*). Upland areas consist of a gravel parking lot and driveway, gardens, picnic areas, boat laydown areas, maintained lawn, and the Pleasant Yacht Club building and appurtenant structures.

North Point Yacht Club includes two large boat docks with slips and a series of three smaller docks and a boat ramp for putting boats into the water. The shoreline near the northern boat dock with slips is dominated by *Phragmites*. The shoreline near the boat ramp is primarily a mix of concrete and rubble with minimal vegetation, but then leads to another patch of *Phragmites* along the shoreline close to the southern boat dock and slips.

Old Road Bay Shoreline at Craighill Lighthouse Peninsula

Site Location and Desktop Analysis

The Craighill Lighthouse Peninsula is located just south of the security gate along Wharf Road on the eastern shoreline of the TPA property. The shoreline runs along Old Road Bay, beginning just north of the Pennwood Channel and continuing for approximately 1,650 linear feet to a cove north of the peninsula and just south of the mouth of Jones Creek. Vegetation along the shoreline ranges from sparse trees and shrubs along the peninsula to a more solid forested buffer on the peninsula to the immediate north, where past forest mitigation plantings have been implemented. The buffer separating the shoulder of Wharf Road and the shoreline is relatively narrow and consists of a mix of trees, shrubs, and *Phragmites*.

The Maryland Coastal Atlas (MDNR 2024b) indicates that 100% of the shoreline has total bank cover with a bank height and condition of 0-5 feet with low erosion. There is no marsh buffer mapped but there is a 300-foot beach buffer on the southeast side of the peninsula to the north. There are no stabilization structures or *Phragmites* areas mapped along the shoreline, although recent aerials indicate a signature similar to other mapped *Phragmites* stands in several locations. Shoreline erosion levels mapped over the last 10 years depict accretion along much of the shoreline of the Craighill Lighthouse Peninsula south to the Pennwood Channel. Based on sea level rise vulnerability of up to 5 feet of inundation, none of the infrastructure currently in this area appears to be at risk. Approximately 825 feet of shoreline to the north and 300 feet within the bend of the peninsula are mapped as having SAV in 2022, 2019, and 2018.

Offshore areas within Old Road Bay are mapped as waterfowl concentration and staging areas. Finfish habitat in this portion of Old Road Bay includes white perch juvenile habitat, herring juvenile habitat, and tidal finfish adult habitat. Wave hazards along the shoreline of Old Road Bay are rated as moderate. Google Earth historic aerial imagery from April 7, 1994, appears to indicate that there were narrow sandy beaches in this area. Newer aerials (2002, 2008, 2014, 2018, 2019, and 2022) that were likely taken during low tide conditions appear to indicate that there is sand movement immediately offshore (Google Earth 2024). Historic aerials by Nationwide Environmental Title Research (NETR) Online (NETR 2024) indicate that the water's edge was closer to the Craighill Lighthouse in 1957, and the Lighthouse Peninsula was reshaped with fill material / slag added into Jones Creek on the north side and into Old Road Bay to form the lower lobe of the peninsula on the south side between 1957 and 1966, when the current configuration was completed.

Site Visit Findings

The cove north of the Craighill Lighthouse Peninsula is dominated by *Phragmites* and a poor-quality riparian buffer. The peninsula has several gravel roads and appears to be used frequently as a temporary staging and stockpile / laydown area. The shoreline is predominantly a mix of gravel, cobble, and boulders, as well as a considerable amount of slag that was used when building out the peninsula and some asphalt that has been dumped. Some of the shoreline is sparsely vegetated with a mix of salt-tolerant shrub species, such as groundsel tree, marsh elder (*Iva frutescens*), false indigo bush (*Amorpha fruticosa*), and wax myrtle (*Morella cerifera*). A 100-foot-long narrow gravel and sandy beach with scattered debris that has washed up from offshore is located in the bend between the two lobes of the peninsula, near the lighthouse. The lighthouse is in a state of disrepair but is still functioning. A mature diamondback terrapin (*Malaclemys terrapin*) was found in the slag / rubble on this peninsula during a site visit in June 2024.

Patapsco River Shoreline at Southeast Peninsula

Site Location and Desktop Analysis

The Patapsco River shoreline, beginning at the finger pier extending from the entrance of the embayment, continuing south of the Lafarge Cement Plant, and proceeding east to the finger that extends south of Pennwood Wharf (i.e., a small peninsula extending south from the southeastern shore of Sparrows Point), measures approximately 6,000 linear feet. Vegetation along the western half of this area is very sparse with small patches of trees and shrubs, and the eastern half of the area below the Lafarge Plant has an approximate 150- to 200-foot forest and wetland buffer. According to MERLIN (MDNR 2024a), the historic shoreline surveyed in 1975 was from 75 to 300 feet landward of the current shoreline in the western half of the area, and from 120 to 220 feet further out into the river in the eastern portion of the area. The 1994 shoreline survey indicated that the shoreline was relatively similar to the current shoreline.

The Maryland Coastal Atlas (MDNR 2024b) indicates that 100% of the shoreline has total bank cover with a bank height and condition of 0 to 5 feet with low erosion. According to the Atlas, there are no marshes or beach buffers along the shoreline, which was built out into the Patapsco River to its current location between 1930 and 1990, although site visits revealed otherwise. Approximately 60% of the shoreline is stabilized with riprap and there are no mapped areas of *Phragmites*, although recent aerials indicate a signature similar to other mapped *Phragmites* stands throughout the wetland buffer in the eastern portion of the area. Shoreline erosion levels mapped over the last 10 years depict no areas of erosion or accretion along this shoreline. Based on sea level rise vulnerability of up to 5 feet of inundation, none of the infrastructure currently in this area or proposed for this area appears to be at risk but the wetland buffer floods. There are no current or historic SAV beds mapped within this portion of the Patapsco River. Offshore areas within the Patapsco River along the shoreline are mapped as waterfowl concentration and staging areas. Finfish habitat includes white perch juvenile habitat, herring juvenile habitat, and tidal finfish adult habitat. Wave hazards in the area are rated as moderate.

Google Earth historic aerial imagery does not appear to indicate any significant sand movement or beach formation anywhere along the shoreline (Google Earth 2024).

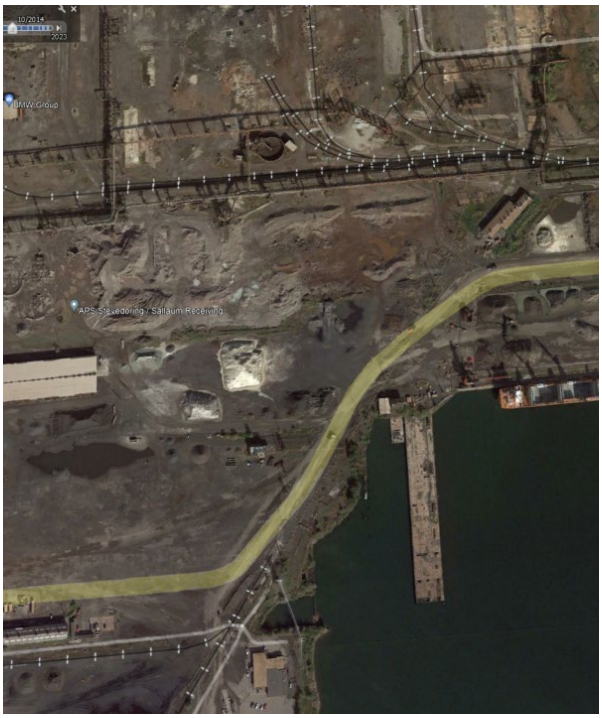
Site Visit Findings

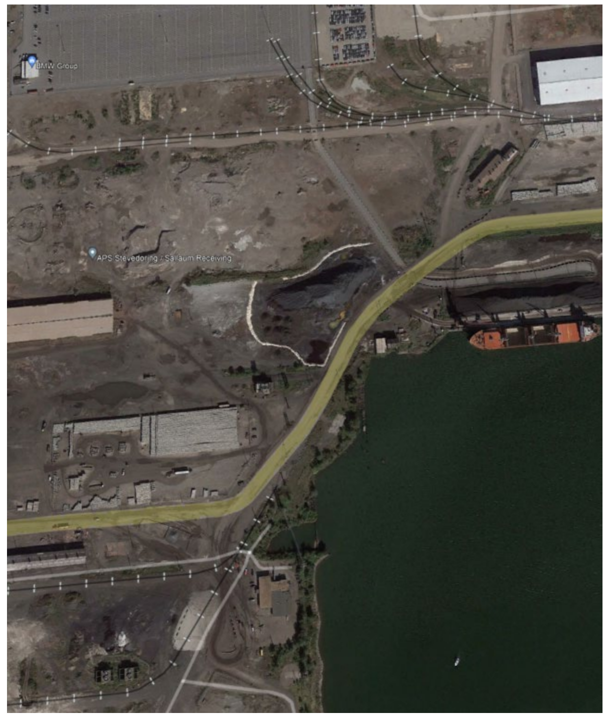
The shoreline west of the Lafarge Cement Plant site was the only area readily accessible during the site investigation, and therefore site photographs of the peninsula that juts out into the Patapsco River from the Pennwood Wharf area were taken from a distance. Further investigation is needed into this area once site access is cleared. Directly south of the Lafarge Cement Plant, there is a forested buffer, wetlands, and stands of *Phragmites* that were viewed from a distance. Much of the shoreline throughout this area is made of land consisting of slag that historically had been pushed into the open waters to extend the Sparrows Point land. Banks range from about 10 to 30 feet in height and are heavily eroding, slumping, and sloughing off into open waters due to wave action. Much of the vegetation is sparse and it generally consists of pioneer species that commonly grow on poor quality soil.

High Pier Wharf

Site Location and Project History

The High Pier wharf was located within the embayment area near the proposed location of the SPCT site. Based on historic aerials and topographic maps, it appears that the wharf was at this location for over a century, well before Coke Point was built-out into the Patapsco River. In 2018, the approximate 100-foot by 700-foot wharf was proposed for demolition by TPA, restoring the area to tidal open water. Below, a view of the High Pier wharf taken in 2014 is shown in the left aerial photograph, and a view of the restored tidal open water following demolition of the High Pier structure is shown in 2018 in the right aerial photograph.





Determination of Mitigation Ratio / Credit

The SPCT project with the wharf development and the offshore DMCF would impact 19.8 acres of tidal open water, including shallow water habitat. The proposed on-site mitigation incorporates both in-kind mitigation at a mitigation ratio of 1:1, as well as out-of-kind mitigation at a ratio of 2:1 and invasive species management at a ratio of 4:1. Table B-2 presents the minimum mitigation area needed for each of the multipliers, given the 19.8 acres of tidal open water impacts.

Table B-2. Mitigation Areas Required Based on Multipliers

Impacted Area	Mitigation Ratio for Impacted Resource	Mitigation Multiplier (for in-kind, out-of-kind, and invasive species management)	Minimum Required Mitigation Area
19.8 acres tidal open water	1:1	1:1 for in-kind	19.8 acres at 1:1
		2:1 for out-of-kind	39.6 acres at 2:1
		4:1 for enhancement	79.2 acres at 4:1

Proposed Mitigation Workplan

This section provides an overview of the on-site mitigation concepts being proposed for the SPCT project, including multi-habitat restoration and creation in existing offshore area distressed from historic operations; conversion of uplands to tidal open water and tidal wetlands / multi-habitat restoration and creation; removal of docks, slips, and posts from tidal open waters; and enhancing existing tidal wetlands with *Phragmites* control. Descriptions of each action and the benefits anticipated for each are described below.

Multi-Habitat Restoration and Creation at Area Distressed from Historic Operations

Multiple types of tidal emergent wetland and aquatic habitat restoration are proposed at the Bethlehem Boulevard shoreline area along Bear Creek, which is an area of the property and adjacent tidal waters that have shown signs of distress from historic operations at the Sparrows Point site (see Figure B-1). The multi-habitat restoration and creation would create a more natural shoreline that provides multiple habitat benefits. This would include:

- Placing an approximate 1,850 linear foot (0.21 acre) perimeter sill of natural rock and / or other man-made or proprietary NbS structures (e.g., reef castles, reef balls) that maintain maximum aquatic connectivity along the shallow water interface and edge areas to promote use of the site by multiple types of aquatic species, attenuate wave energy, and contain materials used to create other nearshore habitats
- Improving the bottom surface substrate in approximately 6.5 acres of shallow water habitat areas immediately behind the perimeter sill or reef structures by introducing a zone featuring natural rock / boulder piles, natural cobble, gravel, and sand materials sourced from a nearby quarry, adding shell bags or loose shell materials to promote use by multiple aquatic species, and removing and replacing human-made materials (e.g., slag, tires) that appear to currently underlie or sit on the surface in some of the area
- Introducing woody debris, potentially with attached root wads, and other NbS habitat structures or improvements, and seeding with native SAV species, such as wild celery (*Vallisneria americana*), within the same 6.5-acre shallow water zone with (Note: total mitigation acreage in zone is not duplicated)
- Creating or restoring approximately 1.75 acres of low to high marsh tidal emergent wetlands with scattered woody debris structures to improve shoreline habitat in nearshore areas

If human-made or proprietary NbS structures are proposed at the site, TTT would contact the manufacturers of those structures to discuss alternative materials that could be used to reduce carbon dioxide-releasing concrete emissions during production of the structures. Tidal wetland boundaries would need to be delineated and surveyed to identify the limits of existing wetlands and existing land, and topographic and bathymetric surveys of the surrounding waters would be conducted to accurately depict existing land conditions above and shallow water habitat conditions below MHW to the proposed limits of the work.

The multi-habitat restoration and creation actions would provide greater edge to water ratio than what currently exists, which would promote use and provide greater protection for multiple aquatic species, including species in need of conservation. The layered effect of the actions would provide multiple ecological benefits and considerable ecological uplift at the project site as compared to creating a single habitat type. The location of the site near the mouth of Bear Creek and immediately north of and adjacent to the US Environmental Protection Agency Superfund project site would provide a contiguous extension to more natural shoreline areas where SAV has been mapped north of I-695.

The improved substrate and habitat structures introduced into the shallow water areas would improve benthic conditions, provide potential shellfish attachment sites, and provide habitat improvements including feeding, foraging, and cover areas for tidal adult finfish, juvenile herring, and white perch spawning. The reduced boat wake and wave action along the shoreline would allow the shallow water habitat zone to be seeded with native SAV species. The tidal emergent wetlands in the nearshore areas along with the SAV would provide vegetative diversity using a mix of shallow water aquatic and low to high marsh zones that would transition to native scrub-shrub species near the toe of the slope.

Wetlands enhanced by the introduction of woody materials or other NbS features would allow for increased finfish forage and refuge areas and would enhance herpetofauna, wading bird, and waterfowl foraging opportunities. The wetlands would also improve water quality and filtering of waters at the site in this highly urban watershed. The SAV provides cover for crabs, juvenile and small fish, and foraging sites for larger fish species. The predominant fish species known to use these areas are species that would benefit from more consistent SAV occurrence and diversity.

Cobble and gravel substrate and / or other reef making materials introduced into waters immediately behind the perimeter sill structures to the edge of the shallow water areas would improve open water habitat and vertical structure. Substrate improvements would improve benthic conditions, which would improve the forage opportunities for fish. An increase in three-dimensional structure of the bottom substrate would provide additional habitat for epibenthic colonization, cover for crabs, juvenile and small fish, and foraging sites for larger fish species. Many of the fish species known to use the waters surrounding the TPA site are species that would benefit from the improved refugia, especially compared to some of the human-made land that extends into the waters currently that included historic pushing of slag and other waste materials towards and into the open waters. The hard vertical structure may also provide substrate for encrusting bivalves, such as fresh to brackish water native mussels or potentially oysters.

More detail on this mitigation concept would be developed as additional information has been collected at the site, including wave and boat wake action to inform the size and strength of materials and the engineering design to ensure stability of the sill and habitat features to be installed, and the concept would be updated in a revised Phase I Mitigation Plan following agency approval of this initial concept. Additional information regarding the need for and type of remedial actions that may need to be undertaken within the proposed mitigation area and / or landward of the area to address historical contamination issues would also be provided in the plan. The revised plan would also include information on the proposed sources of natural stone and materials (e.g., cobble, gravel, sand, shell, woody debris) to improve substrate within the mitigation areas, and a monitoring and adaptive management plan that outlines clear performance criteria, interim checkpoints, and suggested corrective measures for the proposed mitigation. In addition, a maintenance schedule would be developed for ongoing removal of trash and debris that washes up onto shore within the mitigation areas as part of the revised plan.

Tidal Open Water and Tidal Wetlands / Multi-Habitat Restoration and Creation in Existing Uplands

Tidal open water and tidal wetlands / multi-habitat restoration and creation is proposed at three separate upland areas within the TPA property, where the existing shoreline would be pulled back and restored without encroaching channelward into Waters of the United States / Waters of the State, including tidal waters and existing shallow water habitat areas. The proposed locations and minimum acreages of anticipated restoration and creation include: 5.5 acres at the Pleasant and North Point Yacht Clubs; 2.1 acres at the Craighill Lighthouse Peninsula; and 4.0 acres at the Southeast Peninsula point (see Figure B-2).

Tidal wetland boundaries would need to be delineated at each of the sites and surveyed to identify the limits of existing wetlands and existing land and the surrounding waters would be surveyed (topographic and bathymetric surveys) to accurately depict existing land conditions above and shallow water habitat conditions below MHW. Geotechnical borings or test pits would also be conducted at each of the land areas to characterize the materials to be removed, including historic fill. The Sparrows Point material reuse screening program would be implemented for this material.

During detailed design, appropriate elevations would be determined for the newly created tidal open waters, shallow water habitat areas, and / or low to high marsh tidal wetlands along new shoreline areas. This would include determining if there is a potential need for over-excavation to subgrade elevations followed by placement of clean fill materials appropriate for the establishment of wetland vegetation and for providing improved substrate for shallow water habitat areas. The detailed design would include grading that focuses on improving the edge to water ratio (e.g., creation of coves for tidal adult and juvenile finfish habitat), erosion and sediment control (e.g., silt or super silt fence on land, turbidity curtains in water), existing habitat protection, and native wetland species planting plans with the goal of creating multiple tidal open water and wetland habitat types within each area.

The multi-habitat restoration and creation efforts would be similar to those described above for the Bethlehem Boulevard site and would provide similar ecological benefits to these former upland areas. More detail on this mitigation concept would be developed as additional information has been collected at the sites and the concepts would be updated in a revised Phase I Mitigation Plan following agency approval of this initial concept.

Removal of Docks, Slips, and Posts from Tidal Open Waters

Existing docks, slips, and pilings at the Pleasant Yacht Club cover an area of approximately 860 linear feet or 0.11 acre and include one main “T” shaped dock that extends into Jones Creek with approximately 30 slips (depending upon boat sizes). At the North Point Yacht Club, two separate large docks with slips and pilings and three smaller docks cover areas of approximately 1,800 linear feet or 0.23 acre, including the northern dock with between 35 and 40 slips and the southern dock with between 40 and 50 slips. One small dock at the Pleasant Yacht Club adjoining the existing boat ramp is anticipated to remain for local boaters to use to put boats into Jones Creek at the ramp. Removal of the docks at both yacht clubs could result in up to 0.34 acre of tidal open water being restored, depending on how mitigation credits for the removal actions are approved by the agencies.

The High Pier wharf structure removed from within the embayment totaled 70,400 square feet (1.62 acres) in size. Pursuant to guidance from MDE, TPA submitted a letter to MDE referencing their issued

Tidal Wetland License No. 13-0966(R) on April 27, 2018, in which they noted that they were evaluating and deliberating forthcoming berth projects that would involve impacts to tidal open water areas. They requested that the 1.62 acres of tidal open water restoration associated with the demolition of the existing High Pier wharf structure be documented and recognized as advanced mitigation (TPA 2018). The High Pier was demolished in its entirety and the structure was removed to restore the area to open water in 2018. The notification to MDE was made in anticipation of the tidal open water mitigation needs for the forthcoming SPCT and other marine projects proposed at the site. A copy of the relevant correspondence is attached at the end of this draft mitigation plan (Attachment 1).

Invasive Species Management

Several stands of *Phragmites* that are immediately adjoining areas proposed for new tidal wetland and multi-habitat restoration and creation are proposed for *Phragmites* control. Removal of existing plant stems and rhizome and control of the *Phragmites* is recommended to prevent the spread of the invasive plant into newly created wetlands (see Figure B-1 and Figure B-2). The proposed locations and minimum acreages of anticipated *Phragmites* control include: 0.6 acre in two locations at the Pleasant and North Point Yacht Clubs; 0.45 acre along the north side of the Craighill Lighthouse Peninsula; and 1.8 acres in three locations at the Bethlehem Boulevard area, excluding any mitigation credit for *Phragmites* control undertaken within the powerline right-of-way.

The mitigation concept includes *Phragmites* spot treatment and large patch control, consisting of a minimum of 2 years of fall herbicide treatment using herbicides approved in Maryland for aquatic use, such as glyphosate or imazapyr. It would also include mowing or cutting the plants to ground level when not in seed and physical removal of plant materials, followed by excavation and removal of the upper 1- to 2-foot layer of rhizomes to lower the wetland marsh plain elevations where feasible. This would help to promote reestablishment of native high to low-marsh wetland species in these areas. Supplemental plantings of native wetland species would be introduced on the new marsh plain elevations to prevent recovery of *Phragmites* in these areas.

A detailed *Phragmites* Control Plan would be developed detailing the protective measures to be implemented to contain the herbicide application and reduce exposure to non-targeted species, as well as the overall restoration and enhancement process and seasonality of the proposed mitigation action as part of a revised Phase I Tidal Mitigation Plan following agency approval of this initial concept. The plan would also include a long-term monitoring and adaptive management plan to ensure the long-term ecological function of the enhanced areas.

The enhancement of these tidal wetlands through *Phragmites* control would provide a greater degree of vegetative diversity by using a mix of high to low-marsh species with a scrub-shrub buffer around the perimeter and / or near the toe of slope. Removal of the invasive species in areas immediately adjoining other proposed mitigation areas would also help to prevent establishment of *Phragmites* in newly created or restored tidal wetlands and improve the visual appearance of the shoreline to boaters and properties on the opposite shorelines from the site. The improved substrate conditions and wetland habitat would increase finfish forage and refuge opportunities, and enhance wading bird, herpetofauna, and waterfowl foraging opportunities. The enhanced wetlands would also improve water quality and filtering of waters draining to the site in this highly urbanized portion of the watershed.

Mitigation Ratio / Credits Anticipated for Proposed Actions

Table B-1 provides a breakdown of the proposed mitigation ratio anticipated for each of the on-site in-kind and on-site out-of-kind mitigation actions proposed above, as well as the anticipated mitigation credits to be achieved for the two off-site mitigation projects.

Maintenance Plan

Following agency approval of the proposed mitigation concepts, TTT would prepare a detailed maintenance plan that addresses each type of multi-habitat restoration proposed. The maintenance plan would be incorporated into the revised Phase I Tidal Mitigation Plan. Per the MDE's *Guidance for Tidal Mitigation Plans* (MDE 2024a), at a minimum, the maintenance plan would include the following elements:

1. *Tidal wetland creation* – The plan would provide a description and schedule of maintenance requirements to ensure the project is set to meet the outlined performance standards. A Mitigation Monitoring Report would be submitted that would include the following information:
   - Project identifying information (State Agency Interest number, Tidal Wetlands License number, site address, project name)
   - Date of inspections
   - Project completion date or current status of the project
   - Estimate of percent plant coverage by dominant species
   - Photographs showing the current condition of the site
   - If performance standards are not met, the Mitigation Monitoring Report would include a description of the performance standards that are not being met and proposed remediation measures. This may include:
     - A description of limiting factors to plant growth if native vegetation coverage is not met
     - A description of limiting factors to controlling invasive species grown if invasive coverage is not met
     - A description of the remedial actions that would be taken to meet the native coverage and / or invasive coverage requirements
2. *Habitat for benthic species* – The plan would provide a description and schedule of maintenance requirements to ensure the project is set to meet the outlined performance standards. TTT understands that maintenance may not be required for an artificial reef creation project. However, maintenance activities may be required if there is no increase in biomass on the substrate upon completion of the monitoring period.
3. *Oyster reefs / seeding* – The plan would provide a description and schedule of maintenance requirements to ensure the project is set to meet the outlined performance standards. TTT understands that maintenance may not be required for an oyster reef creation / seeding project. However, maintenance activities may be required if there is no increase in biomass on the substrate upon completion of the monitoring period. Current State monitoring

protocols for oyster reefs require that the area be surveyed every 3 years. Additional oyster spat-on-shell may need to be added periodically to ensure their continued viability.

4. *SAV restoration / creation* – The plan would provide a description and schedule of maintenance requirements to ensure the project is set to meet the outlined performance standards. TTT understands that when restoring SAV, it may be necessary to add additional seeds in the years following the original planting to achieve restoration success as defined in the performance standards.

Performance Standards

Following agency approval of the proposed mitigation concepts, TTT would prepare a description of the performance standards that would need to be met for each of the multi-habitat restoration types, based on the overall goals of the onsite mitigation. The performance standards for tidal wetlands would be prepared in accordance with the *Performance Standards and Monitoring Protocol for Tidal Wetland Mitigation Banks* (Corps 2016), in lieu of more recent agency-issued guidance for permittee-responsible tidal mitigation sites. Performance standards for habitat for benthic species and for oyster reefs / seeding would be prepared in accordance with the *Artificial Reef Management Plan for Maryland* (Loftus and Stone 2007), *Science-Based Restoration Monitoring of Coastal Habitats, Volume Two: Tools for Monitoring Coastal Habitats* (Thayer et al. 2005), or similar guidance provided by the agencies. Performance standards for SAV restoration / creation would be prepared in accordance with "Chapter 11 – Monitoring and Success Criteria" of *Small-scale SAV Restoration in Chesapeake Bay: A Guide to the Restoration of Submerged Aquatic Vegetation (SAV) in Chesapeake Bay and its Tidal Tributaries* (Jasinski et al. 2021) or similar guidance provided by the agencies. All of these performance standards would be incorporated into the revised Phase I Tidal Mitigation Plan.

Monitoring Requirements

Following agency approval of the proposed mitigation concepts, TTT would prepare a detailed onsite mitigation monitoring plan that clearly states what would be monitored for each of the on-site mitigation types to be implemented so MDE can determine progress towards meeting the performance standards. The monitoring protocols used would follow those described above under Performance Standards, as approved by the agencies. Monitoring would include both qualitative (description based on observation) and quantitative (based on sampling and measurement) methods. The plan would outline the monitoring requirements, including:

- Time and frequency of monitoring activities
- Methods to be used for monitoring
- Parties responsible for conducting the monitoring
- Parties responsible for submitting the mitigation monitoring reports
- Frequency for submitting monitoring reports
- Biological (of invertebrates and fish populations), fishing success, and socioeconomic assessments if creating habitats for benthic species

In accordance with MDE's Guidance for Tidal Mitigation Plans (MDE 2024a), mitigation monitoring reports would include supporting documents such as the following:

- Narrative
  - Overview
  - Requirements
  - Summary data
  - Map / Plan
  - Conclusion
- Supporting data
  - As-builts
  - Maps
  - Photographs
  - Assessment results
  - Raw data and interpretation

The mitigation monitoring reports would also meet the requirements of the Corps, in accordance with *Performance Standards and Monitoring Protocol for Tidal Wetland Mitigation Banks* (Corps 2016), in lieu of more recent agency-issued guidance for permittee-responsible tidal mitigation sites.

TTT would submit the first monitoring report the year the mitigation planting occurs, unless it occurs after April 15 of that year, in which case, the first monitoring report would be submitted at the end of the next year. For each monitoring report, vegetative monitoring would be conducted between June 15 and September 30, and the site visits would be conducted during a period with normal hydrologic conditions. As an example, if the mitigation planting occurs in May 2026, the first vegetative monitoring effort would be completed between June 15 and September 30, 2027, and the first monitoring report would be submitted in December 2027.

If TTT is required in the authorization to submit an as-built report / survey to MDE, it would be completed and submitted within 60 days following completion of the construction and planting of the mitigation site or as otherwise specified in the authorization. As-built reports / surveys would depict the completed portions of the mitigation site, including a plan view of the constructed / restored wetlands with locations of all the permanent sampling and photo stations, the survey of the finished grades, cross-sections of the planting zones, and densities. The report would describe the site's performance relative to the performance standards and would be used as a baseline measure for deviations from the approved mitigation plan. It would also include photographs of the completed mitigation site taken from designated photo stations.

Long-Term Management Plan

If requested by the agencies following approval of the proposed mitigation concepts, TTT would prepare a long-term management (LTM) plan for the on-site mitigation efforts. The plan would provide a description of how the mitigation project would be managed after performance standards have been met and mitigation monitoring by MDE and the Corps has finished to ensure long-term sustainability of the mitigation areas. A template LTM Plan would be submitted for approval by the agencies, if requested, as part of the approval process for the Phase II Tidal Mitigation Plan. Details would be provided on the long-term financing mechanisms established by TTT and the party or parties responsible for LTM activities for each of the mitigation sites (i.e., long-term stewards).

The Phase II Tidal Mitigation Plan would include realistic detailed cost estimates for LTM with estimates to be provided from at least two separate contractors, if required. The Nature Conservancy's long-term stewardship calculator and handbook (Nature Conservancy 2024) would be used to provide additional detailed cost estimates for the LTM Plan.

Adaptive Management Plan

If an adaptive management plan is required by the agencies, TTT would prepare a description of activities associated with that plan and responsible parties for implementing the plan and include the adaptive management plan in the Phase II Tidal Mitigation Plan for approval. The adaptive management plan would tie the specific performance standards to actions (e.g., the site does not meet the hydrologic regimes anticipated so should be regraded), It is meant to guide decisions for revising mitigation plans and implementing measures to address any unforeseen circumstances and changes in site conditions, such as local land use development, heavy storms, and rapid spread of invasive species on site that adversely affect mitigation success. The plan would include a "trigger level" and an associated "potential management response." For example, if 15% of the relative vegetation cover is invasive species during monitoring, then glyphosate would be sprayed in late July through October to control the invasives. This serves as an action plan should any circumstances negatively impact the site's success during the monitoring period and should be reevaluated every couple of years. TTT understands that some adaptive management techniques would require prior authorization from MDE.

Financial Assurances

TTT would provide the fiscal resources necessary for final design, implementation, monitoring and remediation or adaptive management, and possible long-term management of each of the onsite mitigation areas in accordance with the financial assurances section of *Components of a Compensatory Mitigation Plan – Guidance for Developing Wetland and Waterway Mitigation in Maryland* (MDE 2024b). If required by the permits, TTT would establish an agency acceptable funding mechanism (e.g., bond, escrow, endowment) to provide separate financial assurances to ensure the overall success of the onsite mitigation projects, which may include the following: 1) construction fund; 2) maintenance and monitoring fund; 3) catastrophic event fund, and 4) long-term management fund.

All funds would be placed in separate interest-bearing accounts at a federally insured financial institution. The proposed funding mechanism to be used by TTT and rate of funding would be determined following consultation with the agencies with a goal of ensuring at least a 4% return. An estimate describing the itemized tasks and associated dollar amounts required for each fund would be presented to the agencies for approval prior to their approval of the Phase II Tidal Mitigation Plan. TTT understands that typically, the construction, maintenance and monitoring, and catastrophic event fund financial assurances must be in place prior to commencing impacts at the SPCT site and that the long-term management fund, if required, may be fully funded later. Elements of the four funds would typically include the following:

1. *Construction Fund* – This financial assurance would account for all costs associated with providing replacement mitigation, including land acquisition, design, engineering, permitting,

legal fees, mobilization, and construction. TTT understands that if the mitigation is completed prior to impacts commencing, this financial assurance may not be required.

2. *Maintenance and Monitoring Fund (MM Fund)* – This financial assurance would account for all costs associated with the required period of maintenance and monitoring (e.g., site inspections, installing monitoring equipment, preparing monitoring reports, replanting, treating invasive species, repairing minor erosion). The cost estimates would need to be verified from an independent third-party estimate, for similar project costs in the area.
3. *Catastrophic Event Fund (CE Fund)* – The Corps and MDE intend that mitigation sites and their functions and values be self-sustaining and not incur any more catastrophic events than similar acreages, functions and values that exist within natural systems. TTT understands that this fund is intended to provide money to remediate damage caused by catastrophic events to systems that are not as natural or self-sustaining and that are likely more vulnerable to such damage because of their location, design, and / or construction to ensure that they continue to provide adequate compensatory mitigation. No CE Fund monies would be used to finance work or activities other than those repairs to the mitigation site necessitated by catastrophic events as would be defined by the Phase II Mitigation Plan, unless approved by the regulatory agencies. TTT also understands that the CE Fund may be rolled into the MM Fund or the LTM Fund to allow more flexibility. However, use of the money would still need to be approved by the regulatory agencies.
4. *Long-Term Management Fund (LTM Fund)* – The Corps and MDE intend that mitigation sites and their functions and values be self-sustaining and not require any more long-term maintenance and monitoring than similar areas occurring naturally. The goal of the proposed mitigation actions is to establish self-sustaining systems that do not require long-term maintenance and monitoring after the initial monitoring period and mitigation site closure. If an LTM Fund is required by the permits, TTT will meet with the agencies to discuss the elements, timing, and necessary funding required to fund long-term management of the mitigation sites.

TTT would electronically submit to the regulatory agencies a financial report by January 30 of each monitoring year and every subsequent year until mitigation site closure. The report would contain information on the balances and yearly fees for the MM Fund, LTM Fund, and CE Fund.

Off-Site Mitigation Project #1 – Derelict Crab Trap Removal

Introduction / Mitigation Site Description and Objectives

The proposed mitigation package also includes a project located offsite within nearby waters within Chesapeake Bay near Hart-Miller Island and / or the mouth of the Patapsco River that was added to supplement the on-site mitigation. The proposed off-site and out-of-kind mitigation includes partnering, coordinating, and implementing a project that involves the removal of derelict crab traps to improve bottom habitats within portions of the Bay where the traps are prevalent.

The following describes this off-site mitigation project and the benefits it would provide. This mitigation project was recommended by the Maryland Board of Public Works during and following a Joint Evaluation Committee Meeting held on June 26, 2024. MDNR maps recreational fishing grounds within the Chesapeake Bay and its larger estuarine tributaries on the Maryland Coastal Atlas website (MDNR 2024b). These areas are also locations where “ghost” or derelict crab traps are found. There is no recreational fishing grounds located within the 8-digit Patapsco River watershed (02130903), but numerous mapped recreational fishing grounds are located within the adjacent Middle Chesapeake Bay 8-digit watershed (02139997), north of the Chesapeake Bay Bridge. These include several near the mouth of the Patapsco River and between Hart-Miller Island and Tolchester Beach in Kent County, Maryland (see Figure B-3).

Derelict crab trap removal is considered a form of restoration of tidal open waters, and tidal open water is the type of impact proposed by the SPCT project that requires mitigation. The exact location where the project would take place would be determined as part of the project workplan, as described below. The overall goal for TTT for this effort is to achieve a minimum of 2.0 acres of mitigation credit.

Site Selection

As mentioned above, the site search for potential mitigation sites where derelict crab traps are likely to be found began with a review of information mapped by the Maryland Coastal Atlas website. No recreational fishing grounds were identified within the same 8-digit watershed as the SPCT project site; therefore, the adjoining 8-digit watershed to the east was selected for consideration. While the mapped areas are currently assumed to be "feasible" sites for this type of mitigation, confirmation that one or more sites are viable sites for achieving the overall mitigation goals for this project would be a part of the project workplan, as would identifying a project partner and resources to perform the mitigation.

If possible, the sites chosen for initial study would focus on areas mapped closer to the mouth of the Patapsco River to improve overall connectivity of the project to the impact site. The project is anticipated to have a positive impact on other relevant resources, including potential federal and state-listed rare, threatened, and endangered species and their habitats, shallow open water habitats, and habitat for other aquatic species. Based on the positive results of a similar mitigation project completed by the Maryland Department of Transportation (MDOT) State Highway Administration (SHA) in an area northeast of Hart-Miller Island near the mouth of the Gunpowder and Middle Rivers in 2017 / 2018, the likelihood of success of this mitigation project is good.

Site Protection Instrument

The mitigation site(s) is located within Chesapeake Bay and is owned in its entirety by Maryland, and therefore, an easement is not required. Under Maryland State Environment Article Title 16 and COMAR 26.24, MDE is authorized to regulate activities related to filling, construction, and dredging within tidal Waters of the State. In addition, special interest groups including federal and state agencies, local governments, non-profits, and academic institutions would work together to protect the Bay.

Baseline Information

A study led by researchers at William & Mary's Virginia Institute of Marine Science (VIMS) showed that "ghost" crab traps are the most common type of derelict fishing gear in Chesapeake Bay. These have significant impacts bay-wide on the environment and on crabbers' financial resources. There are now efforts to find and remove derelict traps and keep them from being lost in the first place. The Chesapeake Bay crabbing industry continues to be a significant source of local revenue and watermen use a trap called a crab "pot" to harvest blue crabs (*Callinectes sapidus*) for sale. The traps are baited to attract and capture crabs and are designed to have minimal escapement to minimize loss of harvest. Traps often get lost for various reasons and become derelict crab pots, which are a prevalent form of marine debris in the Bay (National Oceanic and Atmospheric Administration [NOAA] and Versar 2010).

In 2005, NOAA, Chesapeake Bay Office created the Derelict Fishing Gear Program to address the negative impacts that derelict crab traps were having on blue crabs and other species in the Chesapeake Bay. The traps are typically lost during storms, vandalized, or abandoned by fishers and are estimated to persist for 1 to 7 years (Arthur et al. 2014). During this time, they continue to trap blue crabs as well as other marine organisms known as bycatch, such as white perch, oyster toadfish (*Opsanus tau*), black seabass (*Centropristis striata*), and American eel (*Anguilla rostrata*). Diamondback terrapins (*Malaclemys terrapin*) are considered high risk for active crab traps and have been found in derelict traps recovered from Chesapeake Bay waters (VIMS 2010). NOAA estimates that more than 250,000 commercial crab traps are deployed in Chesapeake Bay per day during the summer (NOAA and Versar 2010). A report by VIMS estimates that 50,000 to 150,000 traps (10 to 30%) of deployed commercial traps are lost annually (VIMS 2010). Yearly estimates indicate that 3.3 million blue crabs, or approximately 4.5% of the annual harvest are trapped in derelict crab traps within the Chesapeake Bay (Bilkovic et al. 2016). Past projects in the Chesapeake Bay have shown that the removal of derelict crab traps can have a noticeable impact on blue crab populations after only one season. Increasing blue crab populations and reducing capture of bycatch species provide ecological and economic benefit.

Determination of Mitigation Ratio / Credits

According to MDE, based on previous crab pot mitigation projects, MDE determined that the value of removing one crab pot is $83.33. Based on a mitigation in lieu fee of $90,000 per acre, crab pot removal would be acceptable to MDE as mitigation based on 1,080 crab pots per acre of required mitigation. It is understood that these prices may differ in today's market and further coordination with the agencies would be needed to refine the mitigation crediting for this activity (MDE 2024c).

For a crab pot removal mitigation project completed by the MDOT SHA in the winter 2017 / 2018, a fleet of up to 25 watermen were able to remove 1,451 derelict pots over a period of approximately 10 working days. This would equate to approximately 1.34 acres of mitigation credit based on the calculations provided by MDE. The final amount of mitigation TTT achieves from the derelict crab trap removal efforts would be based on the quantity of traps removed over a set amount of time that the watermen hired for the activity work.

Proposed Mitigation Workplan

The proposed mitigation effort would initially include conducting research into recent and available bathymetric and hydrographic surveys using side-scan sonar to map the bottom of the Chesapeake Bay and identify potential derelict crab traps at the recreational fishing grounds nearest the mouth of the Patapsco River, as well as between Hart-Miller Island and Tolchester Beach in Kent County, Maryland. If recent bathymetric and hydrographic surveys are unavailable, TTT would subcontract with a firm or partner with an organization to complete new surveys of these areas, similar to the work they did for the MDOT SHA in an area northeast of Hart-Miller Island near the mouth of the Gunpowder and Middle Rivers in 2012 for a similar derelict crab trap removal mitigation project.

Once an area with a high density of derelict crab traps is located, TTT would develop a more detailed mitigation work plan and work with their partner to hire and train a fleet of waterman on methods to remove the traps during the winter season when the mitigation efforts would take place. Ideally, potential watermen to assist on this project would first be identified from within environmental justice communities in the vicinity of the TPA site that are familiar with the nearby waters, before locating watermen from other areas around the Bay, where available.

A specified number of days of work would be dedicated to the removal of derelict crab traps by the watermen hired by TTT. Fleet operations would be conducted to maximize derelict trap recovery, focusing on the area with the greatest mapped trap concentrations. The total number of derelict crab traps and gear removed would be tallied each day and the recovered traps and gear would be inspected for trapped organisms and documented by the watermen. Any traps and gear recovered would be disposed of at the nearby Eastern Sanitary Landfill in Baltimore County following procedures outlined in the work plan.

Based on the previous MDOT SHA project completed during the winter of 2017 / 2018, it is estimated that 25 watermen with vessels and crews working for five days could be capable of removing 1,200 pieces or more of derelict gear from an approximate 3,000-acre mitigation site for an estimated total cost of $150,000 to $200,000, based on inflation. Of that amount, nearly 75% would be used to pay the licensed watermen and crews performing the work in the winter months when watermen are typically not working. This cost would be adjusted based on the number of days and pieces of derelict gear expected to be removed in the final mitigation plan, and the mitigation credit ratios provided for the efforts.

Maintenance Plan

TTT does not plan to implement a maintenance plan for the derelict crab trap mitigation site(s). The proposed mitigation is a one-time effort, and therefore, is considered complete once the derelict crab traps and fishing gear are removed. No additional or future maintenance is planned once the removal effort has been completed.

Performance Standards

TTT would be responsible for the performance of the derelict crab trap mitigation plan. During the removal, TTT would provide personnel onsite to oversee activities and make recommendations, as necessary, if site conditions should vary from those that are anticipated. Watermen would be trained to properly document gear recovered and trapped species observed. Following the completion of the one-time removal, TTT, in coordination with their partner, would provide a final report documenting gear and organisms recovered during the effort that would be submitted for agency approval. Coordination with MDE and the Corps during the removal effort would occur to ensure that the minimum standards have occurred, which include spending at least 10 days on the water using 25 watermen.

Monitoring Requirements

The proposed derelict crab trap mitigation is a one-time effort, and therefore, is considered complete once the 10-day minimum effort is complete. No monitoring of the mitigation site is planned.

Long-Term Management Plan

TTT does not plan to implement long-term management of the derelict crab trap mitigation site(s). The proposed mitigation is a one-time, minimum 10-day effort to remove derelict crab traps from the mitigation site(s). Derelict crab traps in Chesapeake Bay are estimated to persist for 1 to 7 years (Arthur et al. 2014). Although the proposed mitigation is a one-time effort, the ecological benefits of removing the derelict crap traps would have a long-term positive impact on the mitigation site(s).

Reducing the concentration of derelict crab traps from the area would improve site-specific annual mortality of blue crab and other resident aquatic species. Individuals not captured in traps would have the potential to be captured commercially or recreationally or would provide longer term ecological benefits by contributing to the populations through spawning or serving as prey for other species.

The positive socioeconomic and ecological benefits from the proposed mitigation are expected to continue for many years until derelict trap concentrations reach pre-removal densities. While derelict crab trap accumulation rates at the mitigation site are unknown, the concentrations of derelict traps are not expected to reach pre-removal levels within the next 10 years. In the short-term, the positive socioeconomic benefit to potential watermen used to perform the mitigation from environmental justice communities would benefit those individuals and communities, especially during winter months when they are typically not making money on the water.

Adaptive Management Plan

The mitigation site would remain under the ownership of the State of Maryland and would continue to be protected under state law and by special interest groups. TTT would be responsible for implementing the proposed mitigation and ensuring that the site meets the minimum proposed parameters which would be submitted in the Phase II Mitigation Plan. TTT would provide personnel onsite to oversee activities and make recommendations as necessary if site conditions should vary from those that are anticipated. For example, if recovery numbers begin to slow or are lower than anticipated during the removal effort, TTT may recommend expanding the removal effort to include additional areas shown in Figure B-3. Coordination with MDE and the Corps during the removal effort would occur to ensure that the minimum standards are met as agreed upon in the Phase II Mitigation Plan.

Financial Assurances

TTT would provide the fiscal resources necessary for implementation of the derelict crab trap mitigation project. Bonding for the one-time effort should not be necessary.

Off-Site Mitigation Project #2 – Oyster Reef Creation

Introduction / Mitigation Site Description and Objectives

The proposed mitigation package also includes a project that would involve oyster reef creation or seeding at a location and of an acreage yet to be determined within the Chesapeake Bay that was added to supplement the on-site mitigation. The proposed off-site and out-of-kind mitigation would include partnering, coordinating, and implementing the project at a location acceptable to the agencies. The acreage of new oyster reef creation will depend upon the remaining mitigation needs of the project following implementation of the on-site mitigation projects and off-site mitigation project #1.

The National Marine Fisheries Service (NMFS) recommended a similar project at the nearby Fort Carroll Sanctuary in comments received on the initial draft mitigation package submitted to the agencies for review in October 2024. That project would entail placement of suitable bedding material (e.g., stone), the addition of spat on shell on top of the foundation stone, and subsequent application of additional spat on shell at 5- to 10-year intervals to ensure sustained ecological function. The long-term maintenance of any new reef created at Fort Carroll should be coordinated with MDNR. TTT is seeking agency feedback on oyster reef mitigation options, sustainable reef locations, and anticipated crediting before planning this mitigation project.

Site Selection

The site recommended by NMFS is the nearby Fort Carroll Sanctuary, which is managed by MDNR and is the location of two other successful oyster reefs. There may be more sustainable sites lower in Chesapeake Bay where salinity is higher, but these sites would be outside of the 8-digit watershed where the impacts are proposed or an adjoining watershed. There are also several areas mapped on the Maryland Coastal Atlas of historic oyster bottom and historic / recent oyster plantings within the neighboring Middle Chesapeake Bay 8-digit watershed, with several areas near where derelict crab trap removal is proposed. The regulatory agencies may want to consider these areas for the mitigation package as well.

Site Protection Instrument

The Fort Carroll site or alternative sites would be located within Chesapeake Bay at locations owned in their entirety by Maryland, and therefore, an easement would not be required. In addition, the Fort Carroll site is an existing sanctuary managed by MDNR, providing further site protection mechanisms. Under Maryland State Environment Article Title 16 and COMAR 26.24, MDE is authorized to regulate activities related to filling, construction, and dredging within tidal waters of the state. In addition, special interest groups including federal and state agencies, local governments, non-profits, and academic institutions would work together to protect the Bay.

Baseline Information

The Fort Carroll Sanctuary is in the Patapsco River, approximately 0.5 miles southeast of the former Francis Scott Key Bridge and approximately 1.0 mile west of the proposed DMCF site at the Coal Pier Channel on the TPA property. The sanctuary is in a low salinity (less than 12 parts per thousand) region of the upper Chesapeake Bay. It was created in 1995 for educational programs run by the Living Classrooms Foundation, and as of 2016, the entire sanctuary encompasses 30 acres. There was no historic oyster bottom in the location of the sanctuary (MDNR 2016b).

Two oyster reefs, each approximately 1 acre in size, have been established at the Fort Carroll Sanctuary. Since at least 1999, nine-month-old oysters from Chesapeake Bay Foundation’s (CBF’s) Oyster Gardening program have been planted annually at the reef directly adjacent to Fort Carroll. The rectangular oyster reef to the northeast of Fort Carroll was constructed in 2017 in partnership with Maryland Environmental Service (MES) as compensatory mitigation for Maryland Port Administration activities and is known as the MES Reef, and it. The MES Reef is made of stone built to a height of 6 inches off the bottom. CBF seeded the substrate with more than 6 million spat on shell oysters over a 2-year period (2017 through 2019). Multiple plantings were included to ensure multiple year classes of oysters were present on the reef. Overall, at the two reefs, CBF has planted over 9 million oysters at the site (NMFS 2024).

In early 2024, the CBF Reef was sampled by dredge and there was evidence found of natural oyster reproduction at this location in the Upper Bay where natural recruitment is rare. For the MES Reef, diver surveys conducted in 2017 and 2018 indicated over 80% survival of the initial 2017 planting and the presence of multiple size classes of oysters, suggesting natural recruitment. In September 2024, another diver-led survey was conducted, and evidence was found of at least 3-year classes and an average density of 81 oysters per square meter. Based on the results of these surveys, all indicators suggest that the Fort Carroll reefs are healthy, as they support high oyster growth and survival rates and support emergent reef habitat that has been sustained over time (NMFS 2024).

The Fort Carroll reefs are healthy and there is more capacity for oyster reef restoration at this site. The potential spawning event witnessed in spring of 2024, as well as the presence of multiple year classes suggest a promising future for oyster reefs in this area. This site could be a suitable site for future oyster restoration work to benefit the tidal Patapsco River. Future oyster gardening would help sustain initial mitigation efforts across multiple years.

Baseline information on alternative oyster reef creation sites in areas with higher salinity within the Bay where creation may be more sustainable would need to be gathered if the agencies approve this mitigation concept and the additional mitigation is necessary.

Determination of Mitigation Ratio / Credits

As the oyster reef creation activities would directly improve habitat in tidal open waters, a 1:1 mitigation ratio is anticipated for these efforts. The acreage of oyster reef creation proposed for this mitigation package will depend on the need for additional mitigation beyond the on-site mitigation projects and off-site mitigation project #1.

Proposed Mitigation Workplan

The details of this mitigation project would need to be discussed further with the regulatory agencies. TTT would consider working with partners for this project to create and seed additional acres of oyster reefs for mitigation credit and / or to replenish the oyster population within existing reefs. Coordination between TTT and these entities to discuss additional partnering arrangements still needs to take place prior to developing a more detailed work plan for the oyster reef restoration. At this time, TTT is seeking feedback from the agencies on this mitigation option and mitigation crediting for these activities before proceeding further with a detailed work plan.

At a minimum, the oyster reef creation work plan would include:

- The geographic boundaries of the project
- Reef construction methods
- Timing and sequence of reef construction
- Amount of oyster spat to be deployed (if applicable)
- Timing and sequence of oyster spat seeding (if applicable)

Maintenance Plan

Following agency approval of the proposed mitigation concept, TTT would prepare a detailed maintenance plan that addresses the oyster reef creation proposed. The maintenance plan would be incorporated into the revised Phase I Tidal Mitigation Plan. Per the MDE's *Guidance for Tidal Mitigation Plans* (MDE 2024a), at a minimum, the maintenance plan would include the following element:

- *Oyster Reefs* / *Seeding* – The plan would provide a description and schedule of maintenance requirements to ensure the project is set to meet the outlined performance standards. TTT understands that maintenance may not be required for an oyster reef creation / seeding project. However, maintenance activities may be required if there is no increase in biomass on the substrate upon completion of the monitoring period. Current State monitoring protocols for oyster reefs require that the area be surveyed every 3 years. Additional oyster spat-on-shell may need to be added periodically to ensure their continued viability.

Performance Standards

Following agency approval of the proposed mitigation concept, TTT would prepare a description of the performance standards that would need to be met for the oyster reef creation project. Performance standards for oyster reefs / seeding would be prepared in accordance with the *Artificial Reef Management Plan for Maryland* (Loftus and Stone 2007), *Science-Based Restoration Monitoring of Coastal Habitats, Volume Two: Tools for Monitoring Coastal Habitats* (Thayer et al. 2005), or similar guidance provided by the agencies. The final performance standards would be incorporated into the revised Phase I Tidal Mitigation Plan.

TTT, in conjunction with their project partners, would be responsible for the performance of the oyster reef creation mitigation plan. During the initial reef construction, TTT would provide personnel onsite to oversee activities and make recommendations, as necessary, if site conditions should vary from those that are anticipated. Following the completion of the initial construction and oyster seeding of the reef, TTT in coordination with their partners, would provide a final report documenting the as-built conditions and quantity of oysters planted that would be submitted for agency approval.

Typically, the reef would be monitored at the 3-year and 6-year marks to track if it is meeting the standards for a “restored reef.” A restored reef must meet a set of criteria that includes having a proper oyster density, reef size, and reef height, among other standards. To monitor reefs, TTT and their partners would use sonar, divers, and patent tongs, which are hydraulic claws attached to boats that pick-up oyster samples. If available at the time of monitoring, TTT would use a new Rapid Assessment Protocol which uses underwater cameras to monitor reefs to lower the cost of the monitoring. Coordination with MDE, MDNR, and the Corps during the final design and Phase II Tidal Mitigation Plan efforts would be conducted to refine the minimum standards as well as following the reef creation efforts to ensure that the minimum standards have been met.

Monitoring Requirements

Following agency approval of the proposed mitigation concept, TTT would prepare a detailed oyster reef creation monitoring plan that clearly states what would be monitored so MDE can determine progress towards meeting the performance standards. The monitoring protocols used would follow those described above under Performance Standards, as approved by the agencies. Monitoring would include both qualitative (description based on observation) and quantitative (based on sampling and measurement) methods. The plan would outline the monitoring requirements, including:

- Time and frequency of monitoring activities
- Methods to be used for monitoring
- Parties responsible for conducting the monitoring

- Parties responsible for submitting the mitigation monitoring reports
- Frequency for submitting monitoring reports
- Biological (of invertebrates and fish populations), fishing success, and socioeconomic assessments if creating habitats for benthic species

In accordance with MDE's *Guidance for Tidal Mitigation Plans* (MDE 2024a), mitigation monitoring reports would include supporting documents such as the following:

- Narrative
  - Overview
  - Requirements
  - Summary data
  - Map / Plan
  - Conclusion
- Supporting data
  - As-builts
  - Maps
  - Photographs
  - Assessment results
  - Raw data and interpretation

The mitigation monitoring reports would also meet the requirements of the Corps, in accordance with *Performance Standards and Monitoring Protocol for Tidal Wetland Mitigation Banks* (Corps 2016), in lieu of more recent agency-issued guidance for permittee-responsible tidal mitigation sites.

TTT would submit the first monitoring report following completion of the reef monitoring activities conducted in year three following the initial reef creation with the second monitoring report occurring following completion of year six monitoring activities, if required by the permits.

If TTT is required in the authorization to submit an as-built report / survey to MDE, it would be completed and submitted within 60 days following completion of the construction and seeding of the oyster reef or as otherwise specified in the authorization. As-built reports / surveys would depict the limits of the bed materials placed for the reef with locations of all planned permanent monitoring stations. The report would describe the site's performance relative to the performance standards and would be used as a baseline measure for deviations from the approved mitigation plan. It would also include photographs of the completed mitigation site taken from designated photo stations.

Long-Term Management Plan

If requested by the agencies following approval of the proposed mitigation concept, TTT would prepare an LTM Plan for the off-site oyster reef creation. The plan would provide a description of how the mitigation project would be managed after performance standards have been met and mitigation monitoring by MDE and the Corps has finished to ensure long-term sustainability of the reef. A template

LTM Plan would be submitted for approval by the agencies, if requested, as part of the approval process for the Phase II Tidal Mitigation Plan.

Adaptive Management Plan

The mitigation site would remain under the ownership of the State of Maryland and would continue to be protected under state law and by special interest groups. TTT would be responsible for implementing the proposed mitigation and ensuring that the site meets the minimum proposed parameters which would be submitted in the Phase II Tidal Mitigation Plan. TTT would provide personnel onsite to oversee activities and make recommendations as necessary if site conditions should vary from those that are anticipated. For example, if site conditions warrant, TTT may recommend shifting the site slightly, and / or adding directly onto one of the other reefs. Coordination with MDE, MDNR, and the Corps during the reef siting and creation effort would occur to ensure that the minimum standards are met as agreed upon in the Phase II Tidal Mitigation Plan.

As part of the adaptive management and the long-term management plans, TTT would consider partnering with others for the periodic replenishment of the reef with new oysters over time.

Financial Assurances

TTT would provide the fiscal resources necessary for implementation of the oyster reef creation and supplemental oyster reef replenishment for this mitigation project. This would include the fiscal resources necessary for final design, implementation, monitoring and remediation or adaptive management, and possible long-term management of the off-site oyster reef creation area. If required by the permits, TTT would establish an agency acceptable funding mechanism (e.g., bond, escrow, endowment) to provide separate financial assurances to ensure the overall success of the oyster reef creation project, which may include the following: 1) construction fund; 2) maintenance and monitoring fund; 3) catastrophic event fund, and 4) long-term management fund. For further details regarding how the financial assurances would be addressed for this off-site mitigation project, see the information provided on financial assurances above under the on-site mitigation concepts section.

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Attachment 1: Agency Correspondence

TRADEPOINT ATLANTIC

April 27, 2018

Maryland Department of the Environment
Water Management Administration
Regulatory Services Coordination Office
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230

Attn: Mr. Robert Rushlow

Re: Tidal Wetlands License No. 13-0966(R)
Tradepoint Atlantic - Sparrows Point Terminal
High Pier Demolition

Tradepoint Atlantic is pursuing demolition of the existing High Pier structure located in the Turning Basin area at Sparrows Point Terminal, 1600 Sparrows Point Boulevard, Baltimore, Maryland 21219. The approximate geographic coordinates of the High Pier are Latitude 39°12'38.00"N, Longitude 76°29'4.00"W. The High Pier is a timber structure, 704 feet long by 100 feet wide, totaling 70,400 square feet (1.62 acres) in area. Attached are record drawings of the High Pier ("High Wharf") showing the overall pier dimensions and a typical section. Pertinent information is marked in red on the record drawings.

Tradepoint Atlantic is in the process of rebuilding infrastructure at the Sparrows Point Terminal, including renovation and rehabilitation of the waterfront structures and port facilities. In accordance with the Code of Maryland Regulations (COMAR) Section 26.24.05.01., MDE may recommend mitigation for the alteration of tidal wetlands, and the mitigation activity shall be "designed to replace the values and function associated with the wetlands to be impacted." The regulations also prefer that mitigation be located on-site.

Tradepoint Atlantic is currently evaluating and deliberating forthcoming berth projects that will involve impacts to tidal open water areas; accordingly, Tradepoint Atlantic requests the **1.62 acres of tidal open water restoration** associated with demolition of the existing High Pier structure be documented and recognized. The High Pier will be demolished in its entirety, removing the structure and restoring the area to open water. This notification and filing is made in anticipation of the forthcoming marine projects.

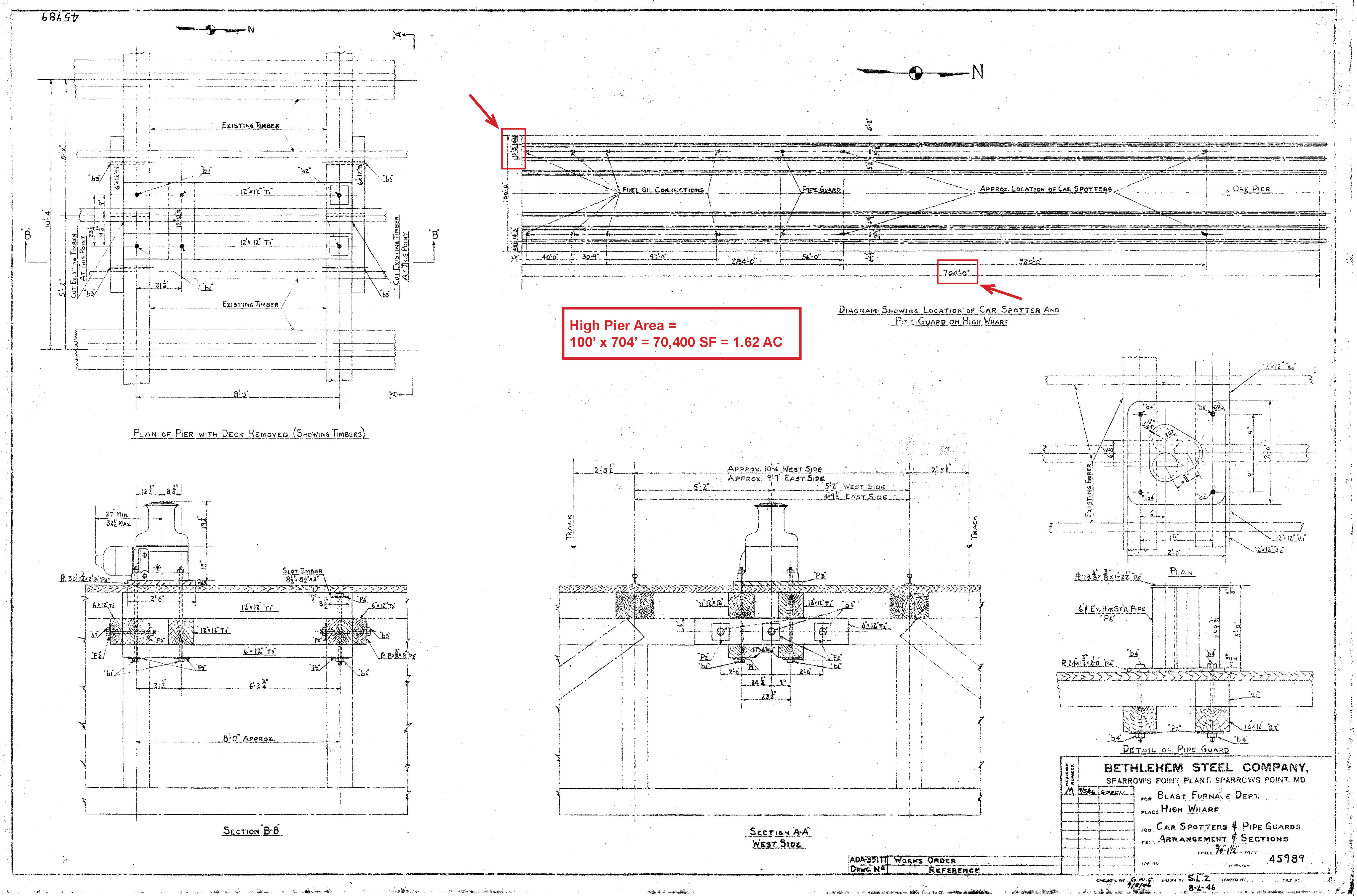
If you have any questions or require additional information, please contact me at 443-649-5055.

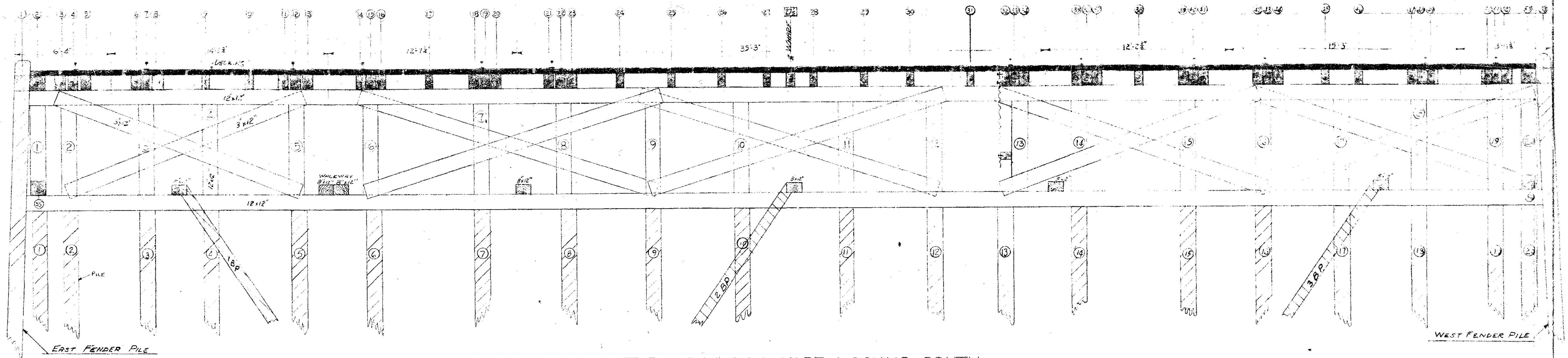
Thank you.

TRADEPOINT ATLANTIC

Peter Haid
Senior Director of Environmental

Cc: Maria Teresi, USACE
Paul Nevenglosky, NMP Engineering Consultants, Inc.


45989
EXISTING TIMBER
12"x12" "T1"
CUT EXISTING TIMBER AT THIS POINT
8'-0"
PLAN OF PIER WITH DECK REMOVED (SHOWING TIMBERS)
FUEL OIL CONNECTIONS
PIPE GUARD
APPROX. LOCATION OF CAR SPOTTERS
ORE PIER
40'-0"
30'-9"
97'-0"
284'-0"
56'-0"
320'-0"
704'-0"
100'-0"
DIAGRAM SHOWING LOCATION OF CAR SPOTTER AND PIPE GUARD ON HIGH WHARF
High Pier Area =
100' x 704' = 70,400 SF = 1.62 AC
27" MIN.
32 1/2" MAX.
SLOT TIMBER
6"x12" "T3"
12"x12" "T2"
8'-0" APPROX.
SECTION "B-B"
APPROX. 10'-4" WEST SIDE
APPROX. 9'-7" EAST SIDE
5'-2" WEST SIDE
4'-9 1/2" EAST SIDE
TRACK
SECTION "A-A" WEST SIDE
EXISTING TIMBER
PLAN
6" EX. HY. STL PIPE "P6"
DETAIL OF PIPE GUARD
BETHLEHEM STEEL COMPANY,
SPARROWS POINT PLANT, SPARROWS POINT, MD.
FOR BLAST FURNACE DEPT.
PLACE HIGH WHARF
JOB CAR SPOTTERS & PIPE GUARDS
PART ARRANGEMENT & SECTIONS
SCALE 3/4"-1 1/2" = 1 FOOT
45989
ADA-35117 WORKS ORDER
DRWG. NO. REFERENCE
S.L.Z.
8-2-46



TYPICAL SECTION THROUGH HIGH WHARF-LOOKING SOUTH

LEGEND

- PILES
- FRAMING - 12"x12"
- STRINGERS - 8"x12" UNDER TRACKS - 6"x12" BETWEEN
- DECKING - 3"x12"

SURFACE FINISH STANDARD

UNDERSCORED FINISHES ARE PREFERRED

SYMBOL	MICRO-INCH RMS VALUE	SYMBOL	MICRO-INCH RMS VALUE	SYMBOL	MICRO-INCH RMS VALUE	SYMBOL	MICRO-INCH RMS VALUE	SYMBOL	MICRO-INCH RMS VALUE
	4		16		63		250		1000
	8		[illegible]		125		500		2000

BETHLEHEM STEEL COMPANY

SPARROWS POINT PLANT, SPARROWS POINT, MD.

REVISION NUMBER		
1	5-31-49 2-21-53 H.M.S.	GENERAL REVISION

FOR BLAST FURNACE DEPARTMENT

PLACE HIGH WHARF

JOB TYPICAL SECTION - LOOKING SOUTH

PART FIELD MEASUREMENTS

SCALE 3/8" = 1 FOOT

JOB NO.

APPROVED

53448

CHECKED BY DRAWN BY MMM TRACED BY FILE NO.

PIER DEMOLITION PLAN

NOTES

1. DEMOLISH EXISTING TIMBER HIGH PIER
   (APPROXIMATELY 70,400 SF)

LEGEND

DEMOLITION

DATUM

MEAN LOW WATER (MLW) = 0.0
SOUNDINGS IN FEET

APPLICATION BY:
TRADEPOINT ATLANTIC
1600 SPARROWS POINT BLVD.
BALTIMORE, MARYLAND 21219

AGENT: NMP ENGINEERING CONSULTANTS, INC.

SPARROWS POINT TERMINAL
MAINTENANCE DREDGING

PROJECT LOCATION:
PATAPSCO RIVER
BALTIMORE, MARYLAND

0 500' 1000'
1"=500'

DATE: JUNE 7, 2017
REVISED: APRIL 02, 2018

SHEET 9 OF 10

File: I:\2017\17-082-001-TPA Permit Renewal & Modification\CAD\17082001-P009 - Aerial; Plotted: 4/24/2018 4:15 PM by KATHLEEN HAYES; Saved: 4/24/2018 4:14 PM by KHAYES

Appendix C: Resources Not Subject to Detailed Consideration

APPENDIX C: RESOURCES NOT SUBJECT TO DETAILED CONSIDERATION

The following issues were initially considered but were ultimately dismissed from detailed analysis for the Sparrows Point Container Terminal (SPCT) project because they are not potentially significant, are not critical to choosing among alternatives, or are not subject to concern from the public or governmental agencies. Additionally, some of the US Army Corps of Engineers (Corps) Public Interest Review factors did not apply to the type of project being proposed and evaluated by this Draft Environmental Impact statement (EIS). Issues dismissed from detailed consideration are described below, including the reason(s) why further analysis was not warranted. "PI" indicates that a topic is one of the Corps' public interest factors presented in Table 7 of the Draft EIS.

Water Supply / Conservation (PI)

The proposed project does not include significant water consumption for construction or operation. The SPCT project area is served by municipal water, and water consumption needs for the proposed project would be provided by existing facilities. Therefore, further analysis is not needed.

Wetlands

All areas of the proposed project were surveyed for wetlands. A wetland delineation report was prepared (EA Engineering, Science, and Technology, Inc., PBC [EA] 2023), and an onsite review of the SPCT project area was completed on November 30, 2023, with representatives from the Corps and Maryland Department of the Environment. During this meeting, both agencies confirmed that there are no wetlands within the SPCT project area; therefore, further analysis is not needed.

Terrestrial Special Status Species

The applicants reviewed a preliminary list of Endangered Species Act (ESA) listed species and critical habitat expected to be in or near the project area using the US Fish and Wildlife Service (USFWS) Information for Planning and Consultation tool (USFWS 2024a). The list included the following three species: northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), and monarch butterfly (*Danaus plexippus*). No critical habitats for terrestrial species were identified in the project area. The following paragraphs identify the rationale for dismissing these three species from detailed analysis.

The northern long-eared bat is found across much of the eastern and north-central United States and its range includes 37 states. During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees; they may also roost in cooler places, like caves and mines (USFWS 2024b). They emerge at dusk to feed on insects (USFWS 2024b). Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula, and breeding begins in late summer or early fall when males begin swarming near hibernacula (USFWS 2024b). Pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup (USFWS 2024b). The largest threat to the northern long-eared bat is white-nose syndrome, a fungal disease known to affect bats, which has caused the decline of this species in the northeast by up to 97 to 100% from pre-white-nose syndrome levels at many hibernation sites (USFWS 2024b). Other threats to the northern long-eared bat include habitat loss, winter habitat disturbance, mortality related to wind turbines, and climate change (USFWS 2024b). Northern long-eared bats could use the forested habitat at High Head Industrial Basin. If a dredged material containment facility (DMCF) is constructed at the existing basin, guidance from the USFWS protective of bats would be followed and tree clearing would not be conducted between April 1 and November 16; therefore, the project *may affect but is not likely to adversely affect* northern long-eared bats.

The tricolored bat is a small, wide-ranging bat known to occur in 39 states, as well as Canada, Mexico, and Central America (USFWS 2024c). During winter months, tricolored bats hibernate in caves, mines, and culverts (USFWS 2024c). The bats migrate to summer habitats where they form maternity colonies and raise their young. In spring, summer, and fall, tricolored bats inhabit forested habitats, roosting in trees primarily among leaves. The pups disperse once they can fly, and the bats then return to their winter habitats (USFWS 2024c). Tricolored bats have been greatly affected by white-nose syndrome, which has caused 90 to 100% declines in winter colony abundance at sites impacted by the disease (USFWS 2024c). Tricolored bats are also threatened by human disturbance at hibernation and roost sites, wind energy, habitat loss, pesticides, and climate change (Center for Biological Diversity 2024). Tricolored bats could use the forested habitat at High Head Industrial Basin, but time-of-year restrictions for vegetation removal would be followed. Thus, the project *may affect but is not likely to adversely* affect tricolored bats.

The monarch butterfly is a candidate species for listing under the ESA. Monarch butterflies are native to North and South America and can be found throughout the lower 48 states and in Hawaii (USFWS 2024d). Populations in eastern and western North America will undergo a migration of up to 1,800 miles to reach an overwintering site (USFWS 2024d). Monarch butterflies are milkweed butterflies meaning that they obligately use milkweed (*Asclepias* spp.) host plants as an egg-laying substrate and subsequent larval food source (USFWS 2024d). Based on survey data, the project area does not support monarch butterfly habitat; therefore, the project would have *no effect* on the monarch butterfly.

Submerged Aquatic Vegetation

Existing information indicates that submerged aquatic vegetation (SAV) does not occur within the SPCT project area. The Virginia Institute of Marine Science (VIMS) plays a key role in mapping SAV in the Chesapeake Bay and surrounding areas. Although VIMS did not delineate SAV in their entire survey history in this area, some SAV has been documented in the lower portion of Bear Creek and Jones Creek, north of Old Road Bay (VIMS 2024). A presence / absence survey for SAV was conducted in the SPCT project area in June and August 2024. The survey included visual inspections, as well as sampling of SAV at the river bottom using a rake throw method. No SAV was identified at any of the sampling points with suitable habitat and water depth for SAV (EA 2024).

The majority of the shoreline in the SPCT project area is hardened with concrete, slag, and rock material with large rocks and gravel further away from the shoreline, which is unsuitable substrate to support SAV growth. The majority of the shoreline is exposed to heavy wave action, which would limit SAV establishment. The more protected areas along the shoreline include historic and current piers and berthing areas for ships and vessels; these areas typically have water depths greater than 12 feet, which are unsuitable for SAV (EA 2024). Based on site conditions, existing mapping, and the survey effort, the project area does not support SAV or suitable habitat for SAV; therefore, further analysis is not needed.

Cultural Resources

Tradepoint TiL Terminal, LLC (TTT) submitted a letter on July 27, 2023, to Maryland Historical Trust (MHT) providing information on the proposed project and requesting comments and available information. MHT responded on August 22, 2023, noting that they had determined that this undertaking would have no adverse effects on historic properties. During the Fixing America's Surface Transportation Act (FAST-41) kickoff meeting on November 8, 2023, MHT indicated that although the agency had made a determination for historic properties, no determination had been made for underwater archeological resources. In 2012 as part of the Maryland Port Authority's analysis of Sparrows Point as a potential DMCF, an underwater archeological survey— *Phase I Submerged Cultural Resources Investigation for the Coke Point Dredged Material Containment Facility at Sparrows Point, Baltimore, Maryland* (Goodwin 2012) — was completed. TTT provided this report to MHT by email on April 26, 2024. On June 3, 2024, MHT requested additional information, including a functioning link for the report, indicating that they had not received the report when it was first completed in 2012. TTT provided additional information to MHT on June 3, 2024, information provided included the 2012 Goodwin report and earlier letters sent to MHT providing background information on the proposed project, including a project description and map. On June 21, 2024, MHT responded by email, informing TTT that they had reviewed the report and determined that there were 8 locations identified in the vicinity of the proposed project that potentially contain cultural resources. MHT requested a map overlain of the proposed project area with the 8 potential locations. TTT provided this map to MHT by email on July 12, 2024. After reviewing the map, MHT advised that TTT avoid these locations. If avoidance were not possible, MHT advised that additional surveys would be needed to assess. The original proposed action, the 100-acre DMCF, would not have avoided these locations; the 35-acre DMCF was redesigned to avoid these eight locations. Separately, TTT had decided to dismiss both the 100-acre and the 35-acre DMCFs. The Coal Pier Channel DMCF was also designed to avoid the eight locations. A map of the Coal Pier Channel DMCF, overlain with the eight locations, was shared with MHT, who confirmed avoidance. Any additional requirements from MHT will be added to the Draft EIS.

Energy Needs (PI)

The proposed project would include green infrastructure to reduce energy demands when compared to similar projects with traditional infrastructure. The proposed project would not include any energy development aspects. Therefore, further analysis is not needed.

Food and Fiber Production (PI)

The proposed project would have no effect on food or fiber production; therefore, further analysis is not needed.

Mineral Needs (PI)

The proposed project would not require mineral use or extraction; therefore, further analysis is not needed.

Property Ownership (PI)

The area of the proposed project is wholly owned by a partner of Tradepoint TiL Terminal, LLC, the owner of the proposed project. Furthermore, the proposed project would not cause injury to any other property owner or an invasion of other rights of adjacent property owners. Therefore, further analysis is not needed.

Topography

Within the SPCT project area, the topography of Coke Point and the High Head Industrial Basin is level with an approximate topographic range of 1 to 14 feet North American Vertical Datum of 1988. No naturally occurring steep slopes occur along the existing Sparrows Point Channel, along the Coke Point shoreline, or within the Coal Pier area. The site is entirely human-made land, created by filling in a portion of the Patapsco River with steel mill slag over several decades. The Proposed Action would alter existing topography through the construction of one or more DMCFs. These constructed features would modify the previously human-made land. Specific impacts on floodplain and flood hazard, vegetation / habitat, birds, and aesthetics / viewshed conditions resulting from changes in topography are addressed in the analyses of those resources. For these reasons, topography as a stand-alone resource topic was dismissed from detailed analysis.

Bathymetry

The west side approach of Sparrows Point Channel is currently permitted to a depth of -42 feet mean low water (MLW) and the east side approach and berthing area of the finger pier is currently permitted to a depth of -47 MLW. A multi-beam hydrographic survey of the SPCT project area was performed in September 2023 (ARC Surveying and Mapping Inc. 2023). The permitted Sparrows Point Channel and areas outside of it that would be included in the widened Sparrows Point Channel were surveyed. Elevations are typically between -2 feet mean lowest low water (MLLW) and -38 feet MLLW near the shoreline of the northern portion of the channel, outside of the permitted channel. South toward the Brewerton Channel, bottom elevations range from approximately -16 feet MLLW to -44 feet MLLW.

Elevations west of Coke Point (within the footprint of the potential offshore DMCFs at Sparrows Point) range from approximately -4 feet MLLW near the shoreline to -18 feet MLLW. Bathymetry would be impacted by the deepening and widening of the Sparrows Point Channel with proposed dredging depths of up to -50 feet MLLW (plus -2 feet of over depth allowance). Specific impacts on benthic and fish (as well as essential fish habitat and aquatic special status species) habitat conditions resulting from changes in bathymetry are addressed in the analyses of those resources. For these reasons, bathymetry as a stand-alone resource topic was dismissed from detailed analysis.

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US Fish and Wildlife Service (USFWS). 2024d. “Monarch.” Accessed July 2024. https://www.fws.gov/species/monarch-danaus-plexippus.

Appendix D: Underwater Pile Driving Noise Modeling

APPENDIX D: UNDERWATER PILE DRIVING NOISE MODELING

Noise impacts from anthropogenic sources (e.g., in-water construction activities) have the potential to impact fish, sea turtles, and other marine species that rely on hearing underwater to forage, communicate, detect predators, and navigate (NMFS 2022a). Receptor response to noise varies by the types and characteristics of the noise source, distance from the source, water depth, receptor sensitivity, and temporal scale. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by either mobile or stationary sources.

Noise Impact Types and Scenario Overview

Construction activities that could generate noise with the potential to impact fish and dolphins are associated with construction of the SPCT terminal. These activities include:

1. Installation of steel pilings during construction of the marginal wharf with piling diameters of 24, 30, and 36 inches
2. Installation of steel pilings during construction of mooring dolphins with piling diameters of 24 inches
3. Water-based near-shore demolition activities before construction of the terminal
4. Potential concurrent construction of the marginal wharf and mooring dolphins

Noise that would rise to the level of affecting fish could also be associated with vessel traffic during construction, operation, and dredging activities. During construction, the noise generated by pile driving would far outweigh that of vessel traffic. These activities are the scenarios that were modeled to assess underwater noise impacts on fish.

The details on the pile driving activities for each construction scenario are summarized in Table D-1. During the terminal design process, measures to reduce the overall number of piles necessary for the terminal wharf structure were used to the extent practicable.

Table D-1. In-water Pile Driving Activities

Activity	Approximate Activity Duration (days)	Average Number of Piles Installed per Day	Number and Diameter of Steel Piles	Method of Pile Driving
Wharf piling installation	243	6	150 24-inch piles 600 30-inch piles 600 36-inch piles	Impact and vibratory
Mooring dolphin piling installation	20	3	60 24-inch piles	Impact and vibratory
Concurrent wharf piling and mooring dolphin piling installation	20	9	120 36-inch piles (maximum expected) 60 24-inch piles	Impact and vibratory
Water-based demolition	20	NA	Varied	Vibratory

Notes:

NA = not applicable

General assumptions were used in the model with the best available project information and technical guidance to estimate the impacts of underwater sound on fishes (see Table D-2 footnotes). More specific assumptions associated with each scenario are discussed below.

Both vibratory and impact hammers are proposed to be used to install piles for the terminal construction. Impact pile driving produces intense, broadband (a sound signal that includes acoustic energy across a wide range of frequencies), impulsive sounds in which the sound pressure is very large at the instant of the impact and then decays rapidly with distance; the duration of the peak pressure pulse is usually only a few milliseconds (University of Rhode Island [URI] 2017). The majority of energy in pile impact pulses is at frequencies between 100 and 400 Hertz (Hz) (Matuschek and Betke 2009).

Vibratory pile driving produces a continuous sound with peak pressures lower than those observed in pulses generated by impact pile driving. Sound signals generated by vibratory pile driving usually consist of a low fundamental frequency of 20 to 40 Hz (URI 2017). Low-frequency signals produce long sound wavelengths. These long-wavelength signals encounter fewer suspended particles as they pass through the water and thus their energy is absorbed more slowly (Hatch and Wright 2007). As a result, low-frequency signals travel farther than higher-frequency signals. Therefore, noise produced by a vibratory hammer can travel farther in water than noise produced by an impact hammer, despite having a lower peak pressure at the source.

Modeling Results

The geographic extent of underwater noise impacts from pile driving is dependent on factors such as the type of pile driving equipment, length of time spent pile driving, and environmental conditions. The extent to which fishes react to sound varies among species, their life stage, inter- and intra-specific interactions, and other environmental conditions. Guidelines on the impact of impulsive sounds on the behavior of fishes and dolphins are found in the *National Marine Fisheries Service: Summary of Endangered Species Act Acoustic Thresholds (Marine Mammals, Fishes, and Sea Turtles)*, specifically the 2008 Fisheries Hydroacoustic Working Group (FHWG) criteria (FHWG 2008). Non-injury behavioral responses of fishes range from strong avoidance by virtually all individuals to tolerance and habituation (Anderson 1990; Fiest 1992).

Fish

Though the injury criteria distinguish between fish of different sizes (fish weighing less than 2 grams and those weighing 2 grams or more), the criteria do not distinguish between fish of different hearing sensitivity. However, criteria are expected to be conservative and protective of pelagic and demersal fish potentially present within the project area. It is worth noting that the hearing sensitivity of fish varies by species and has been linked to morphology, specifically the presence of a swim bladder, the proximity of the swim bladder to the ear, and the presence of adaptations that link the swim bladder to the ear. Fish with swim bladders closest to the ear and those with specialized adaptations are most sensitive to sound since they are stimulated by sound pressure via the gas within the swim bladder as well as by particle motion, whereas fish without swim bladders and fish without swim bladders near the ear are only stimulated by particle motion (Popper and Hawkins 2019).

Within the different morphological groups, hearing sensitivity also varies by species; for example, black sea bass (*Centropristis striata*), an EFH species potentially present in the project area, is fairly sensitive to sound compared to related species (Stanley et al. 2020). Several species of clupeid fishes are able to detect and respond to ultrasonic sounds, likely due to an ear specialization unique to clupeids (Popper et al. 2004). Clupeid fishes are of particular concern given proximity of the site to migratory corridors for anadromous herrings. Blueback herring (*Alosa aestivalis*), unidentified herring species, Atlantic menhaden (*Brevoortia tyrannus*), and gizzard shad (*Dorosoma cepedianum*), all clupeid fishes, were found during surveys (see Section 4.8.1, Table 15), indicating that fish with high hearing sensitivity may be in the project area during pile driving. Though given the sensitivity to underwater sound, it is still anticipated that these fish would be protected using the FHWG criteria.

Acoustic thresholds for the onset of underwater acoustic impacts from pile driving activities were calculated for fish in the project area using the Optional Multi-Species Pile Driving Calculator Tool, VERSION 1.2-Multi-Species: 2022, provided on the NMFS website (NMFS 2022b). The calculations were used to create a multi-ring buffer of isopleths (i.e., sound contours) diminishing in 1 decibel (dB) increments from the sound source. These thresholds are the lowest level where injury could occur (FHWG 2008) and are used to indicate the distance from the noise source where fishes are anticipated to potentially be exposed to injury or disturbance.

The modeled fish thresholds for physical injury and behavioral disturbance were used to determine the distances to onset of physical injury and behavioral disturbances (Table D-3). Physical injuries to fish from noise sources can include inner ear tissue damage and hearing loss (Casper et al. 2013) and rupture or damage to the swim bladder (California Department of Transportation [Caltrans] 2020). Behavioral disturbances include showing a brief awareness of the sound, small movements, or escape responses to move away from the noise source entirely (URI 2017). Thresholds for these effects are measured by evaluating the cumulative sound exposure level over the duration of a noise event (SEL_{cum}), the maximum instantaneous sound pressure over the duration of a noise event (SPL_{peak}), and the root mean square (RMS) pressure.

A **noise proxy** is a variable or measurement used to represent or estimate noise in a system where direct measurement of noise is difficult or impractical.

Sound pressure level (SPL) is a measure of the pressure of a sound wave relative to a reference pressure. It quantifies the intensity or loudness of sound and is expressed in decibels (dB).

Peak sound pressure level (SPL_{peak}) is the measure of the highest-pressure variation in a sound signal, providing an indication of the loudest moment within the underwater sound wave.

Sound exposure level (SEL) condenses the varying intensity and duration of a sound into a single value, making it easier to compare different noise events regardless of their duration.

Cumulative sound exposure level (SEL_{cum}) is used to quantify the total sound energy exposure over an extended period, aggregating multiple noise events into a single metric that reflects the overall noise exposure during that period.

Root mean square (RMS) pressure calculation provides a consistent measure of sound exposure, even in environments with fluctuating noise levels.

The intensity of pile driving noise is greatly influenced by factors such as the types of piles and hammers and the physical environment in which the driving activity takes place. Since site-specific sound monitoring data are not available, reasonable noise source levels that would be likely to result from pile driving during construction, or proxy sound levels, from the NMFS calculator were selected (Table D-2). Proxy sound levels were selected based on the pile size and type. When possible, sound levels from water depths similar to the maximum water depth expected in SPCT project area (-52 feet following dredging for SPCT) were selected. However, the sources of the available monitoring data vary and values from shallower water depths were used in the sound modeling when values from deeper water depths were not available.

Table D-2. Underwater Noise Modeling Inputs

Pile Type / Activity	Installation Method	Maximum Number of Hammers Used Concurrently	Impact Driving Strikes per Pile [1]	Vibratory Driving Estimated Minutes Time to Drive Each Pile [2] (minutes)	Proxy Value Source [3]	Proxy Value Water Depth (feet)	Proxy Value Peak (dB re 1 μPa)	Proxy Value SEL (dB re 1 μPa^2 s)	Proxy Value RMS (dB re 1 μPa)	RMS Used in Model [4] (dB re 1 μPa)
24-inch wharf piling	Vibratory	3	NA	90	Caltrans 2020	9.8	NA	NA	153	153
	Impact	3	600	NA	Caltrans 2015	49	207	178	194	199
30-inch wharf piling	Vibratory	3	NA	120	Caltrans 2020	26 to 36	NA	NA	172	172
	Impact	3	750	NA	Caltrans 2015	9.8	210	177	190	195
36-inch wharf piling	Vibratory	3	NA	180	Caltrans 2015	16	NA	NA	175	175
	Impact	3	900	NA	Caltrans 2015	33	210	183	193	198
24-inch mooring dolphin piling	Vibratory	1	NA	120	Caltrans 2020	9.8	NA	NA	153	153
	Impact	1	600	NA	Caltrans 2015	49	207	178	194	194
Concurrent 36-inch wharf and 24-inch mooring dolphin piling [5]	Vibratory	4	NA	120	Caltrans 2020	16	NA	NA	175	175
	Impact	4	800	NA	Caltrans 2015	33	210	183	194	199
Water-based demolition [6]	Vibratory	2	NA	NA	Caltrans 2020	16	NA	NA	180	180

Notes:

1 – Strikes per pile for impact driving and time to drive each pile for vibratory pile driving estimated based on the driving logs of recent projects. For the concurrent scenario, a weighted average based on average piles per day was used to estimate values.

2 – For water-based demolition, activity types and durations may vary. Modeling assumed constant use of both vibratory hammers during work hours (10 hours).

3 – Proxy values selected from Optional Multi-Species Pile Driving Calculator Tool, VERSION 1.2-Multi-Species: 2022 (NMFS 2022b).

4 – The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently, as per guidelines in the Washington State Department of Transportation Biological Assessment Preparation Manual (Washington State Department of Transportation [WSDOT] 2020; described in Section 4.8.2.2). To determine the full range of noise levels, underwater noise modeling for wharf piling activities assumed that each of the hammers would be driving the same pile size. No changes were made to RMS values for vibratory installation.

5 – Proxy values for the concurrent scenario defaulted to the larger values between the two pile sizes. Peak and SEL values are based on 36-inch piles. Calculation of RMS for multiple impact hammers followed methodology above based on proxy RMS for 24-inch piles.

6 – As pile types are unknown for water-based demolition, modeling used the maximum RMS proxy value for vibratory pile driving.

NA = not applicable

RMS = root mean square

SEL = sound exposure level

dB re 1 μPa = underwater noise in decibels referenced to a pressure of 1 micropascal

dB re 1 μPa^2 s = underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds

Table D-3.. Fish Impact Pile Driving Injury Guidance

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing less than 2 grams	183 dB	206 dB	150 dB

Different types of sound pressure effects can cause different reasonable noise source levels that may result from pile driving. The peak pressure effect occurs from impact driving, as opposed to vibratory driving, which creates a more constant sound pressure with no peak decibel level. The peak effect from impact driving is the greatest value of the sound signal and is measured in dB re 1 µPa (underwater noise in decibels referenced to a pressure of 1 micropascal) used to specify the intensity of sound underwater (NMFS 2022c). The root mean square (RMS) pressure effect is the average intensity of the sound signal over time, which is applied to both impact and vibratory driving. The sound effect level (SEL) is the measure of energy that considers both the level and duration of exposure to the sound (Table D-2) (NMFS 2022c). SEL is measured in units of dB re 1 μPa^2 s (underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds).

The maximum number of hammers for each activity associated with construction of the terminal is included in Table D-2. The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently. The Washington State Department of Transportation Biological Assessment Preparation Manual (WSDOT 2020) presents the rules for combining noise levels. To combine noise levels, only the three loudest pieces of equipment are considered. The two lower noise levels are combined first and then the result is combined with the loudest noise level. For each activity in Table D-2, the noise levels for each hammer are assumed to be the same. To combine noise from two pieces of equipment that are within 0 to 1 dB of each other, 3 dB is added to the higher value to combine noise levels. To add the third piece of equipment to the combined noise level (now 3 dB greater), 2 dB is added to the combined noise level. Thus, for two hammers being used concurrently, 3 dB was added to the RMS proxy value, and for three or five hammers being used, 5 dB was added to the RMS proxy value. The underwater noise modeling for wharf piling installation assumed that the hammers would be driving to the same pile size to determine the worst-case (highest) noise levels.

Also presented in Table D-2, the impact pile driving RMS proxy value for 24-inch piles is greater than that for the larger pile types and the SEL proxy value for 24-inch piles is greater than that for 30-inch piles. Larger piles are associated with higher recorded underwater sound levels (Jimenez et al. 2020). However, underwater sound is influenced by more than the type of hammer and pile. The physical environment of the site, including temperature, water depth (pressure), salinity, and presence of obstacles, can influence sound. Generally, sound travels faster in warmer, deeper water with higher salinity (Sinay 2024). Temperature and salinity measurements were not given for the proxy values, but the sound levels for the different piles were recorded in different water depths. Underwater sound is dependent on pressure, which varies with depth. At greater water depths, pressure increases, which compresses the water molecules and increases the speed of sound (Sinay 2024).

> **Cushion blocks** are used in reducing the impacts of pile driving to absorb and distribute the energy from the hammer blows, thus reducing the intensity of the underwater noise generated during pile driving. Cushion blocks can be made from wood, nylon, or other materials of varying thickness.

A sound reduction measure was included in the modeling for noise impacts from SPCT construction. A cushion block is frequently used during pile driving to reduce sound propagation. As noted in Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2009), studies have demonstrated that wood cushion blocks can reduce underwater sound levels by 11 to 26 dB (WSDOT 2006). For at least two recent National Marine Fisheries Service Endangered Species Act Biological Opinions for the Corps, Philadelphia District (NMFS 2022b, 2022c), the parameters included proxy sound levels with a 11 dB attenuation to account for a cushion block. It should be noted that due to the variability of the noise attenuation, the fact that wood cushion blocks can splinter and break during use, and the limited nature of the WSDOT (2006), it is also recommended that a specific sound level reduction credit not be taken (Caltrans 2020).

The noise level parameters were decreased by 11 dB for modeling impact pile driving thresholds with the effective use of a wood cushion block for the largest noise producing activity. This decibel reduction applies only to the use of an impact hammer for driving piles, as cushion blocks are not used on vibratory hammers.

Bottlenose Dolphins

The NMFS Multi-Species Tool for modeling underwater noise impacts was used to estimate the impacts of construction activities on bottlenose dolphins (mid-frequency cetaceans) that could be in the project area. Table D-4 shows guidance to onset to noise levels for the onset of physical injury and behavioral disturbance in marine mammals (including dolphins). Thresholds for behavioral disturbance were available only for all marine mammals in the Multi-Species Tool, while physical injury thresholds were available for mid-frequency cetaceans which include dolphins. Other noise modeling assumptions and proxy values utilized are described for fish in section 4.8.2.2.

Table D-4. Fish and Marine Mammal Impact Pile Driving Injury Guidance

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing 2 grams or less	183 dB	206 dB	150 dB
Mid-frequency cetaceans	185 dB	230 dB	--
All marine mammals	--	--	160 dB

Noise Impacts

The results presented in this Draft EIS show the distances to onset of behavioral disturbance from a vibratory hammer with no sound reduction measure for each activity, physical injury and behavioral disturbance from an impact hammer with no sound reduction measure, and physical injury and behavioral disturbance from an impact hammer with the use of a cushion block for the largest noise producing activity only (concurrent wharf and mooring dolphin piling installation). Noise modeling results are presented in figures based on two in-water sound source locations for the SPCT pile driving activities — one location within the embayment on the east side of Coke Point and one location outside the embayment on the south tip of the Coke Point peninsula. Figures are limited to the following: concurrent wharf and mooring dolphin piling installation via impact driving with a cushion block as well as the maximum distance to behavioral disturbance due to vibratory driving during water-based demolition.

Fish

Marginal Wharf Pilings

Wharf pilings are steel pipe piles measuring 24, 30, and 36 inches in diameter (Table D-1). As summarized in Table D-5, the largest maximum distance to peak onset (SPL_{peak}) of physical injury in any size fishes is 61 feet (approximately 0.01 mile) for impact driving of a 30- or 36-inch steel pipe. The maximum distance to cumulative (SEL_{cum}) of physical injury is within 5,200 feet (approximately 1 mile) for any size fish is based on 36-inch steel pipe. Data used to develop the proxy sound values were from different water depths. The distance for behavioral disturbance in any size fishes from impact driving of wharf piles is largest for the driving of 24-inch piles (60,625 feet or 11.5 miles). Sound behaves differently at varying depths; therefore, depending on the water depth, a larger sound impact may not always be correlated to a larger diameter pile. For vibratory impact, the distance to onset of behavioral disturbances for fishes increases with increasing pile size.

Mooring Dolphin Pilings

Mooring dolphin pilings are 24-inch steel pipes driven by both impact and vibratory hammers. The distance to peak onset (SPL_{peak}) of physical injury in any size fish is 38 feet or less than 0.01 mile (Table D-5). The distance to cumulative (SEL_{cum}) of physical injury is within 1,220 feet (approximately 0.2 mile) for fish weighing 2 grams or more and within 2,253 feet (approximately 0.4 mile) for fish weighing less than 2 grams. Behavioral disturbance occurs within 28,140 feet (approximately 5.3 miles) regardless of fish weight. For vibratory driving, behavioral disturbance occurs within 52 feet for any size fish.

Concurrent Wharf Piling and Mooring Dolphin Piling

A 20-day period for concurrent activities is used to estimate when both wharf piling and mooring dolphin piling may occur simultaneously (Table D-1), and it is assumed that the maximum wharf piling size (36 inches) is what will be installed during the concurrent activities. For concurrent impact driving, the distance to peak onset (SPL_{peak}) of physical injury in any size fish is within 61 feet (approximately 0.01 mile) (Table D-5). For injury from concurrent impact driving, the maximum distance for physical injury for any size fish is within 5,200 feet (approximately 1 mile), while the onset for distance for behavioral disturbance for any size fish is within 60,625 feet (11.5 miles). For concurrent vibratory driving, behavioral disturbance occurs within 1,523 feet (approximately 0.3 mile) for any size fish.

Water-based Demolition

Precise activities and pile sizes to be removed during water-based demolition are yet to be determined and would be finalized closer to project construction. For modeling, it is assumed that only vibratory impacts would be produced during removal of existing in-water structures. Modeling predicts that fishes of any size may experience behavioral disturbance within a distance of 3,281 feet (approximately 0.6 mile) from demolition activities (Table D-5). This activity has the largest potential area of behavioral disturbance from vibratory pile driving. No sound mitigation was modeled for vibratory pile driving.

Concurrent Wharf and Mooring dolphin Piling Installation with a Cushion Block

The models indicate that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area. Due to the large areas of potential disturbance, the concurrent wharf and mooring dolphin piling installation was also modelled with the effective use of a wood cushion block to mitigate the impacts due to operation of the impact hammers.

For the concurrent wharf and mooring dolphin piling installation with a cushion block, the distance to the peak onset of physical injury for any size fish is 11 feet and the distance to the onset of physical injury is 961 feet. Behavioral disturbance onset occurs within 11,203 feet (or 2.1 miles) from either sound source location. For pile driving activities occurring inside the embayment, the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 4,000 feet wide where fish could transit and avoid noise impact. A zone of passage approximately 2,000 feet wide would be present when pile driving activities occur closer to the mouth of the embayment. In addition to use of a cushion block to reduce sound propagation, a soft start (gradual startup of impact pile driving) may be used to produce small sound waves that would encourage fish to move away from the project area before pile driving begins. Construction within the embayment may be phased to avoid impact driving of steel piles during the time-of-year restriction window for fish.

Concurrent wharf and mooring dolphin piling installation and water-based demolition activities were modeled for a vibratory hammer. For behavioral disturbance, the maximum distance to onset of impact is 3,281 feet from the sound source from water based demolition (Figure 31 and Figure 32); concurrent wharf and mooring dolphin piling installation would have a maximum distance of 1,523 feet. For activities inside and near the mouth of the embayment, the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 12,000- and 10,700- feet wide where fish could transit and avoid noise impact, respectively. No sound mitigation was modeled for vibratory pile driving.

Dolphins

Assuming an 11 dB reduction in sound mitigation provided by use of the wood cushion block for impact pile driving the anticipated zones of impact for injury and behavior disturbance (applied to the largest noise producing activity, concurrent wharf piling and mooring dolphin) are found in Table D-6.

The maximum distance to onset of behavioral disturbance for marine mammals (including dolphins) from an impact hammer (with a cushion block for sound attenuation reduction) is 2,414 feet from the installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation for the highest sound wave and 80 feet over the course of the sound event. The maximum distance to onset of physical injury from impact driving occurs at 0.3 feet from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation. Distances of behavioral effects from vibratory pile driving are largest from both installation of a 36- inch wharf piling and concurrent wharf and mooring dolphin piling installation (152,283 feet or 28 miles) and for physical injury from vibratory driving, distances are largest during water-based demolition activities (270 feet). Sound attenuation measures are not applied to vibratory driving.

Table D-5. Maximum Distances to Fish Sound Thresholds from Impulsive Sources

Activity	Pile Count and Size / Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance [1] (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)		
		150 dB RMS (any size fish)	150 dB RMS (any size fish)	206 dB SPL_{peak} (any size fish)	187 dB SEL_{cum} (fish 2 grams or more)	183 dB SEL_{cum} (fish less than 2 grams)
Wharf piling	150, 24-inch steel pipe piles	52	60,625	38	1,936	2,414
Wharf piling	600, 30-inch steel pipe piles	961	32,808	61	1,927	2,070
Wharf piling	600, 36-inch steel pipe piles	1,523	51,998	61	5,200	5,200
Mooring dolphin piling	60, 24-inch steel pipe piles	52	28,140	38	1,220	2,253
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	60,625	61	5,200	5,200
Water-based demolition	Varied	3,281	NA	NA	NA	NA
Concurrent wharf and mooring dolphin piling with cushion block	120, 36-inch steel pipe piles [2] 60, 24-inch steel pipe piles	1,523	11,203	11	961	961

Notes:

1 – For vibratory pile driving, only behavioral thresholds exist for fishes.

2 – For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period and the average daily pile installation rate for mooring dolphin activity is 3 piles per day, therefore, a total of 9 piles per day.

dB = decibel; RMS = root mean square; SEL^{cum} = cumulative sound exposure level over the duration of a noise event; SPL^{peak} = maximum instantaneous sound pressure over the duration of a noise event; NA = not applicable

Table D-6. Maximum Distances to Marine Mammals Sound Thresholds from Impulsive Sources for the Largest Noise Producing Activity with Sound Attenuation (where applicable)

Activity	Pile Count and Size / Type	Distance to Onset of Behavioral Disturbance for All Marine Mammals (including dolphins) (feet)		Distance to Onset of Physical Injury for Mid-Frequency Cetacean (feet)		
		Impact Hammer 160 dB RMS	Vibratory Hammer 120 dB RMS	Impact Hammer 230 dB SPL_{peak}	Impact Hammer 185 dB PTS SEL_{cum}	Vibratory Hammer 198 dB PTS SEL_{cum}
Wharf piling	150, 24-inch steel pipe piles	2,414	5,200	0.2	24	3
Wharf piling	600, 30-inch steel pipe piles	7,068	96,084	2	126	56
Wharf piling	600, 36-inch steel pipe piles	2,070	152,283	0.3	66	117
Mooring dolphin piling	60, 24-inch steel pipe piles	1,120	5,200	0.2	15	2
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	13,061	152,283	1.5	435	142
Concurrent wharf and mooring dolphin piling (11 dB attenuation)	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	2,414	152,283	0.3	80	142
Water-based demolition	Varied	NA	328,084	NA	NA	270

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for marine mammals. Sound attenuation not applied to vibratory driving.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

NA = not applicable

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Appendix E: Essential Fish Habitat Assessment

Draft
Essential Fish Habitat Assessment for the Sparrows Point Container Terminal Project

Patapsco River, Baltimore County, Maryland

Prepared for

NOAA Fisheries, Habitat and Ecosystem Services Division
Mid-Atlantic Habitat Conservation Branch

Prepared by

US Army Corps of Engineers, Baltimore District

December 2024

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Acronyms and Abbreviations

°F	degrees Fahrenheit
BMP	Best Management Practices
Caltrans	California Department of Transportation
CY	cubic yards
dB	decibel(s)
dB re 1 μPa	underwater noise in decibels referenced to a pressure of 1 micropascal
dB re 1 μPa2 s	underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds
DMCF	Dredged Material Containment Facility
EFH	Essential Fish Habitat
FHWG	Fisheries Hydroacoustic Working Group
HAPC	habitat area of particular concern
MCY	million cubic yards
MDNR	Maryland Department of Natural Resources
mg/L	milligram(s) per liter
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTU	nephelometric turbidity units
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEL	probable effects level
ppt	parts per thousand
RMS	room mean square
SAV	submerged aquatic vegetation
SEL	sound effect level
SPCT	Sparrows Point Container Terminal
SVOC	semivolatile organic compound
TIL	Terminal Investments Limited
TPA	Tradepoint Atlantic
TSS	total suspended solids
TTT	Tradepoint TiL Terminal
USDOT	US Department of Transportation
WSDOT	Washington State Department of Transportation

1. Introduction

Pursuant to Section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, the U.S. Army Corps of Engineers is required to prepare an Essential Fish Habitat (EFH) Assessment for all proposed actions that occur within coastal waters of the United States. This assessment is being prepared to address the impacts of the proposed Sparrows Point Container Terminal (SPCT) Project to construct a new container terminal (the terminal) in the Port of Baltimore (the Port). The action is proposed by Tradepoint TiL Terminal (TTT), LLC, a joint venture between Tradepoint Atlantic (TPA) and Terminal Investments Limited (TIL).

This EFH Assessment is the result of formal agency consultation between the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS or NOAA Fisheries) and TTT. In June 2023, TTT sent a project introduction letter to NOAA Fisheries providing a project overview and requesting any initial agency input. NOAA Fisheries responded confirming the list of federally managed species that may occur within the vicinity of the Proposed Action. TTT has also coordinated with NMFS in several Joint Evaluation Committee meetings in 2023 and 2024 to discuss agency comments on the Environmental Impact Statement for the Proposed Action. Additional calls with NMFS Habitat Conservation were held in October and November 2024 to discuss impacts of the Proposed Action and potential agency requirements.

This document is consistent with requirements specified in Section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act. This section (Section 1) includes the introduction, purpose, and need as well as the general project location. The remainder of this EFH Assessment is organized as follows:

- Section 2—Description of the Proposed Action
- Section 3—Description of the Action Area Environment
- Section 4—EFH Designated Species in the Action Area
- Section 5—Effects of the Proposed Action on EFH
- Section 6—Impacts to EFH Prey and Other Important Species
- Section 7—Potential Avoidance and Minimization
- Section 8—Effects of Climate Change
- Section 9—Determination of the EFH Assessment
- Section 10—Potential Mitigation Measures
- Section 11—References

TTT has separately coordinated with NMFS to evaluate potential impacts to federally listed species and critical habitats in accordance with Section 7 of the Endangered Species Act.

1.1 Purpose and Need

The purpose of the Proposed Action is to develop the SPCT, a new terminal and associated facilities that would be located on Coke Point within the Patapsco River in Baltimore County, Maryland. The action would include terminal construction, dredging a new channel to support the terminal, and placement of the dredged material. The applicant's proposed project would address several economic and shipping logistical concerns. The SPCT project would enhance the economic strength of the Port of Baltimore by increasing its overall container capacity. This, along with the on-dock rail and Howard Street Tunnel project, would increase the throughput of containers through the Port. The proposed project would not only provide direct jobs at the project site but would also provide a foundation for sustained regional economic growth within the Port and throughout the region. By strengthening and growing the Port, the project will enhance the United States' supply chain efficiencies and resiliency.

1.2 Project Location

The proposed SPCT would be located in Baltimore County, Maryland, within the Tradepoint Atlantic development on a 330-acre area on the southwest peninsula of Sparrows Point known as Coke Point Peninsula (Coke Point) (Figure 1). The historical uses of this site include coking operations as part of the former Bethlehem Steel Mill. The site is entirely human-made land, which was created by filling in a portion of the Patapsco River with steel mill slag over several decades. Previously developed areas within the site are currently undergoing demolition and razing of structures. Sparrows Point, with its industrial history, is an example of a brownfield. In recent years, Sparrows Point has been undergoing a major redevelopment initiative aimed at transforming the site into a hub for modern industrial and commercial activities. The SPCT project would continue to redevelop the site.

The Action Area for this project includes the area of in-water and upland work (further described in Section 2), including the construction of a dredged material containment facility (DMCF) in the Coal Pier Channel and in the High Head Industrial Basin, as well as use of the transit routes from Sparrows Point through the Patapsco River, Chesapeake Bay and to the Atlantic Ocean for potential disposal of a portion of the dredged material. Details of the Proposed Action are provided in Section 2.

Figure 1. SPCT Project Area

2. Description of the Proposed Action

The proposed terminal would consist of a ±3,000-foot marginal wharf with ship-to-shore cranes, a container yard, gate complex, intermodal/rail yard, and various support structures. To provide vessel access to the wharf, the project would include deepening and widening of the existing Sparrows Point Channel and turning basin, which would require dredging and placement of approximately 4.2 million cubic yards (MCY) of dredged material (Figure 2). The proposed project would include the construction of an offshore DMCF within the Coal Pier Channel to provide placement capacity for a portion of the dredged material. A DMCF in the High Head Industrial Basin will receive additional material placement. This is in an upland area of the Sparrows Point site and does not have EFH. Additional options for disposal of dredged material that may affect waters with EFH are also discussed in Section 2.2. Details on each in-water activity are presented below.

2.1 Dredging

The existing Sparrows Point Channel would be widened and deepened to provide vessel access to the terminal, and the entrance would continue to connect to the Brewerton Channel (Figure 2). The Sparrows Point Channel would be dredged using a clamshell bucket on a barge. The entrance would be widened to create a turning basin 1,650 feet in diameter, transitioning gradually to a nominal channel width of 450 feet. The vessels would require a minimum berth pocket width of 250 feet adjacent to the channel. Based on the vessel simulations, additional width was added to provide passing clearance between the existing finger pier and the SPCT berth face. To provide additional passing distance while minimizing additional dredged material volume, the berth face would be angled such that the dredging of the berth and channel is wider at the southern end of the terminal and tapers to the north. The navigable depth would be -50 feet mean lower low water. The maximum proposed dredging depth would be -50 feet mean lower low water plus -2 feet of overdepth allowance. Following construction, maintenance dredging of the Sparrows Point Channel would be required. It is anticipated that maintenance dredging would be required on average once every 10 years with an additional volume of approximately 12,500 cubic yards (CY) per year added to the existing maintenance dredging volume for Sparrows Point Channel.

The project would require approximately 4.2 MCY of dredging to meet the required design width and depth for the vessels. The 4.2 MCY of dredged material would include 330,000 CY of slag (discussed below) and approximately 3.87 MCY of dredged material that would not be reused elsewhere on-site and would require appropriate placement.

Dredging would occur as designated by the time-of-year restrictions required to protect aquatic life, as determined through consultation with NMFS and the Maryland Department of Natural Resources (MDNR). Dredging would be staged to align with construction phasing and would also be guided by dredged material placement. As noted above, the total dredged material volume would be approximately 4.2 MCY including approximately 3.87 MCY of silt, clay, and sand material and 330,000 CY of slag. Dredging would be performed mechanically using waterborne equipment, a clamshell bucket, and landside equipment, where possible and practical.

Figure 2. SPCT Proposed Action – Terminal and Channel Dredging

Dredging of the wharf area would occur in conjunction with the wharf installation. The first step would be to mechanically excavate in-water slag material from the landside, where practical. The slag would be placed into trucks and transported to a designated on-site stockpiling location for reuse as fill or for dike construction. The remaining slag would be dredged using waterborne equipment, as necessary. The slag would be placed into scows (small barges), transported to shore, mechanically offloaded into trucks, and transported to a designated on-site location for stockpiling and reuse. Dredging of the silt and clay material underneath slag would be performed using waterborne equipment, a clamshell bucket, and landside equipment, where possible and practical. The silt and clay material would be placed into scows and transported to the designated DMCF. The silt and clay material would be mechanically dredged using waterborne equipment and a clamshell bucket. Dredging plans are included in Attachment A.

2.2 Dredged Material Placement

Evaluation of dredged material placement alternatives was conducted by TTT in consultation with the Joint Evaluation Committee in meetings during 2023 and 2024. Numerous placement alternatives were considered and eliminated (Figure 3), while a combination of alternatives was retained and selected as part of the Proposed Action (Figure 3).

2.2.1 Placement Alternatives Considered but Eliminated

The alternatives that were considered but eliminated from consideration include:

- A 100-acre DMCF in the Patapsco River, resulting in a loss of 100 acres of open water. This was eliminated due to agency concern over permanent impacts to the aquatic community.
- An offshore 35-acre DMCF in the Patapsco River (encompassing the Coal Pier Channel), resulting in a loss of 35 acres of open water. The 35-acre concept was further reduced to 19.6 acres based on combined use of other placement options, including Maryland Port Administration DMCFs and the Norfolk Ocean Disposal Site.
- A DMCF in Coke Point Cove on the west side of Coke Point was considered, but determined not needed, as constructing a DMCF in the Coal Pier Channel would provide more volume for dredged material and avoid loss of the more abundant benthic community within Coke Point Cove.
- Use of an existing DMCF at Hart-Miller Island to place all 4.2 MCY of dredged material from SPCT. This was considered thoroughly and included legislative efforts and a robust public outreach program. The public engagement process revealed long-held community reservations regarding the use of Hart-Miller Island for the placement of dredged material. During this time, TTT was also engaged in discussions with the State Agencies who operate Hart-Miller Island, and these discussions brought forth significant concerns regarding the facility's readiness to accept dredged material, which introduced considerable risk in achieving the dredged material placement schedule for the project. Ultimately, TTT announced that they had decided to withdraw from the process, expressing concern that the project could affect TPA's longstanding commitment to community partnerships.
- An upland DMCF at Coke Point was considered. However, constructing an on-land DMCF would limit the constructability and available cargo and container storage space of the proposed SPCT. The viability of the terminal is reliant on the ability to efficiently move goods through the Port and

into the adjacent markets. Losing this location for the buildings would not allow the terminal to function in a way that meets the overall goals of the project.

- Other land-based placement sites in Virigina, New Jersey, and Pennsylvania were considered. All options were either infeasible due to facility limitations, additional transport costs for material, or schedule and economical constraints due to time to transport material (delaying overall dredging operations).

2.2.2 Placement Alternatives Retained with the Proposed Action

The combination of options retained for the Proposed Action represented the most feasible options with the least environmental impacts for dredged material placement and reduced concerns from the community and the regulating agencies. The Proposed Action involves several material placement options (Figure 3):

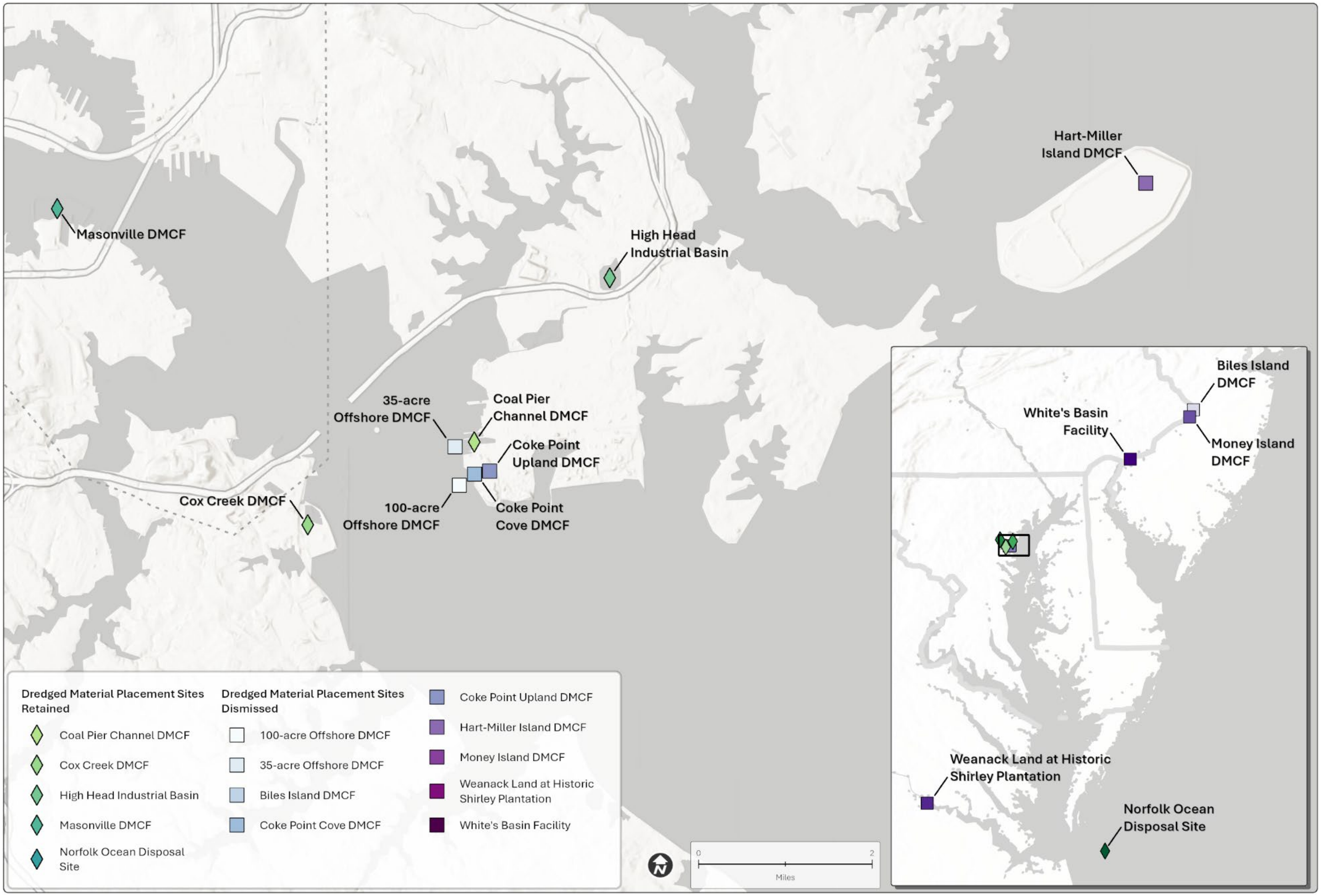
1. Creation of an in-water DMCF at the Coal Pier Channel to contain dredged material
2. Placement of dredged material in the High Head Industrial Basin on TPA property
3. Ocean Placement at the Norfolk Ocean Disposal Site in the Atlantic Ocean
4. Placement at an existing DMCF managed by the Maryland Port Administration (Cox Creek or Masonville)

The Proposed Action could involve a combination of the options listed above. The High Head Industrial Basin does not contain EFH or EFH species. Placement of a portion of the dredged material at the Norfolk Ocean Disposal Site or at existing DMCFs would comply with all applicable permits and approvals for those active sites. Therefore, the description of the Proposed Action and analysis later in this EFH assessment focuses on the placement option of creating an in-water DMCF at the Coal Pier Channel.

A new offshore DMCF would be constructed at the mouth of the Coal Pier Channel, an in-water area along the west shoreline of Coke Point, to provide placement capacity for dredged material (Figure 3). The DMCF would permanently fill approximately 19.6 acres of tidal waters. A sand dike would be constructed across the mouth of the basin to provide a containment area for dredged material. This sand dike would be built to an elevation of +15 feet and have a 3:1 side slope protected with riprap. It would be constructed on relatively firm foundation material. The upland perimeter dike would be approximately 4 feet high above grade and would be constructed to an elevation of +15 feet. The estimated capacity of this placement area is approximately 750,000 CY.

Dredged material would be mechanically placed into scows, transported to an offloading location, and hydraulically pumped into the Coal Pier Channel DMCF. Water would be withdrawn from the river to be slurried with the dredged material. Once the sediments are hydraulically offloaded into the DMCF, the water would be recirculated/recycled to the maximum extent possible back to the unloader and used for the continued pumping operation to reduce the amount of additional water needed. Recycling water during pumping would reduce the total volume of water requiring discharge from the DMCF to a permitted outfall.

Figure 3. Map of Dredged Material Placement Options Retained and Eliminated



The DMCF perimeter dike would be constructed in phases and the dike material would be placed in phases. Material placement would not exceed the allowable elevation of the DMCF and would maintain a minimum of 2 feet of freeboard. Construction of the DMCF perimeter would be completed in approximately 7 months.

Dredging would be performed in two to three phases, and each phase would be approximately 1 year apart to allow for optimal dewatering and consolidation of the placed material. The volume of dredged material placed into the DMCF for each phase would be appropriate for the DMCF capacity at the time of placement.

2.3 Pile Driving for Terminal Construction

Marine structure design includes an open-type (steel pipe pile-supported) marginal wharf structure, consisting of a pile-supported relieving platform integral to the wharf. Piles for the relieving platform would be located on land, not in-water. A pile-supported mooring dolphin would also be installed to allow for safe mooring. Use of a mooring dolphin also minimizes the length of the constructed wharf. The mooring dolphin, accessed by a short catwalk, would be placed at the southern end of the wharf structure, providing a mooring point for vessel mooring lines. Piles for the mooring dolphin and wharf would be located in-water. The wharf would serve as a platform to receive containers offloaded from the vessels. More information on the types and sizes of piles, number of piles to be used and duration of pile driving, and impact on underwater noise is discussed in Section 5. Plans for wharf construction pile driving are included in Attachment A.

3. Description of the Action Area Environment

This section presents a high-level overview of resources and environment within the Action Area, with a focus on resources in or near Sparrows Point as this would be the area of the most direct impacts from the action.

3.1 Sediment

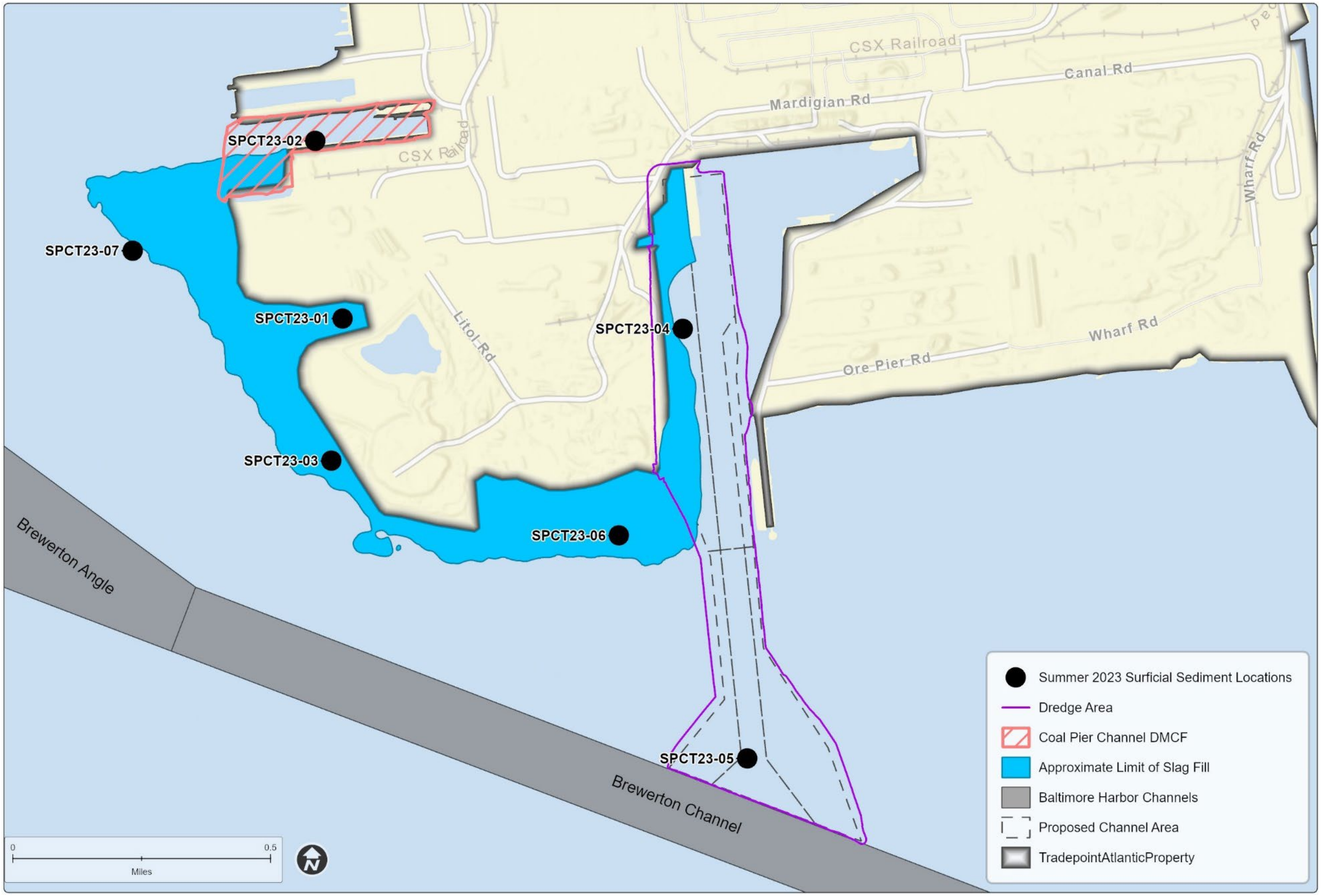
Sediments around Coke Point consist of a soft, fine-grained silty top layer above deep layers of clay and sands. Some surficial sediments along the shoreline of Coke Point contain slag or gravel mixed with the soft, fine-grained sediments from activities on land and from the human-made construction of Coke Point. Within the vicinity of the channel improvements, the silty surface layer overlays deep materials that predominantly consist of native clays in the South Channel and consist of a combination of native clays and sands in the North Channel (Kozera, Inc. 2023; EA Engineering, Science, and Technology, Inc., PBC [EA] 2024a,c).

The column of sediment in the South Channel is uniform with little layering or stratification of material types. Within the deepening area of the South Channel segment, the sediments are primarily comprised of a combination of silt and clay. The column of sediment in the North Channel includes layers of differing material types. Within the deepening area in the North Channel and in the west widener, the silty top materials extend from the sediment surface to varying depths.

Sediments within the Action Area have been the subject of numerous past investigations (EA 2003, 2009, 2010a, 2010b, 2011) as well as recent investigations to support the Proposed Action. The past studies of offshore sediment identified elevated concentration of metals, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). Results of a subsequent risk assessment found that several offshore areas with impacted sediments on the west and south side of Coke Point contribute to elevated risk for human health and ecological communities. These areas are not proposed for dredging. In previous studies, benzene, ethylbenzene, and toluene were detected in the subsurface sediment near the mouth of the Coal Pier Channel, and sheens and hydrocarbon odors were noted in the subsurface samples on the east side of the Coal Pier Channel and at the mouth of the Coal Pier Channel (EA 2009).

For the Proposed Action, surficial sediment quality was evaluated to support assessment of aquatic resources (EA 2024b) (Figure 4). Surface and subsurface sediment was evaluated to support widening and deepening of the SPCT channel and to assess sediment quality with respect to upland placement of the material within an on-site DMCF and potential ocean placement. Around the Coke Point Peninsula, PAHs and metals are the constituents that most frequently exceed probable effects levels (PELs) for aquatic life. While these areas are not proposed for dredging, they serve as impacted habitat for benthic organisms and many smaller fish that are prey for ESA listed species. Collectively, nine metals, 13 individual PAHs, total PAHs, and dioxin toxic equivalency quotients exceeded PELs in the offshore surficial sediments surrounding the peninsula. The highest total PAHs were detected in surficial sediments in Coke Point Cove on the west side (SPCT23-01) and along the southeast side (SPCT23-06) of Coke Point with concentrations in Coke Point Cove approximately 10 times higher than concentrations on the southeast side of the peninsula. The highest concentrations of metals were detected in the nearshore area on the southwest side of Coke Point (SPCT23-03). The location near the Brewerton Channel (SPCT23-05) was furthest offshore and had the fewest PEL exceedances.

Figure 4. Surficial Sediment Sampling Locations for the 2023 Aquatic Resources Studies



Within the Coal Pier Channel, chemical concentrations of six metals (chromium, copper, lead, nickel, silver, and zinc), two PAHs (acenaphthylene and naphthalene), and the dioxin toxicity equivalency quotient in surficial sediments in the central portion of the channel exceeded PEL values (EA 2024a). These sediments will be encapsulated by the Coal Pier Channel DMCF.

Sediments in the southern portion of the main SPCT channel, which is proposed for dredging, are predominantly fine-grained silts and clays. Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, and dioxin/furan congeners were detected most frequently in the sediments. In the northern portion of the channel, sediments are mostly sand and fine-grained silts and clays. Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, dioxin/furan congeners, volatile organic compounds, total petroleum hydrocarbons, and oil and grease were detected most frequently in the sediments.

3.2 Water Quality

Surface water provides habitat and resources for fish and wildlife, means for shipping of goods and for transit of people, and a place for recreation and fishing. State of Maryland surface waters affected by the SPCT project are the tidal waters of the Patapsco River in the vicinity of Coke Point and near the mouth of Bear Creek. The tidal waters surrounding the project area and extending eastward into the Upper Chesapeake Bay are classified as Use Class II (Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting) by the Maryland Department of the Environment. The individual designated uses of Use Class II waters include: growth and propagation of fish, other aquatic life, and wildlife; water contact sports; leisure activities involving direct contact with surface water; fishing; agricultural water supply; industrial water supply; propagation and harvesting of shellfish; seasonal migratory fish spawning and nursery use; seasonal shallow-water submerged aquatic vegetation (SAV) use; open-water fish and shellfish use; seasonal deep-water fish and shellfish use; and seasonal deep-channel refuge use.

3.2.1 Physical Conditions

Baltimore Harbor includes an approximate 15-statute-mile tidal portion of the Patapsco River with water depths generally less than 20 feet with the exception of the federal navigation channels and other state and private access channels that are dredged to provide safe navigation for waterborne commerce. Surface water circulation and exchange within the harbor are governed by the effects of wind, tides, salinity-based density gradients, and river flows (Garland 1952; Boicourt and Olson 1982). Vertical stratification of the water column is common, particularly in areas of deeper waters (such as the navigation channels) where denser (heavier), saltier and cooler bottom waters move upstream with incoming tides and remain below less dense (lighter) freshwater or low salinity surface waters moving downstream towards the Chesapeake Bay. Due to water column density, salinity stratification, limited vertical mixing, and use of dissolved oxygen by organisms and chemical degradation processes, low dissolved oxygen concentrations in deep bottom waters are often present below the requirements to support aquatic life, particularly in late summer and fall. The severity of this condition in the Patapsco River varies from year to year based on precipitation and freshwater inflow and is most common in deep water areas, including the navigation channels.

Within the SPCT area, Coke Point is surrounded by the Patapsco River to the west and south, and the existing Sparrows Point Channel to the east. Surface water quality in these areas is affected by river flow and precipitation, daily tides, and the groundwater flow patterns under Coke Point. Water depths in the SPCT project area vary and range from less than 2 feet up 15 feet in the nearshore areas, from approximately 15 feet up to 45 feet in the west and south offshore areas, and from approximately 10 feet up to 47 feet in the proposed channel improvements footprint. Water quality measurements recorded in the vicinity of Coke Point during seasonal nutrient surveys in Summer and Fall 2023 and Winter and Spring 2024 (EA 2024a, 2024d, 2024e, 2024f) indicated that water temperature, salinity, pH, and dissolved oxygen varied by season and water depth. Within the project area, salinities are typically classified as oligohaline (≤0.5 to 5 parts per thousand [ppt]) within the winter and spring and as either low mesohaline (≥5 to 12 ppt) or high mesohaline (≥12 ppt to 18 ppt) during the summer and fall. Salinities in the project area ranged from 1.6 to 17.8 ppt with highest salinities measured in summer and fall bottom waters. Water temperature ranged from 41.2 to 81.7 degrees Fahrenheit (°F) with highest and lowest water temperatures measured in summer and winter season surface waters, respectively. Dissolved oxygen ranged from 0.5 to 13.4 milligrams per liter (mg/L) with low dissolved oxygen and hypoxic conditions measured in the summer season bottom waters. pH ranged from 7.1 to 10.2, with highest and lowest pH values measured in the winter and spring/summer, respectively. Turbidity (measured as nephelometric turbidity units [NTUs]) ranged from 1.0 to 32.3 NTU and tended to be higher in bottom waters, regardless of season.

3.2.1.1 Nutrients

Excess nitrogen and phosphorus have been identified as a concern for Baltimore Harbor surface waters, and the inputs and the total maximum daily load for these nutrients are managed and regulated by the Maryland Department of the Environment through the National Pollutant Discharge Elimination System process. Overall in the SPCT area, total nitrogen concentrations were higher in winter and spring (between 1 and 2 mg/L) and lower in summer and fall (less than 1 mg/L). Most nitrogen was present in dissolved form in winter and spring and was as a combination of particulate and dissolved nitrogen in summer and fall. Total phosphorus concentrations were generally higher in summer and fall and varied by sampling location. Most phosphorus was present bound to particulates in fall, winter, and spring; highest dissolved phosphorus was present during summer. Organic carbon concentrations in the SPCT project area surface waters ranged from 2.4 mg/L in winter to 4.4 mg/L in summer.

3.2.2 Chemistry

Characterization of surface water chemistry around Coke Point has been investigated through several decades of study of the offshore area. Data collected between 2003 and 2011 were used to model potential risks to human health, fish, benthos, and wildlife and to identify the geographic areas contributing the most to risks. Most chemicals in surface water were either below benchmarks protective of human health or aquatic life or were comparable to concentrations found throughout the Lower Patapsco River. PAHs were the only chemicals identified in surface water as posing potential risks. For aquatic life, PAHs in surface water posed risks in the western and southern offshore areas of Coke Point, while benzene was identified within Coke Point Cove.

3.2.3 Surface Water Quality in the Dredging Area and Coal Pier Channel

Seasonal water column measurements collected in 2023 and 2024 in the vicinity of the Sparrows Point Channel indicated a stratified water column with respect to salinity at both locations (approximately 30 feet and 45 feet deep, respectively). The combined seasonal data for these locations indicated that salinity ranged from approximately 2 to 11 ppt in surface waters and from approximately 5 to 18 ppt in bottom waters throughout the year. Water column stratification with hypoxic conditions (low dissolved oxygen concentrations) was present in bottom waters in the summer at both locations. Seasonal water column measurements collected in 2023 and 2024 from the Coal Pier Channel indicated a uniform water column with respect to water temperature and pH. Higher salinities in bottom waters were measured in summer, fall, and winter. Hypoxic conditions were present in the bottom waters during the summer sampling event; dissolved oxygen was measured at a concentration of 1.3 mg/L at a bottom depth of approximately 22 feet. Concentrations of nutrients in surface water were consistent with those described for the overall surface waters adjacent to Coke Point. Historical surface water samples collected at two locations in the Coal Pier Channel DMCF footprint indicated that PAHs in surface waters exceeded ecological risk benchmarks (EA 2011).

3.3 Biological Resources

The discussion of biological resources for this EFH assessment focuses primarily on those resources within EFH waters within the immediate Action Area and provides a high-level overview. Detailed seasonal reports for aquatic resource studies conducted for the Proposed Action can be provided to NMFS upon request (EA 2024b, c, d, e, f).

3.3.1 Benthos

Within the larger Chesapeake Bay region, the abundance, species diversity, and biomass of many benthic species has declined over the past 40 years, with significant decline in these metrics and the overall benthic community score noted in sampling stations in the Baltimore Harbor (Versar, Inc. 2017). The decline in these community metrics at the Baltimore Harbor stations has been attributed to seasonal hypoxic (low oxygen in bottom waters) conditions. Benthic fauna samples were collected as part of aquatic studies for the Proposed Action and the community health determined at sample locations throughout the SPCT area using the Chesapeake Bay Benthic Index of Biotic Integrity. Two sample locations were within the SPCT dredging area and one within the Coal Pier Channel (Figure 5).

Benthic habitat within the dredging area and Coal Pier Channel was classified as high mesohaline mud, with salinity between 12 and 18 ppt and more than 40% silt-clay content. Across all sampling locations, 22 unique benthic macroinvertebrate taxa were collected. Of these, nine taxa were polychaetes (bristle worms), five were bivalves (clams and mussels), and three were crustaceans. The remaining taxa included ribbon worms, segmented worms, and snails. Only one taxon was collected within the Coal Pier Channel and no taxa were collected from the southernmost sampling location within the dredging footprint. However, the northern portion of the dredging footprint had four taxa collected. Benthic abundance was lowest within Coal Pier Channel (6.8 organisms per square meter) compared to Coke Point Cove to the south which had 13,170 organisms per square meter. Overall community Benthic Index of Biotic Integrity scores classified all sample locations as either degraded or severely degraded, except for the benthic community along the southeast shoreline of Coke Point, which met restoration goals and will not be disturbed. The benthic community in the Coal Pier Channel was classified as degraded and the community in the dredging area was classified as severely degraded.

Figure 5. Benthic Fauna Sampling Locations

3.3.2 General Fish Community

The Chesapeake Bay supports 348 species of fish at some point in their life cycle (NMFS 2024). The distribution of fish populations is dependent upon water quality factors (temperature, pH, salinity), larval recruitment, availability of prey species (fish and benthic organisms), and migration patterns (Lippson and Lippson 1994). Atlantic Menhaden (*Brevoortia tyrannus*) has been the top fishery in the Chesapeake Bay for several decades with over 150,000 metric tons caught per year. The Striped Bass (*Morone saxatilis*) fishery stocks suffered a decline during the 1970s and 1980s due to overfishing and are in the recovery process. Although not currently overfished, stocks remain low, largely due to loss of spawning habitat and pollution in the Chesapeake Bay (Chesapeake Bay Program 2020). Important predator fish species (including those that are part of commercially significant fisheries) rely on smaller prey species, such as Bay Anchovy (*Anchoa mitchilli*), Atlantic Menhaden, and American Shad (*Alosa sapidissima*) (Zastrow et al. 1991; Chesapeake Bay Program 2020).

The fish community within and adjacent to the SPCT area varies by season and water depth. A summary of the individual fish collected during aquatic surveys for the Proposed Action is provided in Table 1. The highest number of unique species was observed in the summer with 17 unique species (1,772 individual fish) collected in the waters in and around the SPCT project area. During the fall collections, the number of unique and total number of individual fish collected declined to nine unique species and 818 individual fish. In the winter, even fewer unique species and individual fish were captured in the vicinity of the project area (three unique species and 12 individual fish for all locations combined). The following spring (2024), 5,629 total fish were captured with most of the individuals collected along the southern shoreline of Coke Point and downstream of the project area. Within the SPCT dredging area (Figure 6), the total number of fish captured in all seasons was 1,293, largely Atlantic Silverside (*Menidia menidia*), Bay Anchovy, herring sp., and Atlantic Croaker (*Micropogonias undulatus*).

Based on the seasonal survey data, fish assemblages and abundance in habitats in and around the SPCT project appear to be highly driven by seasonal water temperature and salinity. In the spring, hypoxia was only present at sampling location 5 (downstream of the SPCT project area), which had the lowest bottom dissolved oxygen and bottom temperature. Low dissolved oxygen during the summer months in the deeper water areas may also affect fish distribution, as pelagic species are mobile and will avoid areas with low dissolved oxygen. Fish moving upstream from the Chesapeake Bay can thrive in the higher summer salinities and move downstream away from the project area as the salinity and water temperature decrease throughout the water column in the late fall and winter months.

Figure 6. Fish Survey Locations

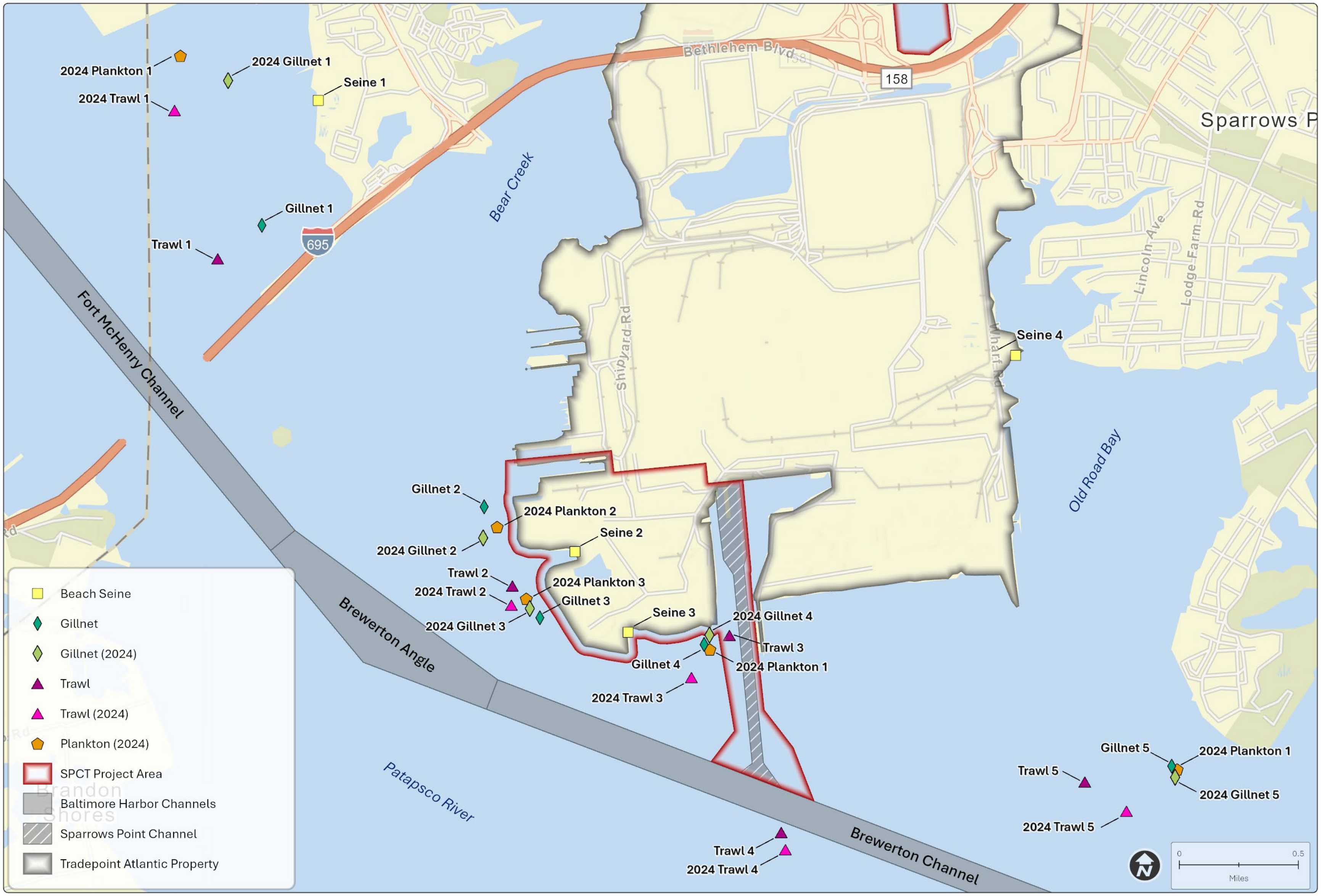


Table 1. Summary of Individual Fish Collected by Each Method per Season

Fish Species	Sampling Method and Season										
	Beach Seine			Gillnet				Bottom trawl			
	Summer	Fall	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring
Atlantic Croaker (Micropogonias undulatus)	6	0	72	2	0	0	0	26	2	3	342
Atlantic Menhaden (Brevoortia tyrannus)	195	0	0	74	0	0	9	4	0	1	0
Atlantic Silverside (Menidia menidia)	755	539	263	0	0	0	0	0	0	0	0
Banded Killifish (Fundulus diaphanus)	1	7	5	0	0	0	0	0	0	0	0
Bay Anchovy (Anchoa mitchilli)	6	78	557	0	0	0	0	379	151	8	231
Bluefish (Pomatomus saltatrix)	0	0	0	3	0	0	0	0	0	0	0
Blueback Herring (Alosa aestivalis)	0	3	0	0	0	0	1	0	0	0	2
Gizzard Shad (Dorosoma cepedianum)	5	0	0	1	4	0	3	0	0	0	0
Herring (Alosa spp.)	0	0	4,662	0	0	0	0	0	0	0	0
Hogchoker (Trinectes maculatus)	0	0	0	0	0	0	0	1	0	0	1
Inland Silverside (Menidia beryllina)	4	0	61	0	0	0	0	0	0	0	0
Northern Pipefish (Syngnathus fuscus)	0	0	0	0	0	0	0	1	0	0	0
Pipefish species	1	0	0	0	0	0	0	0	0	0	0
Pumpkinseed Sunfish (Lepomis gibbosus)	22	0	0	0	1	0	0	0	0	0	0
Spot (Leiostomus xanthurus)	0	0	0	4	0	0	8	170	0	0	1
Striped Bass (Morone saxatilis)	1	0	0	10	0	0	2	0	0	0	0
Striped Killifish (Fundulus majalis)	0	33	8	0	0	0	0	0	0	0	0
Summer Flounder (Paralichthys dentatus)	0	0	0	0	0	0	0	3	0	0	0
Weakfish (Cynoscion regalis)	0	0	0	2	0	0	0	3	0	0	0
White Perch (Morone americana)	74	3	1	0	0	0	0	19	0	0	19
Total individuals	**1,070**	**660**	**5,629**	**96**	**5**	**0**	**23**	**606**	**153**	**12**	**596**

3.3.3 Other Protected and Special Status Species

In addition to designated EFH (discussed in Section 4), the SPCT area may support other protected species under Section 7(a)(2) of the Endangered Species Act, as well as the bottlenose dolphin. TTT is consulting the NMFS Office of Protected Resources regarding these species. State listed special status species are also potentially present in the Action Area. Four species including a turtle and three mussels are on the MDNR (2021) List of Rare, Threatened, and Endangered Species of Baltimore County and five species are on the MDNR in need of conservation list. Through environmental review, it was determined that the four species on the MDNR List of Rare, Threatened, and Endangered Species were unlikely to be in the project area due to habitat requirements. Table 2 lists the species that have potential to be in the project area from the in need of conservation list.

Table 2. Aquatic Species in Need of Conservation in Baltimore County in the SPCT Project Area

Species	State Status or Rank	Required Habitat	Potentially Present in SPCT Project Area?
American shad (*Alosa sapidissima*)	In need of conservation	Spawn in freshwater tributaries of Chesapeake Bay.	Yes; suitable habitat for foraging is available.
Atlantic menhaden (*Brevoortia tyrannus*)	In need of conservation	Found in all salinity zones within the Chesapeake Bay.	Yes; found in project area fish surveys.
Hickory shad (*Alosa mediocris*)	In need of conservation	Spawn in freshwater tributaries of estuaries and bays	Yes; suitable habitat for foraging is available.
Striped bass (*Morone saxatilis*)	In need of conservation	Found in fresh or salt water in estuaries and bays	Yes; found in project area fish surveys.
Yellow perch (*Perca flavescens*)	In need of conservation	Found in brackish waters of Chesapeake Bay.	Yes; suitable habitat is available.

Sources: MDNR 2024.

3.3.4 Hydrodynamics

The Action Area near Sparrows Point is adjacent to and within the mainstem of the Patapsco River about 6 miles south of Baltimore Harbor. The tides in Baltimore Harbor are characterized as semi-diurnal with two high tides and two low tides per day. Spring and neap tides are experienced in Baltimore Harbor in 2-week cycles where the tide range is largest during spring tides and smallest during neap tides. The mean tide range reported at the Fort McHenry tide gauge (NOAA CO-OPS Station 8574680) is relatively low at 1.15 feet, which results in low current velocities throughout the harbor. Modeled tidal currents under existing conditions were evaluated and assessed near Sparrows Point for the Proposed Action. The highest current speeds (0.25 to 0.41 knot) were modeled in the Brewerton Channel adjacent to Sparrows Point. Tidal current velocities measured at the southwest corner of Sparrows Points, as well as between Fort Carroll and the former Key Bridge site, were between 0.20 and 0.33 knot. The lowest modeled current velocities were within the L-shaped basin at Sparrows Point and were less than 0.02 knot. The modeled current velocities were generally higher during flood tides than during ebb tides.

4. EFH Designated Species in the Action Area

The Mid-Atlantic Fishery Management Council manages more than 65 species in federal coastal waters and in the exclusive economic zone (extending from 3 to 200 miles off the coast) of New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia. The Patapsco River at its confluence with the mainstem Chesapeake Bay is designated as EFH for a variety of federally managed fish species. The NMFS EFH mapper tool identified nine EFH species and one habitat area of particular concern (HAPC) as potentially present within the SPCT project area.

During public scoping in February 2024, NMFS recommended that the EFH assessment focus on six of the nine potential EFH species (Table 3). Scup (*Stenotomus chrysops),* Red Hake (*Urophycis chuss*), and Atlantic Herring (*Clupea harengus*) are not known to use habitats around the project area and are therefore not evaluated further as part of the Draft Environmental Impact Statement or the EFH assessment. Although the EFH mapper identified the Summer Flounder (*Paralichthys dentatus*) SAV HAPC as potentially occurring in the project area, the NMFS scoping letter did not identify the SAV beds that comprise this HAPC as being present within the project area. Further site-specific surveys have confirmed the absence of SAV within the direct project area (EA 2024g), although some SAV has been documented in the lower portion of Bear Creek and in Jones Creek, north of Old Road Bay (Virginia Institute of Marine Science 2024). Three individual Summer Flounder were captured in the Summer 2023 fish surveys, indicating some usage of the project area by this EFH species. As such, Summer Flounder HAPC is included in the analysis. Summer Flounder HAPC is defined as "all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH" (Packer et al. 1999).

Table 3 describes the species for which EFH has been designated in the project area, identified by early coordination with NMFS.

Table 3. EFH Species Potentially Present in the SPCT Project Area

EFH Species	Life Stage			
	Eggs	Larvae	Juvenile	Adults
Windowpane flounder (*Scophthalamus aquosus*)			x	x
Summer flounder (*Paralichthys dentatus*)		x	x	x
Bluefish (*Pomatomus saltarix*)			x	x
Atlantic butterfish (*Peprilus triacanthus*)	x	x	x	x
Black sea bass (*Centropristis striata*)			x	x
Clearnose skate (*Raja eglanteria*)			x	x
Summer Flounder HAPC	-	-	-	-

Notes:

EFH has been designated for a given species and life stage.

Sources: Mid-Atlantic Fishery Management Council 1988, 1996a, 1996b, 1998a,1998b, 2011; Nelson et al. 2017; NMFS 2018.

Detailed descriptions for each EFH species including habitat descriptions, natural history, and stock status are described below. Based on salinity and temperature requirements for each EFH species, there is potential for each species listed in Table 3 to utilize the Action Area.

4.1 Windowpane Flounder

EFH for juvenile Windowpane Flounder (*Scophthalamus aquosus*) is bottom habitat with a substrate of mud or fine-grained sand in bays and estuaries, and coastal habitats from the Gulf of Maine to northern Florida. Juveniles prefer mixed (0.5 to 25 ppt) and high (> 25 ppt) salinity zones in estuaries with warmer waters at depths of up to 197 feet. Rough bottom habitat and eelgrass beds are also utilized.

EFH for adult Windowpane Flounder is intertidal and subtidal bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine to Cape Hatteras. Generally, adults prefer waters up to 230 feet deep in mixed and high salinity zones.

Windowpane Flounder range from the Gulf of Saint Lawrence to northern Florida; in the northwest Atlantic they inhabit the continental shelf, nearshore waters, and estuaries including the Chesapeake Bay. Spawning occurs offshore beginning in April south of the Chesapeake Bay and progresses northward to southern New England in summer and returns southward in fall (Wang and Kernahan 1979). Windowpane Flounder juveniles that settle in shallow inshore waters move to deeper waters as they grow. Juveniles and adults may migrate to nearshore or estuarine habitats in the southern Mid-Atlantic Bight in the fall (Chang et al. 1999).

Juvenile and adult Windowpane Flounder feed on small crustaceans and various fish larvae. Predators include a number of demersal fish including Spiny Dogfish (*Squalus acanthias*), Weakfish, and Summer Flounder (Chang et al. 1999). Windowpane Flounder are not recreationally fished (Murdy et al. 1997). Windowpane Flounder are not a target of the commercial fishing industry and are mainly caught as bycatch in bottom trawl fisheries.

4.2 Summer Flounder

EFH for Summer Flounder larvae is nearshore waters at depths greater than 30 feet. They are abundant in mixing and seawater salinity zones and most frequently found in the northern part of the Mid-Atlantic Bight from September to February and the northern part from November to May.

Juveniles use estuarine and open bay areas as well as marshy creek areas with water temperatures greater than 37°F and salinities from 10 to 30 ppt. EFH for juveniles also includes the continental shelf to depths of 500 feet. EFH for adults is sandy seafloor areas of shallow coastal waters and estuaries in the late spring and early summer. Generally, Summer Flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer continental shelf at depths of 500 feet in colder months.

Summer Flounder exhibit strong seasonal inshore-offshore movements. Adult and juvenile Summer Flounder normally inhabit shallow coastal and estuarine waters during the warmer months of the year and remain offshore during the fall and winter (Packer et al. 1999). Generally, spawning occurs over the continental shelf during the fall offshore migration and into the winter months. Spawning north of the Chesapeake Bay peaks in October and south of the Bay in November (Smith 1973). Summer Flounder congregate in shallow warm water in upper reaches of channels and large tidal creeks in April and move into the inlets as spring and summer set in. Abundance peaks in the ocean near inlets during July and August.

Smaller juveniles feed upon infauna such as polychaetes; larger juveniles feed upon fish, shrimp, and crabs in relation to their environmental abundance. Adults are opportunistic feeders with fish and crustaceans making up a substantial portion of their diet. Summer Flounder supports commercial and recreational fisheries (Packer et al. 1999). Summer Flounder is not considered to be overfished, and overfishing is not occurring for this species (NMFS 2024). Three Summer Flounder were captured in the project area during the seasonal aquatic surveys.

4.3 Bluefish

EFH for juvenile Bluefish (*Pomatomus saltatrix*) in the Chesapeake Bay is waters within mixing and seawater salinity zones from May to October. Adults use the Chesapeake Bay between April and October. Bluefish adults are highly migratory, and distribution varies seasonally and according to the size of the individuals comprising the schools. Bluefish are generally found in normal shelf salinities (greater than 25 ppt).

Bluefish travel in schools of like-sized individuals and undertake seasonal migrations, moving into the Mid-Atlantic Bight during spring, and south or farther offshore during fall. Juveniles have been recorded from all Mid-Atlantic Bight estuaries surveyed (Fahay et al. 1999).

Juvenile Bluefish consume invertebrates such as shrimp, and small fish such as Atlantic Menhaden. Adults consume larger fish including menhaden, Atlantic Silverside, herring, Striped Bass, and Bay Anchovy. Bluefish support commercial and recreational fisheries. Large population fluctuations are common (Fahay et al. 1999). Within the Mid-Atlantic Bight, Bluefish is one of the most important recreational species. Currently, Bluefish are considered to be overfished, but overfishing is currently not occurring (NOAA Fisheries 2019).

During surveys for the Proposed Action, three individual Bluefish were captured during the summer surveys.

4.4 Atlantic Butterfish

EFH for Atlantic Butterfish (*Peprilus triacanthus*) eggs is inshore estuaries and embayments from Massachusetts Bay to the Chesapeake Bay. EFH is the upper 656 feet with water temperatures between 43.7 and 69.8°F. Larvae are generally found over bottom depths between 134 and 1,148 feet, and water temperatures between 47.3 to 70.7°F. EFH for juveniles is pelagic habitats in inshore estuaries and embayments from Massachusetts Bay to Pamlico Sound, North Carolina, in inshore waters of the Gulf of Maine and the South Atlantic Bight, and on the inner and outer continental shelf from southern New England to South Carolina. EFH for juvenile Atlantic Butterfish is generally found in areas with depths between 33 and 919 feet and temperatures between 47.3 and 70.7°F and salinity above 5 ppt. Adults utilize water depths of 108 to 2,690 feet with salinity above 5 ppt and 15 ppt for spawning.

Butterfish are fast growing and short-lived. They are pelagic (live in open water) and form loose schools, often near the surface. Atlantic Butterfish are common in the Chesapeake Bay from March to November (Geer and Austin 1997) and spawn in the Chesapeake Bay from May to July. In late fall, butterfish move southward and offshore in response to falling winter temperatures (Cross et al. 1999). Stone et al. (1994) found that butterfish eggs, larvae, juveniles, adults, and spawning adults were common in the mixing zone and in saltwater zones of the Chesapeake Bay mainstem.

4.5 Black Sea Bass

EFH for juvenile Black Sea Bass (*Centropristis striata*) is estuaries with warmer waters (greater than 43°F), salinity greater than 18 ppt, and rough bottom habitat or shellfish and eelgrass beds. Juveniles are predominately found in estuaries in spring and summer. During winter months, juveniles may also use offshore clam beds and shell patches along the continental shelf.

Adult Black Sea Bass are generally found in estuaries from May through October. Wintering adults (November through April) are generally offshore, south of New York to North Carolina. Temperatures above 43°F seem to be the minimum requirements for EFH. Structured habitats (natural and man-made), sand and shell are preferably used.

Black Sea Bass distribution changes seasonally as they migrate from coastal areas to the outer continental shelf while water temperatures decline in the fall, and migrate from the outer shelf to inshore areas as temperature warms in the spring (Steimle et al. 1998). Unlike juveniles, adults tend to enter only larger estuaries and are most abundant along the coast. Larger fish occur more in deeper water than smaller fish. Adults remain near structures during the day but can move away to feed on open bottom at dawn and dusk. Juveniles in estuaries prey upon small epibenthic invertebrates, especially crustaceans and mollusks. Adults in estuaries prey upon benthic and near-bottom invertebrates and small fish. Black Sea Bass support commercial and recreational fisheries (Steimle et al. 1998). The most recent stock assessment for Black Sea Bass indicates that this species is not overfished, and that over-fishing is not occurring (NOAA Fisheries 2019).

4.6 Clearnose Skate

EFH for juveniles is bottom habitat with sand, gravel, or mud substrate from the shoreline to 1,312-foot water depth with water temperatures between 39.2 and 60.8°F. Adults utilize subtidal bottom habitat in the Chesapeake Bay with higher (>25 ppt) salinities. Clearnose Skate (*Raja eglanteria*) is the most common skate found in the Chesapeake Bay and feed on crustaceans, mollusks, and small fish.

4.7 Summer Flounder HAPC

Three Summer Flounder were captured in Summer 2023 surveys, although no notable SAV habitat was documented. HAPC includes all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes for juvenile and adult Summer Flounder. Both adults and juveniles exhibit a marked preference for sandy bottom and/or SAV beds, particularly areas nearby.

4.8 Other Important Species

Coordination with NMFS also indicated that several prey species, such as Bay Anchovy, Spot (*Leiostomus xanthurus*), and White Perch (*Morone americana*), use the waters in the navigation channel as feeding, resting, and winter refugia habitat. The benthic habitats in the project area support a variety of invertebrate prey species, including polychaete worms, bivalves, and crustaceans. During the SPCT fish surveys, these prey species were documented in the project area.

5. Effects of the Proposed Action on EFH

In-water construction activities for the Proposed Action will comply with any applicable environmental windows for sensitive species to be determined by NMFS. This section includes a summary of impacts on federally managed fish species and their life stages (as identified in Table 1) and the designated EFH in the Proposed Action Area. The analysis focuses on impacts that reduce the quality or quantity of the EFH or result in conversion to a different habitat type for all life stages of species with designated EFH within the Action Area.

The impacts evaluated for EFH and other important fish species are:

1. **Underwater Noise** from pile driving
2. **Turbidity** from channel dredging, pile driving, and DMCF construction
3. **Habitat Alteration** from channel dredging and DMCF construction
4. **Vessel Traffic** from construction and long-term use of the SPCT; and
5. **Impingement and Entrainment** from hydraulic dredging operations for offloading dredged material.

5.1 Underwater Noise from Pile Driving

Noise impacts from anthropogenic sources (e.g., in-water construction activities) have the potential to impact fish, sea turtles, and other marine species that rely on hearing underwater to forage, communicate, detect predators, and navigate (NMFS 2022a). Receptor response to noise varies by the types and characteristics of the noise source, distance from the source, water depth, receptor sensitivity, and temporal scale. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by either mobile or stationary sources.

5.1.1 Noise Impact Types and Scenario Overview

Construction activities that could generate noise with the potential to impact fish are associated with the construction of the SPCT terminal. These activities include:

1. Installation of steel pilings during construction of the marginal wharf with piling diameters of 24, 30, and 36 inches
2. Installation of steel pilings during construction of mooring dolphin with piling diameters of 24 inches
3. Water-based near-shore demolition activities before construction of the terminal
4. Potential concurrent construction of the marginal wharf and mooring dolphins

During construction, the noise generated by pile driving could rise to the level of affecting fish, as driving can produce loud, impulsive sound waves. Other activities such as dredging or vessel traffic would produce some noise, but not at levels that would impact fish. Activities involving driving of piles are the scenarios that were modeled to assess underwater noise impacts on fish.

The details on the pile driving activities for each construction scenario are summarized in Table 4. During the terminal design process, measures to reduce the overall number of piles necessary for the terminal wharf structure were used to the extent practicable.

Table 4. In-Water Pile Driving Activities

Activity	Approximate Activity Duration (days)	Average Number of Piles Installed per Day	Number and Diameter of Steel Piles	Method of Pile Driving
Wharf piling installation	243	6	150 24-inch piles 600 30-inch piles 600 36-inch piles	Impact and vibratory
Mooring dolphin piling installation	20	3	60 24-inch piles	Impact and vibratory
Concurrent wharf piling and mooring dolphin piling installation	20	9	120 36-inch piles (maximum expected for wharf piling) 60 24-inch piles	Impact and vibratory
Water-based demolition	20	NA	Varied	Vibratory

Acoustic thresholds for the onset of underwater acoustic impacts from pile driving activities were calculated for fish in the project area using the Optional Multi-Species Pile Driving Calculator Tool, Version 1.2-Multi-Species: 2022, provided on the NMFS website (NMFS 2022b). General assumptions were used in the model with the best available project information and technical guidance to estimate the impacts of underwater sound on fishes. More specific assumptions associated with each scenario are discussed below.

Both vibratory and impact hammers are proposed to be used to install piles for the terminal construction. Impact pile driving produces intense, broadband (a sound signal that includes acoustic energy across a wide range of frequencies), impulsive sounds in which the sound pressure is very large at the instant of the impact and then decays rapidly with distance; the duration of the peak pressure pulse is usually only a few milliseconds (University of Rhode Island 2017). The majority of energy in pile impact pulses is at frequencies between 100 and 400 hertz (Matuschek and Betke 2009).

Vibratory pile driving produces a continuous sound with peak pressures lower than those observed in pulses generated by impact pile driving. Sound signals generated by vibratory pile driving usually consist of a low fundamental frequency of 20 to 40 hertz (University of Rhode Island 2017). Low-frequency signals produce long sound wavelengths. These long-wavelength signals encounter fewer suspended particles as they pass through the water and thus their energy is absorbed more slowly (Hatch and Wright 2007). As a result, low-frequency signals travel farther than higher-frequency signals. Therefore, noise produced by a vibratory hammer can travel farther in water than noise produced by an impact hammer, despite having a lower peak pressure at the source.

5.1.2 Noise Modeling Considerations and Inputs

5.1.2.1 Geographic Range of Noise Impacts

The geographic extent of underwater noise impacts from pile driving is dependent on factors such as the type of pile driving equipment, length of time spent pile driving, and environmental conditions. The extent to which fishes react to sound varies among species, their life stage, inter- and intra-specific interactions, and other environmental conditions. Guidelines on the impact of impulsive sounds on the behavior of fishes are found in the *National Marine Fisheries Service: Summary of Endangered Species Act Acoustic Thresholds (Marine Mammals, Fishes, and Sea Turtles)*, specifically the 2008 Fisheries Hydroacoustic Working Group (FHWG) criteria (FHWG 2008). Non-injury behavioral responses of fishes range from strong avoidance by virtually all individuals to tolerance and habituation (Anderson 1990; Feist 1992). It is anticipated that impacts from noise sources would be the same for all fish species (less than and greater than 2 grams) potentially present within the project area. All fish species in the area could potentially use the pelagic and bottom habitat near the sound source, and there are no data indicating that a particular fish species would be more sensitive to impulsive sound than another.

5.1.2.2 Fish Physiology and Morphology

Though the injury criteria distinguish between fish of different sizes (fish weighing less than 2 grams and those weighing 2 grams or more), the criteria do not distinguish between fish of different hearing sensitivity. However, criteria are expected to be conservative and protective of pelagic and demersal fish potentially present within the project area. It is worth noting that the hearing sensitivity of fish varies by species and has been linked to morphology, specifically the presence of a swim bladder, the proximity of the swim bladder to the ear, and the presence of adaptations that link the swim bladder to the ear. Fish with swim bladders closest to the ear and those with specialized adaptations are most sensitive to sound since they are stimulated by sound pressure via the gas within the swim bladder as well as by particle motion, whereas fish without swim bladders and fish without swim bladders near the ear are only stimulated by particle motion (Popper and Hawkins 2019).

Within the different morphological groups, hearing sensitivity also varies by species; for example, Black Sea Bass, an EFH species potentially present in the project area, is fairly sensitive to sound compared to related species (Stanley et al. 2020). Several species of clupeid fishes are able to detect and respond to ultrasonic sounds, likely due to an ear specialization unique to clupeids (Popper et al. 2004). Clupeid fishes are of particular concern given proximity of the site to migratory corridors for anadromous herrings. Blueback Herring (*Alosa aestivalis*), unidentified herring species, Atlantic Menhaden, and Gizzard Shad (*Dorosoma cepedianum*), all clupeid fishes, were found during surveys, indicating that fish with high hearing sensitivity may be in the project area during pile driving. Though given the sensitivity to underwater sound, it is still anticipated that these fish would be protected using the FHWG criteria.

5.1.2.3 Fish Acoustic Thresholds

The calculations from the NMFS Multi-Species Pile Driving Calculator Tool were used to create a multi-ring buffer of isopleths (i.e., sound contours) diminishing in 1 decibel (dB) increments from the sound source. These thresholds are the lowest level where injury could occur (FHWG 2008) and are used to indicate the distance from the noise source where fishes are anticipated to potentially be exposed to injury or disturbance.

The modeled fish thresholds for physical injury and behavioral disturbance were used to determine the distances to onset of physical injury and behavioral disturbances (Tables 5 and 6). Physical injuries to fish from noise sources can include inner ear tissue damage and hearing loss (Casper et al. 2013) and rupture or damage to the swim bladder (California Department of Transportation [Caltrans] 2020). Behavioral disturbances include showing a brief awareness of the sound, small movements, or escape responses to move away from the noise source entirely (University of Rhode Island 2017). Thresholds for these effects are measured by evaluating the cumulative sound exposure level over the duration of a noise event

(SEL_{cum}), the maximum instantaneous sound pressure over the duration of a noise event (SPL_{peak}), and the root mean square (RMS) pressure.

The intensity of pile driving noise is greatly influenced by factors such as the types of piles and hammers and the physical environment in which the driving activity takes place. Since site-specific sound monitoring data are not available, reasonable noise source levels that would be likely to result from pile driving during construction, or proxy sound levels, from the NMFS calculator were selected (Table 5). Proxy sound levels were selected based on the pile size and type. When possible, sound levels from water depths similar to the maximum water depth expected in the SPCT project area (-52 feet following dredging for SPCT) were selected. However, the sources of the available monitoring data vary and values from shallower water depths were used in sound modeling when values from deeper water depths were not available.

Different types of sound pressure effects can cause different reasonable noise source levels that may result from pile driving. The peak pressure effect occurs from impact driving, as opposed to vibratory driving, which creates a more constant sound pressure with no peak decibel level. The peak effect from impact driving is the greatest value of the sound signal and is measured in dB re 1 μPa (underwater noise in decibels referenced to a pressure of 1 micropascal) used to specify the intensity of sound underwater (NMFS 2022c). The RMS pressure effect is the average intensity of the sound signal over time, which is applied to both impact and vibratory driving. The sound exposure level (SEL) is the measure of energy that considers both the level and duration of exposure to the sound (Table 5) (NMFS 2022c). SEL is measured in units of dB re 1 μPa^2 s (underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds).

Table 5. Underwater Noise Modeling Inputs

Pile Type/Activity	Installa-tion Method	Maximum Number of Hammers Used Concurrently	Impact Driving Strikes per Pile[1]	Vibratory Driving Estimated Minutes Time to Drive Each Pile[2] (minutes)	Peak (dB re 1 µPa)	SEL (dB re 1 µPa^2 s)	RMS[3] (dB re 1 µPa)	Proxy Value Water Depth (feet)	Proxy Value Source[4]
24-inch wharf piling	Vibratory	3	NA	90	NA	NA	153	9.8	Caltrans 2020
	Impact	3	600	NA	207	178	199	49	Caltrans 2015
30-inch wharf piling	Vibratory	3	NA	120	NA	NA	172	26 to 36	Caltrans 2020
	Impact	3	750	NA	210	177	195	9.8	Caltrans 2015
36-inch wharf piling	Vibratory	3	NA	180	NA	NA	175	16	Caltrans 2015
	Impact	3	900	NA	210	183	198	33	Caltrans 2015
24-inch mooring dolphin piling	Vibratory	1	NA	120	NA	NA	153	9.8	Caltrans 2020
	Impact	1	600	NA	207	178	194	49	Caltrans 2015
Concurrent 36-inch wharf and 24-inch mooring dolphin piling5	Vibratory	4	NA	120	NA	NA	175	16	Caltrans 2020
	Impact	4	800	NA	210	183	199	33	Caltrans 2015
Water-based demolition6	Vibratory	2	NA	NA	NA	NA	180	16	Caltrans 2020

Notes:

1. Strikes per pile for impact driving and time to drive each pile for vibratory pile driving estimated based on the driving logs of recent projects. For the concurrent scenario, a weighted average based on average piles per day was used to estimate values.

2. For water-based demolition, activity types and durations may vary. Modeling assumed constant use of both vibratory hammers during work hours (10 hours).

3. The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently, as per guidelines in the Washington State Department of Transportation Biological Assessment Preparation Manual (WSDOT 2020). To determine the full range of noise levels, underwater noise modeling for wharf piling activities assumed that each of the hammers would be driving the same pile size.

4. Proxy values selected from Optional Multi-Species Pile Driving Calculator Tool, Version 1.2-Multi-Species: 2022 (NMFS 2022b).

5.Proxy values for Peak and SEL values in the concurrent scenario defaulted to the larger values between the two pile sizes and are based on 36-inch piles. Calculation of RMS for multiple impact hammers followed methodology above.

6. As pile types are unknown for water-based demolition, modeling used the maximum RMS proxy value for vibratory pile driving.

NA = not applicable; SEL = sound exposure level; RMS = root mean square; dB re 1 µPa = underwater noise in decibels referenced to a pressure of 1 micropascal; dB re 1 µPa2 s = underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds

Table 6. Fish Impact Pile Driving Injury Guidance

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing 2 grams or less	183 dB	206 dB	150 dB

5.1.2.4 Sound Proxy Values

The maximum number of hammers for each activity associated with the construction of the terminal is included in Table 5. The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently. The Washington State Department of Transportation Biological Assessment Preparation Manual (Washington State Department of Transportation [WSDOT] 2020) presents the rules for combining noise levels. To combine noise levels, only the three loudest pieces of equipment are considered. The two lower noise levels are combined first and then the result is combined with the loudest noise level. For each activity in Table 5, the noise levels for each hammer are assumed to be the same. To combine noise from two pieces of equipment that are within 0 to 1 dB of each other, 3 dB is added to the higher value to combine noise levels. To add the third piece of equipment to the combined noise level (now 3 dB greater), 2 dB is added to the combined noise level. Thus, for two hammers being used concurrently, 3 dB was added to the RMS proxy value, and for three or five hammers being used, 5 dB was added to the RMS proxy value. The underwater noise modeling for wharf piling installation assumed that the hammers would be driving to the same pile size to determine the worst-case (highest) noise levels.

Also presented in Table 5, the impact pile driving RMS proxy value for 24-inch piles is greater than that for the larger pile types and the SEL proxy value for 24-inch piles is greater than that for 30-inch piles. Larger piles are associated with higher recorded underwater sound levels (Jiménez-Arranz et al. 2020). However, underwater sounds are influenced by more than the type of hammer and pile. The physical environment of the site, including temperature, water depth (pressure), salinity, and presence of obstacles, can influence sound. Generally, sound travels faster in warmer, deeper water with higher salinity (Sinay Maritime Data Solution 2024). Temperature and salinity measurements were not given for the proxy values, but the sound levels for the different piles were recorded in different water depths. Underwater sound is dependent on pressure, which varies with depth. At greater water depths, pressure increases, which compresses the water molecules and increases the speed of sound (Sinay Maritime Data Solution 2024).

5.1.2.5 Sound Attenuation

A sound reduction measure was included in the modeling for noise impacts from SPCT construction. The NMFS Multi-Species Tool used for noise modeling does not include a sound reduction for use of a cushion block but does include a 5 dB reduction for use of a bubble curtain surrounding the work area. A cushion block is frequently used during pile driving to reduce sound propagation. TPA evaluated recent studies and reports along with recently accepted sound reductions for modeling fish impacts for wharf construction projects in the Philadelphia area.

WSDOT (2006a) conducted a study to evaluate the effectiveness of wood, micarta, and nylon cushion blocks in reducing underwater sound during the driving of 12-inch diameter steel pipe piles generation (Molnar et al. 2020). A range of decibel reduction for wood cushion blocks was reported to be between 11 and 26 dB (WSDOT 2006b as cited in Caltrans 2009). The range of 11 to 26 dB reduction for wood cushion blocks originated from a technical report that measured sound levels during pile driving using different cap materials (Laughlin 2006). The study is limited and included use of a wood cushion block while pile driving one 12-inch-diameter standard steel pile and one 12-inch pile with 1.5-foot-wide interlocking steel 'wings' at two different water depths at the Cape Disappointment boat launch facility near Ilwaco, Washington (Laughlin 2006). The piles utilized in these studies are different than the ones proposed for use at SPCT; therefore, only the lowest recommended decibel reduction from these studies (11dB) is considered for use in noise modeling as a conservative approach. Additionally, at least two recent Endangered Species Act Biological Opinions from NMFS Greater Atlantic Regional Fisheries Office (NMFS 2022c, 2022d) contained noise modeling for impacts from wharf construction projects in the Philadelphia area, which utilized impact driving of larger 20 and 30-inch steel piles. For these biological opinions, the parameters used in the acoustic calculator tool included proxy sound levels with an 11 dB attenuation to account for a cushion block, the most conservative reduction in the range presented in Caltrans 2009.

Based on the understanding of the NMFS Multi-Species tool's conservative sound reduction allowance for attenuation measures, guidance documents on the effectiveness of different attenuation measures including cushion blocks, and recent biological NMFS consultations for similar projects, the following sound reductions were utilized in the noise modeling for this project:

1. Sound attenuation of 5 dB with use of a bubble curtain during impact pile driving; and
2. Sound attenuation of 11 dB with use of a wood cushion block during impact pile driving.

The noise level parameters were decreased by 5 and 11 dB for modeling impact pile driving thresholds with the effective use of a bubble curtain or wood cushion block for the largest noise-producing activity. This decibel reduction applies only to the use of an impact hammer for driving piles, as cushion blocks are not used on vibratory hammers. As discussed during recent consultation with NMFS in November 2024, TTT presents the result of modeling both 5- and 11-dB reductions, with the understanding that in-field verification of the cushion block would need to be completed in coordination with NMFS.

5.1.3 Noise Modeling Impacts

The results presented in this EFH Assessment show the distances to the following impacts:

1. Onset of behavioral disturbance from a vibratory hammer with no sound reduction measure for each activity;
2. Physical injury and behavioral disturbance from an impact hammer with no sound reduction measure;
3. Physical injury and behavioral disturbance from an impact hammer with the use of a bubble curtain (-5 dB) for the largest noise producing activity only (concurrent wharf and mooring dolphin piling installation).
4. Physical injury and behavioral disturbance from an impact hammer with the use of a cushion block (-11 dB) for the largest noise producing activity only (concurrent wharf and mooring dolphin piling installation).

Noise modeling results are presented in figures based on two in-water sound source locations for the SPCT pile driving activities —one location within the embayment on the east side of Coke Point and one location outside the embayment on the south tip of the Coke Point peninsula. While noise impacts without sound attenuation are presented below and in Table 5, figures presented in this document represent concurrent wharf and mooring dolphin piling installation via impact driving with a bubble curtain and cushion block (modeled separately) as well as the maximum distance to behavioral disturbance due to vibratory driving during water-based demolition (since no mitigation is applied to vibratory driving). This construction scenario produced the largest sound impacts in the model. Results for the additional construction activities with lesser noise impacts (raw model outputs) are included in Attachment B.

5.1.3.1 Noise Impacts without Sound Attenuation Measures

Marginal Wharf Pilings

Wharf pilings are 24, 30, and 36 inches in diameter (Table 4). As summarized in Table 7, the largest maximum distance to peak onset (SPLpeak) of physical injury in any size fishes is 61 feet (approximately 0.01 mile) for impact driving of a 30- or 36-inch steel pipe. The maximum distance to cumulative (SELcum) of physical injury is within 5,200 feet (approximately 1 mile) for any size fish is based on 36-inch steel pipe. Data used to develop the proxy sound values were from different water depths. The distance for behavioral disturbance in any size fishes from impact driving of wharf piles is largest for the driving of 24-inch piles (60,625 feet or 11.5 miles). Sound behaves differently at varying depths; therefore, depending on the water depth, a larger sound impact may not always be correlated to a larger diameter pile. For vibratory impact, the distance to onset of behavioral disturbances for fishes increases with increasing pile size.

Mooring Dolphin Pilings

Mooring dolphin pilings are 24-inch steel pipes driven by both impact and vibratory hammers. The distance to peak onset (SPL_{peak}) of physical injury in any size fishes is 38 feet or less than 0.01 mile (Table 7). The distance to cumulative (SEL_{cum}) of physical injury is within 1,220 feet (approximately 0.2 mile) for fish larger than 2 grams and within 2,253 feet (approximately 0.4 mile) for fish weighing less than 2 grams. Behavioral disturbance occurs within 28,140 feet (approximately 5.3 miles) regardless of fish weight. For vibratory driving, behavioral disturbance occurs within 52 feet for any size fish.

Concurrent Wharf Piling and Mooring Dolphin Piling

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area. A 20-day period for concurrent activities is used to estimate when both wharf piling and mooring dolphin piling may occur simultaneously (Table 4), and it is assumed that the maximum wharf piling size (36 inches) is what will be installed during the concurrent activities. For concurrent impact driving, the distance to peak onset (SPL_{peak}) of physical injury in any size fish is within 61 feet (approximately 0.01 mile) (Table 7). For injury from concurrent impact driving, the maximum distance for physical injury for any size fish is within 5,200 feet (approximately 1 mile), while the onset for distance for behavioral disturbance for any size fish is within 60,625 feet (11.5 miles). For concurrent vibratory driving, behavioral disturbance occurs within 1,523 feet (approximately 0.3 mile) for any size fish.

Concurrent wharf and mooring dolphin piling installation and water-based demolition activities were modeled for a vibratory hammer. For behavioral disturbance, the maximum distance to onset of impact is 3,281 feet from the sound source from in-water demolition; concurrent wharf and mooring dolphin piling installation would have a maximum distance of 1,523 feet. For activities inside and near the mouth of the embayment, the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 12,000 and 10,700 feet wide where fish could transit and avoid noise impact, respectively. Because no sound attenuation was modeled for vibratory pile driving, distances to impacts remain the same regardless of mitigation used and are shown in Figures 7 and 8.

In-Water Demolition

Precise activities and pile sizes to be removed during water-based demolition are yet to be determined and would be finalized closer to project construction. For modeling, it is assumed that only vibratory impacts would be produced during removal of existing in-water structures. Modeling predicts that fishes of any size may experience behavioral disturbance within a distance of 3,281 feet (approximately 0.6 mile) from demolition activities (Table 7). This activity has the largest potential area of behavioral disturbance from removal of in-water structures using vibratory hammers. No sound mitigation was modeled for vibratory hammer use.

Table 7. Maximum Distances to Fish Sound Thresholds from Impulsive Sources (without sound attenuation)

Activity	Pile Count and Size/Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance[1] (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)		
		150 dB RMS (any size fish)	150 dB RMS (any size fish)	206 dB SPL_{peak} (any size fish)	187 dB SEL_{cum} (fish greater than 2 grams)	183 dB SEL_{cum} (fish less than 2 grams)
Wharf piling	150, 24-inch steel pipe piles	52	60,625	38	1,936	2,414
Wharf piling	600, 30-inch steel pipe piles	961	32,808	61	1,927	2,070
Wharf piling	600, 36-inch steel pipe piles	1,523	51,998	61	5,200	5,200
Mooring dolphin piling	60, 24-inch steel pipe piles	52	28,140	38	1,220	2,253
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	60,625	61	5,200	5,200
In-water demolition	Varied	3,281	NA	NA	NA	NA

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for fishes.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

NA = not applicable

Figure 7. Maximum Distance to Noise Impacts from Vibratory Hammer – Wharf Construction within Turning Basin

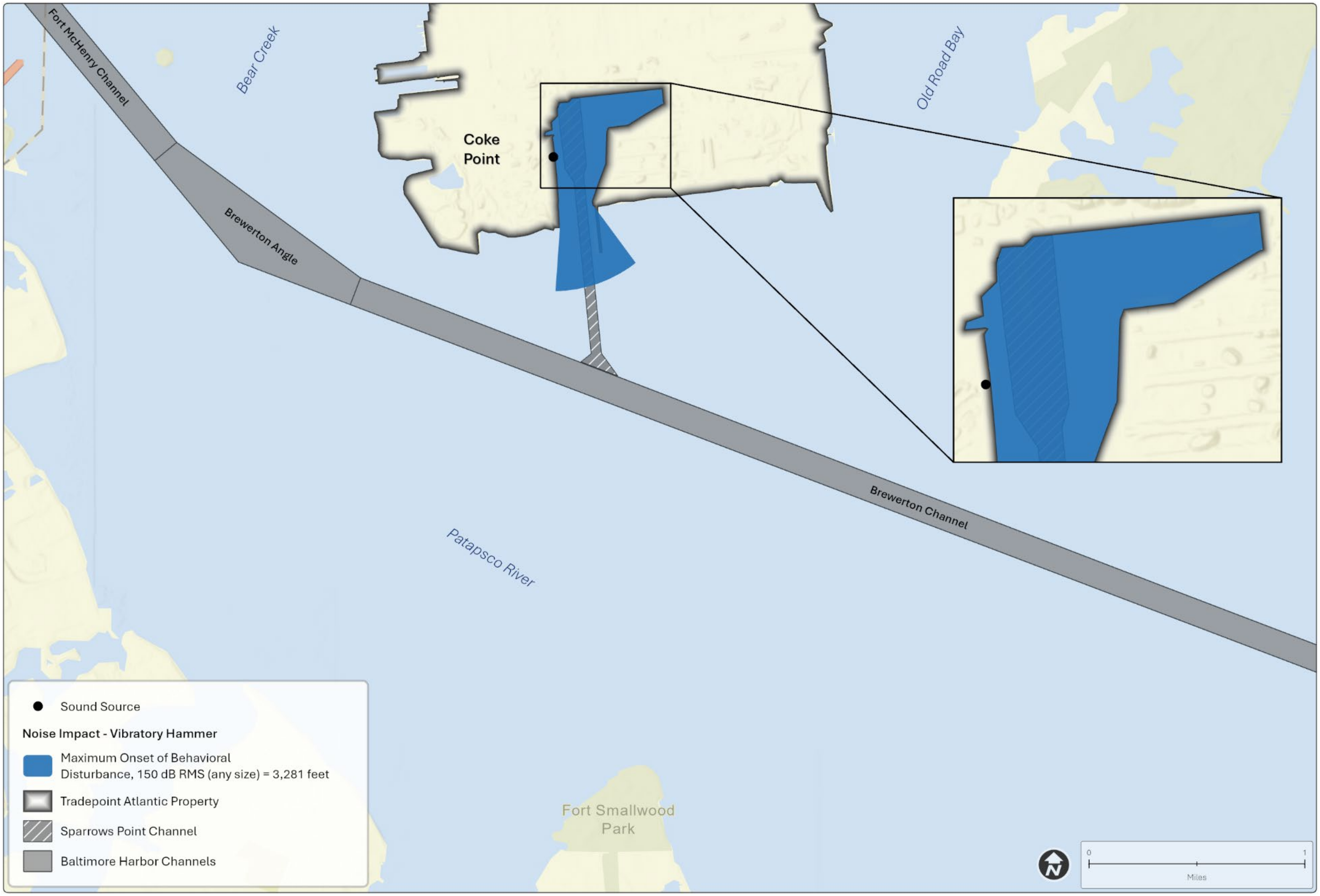
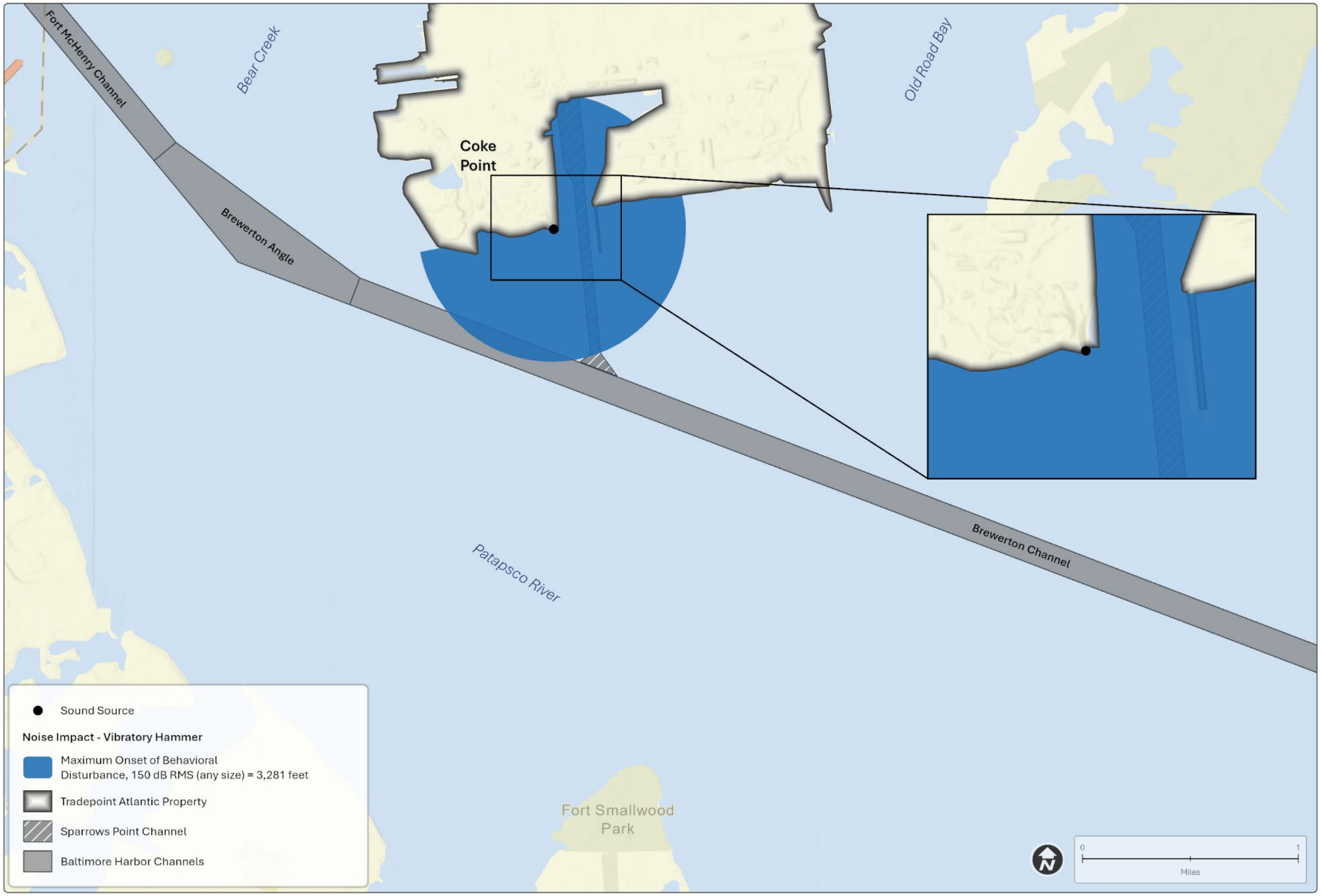


Figure 8. Maximum Distance to Noise Impacts from Vibratory Hammer–Wharf Construction at Southern Point Outside of Turning Basin



5.1.3.2 Noise Impacts with Sound Attenuation of 5 dB (Bubble Curtain)

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area (Section 5.1.3.1). This scenario was modeled again with use of a 5 dB sound reduction for a bubble curtain (Table 8).

For the concurrent wharf and mooring dolphin piling installation with a bubble curtain (-5 dB), the distance to the peak onset of physical injury for any size fishes is 28 feet and the distance to the onset of physical injury is 2,414 feet. Behavioral disturbance onset occurs within 28,139 feet from either sound source location. For pile driving activities occurring inside and outside the embayment (Figures 9 and 10), the noise impact distance would not leave a zone of passage during pile driving activities.

5.1.3.3 Noise Impacts with Sound Attenuation of 11 dB (Cushion Block)

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area (Section 5.1.3.1). This scenario was modeled again with use of an 11 dB sound reduction for a cushion block (Table 8).

For the concurrent wharf and mooring dolphin piling installation with a cushion block, the distance to the peak onset of physical injury for any size fishes is 11 feet and the distance to the onset of physical injury is 961 feet. Behavioral disturbance onset occurs within 11,203 feet (or 2.1 miles) from either sound source location. For pile driving activities occurring inside the embayment (Figure 11), the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 4,000 feet wide where fish could transit and avoid noise impact. A zone of passage approximately 2,000 feet wide would be present when pile driving activities occur closer to the mouth of the embayment (Figure 12). In addition to use of a cushion block to reduce sound propagation, a soft-start (gradual startup of impact pile driving) may be used to produce small sound waves that would encourage fish to move away from the project area before pile driving begins. Construction on the south end of Coke Point (outside of the embayment) may be phased to avoid impact driving of steel piles during the time-of-year restriction window for fish based on agency guidance.

Table 8. Maximum Distances to Fish Sound Thresholds from Impulsive Sources for the Largest Noise-Producing Activity with Sound Attenuation

Activity	Pile Count and Size/Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance[1] (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)		
		150 dB RMS (any size fish)	150 dB RMS (any size fish)	206 dB SPL_{peak} (any size fish)	187 dB SEL_{cum} (fish greater than 2 grams)	183 dB SEL_{cum} (fish less than 2 grams)
Concurrent wharf and mooring dolphin piling (no attenuation)	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	60,625	61	5,200	5,200
Concurrent wharf and mooring dolphin piling with 5 dB attenuation	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	28,139	28	2,414	2,414
Concurrent wharf and mooring dolphin piling with 11 dB attenuation	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	11,203	11	961	961

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for fishes. Sound attenuation not applied to vibratory driving.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

NA = not applicable

Figure 9. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction within Turning Basin with -5 dB Sound Attenuation

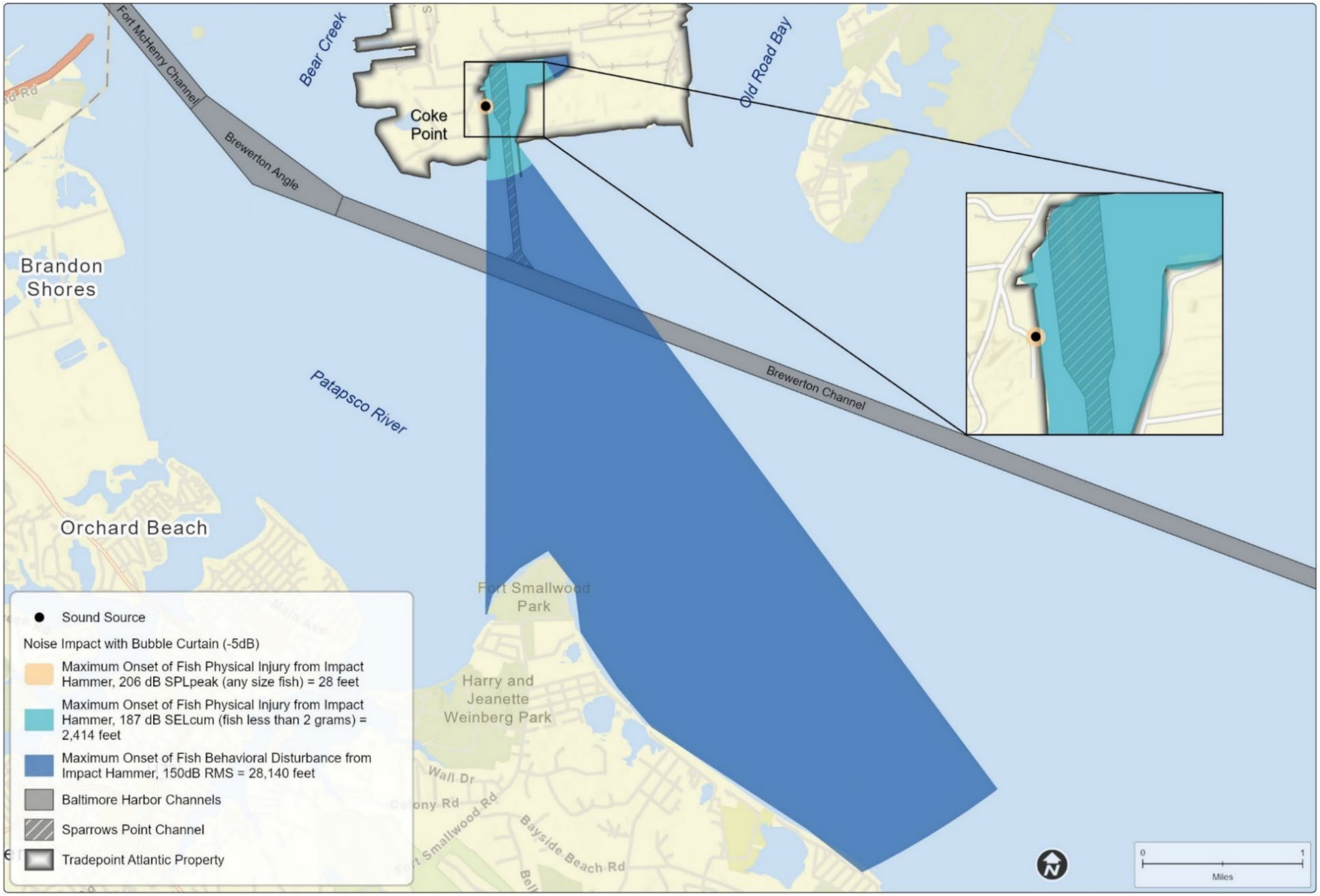


Figure 10. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -5 dB Sound Attenuation

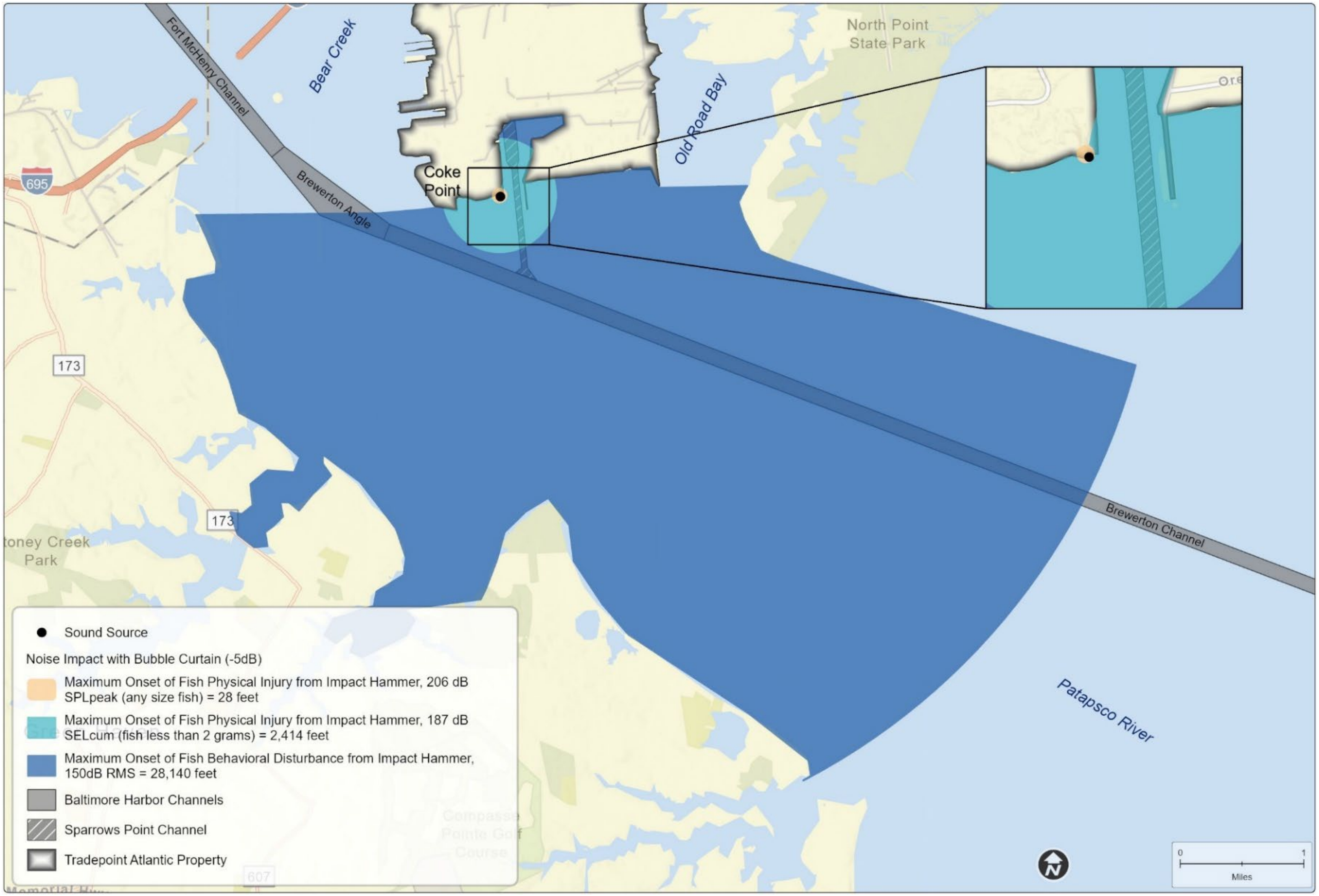


Figure 11. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction within Turning Basin with -11 dB Sound Attenuation

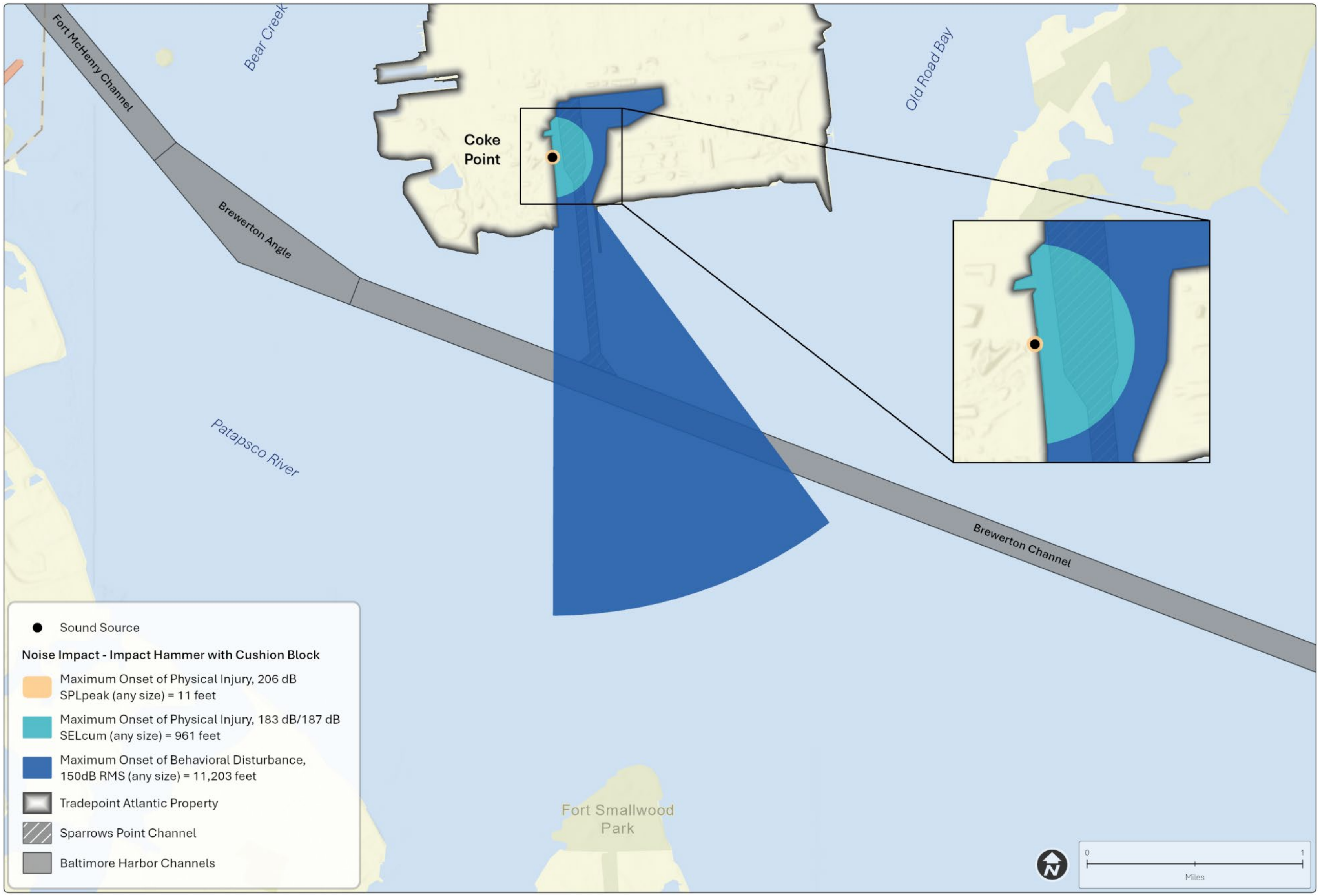
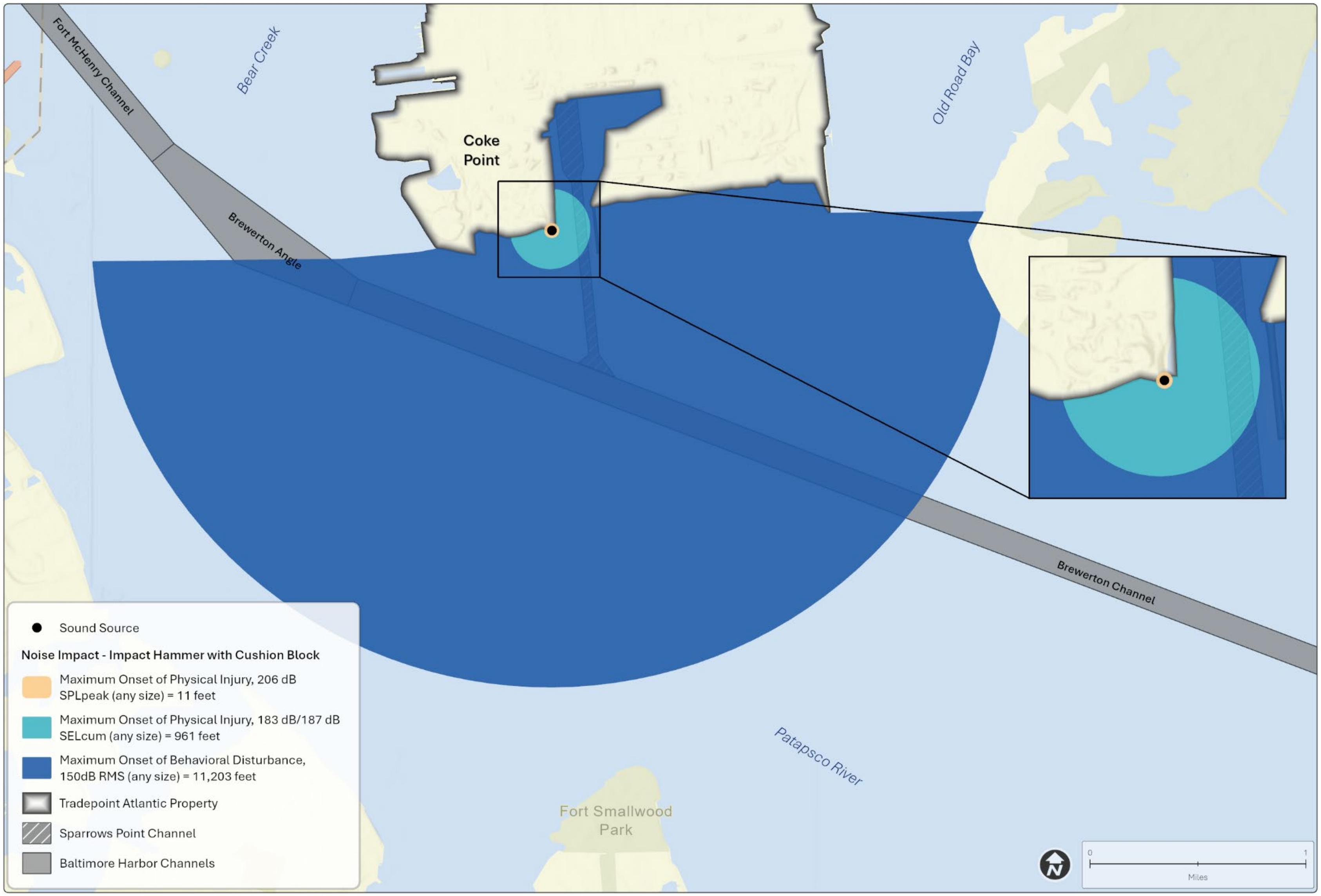


Figure 12. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -11 dB Sound Attenuation



5.1.4 Summary of Noise Impacts

As the largest noise-producing activity without any sound reduction results in a maximum noise impact distance that spans with width of the Patapsco River in the SPCT area, TTT is coordinating with NMFS on use of a sound attenuation measure to reduce sound impacts on fishes and other aquatic life. As recommended in the NMFS Multi-Species Model, a conservative 5 dB reduction for a bubble curtain was modeled. Use of this reduction does not allow for a zone of passage in the river where fish could avoid the sound generated from the SPCT construction. Based on the guidance in recent reports and approved Biological Opinions (NMFS 2022c, 2022d), use of an 11 dB reduction for a cushion block allows passage for fish to avoid sound impacts from pile driving occurring both in the embayment and toward the southern extent of Coke Point closer to the Patapsco mainstem. TTT will continue to consult with NMFS on verification methods to ensure the 11 dB reduction is achieved and a zone of passage during the spring migration period is present during construction.

5.1.5 EFH Effect Determination from Underwater Noise

With a 5dB reduction during impact pile driving, a zone of passage would not be achieved for anadromous fish. Therefore, with only this attenuation, the effects to fish from underwater noise would be adverse and substantial. However, TTT continues to coordinate with NMFS on support for use of an 11dB reduction based on previous studies and guidance. In this scenario (with in-field verification), a zone of passage would be present regardless of the location of impact pile driving on the SPCT site, and the effect on fish from this underwater noise would be adverse, but not substantial.

5.2 Water Column Turbidity

Turbidity is measured in the field in NTU. Water with higher turbidity will often have higher concentrations of total suspended solids (TSS), which can be measured in samples sent to a laboratory. Although there are natural contributors to turbidity within a water body (e.g., storm events, plankton blooms), construction activities such as dredging can increase turbidity. Turbidity from dredging and wharf construction and from the Coal Pier Channel DMCF construction has the potential to impact EFH. For the purposes of the evaluation of impacts from turbidity, DMCF construction includes construction of the enclosure dike. Impacts to EFH from habitat alteration due to material placement within the DMCF are discussed in Section 5.3.

5.2.1 Turbidity from Dredging and Wharf Construction (Pile Driving)

NMFS has estimated TSS concentrations associated with certain in-water activities, including mechanical dredging of fine-grained material, based on numerous studies in the greater Atlantic region. Based on these studies, elevated suspended sediment concentrations at several hundreds of mg/L above background may be present near the bucket but would settle rapidly within a 2,400-foot radius of the dredge location. Based on the extremely low currents within the embayment the turbidity radius is expected to be significantly less within the embayment. The TSS levels expected for mechanical dredging (up to 445.0 mg/L) are below those shown to have adverse effects on fish (typically up to 1,000 mg/L; see summary of scientific literature in Burton 1993; Wilber and Clarke 2001). Turbid conditions during dredging can be controlled to minimize impacts on fish by using Best Management Practices (BMPs) and completing activities during times of year when certain species are less active within the project area.

For pile driving, NMFS has estimated TSS concentrations associated with the disruption of bottom sediments from this activity based on a study performed in the Hudson River. Elevated TSS concentrations of approximately 5.0 to 10.0 mg/L above background levels were produced within approximately 300 feet (91 meters) of the pile being driven (Federal Highway Administration 2012).

Based on the data from the studies noted above, the maximum expected distance for movement of resuspended sediment from the dredging and pile driving operations would affect a small portion of the total width of the Patapsco River (2,400 feet [0.4 mile] or 17.1% of the total 14,000 feet [2.6 miles] of available river width). The expected distance of movement of resuspended sediment is less than half the distance to the end of the southern shore of the Sparrows Point peninsula in either direction. Any resuspended sediment will remain well within the industrial shoreline of the TPA property.

5.2.1.1 Eggs and Larvae

Eggs and larvae of Summer Flounder and Atlantic Butterfish are potentially present within or adjacent to the dredging footprint and would be at the highest risk of impacts from dredging turbidity, as they cannot move to avoid the suspended sediment in the water column. Resuspended sediment can affect all life stages of fish, though egg and larval stages can be particularly vulnerable (Auld and Schubel 1978; Nelson and Wheeler 1997; Burton 1993; Wenger et al. 2018). Eggs and larval stages of demersal EFH species may be impacted by the settlement of turbid sediments back onto the river bottom in areas adjacent to the dredging. Although contaminants are present in a portion of the material to be dredged, it is anticipated that the suspended sediments will not be in the water column for long and would be limited to a small radius from the dredging operation. BMPs would be utilized to limit the amount of suspended sediment generated from dredging (see Section 7). Based on the nature and extent of the turbidity and the availability of unaffected areas, a seasonal restriction on dredging in certain parts of the dredging footprint may be necessary to limit the delivery of contaminants to the estuarine food web and/or protect fish migrations. Any time-of-year restrictions on dredging activities to reduce impacts on eggs, larvae, and less mobile species would be determined through agency consultation.

5.2.1.2 Juveniles and Adults

Impacts from suspended sediments due to dredging on juveniles and adults would be likely short-term and temporary, as individuals would be able to move away from the dredging areas.

Time-of-year restrictions on dredging would also reduce impacts on adult and juvenile EFH individuals. Dredging BMPs, such as use of an environmental bucket, could also be implemented to minimize impacts related to resuspended sediment. Based on sediment plume studies in similar environments, it is anticipated that the maximum movement of any resuspended sediment from the dredging operations would only affect 17.1% of the total width of the Patapsco River, although it would temporarily reduce the quality of EFH in this area. This gives juvenile and adult individuals significant areas of similar pelagic or demersal habitat to use outside of and adjacent to the direct dredging area. There is also similar available habitat outside of the work area within the river from the former Key Bridge to Rock Point (approximately 22,000 feet or 4 miles).

5.2.2. Turbidity from DMCF Construction

Placement of material to build the sand dike for the Coal Pier Channel DMCF could cause temporary turbidity in surrounding waters. The alignment of the dike across the opening of the Coal Pier Channel is approximately 660 linear feet. Once the perimeter dike is completed (approximately 7 months), dredged material would be placed in the DMCF, filling 19.6 acres of open water. This habitat alteration impact is discussed in Section 5.3.

Sand is a coarser-grained material that settles out of the water column faster than finer-grained material, resulting in suspended sediment remaining in the water column in a localized area for a short duration. BMPs would be utilized to limit the amount of suspended sediment escaping the immediate placement area (see Section 7).

5.2.1.3 Eggs and Larvae

Eggs and larvae of EFH species adjacent to the dike alignment (on either side) may be impacted by the suspended sediment resulting from sand placement. Eggs and larval stages would not be able to move away from the turbid conditions and mortality or physical impairment through either reduced feeding ability, reduced visibility, or clogged gills. Eggs existing adjacent to the dike alignment may be smothered when the sand settles out of the water column. Given that the dike alignment covers a limited distance of the river at the opening of the channel, it is unlikely that turbidity from the placement of sand would cause population level impacts to any EFH species. BMPs (such as a turbidity curtain) would be utilized to minimize suspended sediment impacting surrounding areas (see Section 7).

5.2.1.4 Juveniles and Adults

Juvenile and adult EFH individuals outside of the dike perimeter would relocate to similar nearby habitats following the start of material placement and would likely avoid suspended sediment; mobile EFH individuals would experience adverse but temporary impacts from displacement. Turbidity can hinder vision and disrupt foraging behaviors of EFH species, but juvenile and adult species would be more likely to avoid the area during construction. Turbidity following construction of the dike would eventually return to concentrations suitable for EFH species. Any turbidity related to offloading of dredged material would be contained within the dike and would not impact the surrounding habitat for EFH species.

Placement of the sand could also disturb existing sediments at the mouth of the Coal Pier Channel. The movement of the bottom sediments during placement of the sand would be limited due to the shallow sediment depth, the small size of the dike, and the proximity to the shore. Depending on site conditions, BMPs to reduce sediment resuspension (e.g., turbidity curtain) could be employed (see Section 7). Therefore, sediments resuspended during dike construction would be expected to be minimal. Given that the material to create the perimeter dike would be sand and the soft sediments underlying the Coal Pier Channel are shallow, the impacts would be limited to temporary and localized effects on the water column during construction, having minimal impact on fish species.

5.2.2 EFH Effect Determination – Turbidity

Turbidity resulting from dredging, pile driving, and DMCF construction has the potential to temporarily reduce the quality of EFH in the SPCT area, with the largest impacts occurring to less mobile life stages. However, due to the temporary nature of turbidity and the use of BMPs during operations, the effect of turbidity on EFH from the Proposed Action is determined to be **adverse, but not substantial.**

5.3. Habitat/Bottom Alteration

5.2.3 Habitat Alteration from Dredging and Wharf Construction

Removal of the river bottom sediments from dredging to deepen and widen the channel would create deeper water habitat within and adjacent to the existing Sparrows Point Channel. Wharf construction would also cause shading of some existing open water habitat. The river bottom in the action area is a soft-bottom environment, comprised mainly of silt and clay and deeper sand in the north portion of the channel; no SAV is present.

5.2.3.1 Eggs and Larvae

The physical removal of bottom from the dredging area, as well as resuspended sediment, has the potential for direct loss or injury to eggs and larvae present within or adjacent to the dredging footprint.

5.2.3.2 Juveniles and Adults

The removal of bottom sediment resulting from channel dredging would impact demersal EFH species (skates and flounders) more than pelagic species, as juveniles and adults would be directly utilizing sediment bottom in the dredging footprint. Dredging would also result in a loss of the benthic community currently within the area, reducing foraging opportunities for juvenile and adult EFH species. With deepening of the channel, the potential for water column stratification would increase, resulting in lower dissolved oxygen concentrations in deep bottom water, particularly in the summer months. This could also affect fish usage of bottom waters, as they will avoid waters that do not contain enough oxygen. This would also reduce potential prey sources for fish that consume benthic organisms.

Additionally, dredging the channel to attain the preferred alignment for the wharf would include removal of existing shoreline, resulting in the creation of approximately 6.3 acres of new open water habitat. Construction of the wharf would result in shading approximately 8.9 acres of open water habitat—3.3 acres of existing open water and 5.6 acres of new open water habitat. Shading of these areas would impact benthic and water column productivity. Installation of a mooring dolphin and wharf pilings would result in the permanent loss of 0.2 acre of bottom habitat. These habitat changes would cause localized impacts on benthic organisms and prey thus impacting foraging EFH species in the project area.

5.2.4 Habitat Alteration from Material Placement in the DMCF

Dredged material placement within a constructed DMCF at the Coal Pier Channel would result in a loss of 19.6 acres of shallow water EFH available to managed species. It is also possible that slower moving individual adults and juveniles within the footprint would be trapped by the placed material. Any eggs or larvae of EFH within the DMCF would be lost due to material placement. The DMCF would also bury the benthic organisms within its footprint, removing the benthic communities as a possible food source for fish. Although the Coal Pier Channel has a degraded benthic community and sediment contamination, it is utilized by fish year round. These impacts directly reduce the quantity of EFH within the Action Area.

5.2.5 EFH Effect Determination – Habitat Alteration

Habitat alteration resulting from wharf construction would have minimal impacts on EFH. Habitat alteration in the dredging area due to the deepening of the channel would reduce the quality of EFH by reducing the likelihood of a benthic community re-establishing. Creation of the Coal Pier Channel DMCF would directly reduce the quantity of EFH in the Action Area by filling 19.6 acres of shallow open water. As such, the effect of habitat alteration on EFH from the Proposed Action is determined to be **adverse and substantial.**

5.3. Impingement/Entrainment

EFH species could potentially be caught by the equipment used to mechanically dredge the SPCT channel and to hydraulically offload the material to a DMCF. Fish can potentially become impinged or entrained (depending upon size and life stage) in the clamshell dredge bucket, although this is expected to be infrequent. Capture by clamshell dredge bucket is uncommon and would only impact demersal fish that are unable to move away from the operation. When surface water is pumped to slurry dredged material for hydraulic offloading, fish may become caught on the pipe screen (depending upon the size of the fish and the size of the openings of any fish screen that may be used on the pipe) or be pulled into the pipe past the screen. Eggs and larvae would be the life stages most susceptible to entrainment in the hydraulic pipe, as mobile life stages would be more likely to move away from the area of the operation. Therefore, Summer Flounder and Atlantic Butterfish could be more likely to be entrained in these life stages. It should be noted that any hydraulic dredging operation would comply with requirements from MDNR to reduce impingement/entrainment impacts, which may include using an intake screen with a specific size mesh openings and limiting intake velocities.

5.2.6 EFH Effect Determination – Impingement/Entrainment

Impingement or entrainment of EFH species from SPCT operations is possible, with most impacts occurring to eggs and larvae from use of surface water for hydraulic offloading. However, this impact is not expected to be any more than minimal, temporary, and could be alleviated with modifications (fish screens), and the effect of impingement/entrainment on EFH from the Proposed Action is determined to be **adverse, but not substantial**.

5.4. Vessel Traffic

The SPCT project area is located within the Port, which is in the top 20 ports in the United States by tonnage and number of vessels handled annually (U.S. Department of Transportation [USDOT] 2024a), including a variety of ship types (e.g., bulk carriers, general cargo ships, tankers, container ships). More than 2,500 vessels called on the Port in 2021 (USDOT 2024b). Vessel traffic is analyzed as a potential stressor to EFH during both construction and long-term operation of the SPCT.

5.2.7 Construction Vessel Traffic

The proposed project would result in minor and temporary increases in vessel traffic as the vessels transit around the project site and to and from the project site to the Norfolk Ocean Disposal Site or existing Maryland Port Administration DMCFs. In the immediate project area, there would be a small increase in vessel activity, likely not more than 10 vessels operating at any one time, which will not significantly increase vessel usage of the area. Impacts to EFH resulting from increased vessel traffic can include bottom disturbance from mooring or propeller wake. Additionally, collision with vessels could be a source of anthropogenic mortality and injury for marine species as a result of being struck by boat hulls or propellers (Brown and Murphy, 2010). The vessels that will be used to transport sediment from the dredging area to the DMCF or other disposal areas include tugboats and bottom dump scow barges. The vessels will likely travel at speeds of no more than 10 knots to minimize risks of strikes along the transport routes. The existing water depth in the project area and material transit route make it unlikely that effects would occur to EFH or prey species. During dredging and material offloading to the Coal Pier Channel DMCF, there could be minor and temporary bottom disturbances including spud piles into the sediment to hold barges in position, temporary piles to serve as moorings for barges, and anchors and mooring balls/lines to also serve as temporary moorings for barges.

Overall, the addition of project vessels during construction would be intermittent, temporary, and restricted to the project area on any given day so that any increased effects from vessels to EFH would not be adverse, but minor and temporary.

5.2.8 Long-Term Operations Vessel Traffic

Once constructed, operation of the SPCT would increase vessel traffic by approximately 500 vessels per year, an increase of approximately 20% over the Port calls logged in 2021 (USDOT 2024a). Fish would be expected to move away from the areas of the activity or access to EFH would not be impacted. Adding these project vessels to the existing baseline is not likely to increase the risk that any vessel in the area will affect EFH on a yearly basis.

5.2.9 EFH Effect Determination – Vessel Traffic

Because the SPCT is in a heavily utilized area of the Port of Baltimore, the long-term operations increases vessels by only 20% of the current usage, and the risk of a vessel impacting EFH is minimal, the effect on EFH from vessel traffic from the Proposed Action would be **adverse, but not substantial**.

6. Impacts to Prey and Other Important Species

EFH prey species that utilize the Action Area include Bay Anchovy, Spot, and White Perch. Other important anadromous species include Striped Bass and American Shad. For these species, impacts from turbidity, habitat alteration, vessel traffic, underwater noise, and impingement/entrainment would generally be similar to those for EFH species. It can be noted, however, that studies have shown effects from turbidity at lower than 1,000 mg/L in certain species and life stages that are present in the project area. For Striped Bass and White Perch, hatching can be delayed by TSS as low as 100 mg/L in 1 day exposure time. Larval stages of Striped Bass, American Shad, Yellow Perch (*Perca flavescens*), and White Perch showed higher mortality rates with TSS levels of 500 mg/L or lower for up to 4 days (Wilber and Clarke 2001). Feeding rates of several species that use the project area (Atlantic Silverside and Atlantic Croaker) are reduced in waters with higher turbidity (and therefore higher correlated TSS) conditions. Atlantic Silverside and White Perch are some of the most sensitive estuarine species when evaluating lethal responses to suspended sediment with up to 10% mortality at TSS concentrations below 1,000 mg/L. EFH species that forage organisms in benthic communities would lose foraging habitat within the DMCF footprint due to filling of open water, as well as likely within the dredging footprint due to deepening of the open water habitat.

7. Potential Avoidance and Minimization

Many potential avoidance and minimization measures are being considered for the Proposed Action to reduce overall impacts on the aquatic environment. Those which apply to EFH are briefly described in Table 9. These should be considered potential measures that would be finalized following completion of the project design. These measures would be stipulated as permit conditions by regulatory agencies.

Table 9. List of Potential Avoidance and Minimization Measures to Reduce Impacts on EFH

Potential Avoidance/Minimization Measure	Potential Benefit to EFH
Follow time-of-year restrictions (if required by regulatory agencies) for pile driving and dredging	Avoids impacts sensitive life stages of fish and other aquatic resources.
Use a “soft start” method for impact hammer during pile driving	Creates a warning for mobile EFH species to move away from the project area
Use a cushion block and/or bubble curtain during impact driving of piles	Reduces the intensity and distance for underwater noise propagation.
Limit the daily window for pile driving activities to 10 to 12 hours or less of daytime operations	Reduces duration of noise impacts on EFH species
Use a vibratory hammer (if/where feasible) followed by use of an impact hammer for individual piles	Reduces the duration of the underwater noise created by impact hammer.
Operate construction vessels in adequate water depths. Use shallow draft vessels that maximize the navigational clearance between the vessel and the bottom in shallow areas.	Avoids propeller scour or grounding in EFH.
Cut the existing pile(s) at the mudline (where possible) to avoid sediment re-suspension during extraction.	Reduces turbidity impacts on EFH.
Surround the area of demolition, pile removal, and other bottom-disturbing construction activities (as applicable) with a full-height, weighted turbidity curtain in areas where sediment contaminants may be present at concentrations of concern.	Minimizes potential for sediments to be displaced and leave the immediate vicinity and impact EFH species.
Use an environmental-type bucket where feasible and where necessary based on sediment chemical data to minimize sediment release from the bucket while ascending through the water column.	Reduces water column turbidity impacts on EFH species.
Implement operational controls during dredging. These may include: 1. Perform dredging such that the dredge bucket is not overfilled on each deployment, reducing release of sediment. 2. Control the ascent of the bucket in the water column to minimize incidental release while moving through the water column. 3. Control the descent of the bucket to minimize hard contact with the bottom and resuspension of sediment upon bucket contact. 4. Prohibit dragging of the dredge bucket along the sediment surface.	Reduces water column turbidity impacts on EFH species.
Place dredged material in a barge or scow in a manner that maintains sufficient freeboard to eliminate the potential for material leaving/spilling from the barge during transport to the material offloading or placement.	Reduces water column turbidity impacts on EFH species.

8. Effects of Climate Change

Climate change in the Baltimore Harbor area is affecting sea level, the severity and frequency of precipitation events, and the probability of extreme heat. Global Mean Sea Level scenarios are projections used to estimate potential future sea level rise based on different greenhouse gas emission pathways, climate sensitivities, and ice sheet dynamics. The five scenarios are categorized as *low, intermediate-low, intermediate, high,* and *extreme.* By 2100, regional sea level is expected to rise by 3.9 feet under the *intermediate* scenario, and by 5.2 under the *intermediate high* scenario, whereas the global sea level is expected to rise 3.3 and 4.9 feet, respectively (Sweet et al. 2022). The Coastal Vulnerability Index is a tool used to assess the vulnerability of coastal areas to the effects of sea level rise and other coastal hazards. It integrates multiple physical and environmental factors (e.g., geomorphology, tide range, wave height, relative sea level rise) to provide a relative measure of risk for different sections of the coastline. Although the project area is subject to sea level rise, coastal vulnerability in the Sparrows Point area is considered low (U.S. Geological Survey 2024).

It is not anticipated that the effects of climate change would amplify or exacerbate the adverse effects (as described in Section 4) of the proposed action on EFH. The adverse effects of deepening of open water habitat (due to dredging), loss of the benthic community, and loss of open water EFH would not be increased due to effects of sea level rise on EFH that are already occurring and projected to occur. These effects can include increased water temperatures, acidification of waters, or change in flow regimes.

9. Determination of the EFH Assessment

Of the stressors on EFH evaluated in this assessment, individual determinations are either adverse but not substantial, or adverse and substantial. A summary of the EFH impacts and determinations is provided in Table 10. Because of the nature and magnitude of the impacts considered wholistically, TTT has determined that the Proposed Action would have an **adverse and substantial impact on EFH,** due to permanent loss of EFH and alteration of existing EFH. As discussed in Section 7, significant effort was put forth in determining the least environmentally impactful dredged material placement option that still achieved project goals. Additionally, the channel dredging footprint was modified during the project design to minimize the footprint to the maximum extent while still providing safe passage for navigation. The potential mitigation measures discussed in section 10 may be implemented to mitigate adverse and irretrievable impacts to EFH from the Proposed Action.

Table 10. Summary of the EFH Impacts

Stressor/Impact	Activities Producing the Impact	Determination of Effects	Rationale
Turbidity	– Dredging – Pile driving – DMCF construction	Adverse but not substantial	Temporary reduction in quality of EFH
Underwater Noise	– In-water pile driving	Adverse but not substantial (with 11 dB sound reduction)	Sound attenuation of 11 dB allows for sufficient zone of passage; EFH impacts temporary and minimal from noise
Habitat Alteration	– Dredging – DMCF construction – Pile installation	Adverse and substantial	Deepening of 112 acres of bottom permanently altering EFH foraging habitat Loss of 19.6 acres of open water and EFH habitat from DMCF construction Bottom loss of 0.2 acre of EFH from piles
Vessel Traffic	– Vessel usage of SPCT during construction and long-term operations	Adverse but not substantial	Minimal risk of vessel impacting EFH during short- or long-term vessel use of SPCT
Impingement/Entrainment	– Impingement in mechanical dredge equipment – Entrainment in hydraulic dredge equipment	Adverse but not substantial	Impact is minimal, temporary, and could be alleviated with modifications (fish screens)

10. Potential Mitigation for Adverse Effects on EFH

Mitigation options for substantial adverse effects on EFH are discussed in this assessment at the conceptual level. TTT has presented mitigation options to the regulatory agencies as part of the Joint Evaluation Committee consultations. TTT received comments on potential mitigation options from NMFS on 4 November 2024 and continues to refine options in consideration of these comments to finalize mitigation and develop a plan. The preliminary concepts described below focus on creation and improvement of tidal open water habitat to mitigate for loss of EFH habitat associated with the development of the Coal Pier Channel DMCF and installation of piles to support the marginal wharf and mooring dolphins.

Shoreline areas along TPA property as well as adjacent areas in the Patapsco River were analyzed to assess the existing shoreline conditions and determine areas where there may be potential for on-site mitigation opportunities to mitigate for proposed loss of tidal open-water and EFH habitat associated with the development of the SPCT. Areas investigated included nine separate shorelines areas, including four areas along Bear Creek shoreline on the north and west sides of the property, two areas along the Patapsco River on the south side of the property, and four areas along Jones Creek and Old Road Bay on the east side of the property.

10.1. Open Water Creation

Several areas around SPCT are being considered for open water creation. Actions would include removing land to create shallow areas with tidal wetland fringe to support EFH species. These options are in early development and consideration but could include a total of 11.6 acres of new open water as follows:

- Removal of 5.5 acres of land at North Point and Pleasant Yacht clubs and removal of existing docks and slips. Creation of tidal wetland edge along new shoreline.
- Removal of 2.1 acres of man-made land at Craighill Peninsula (near Old Road Bay and Jones Creek) to create open water.
- Removal of the Southeast Peninsula finger upland area to create 4.0 acres of new open water.

10.2. Multi-Habitat Restoration and Creation

The multi-habitat restoration and creation actions would provide greater edge-to-water ratio than what currently exists, which would promote use and provide greater sheltered and protected areas for EFH species. The layered effect of the actions would provide multiple ecological benefits and considerable ecological uplift at the project site as compared to creating a single habitat type.

An area being considered for this type of mitigation is the Bethlehem Boulevard area. This may include the following actions, benefiting 8.5 acres of open water:

- Placing a perimeter sill of natural rock and/or other nature-based system structures (e.g., NATRX, reef castles, reef balls) along edge areas to promote use of the sites by multiple types of aquatic species and contain materials used to create other nearshore habitats, improving 0.21 acres of existing habitat.

- Improving the bottom surface substrate of tidal open water by introducing a zone of more natural cobble, gravel, shell, and sand material, and removing and replacing any human-made materials that appear to currently underlie some of the area. Planting or SAV seeding behind the perimeter sill may also be considered. This would improve 6.5 acres of existing habitat. The wetlands would also improve water quality and filtering of waters at the site in this highly urban watershed. The SAV provides refuge for crabs, juvenile and small fish, and foraging sites for larger EFH species. In particular, Summer Flounder may benefit from SAV restoration, as they utilize beds heavily and it is their HAPC.
- Improving tidal wetland area (low to high marsh habitat) by improving substrate with habitat structures introduced into the shallow water areas would support EFH prey by improving benthic conditions, providing shellfish attachment sites, and providing habitat improvements including feeding, foraging, and cover areas for tidal adult finfish, juvenile herring, and White Perch spawning. This would improve approximately 1.75 acres of open water.
- Tidal wetland enhancement and phragmites control could be proposed along 1.7 acres of shoreline near Bethlehem Boulevard.
- Additional options include the creation of oyster reefs potentially around the DMCF at Coal Pier Channel and other nearby areas.
- Crab pot recovery.

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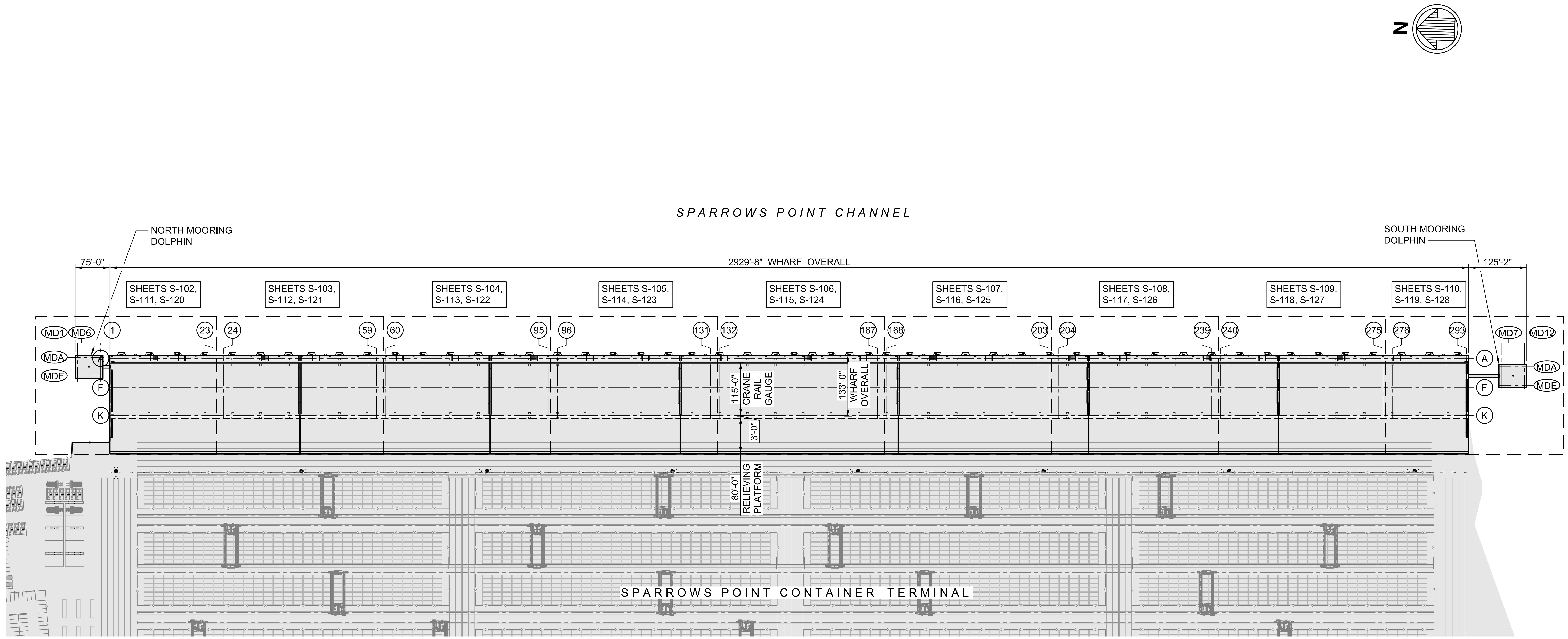
Attachment A: 30% Design Plans for Channel Dredging, Pile Driving, Wharf Construction, and Coal Pier Channel DMCF Construction

Wharf Pile Plans



B1 S-101 PLAN - STRUCTURAL GENERAL ARRANGEMENT AND KEY

SCALE: 1"=120'

120' 0' 120' 240'

SCALE: 1"=120'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark | Description | Date | Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - STRUCTURAL GENERAL ARRANGEMENT AND KEY

Designed by: IS | Dwn by: RG | Reviewed by: | Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Ckd by: IS | GS
Date: 2024-01-30 | Rev.
M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

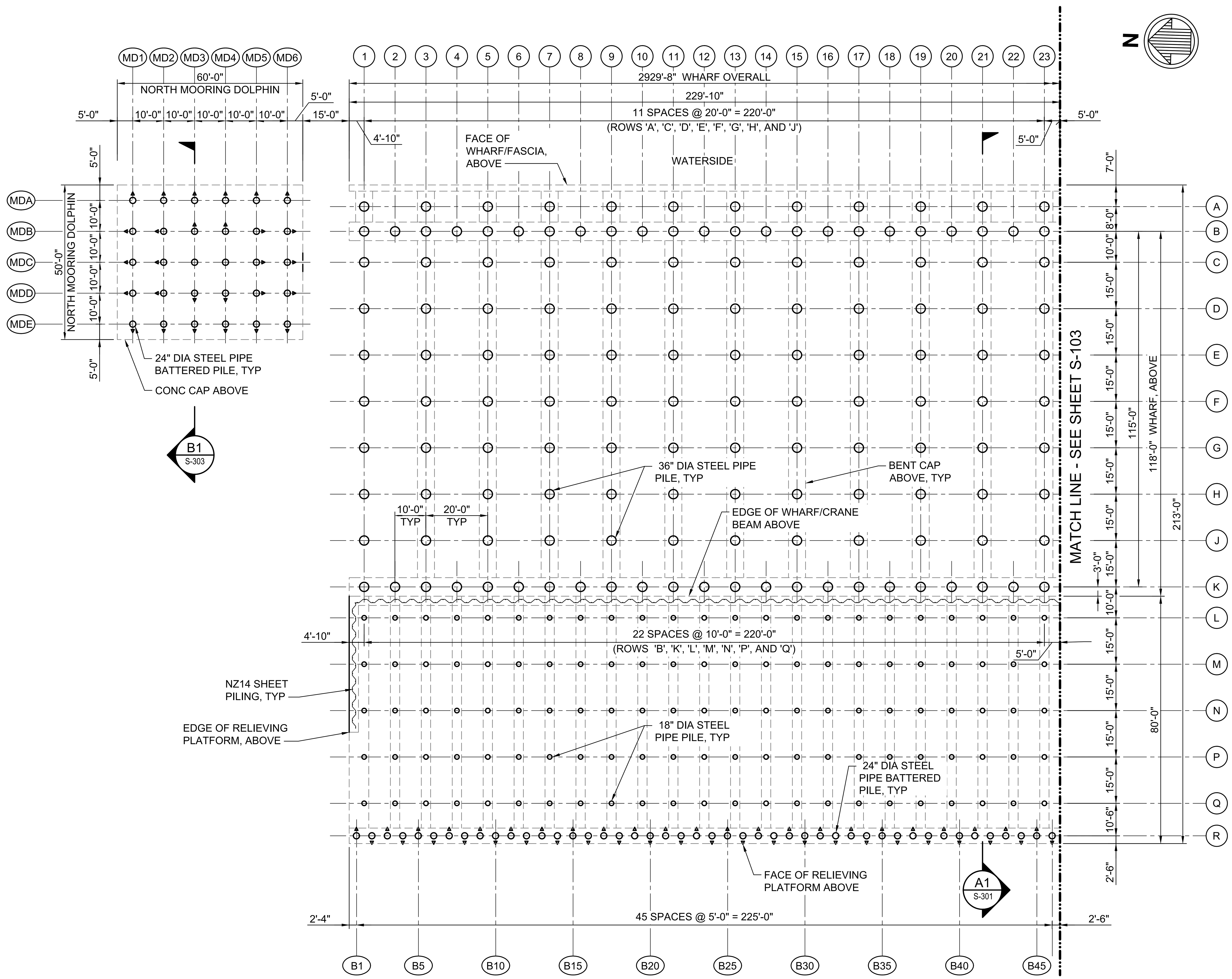
6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

SEAL

I, MEHEDI RASHID, HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. #####
EXPIRATION DATE: ##/##/202#

Sheet Reference No.
S-101
INDEX: 136 OF 242

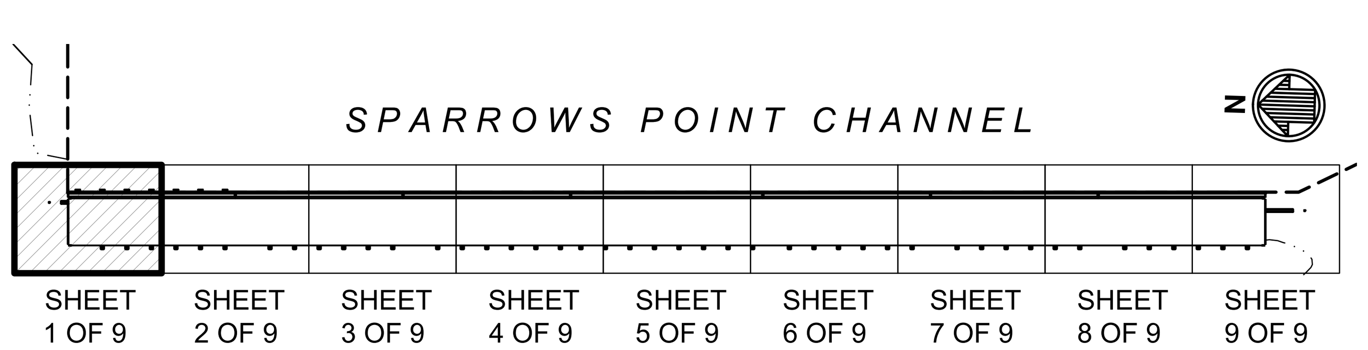
File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329S-101 ; Plotted: 1/30/2024 6:15 PM by VOELKER, PAUL ; Saved: 1/12/2024 12:43 PM by RGERCHIKOVA



B1
S-102

PLAN - PILE (SHEET 1 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 1 OF 9)

Designed by: IS		Date: 2024-01-30	Rev.
Dwn by: RG	Ckd by: IS	M&N Project No. 230329	
Reviewed by: GS		Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

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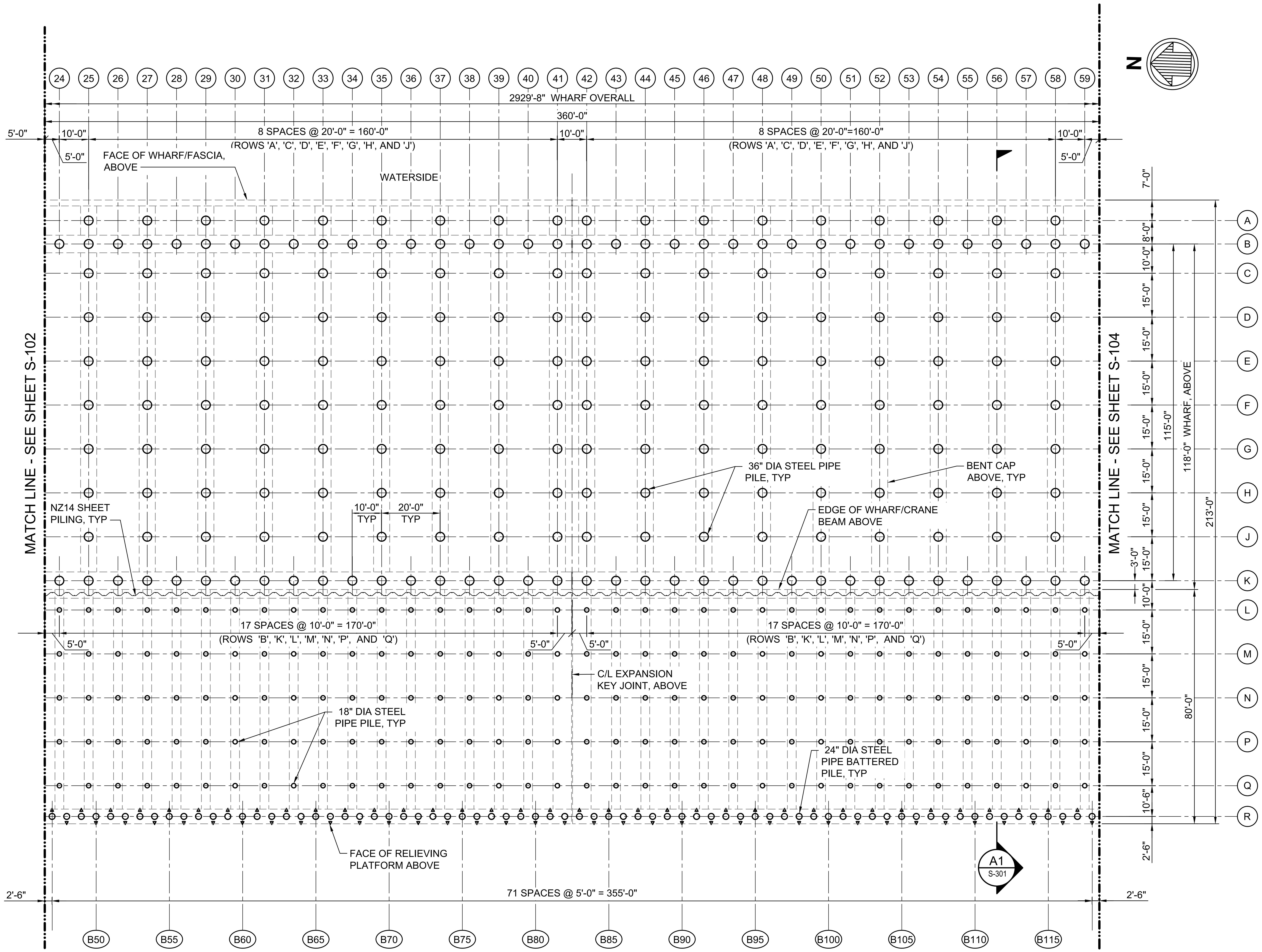
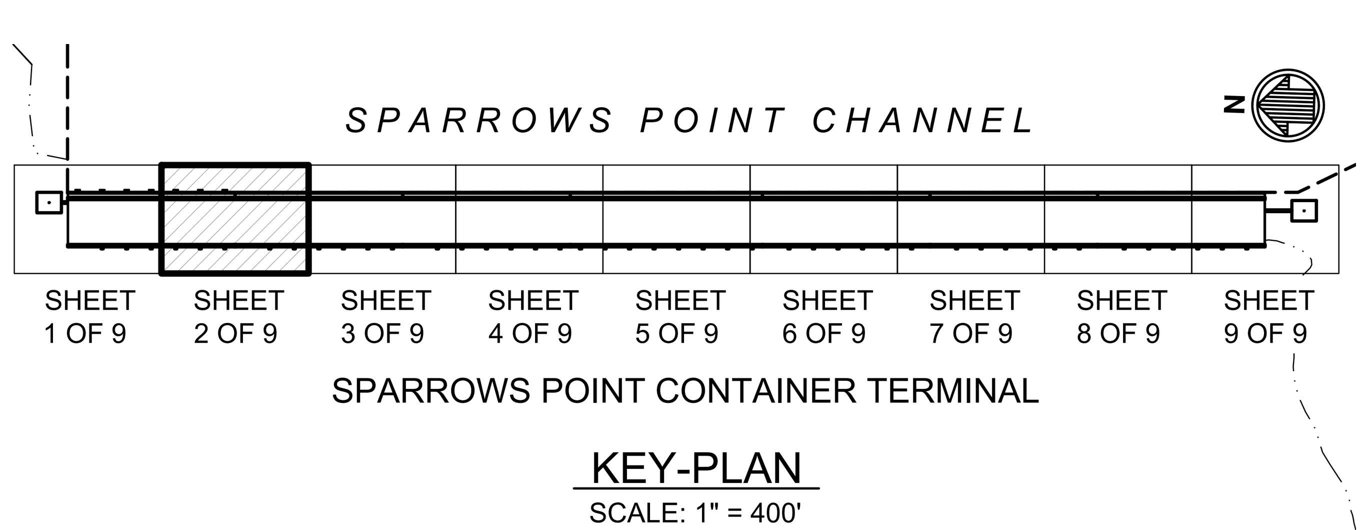


B1
S-103

PLAN - PILE (SHEET 2 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 2 OF 9)

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410-563-7300

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SUITE 100
BALTIMORE, MD 21219

Designed by: IS
Dwn by: RG
Chk'd by: IS
Reviewed by: GS
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL
Date: 2024-01-30
M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:

Sheet Reference No.
S-103
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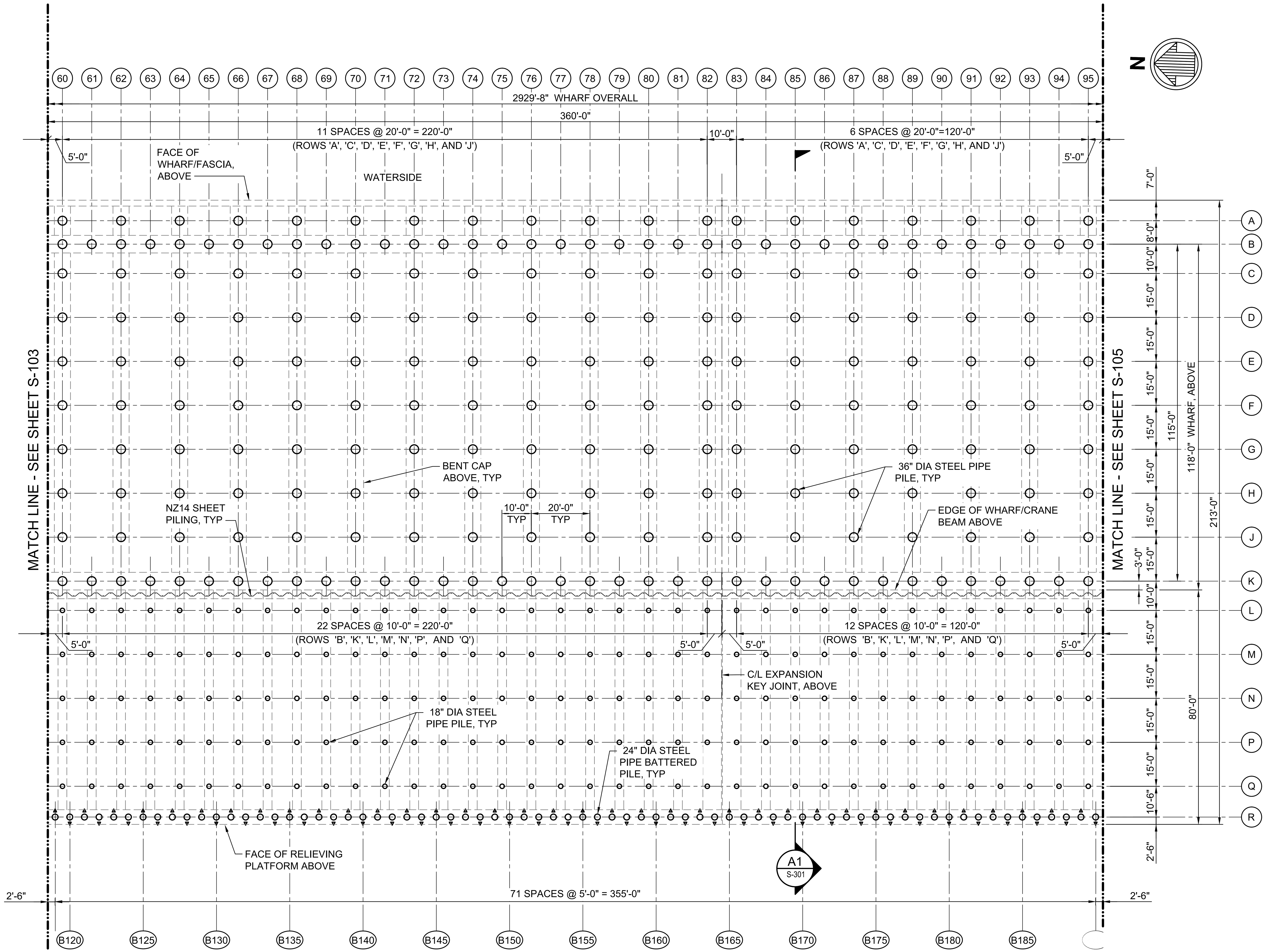
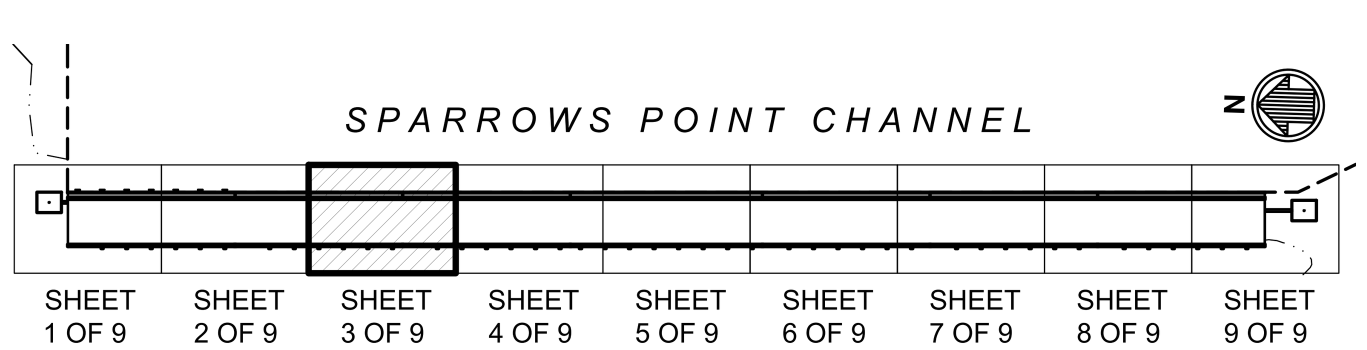


B1 S-104 PLAN - PILE (SHEET 3 OF 9)
SCALE: 1" = 20'



SPARROWS POINT CONTAINER TERMINAL

KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 3 OF 9)

Designed by: IS	Date: 2024-01-30	Rev.
Dwn by: RG	Ckd by: IS	M&N Project No. 230329
Reviewed by: GS	Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)	

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-104
INDEX: 139 OF 242

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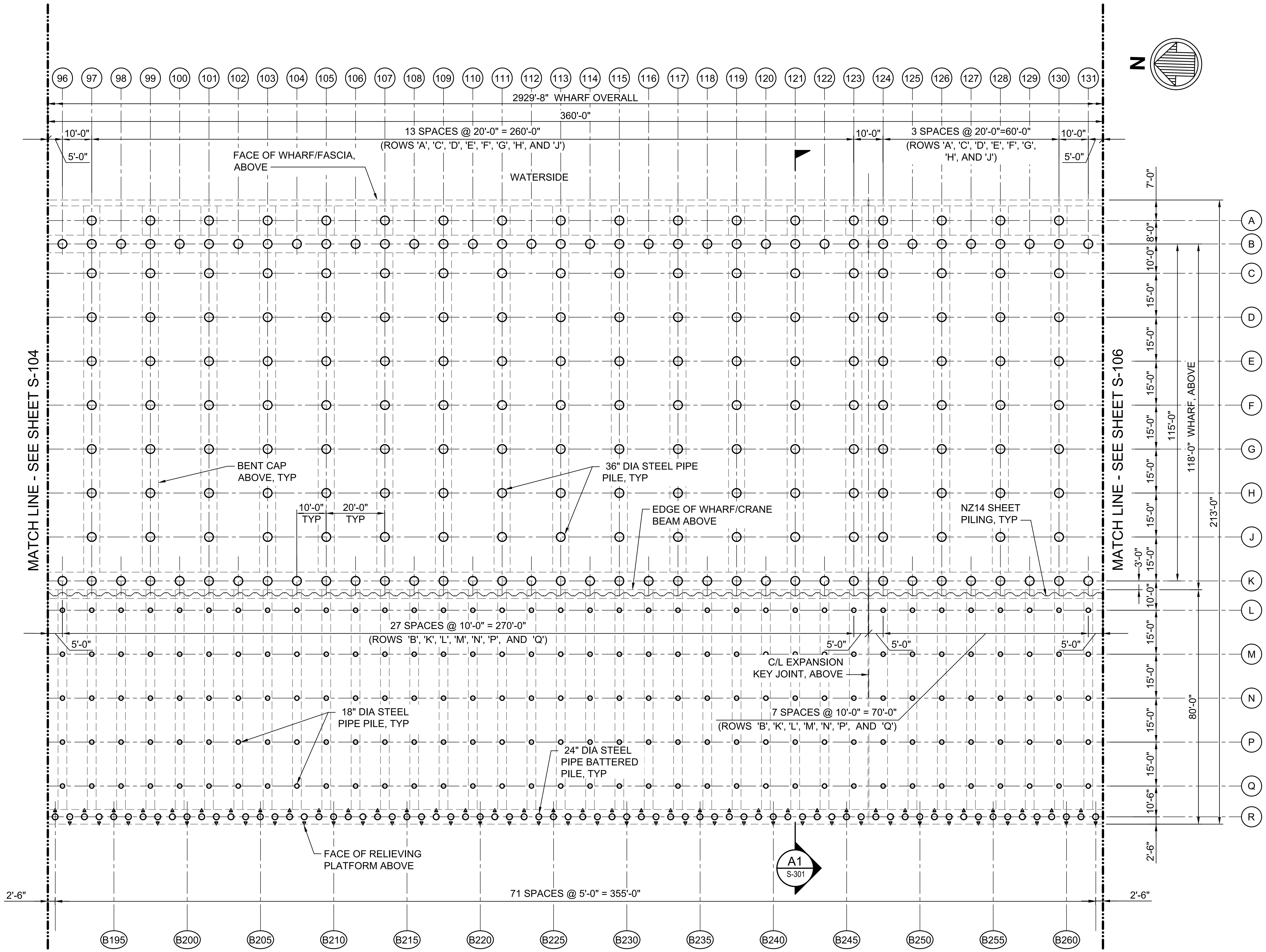
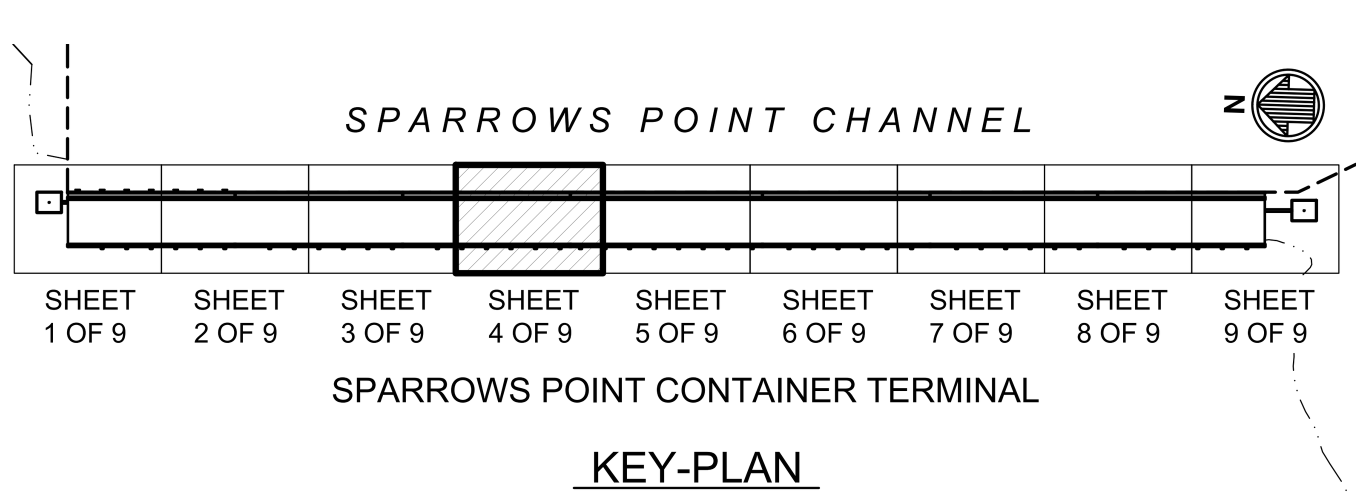


B1 S-105 PLAN - PILE (SHEET 4 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
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TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 4 OF 9)

Designed by: IS | Dwn by: RG | Reviewed by: | Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30 | Ckd by: IS | GS
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M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:

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Sheet Reference No.
S-105
INDEX: 140 OF 242

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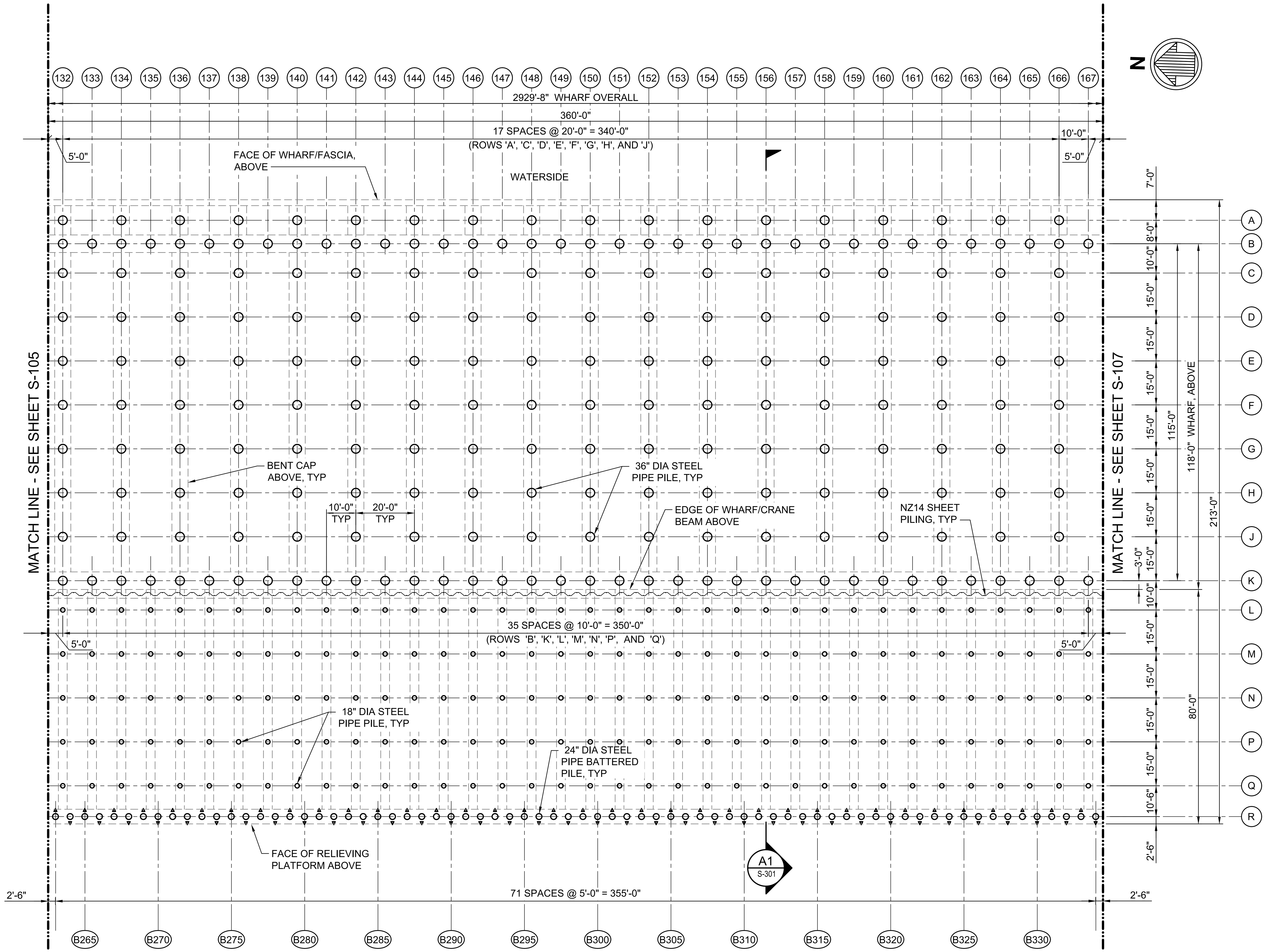
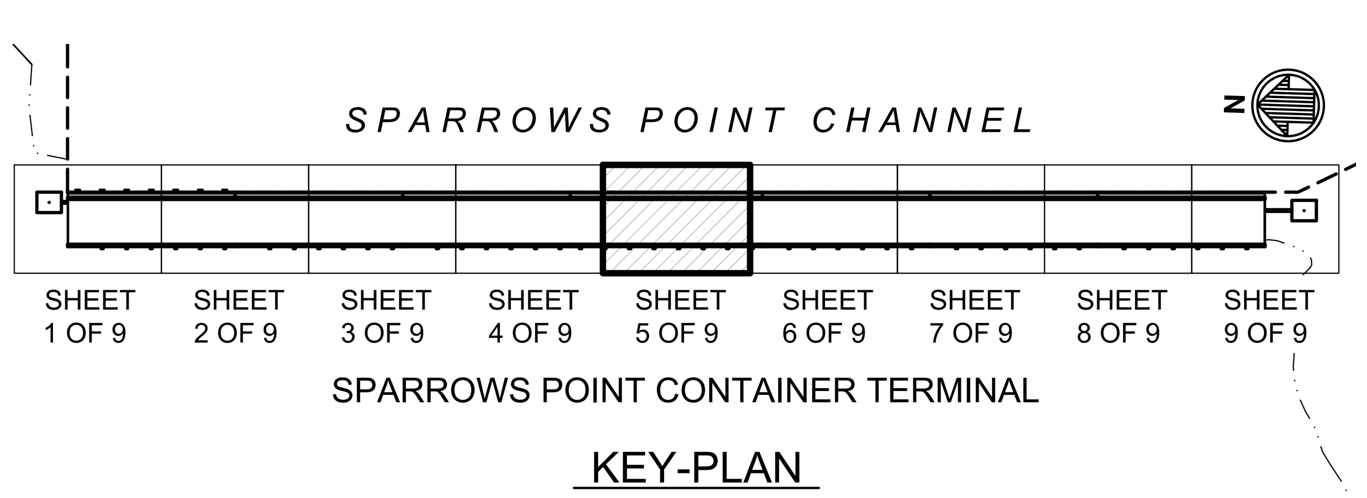


B1 S-106 PLAN - PILE (SHEET 5 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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PLAN - PILE (SHEET 5 OF 9)

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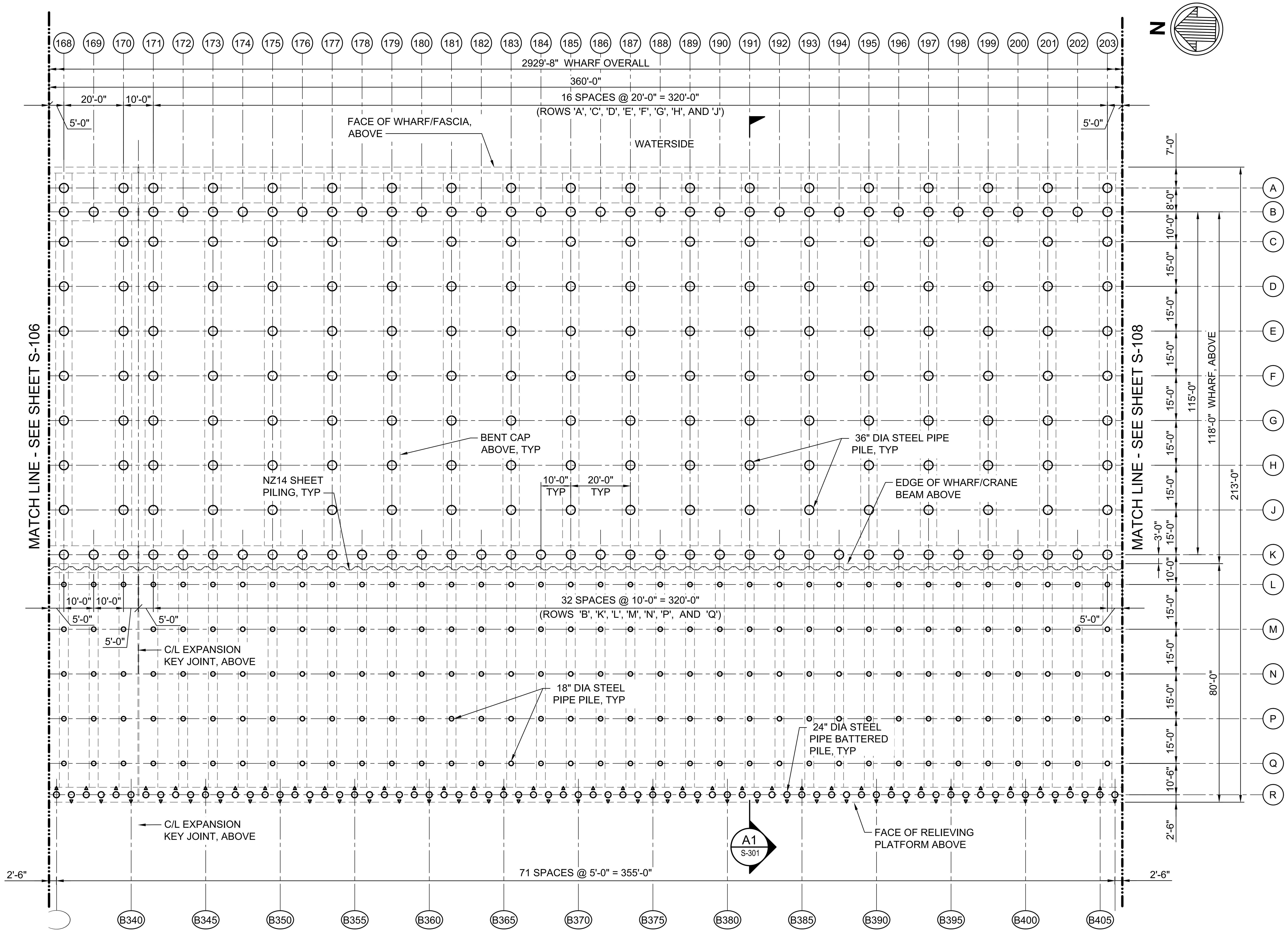
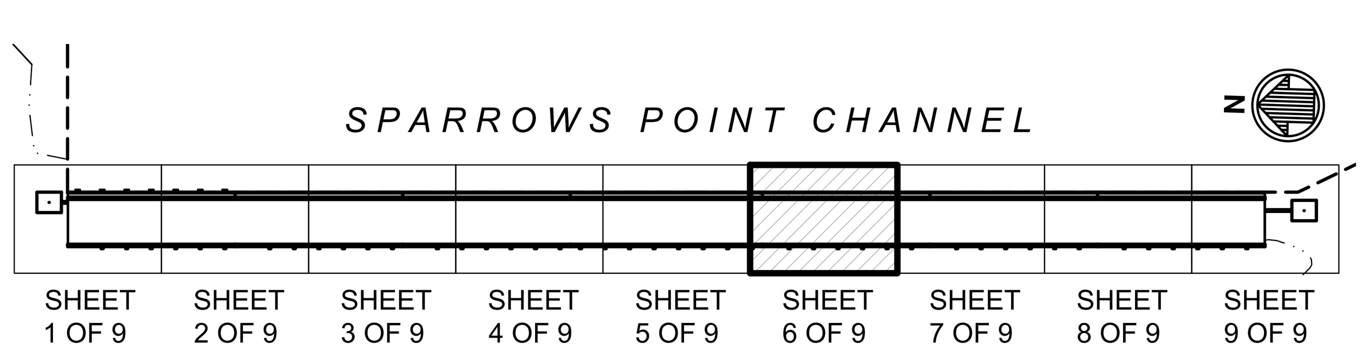
M&N Project No. 230329	Rev.
Reviewed by: GS	Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: 1:1 (D SHEET)

Sheet Reference No.
S-106
INDEX: 141 OF 242



B1 S-107 PLAN - PILE (SHEET 6 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

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TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 6 OF 9)

Designed by: IS	Date: 2024-01-30
Dwn by: RG	Chk'd by: IS
M&N Project No. 230329	Drawing code:
Reviewed by: GS	Submitted by: ERIC D. SMITH, MOFFATT & NICHOL
Drawing Scale: 1:1 (D SHEET)	Plot scale:

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Sheet Reference No.
S-107
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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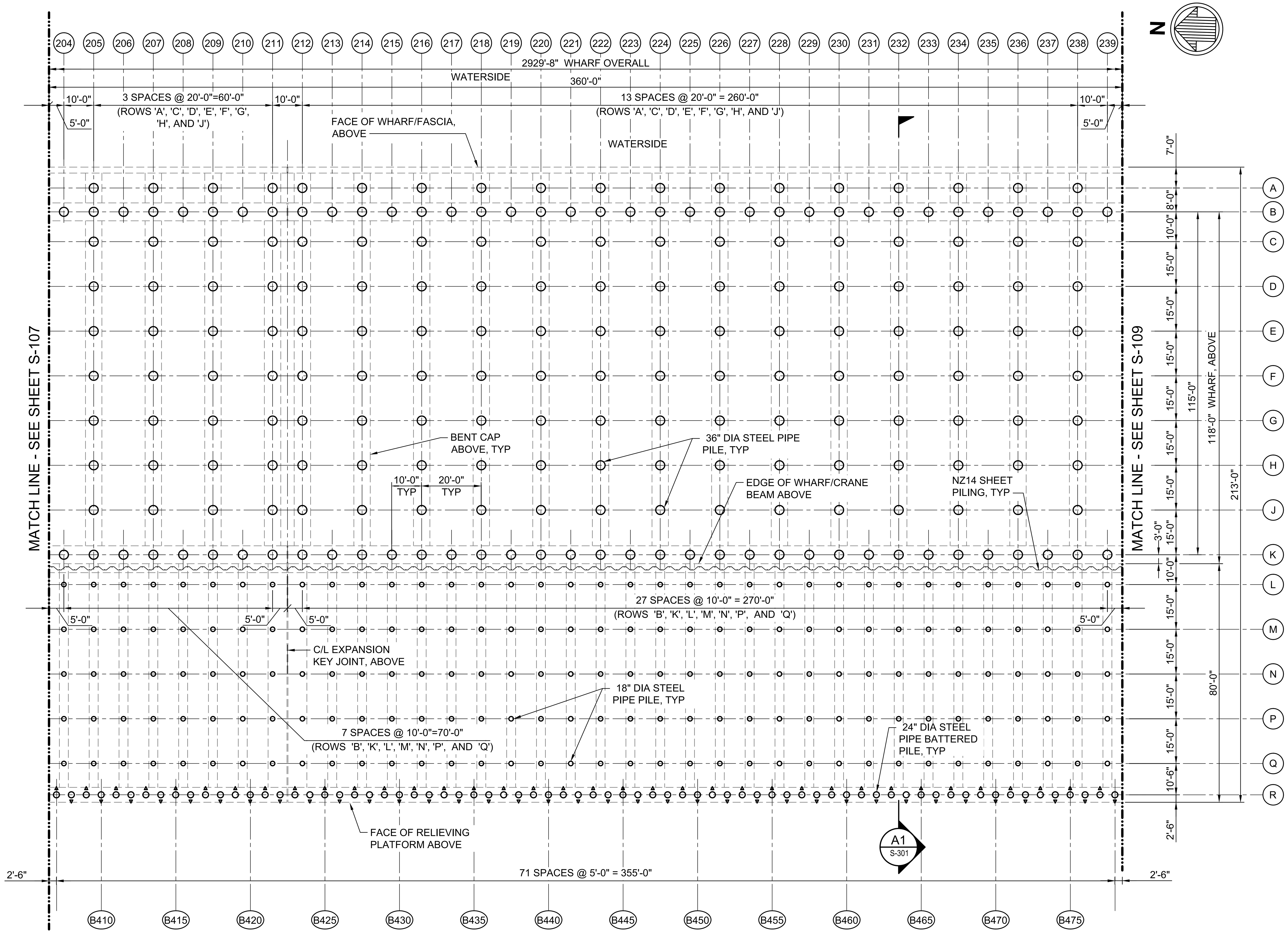
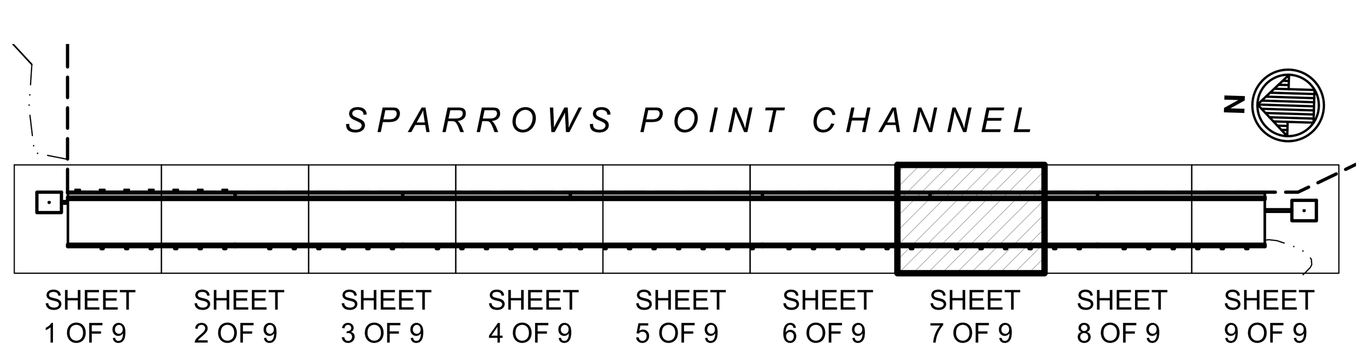


B1
S-108
PLAN - PILE (SHEET 7 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 7 OF 9)

Designed by: IS
Dwn by: RG
Reviewed by: GS
Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30
Chk'd by: IS
Rev.
M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300
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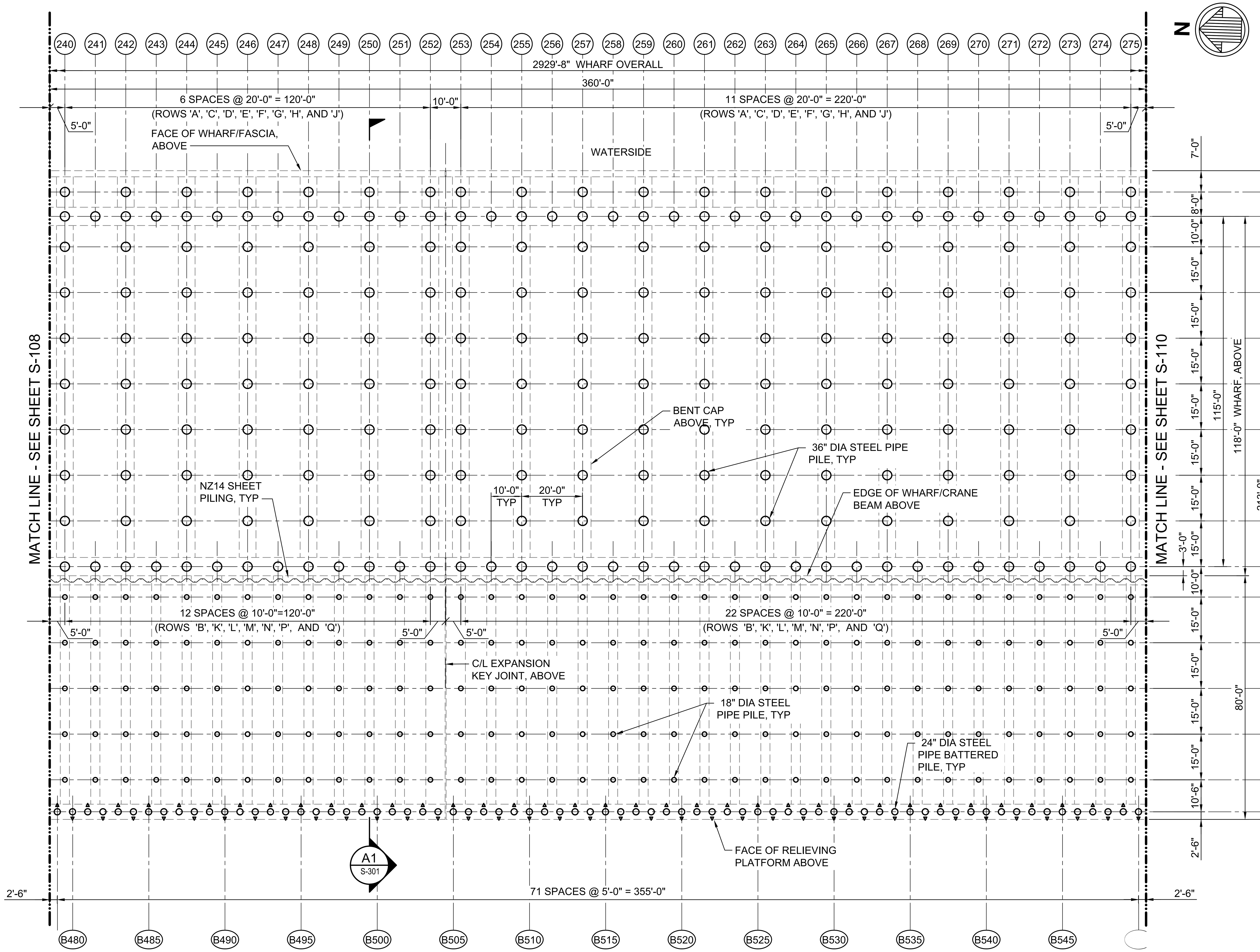
SUITE 100
BALTIMORE, MD 21219

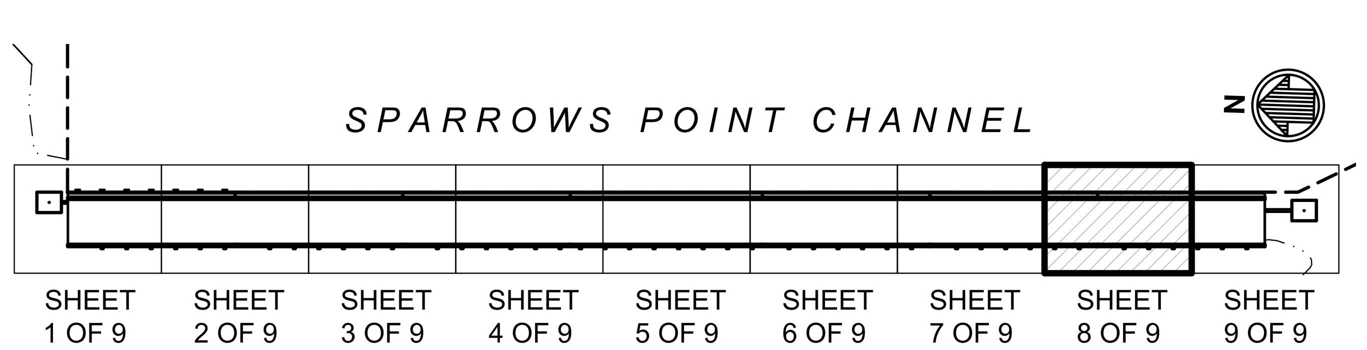
SPARROWS POINT CONTAINER TERMINAL

Sheet Reference No.
S-108
INDEX: 143 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 S-109 PLAN - PILE (SHEET 8 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 8 OF 9)

Designed by: IS
Dwn by: RG
Chk'd by: IS
Reviewed by: GS
Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30
M&N Project No. 230329
Drawing Scale: 1:1 (D SHEET)

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Sheet Reference No.
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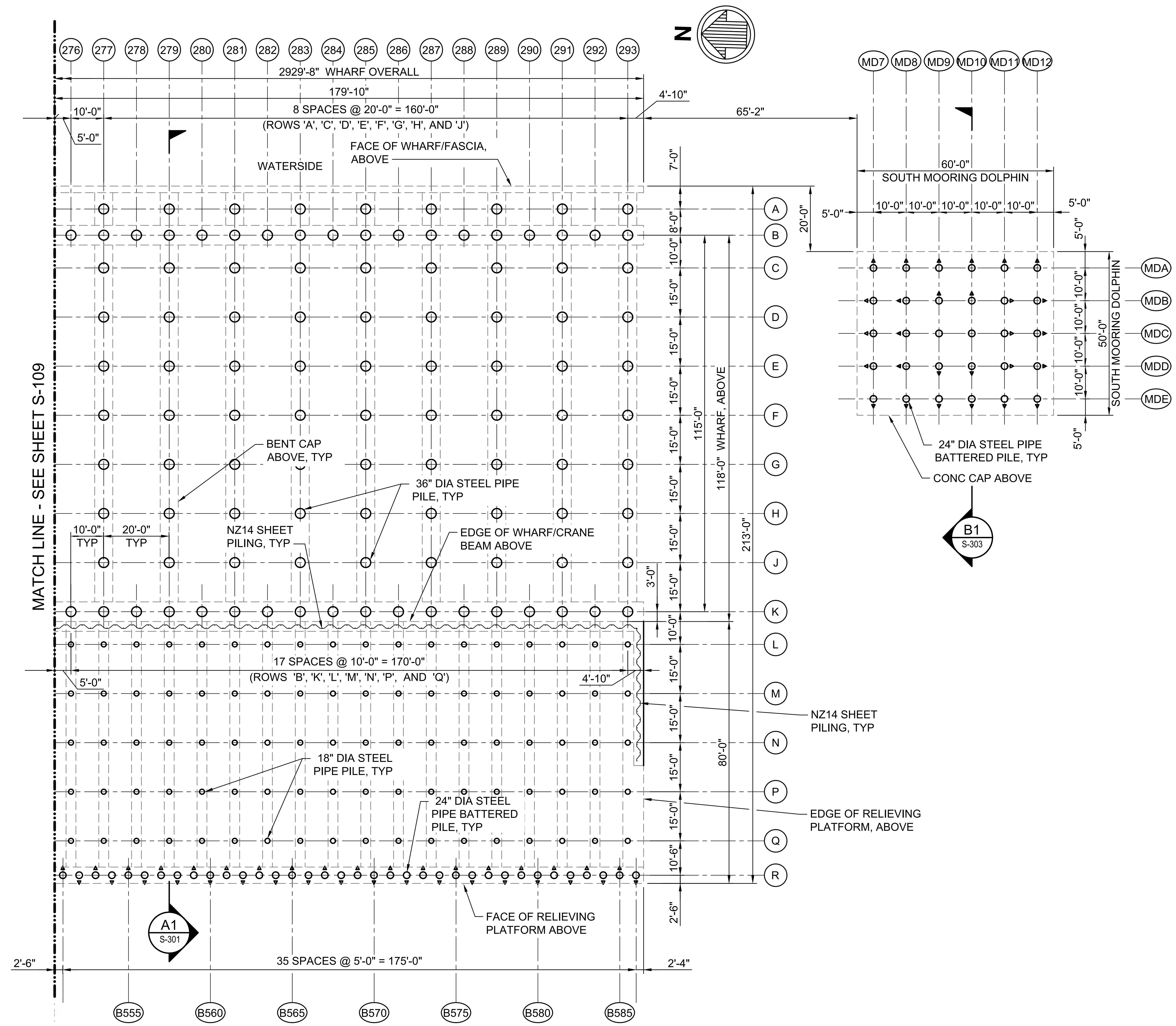
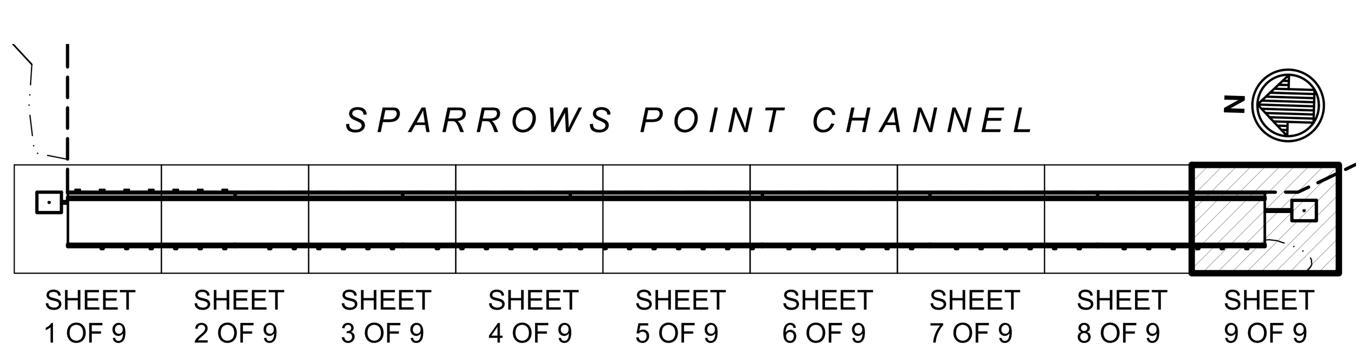
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 S-110 **PLAN - PILE (SHEET 9 OF 9)**
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 9 OF 9)

Date: 2024-01-30	Rev.	M&N Project No. 230329	
Designed by: IS	Chk'd by: IS	Drawing code:	
Dwn by: RG	Reviewed by: GS	Drawing Scale: 1:1 (D SHEET)	Plot scale:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL			

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-110
INDEX: 145 OF 242

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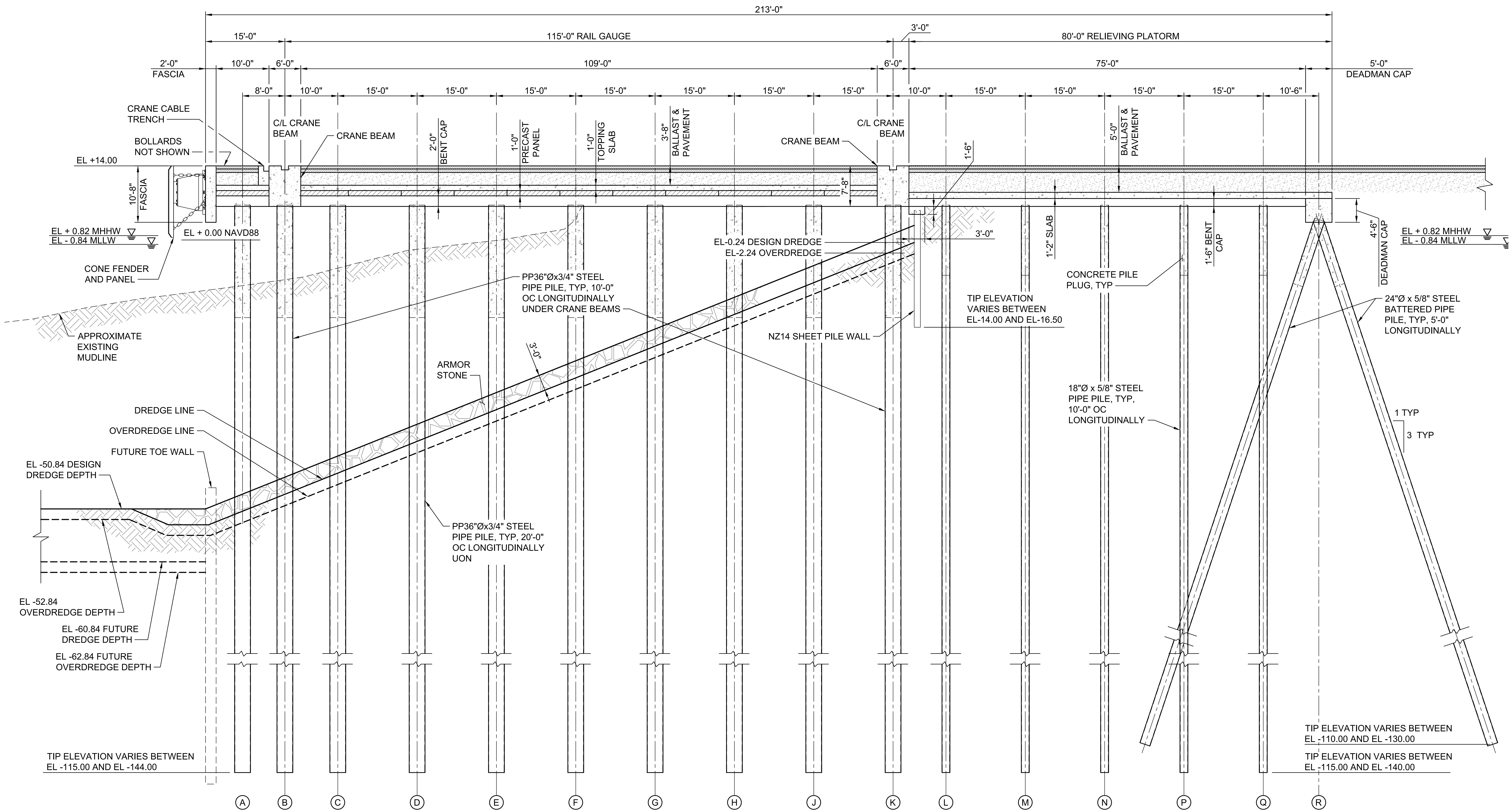
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1
S-301

SECTION - TYPICAL WHARF (SHEET 1 OF 2)

SCALE: 1" = 10'

NOTE:

ALL ELEVATIONS ARE BASED ON NAVD88 DATUM.

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTION - TYPICAL WHARF (SHEET 1 OF 2)

Designed by: IS	Date: 2024-01-30	Rev.	
Dwn by: RG	Ckd by: IS	M&N Project No. 230329	
Reviewed by: GS	Drawing code:		
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale:	Plot scale: 1:1 (D SHEET)	

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410-563-7300

6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
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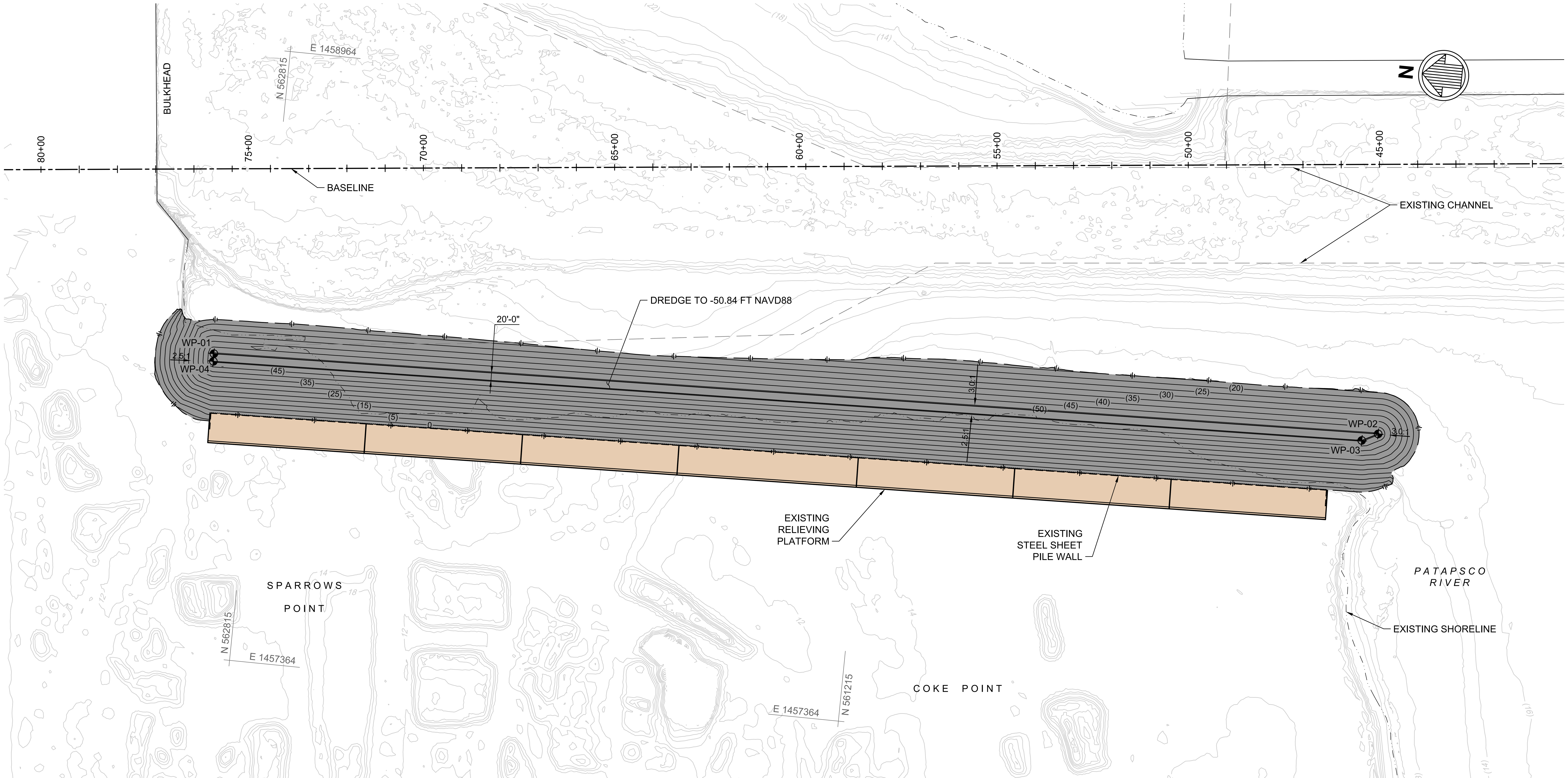
Channel Dredging Plans



C1 / CN101 PLAN - DREDGING PHASE 1

SCALE: 1" = 150'

DREDGING PHASE 1 WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-01	562935.30	1458158.35
WP-02	559885.09	1458251.93
WP-03	559926.17	1458230.66
WP-04	562934.69	1458138.36

LEGEND:

- PHASE 1 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- (40) DESIGN DEPTH CONTOURS NAVD88
- (34) EXISTING DEPTH CONTOURS NAVD88
- BASELINE

150' 0' 150' 300'

SCALE: 1"=150'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

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SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - DREDGING PHASE 1

Date: 2024-01-30 | Rev. | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET)

Designed by: PWK | Dwn by: ED | Ckd by: PGV | Reviewed by: SM | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN102
INDEX: 24 OF 242

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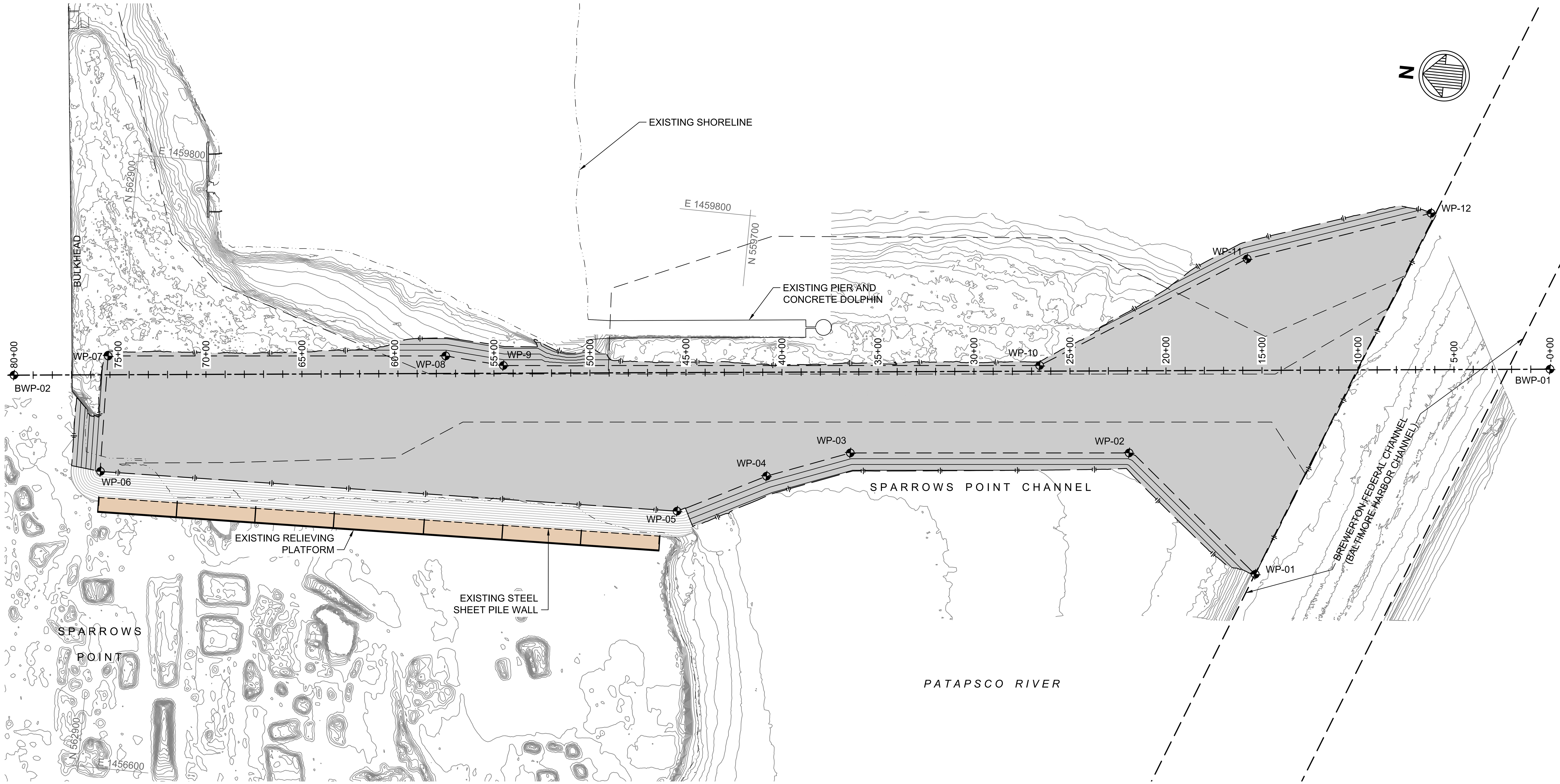
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



C1
CN101

PLAN - DREDGING PHASE 2

SCALE: 1" = 300'

DREDGING CHANNEL WORKING POINTS TABLE		
WP-##	NORTHING	EASTING
WP-01	556896.85	1458202.47
WP-02	557613.46	1458766.30
WP-03	559058.50	1458622.10
WP-04	559480.86	1458458.36
WP-05	559926.17	1458230.66
WP-06	562934.69	1458138.36

DREDGING CHANNEL WORKING POINTS TABLE		
WP-##	NORTHING	EASTING
WP-07	562954.38	1458740.44
WP-08	561205.76	1458915.38
WP-9	560901.83	1458895.46
WP-10	558122.30	1459172.82
WP-11	557102.27	1459832.95
WP-12	556172.88	1460164.75

LEGEND:

EXISTING PHASE 1 DREDGE AREA.

PHASE 2 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.

(40) DESIGN DEPTH CONTOURS NAVD88

(34) EXISTING DEPTH CONTOURS NAVD88

BASELINE

300' 0' 300' 600'

SCALE: 1"=300'

30% DESIGN SUBMITTAL
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BALTIMORE MARYLAND 21219

PLAN - DREDGING PHASE 2

Designed by: PWK | Dwn by: ED | Ckd by: PGV | Date: 2024-01-30 | Rev.
M&N Project No. 230329
Drawing code:
Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Drawing Scale: 1:1 (D SHEET)
Plot scale:

moffatt & nichol
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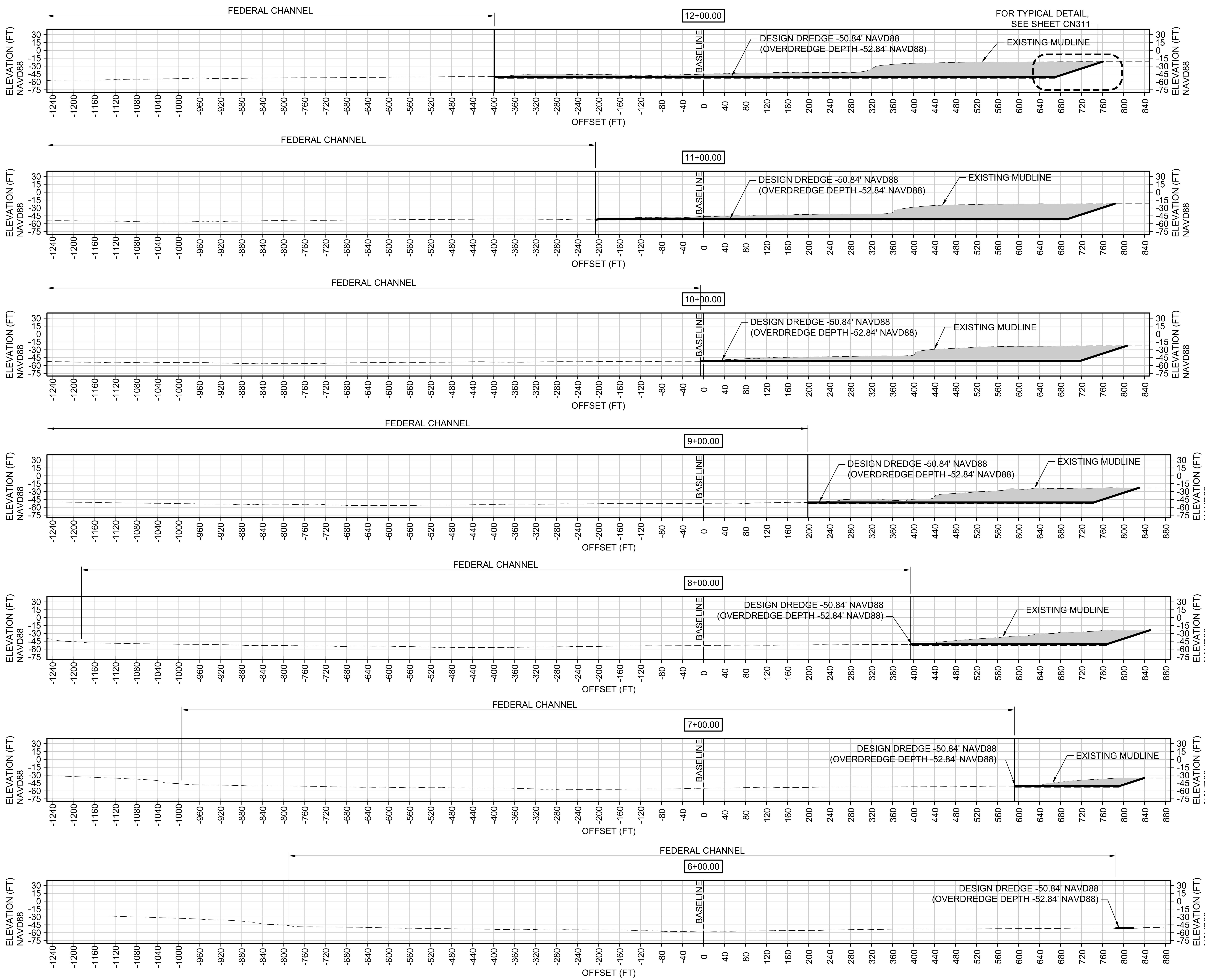

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 1 OF 11)

Designed by: PWK	Date: 2024-01-30
Dwn by: ED	Ckd by: PGV
M&N Project No. 230329	Rev.
Reviewed by: SM	Drawing code:
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL	Drawing Scale:
Plot scale: 1:1 (D SHEET)	

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Mark | Description | Date | Appr

Sheet Reference No.
CN301
INDEX: 26 OF 242

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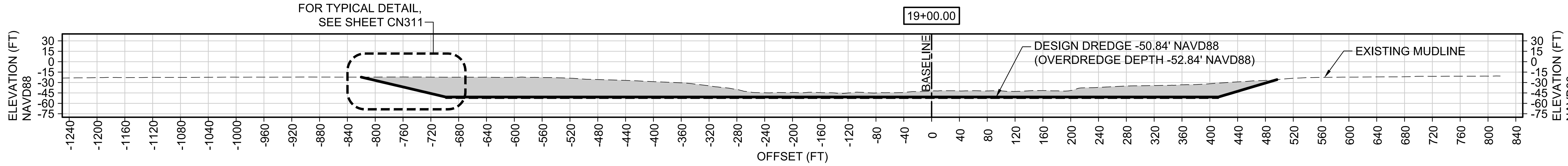

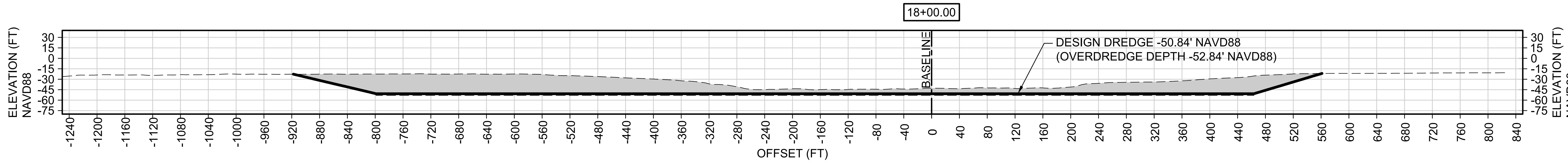

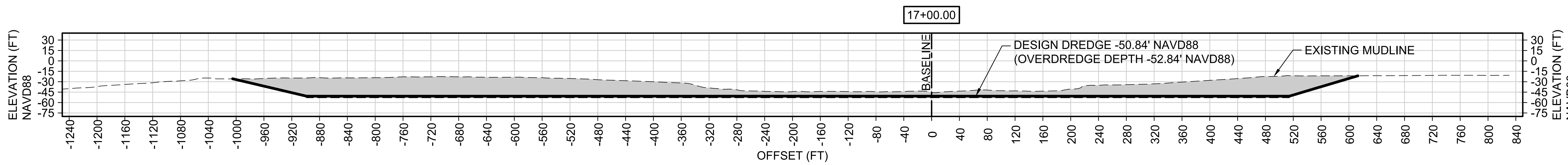

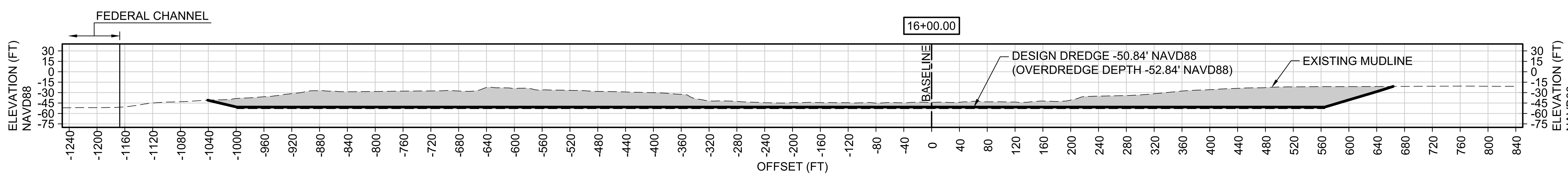

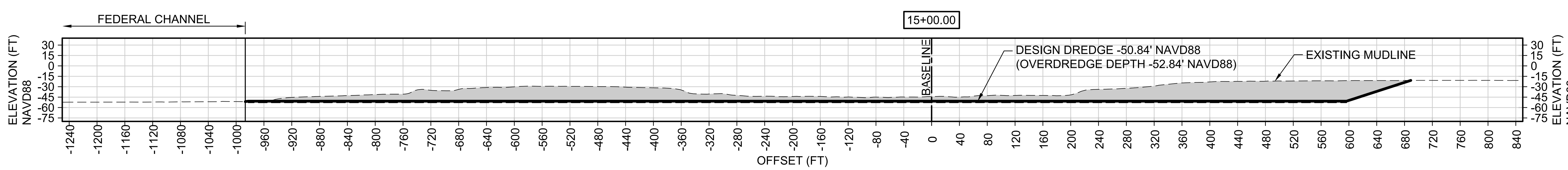

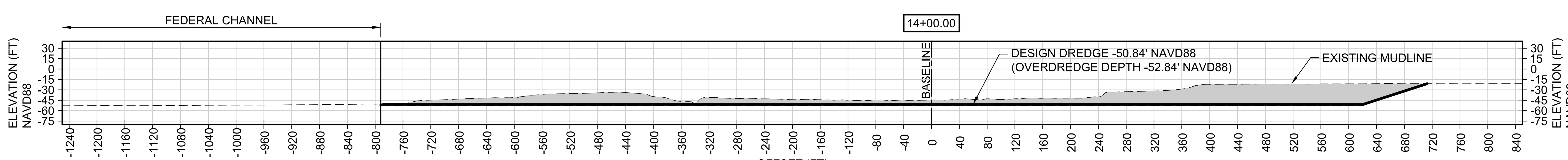

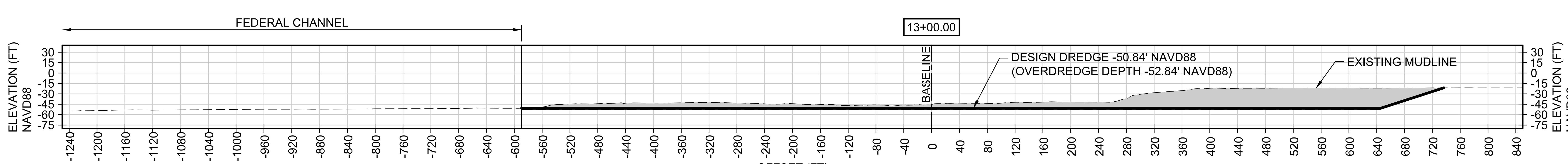

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 2 OF 11)

Designed by: PWK	Date: 2024-01-30
Dwn by: ED	Ckd by: PGV
M&N Project No. 230329	Rev.
Reviewed by: SM	Drawing code:
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL	Drawing Scale:
Plot scale: 1:1 (D SHEET)	

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6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN302
INDEX: 27 OF 242

Mark | Description | Date | Appr.

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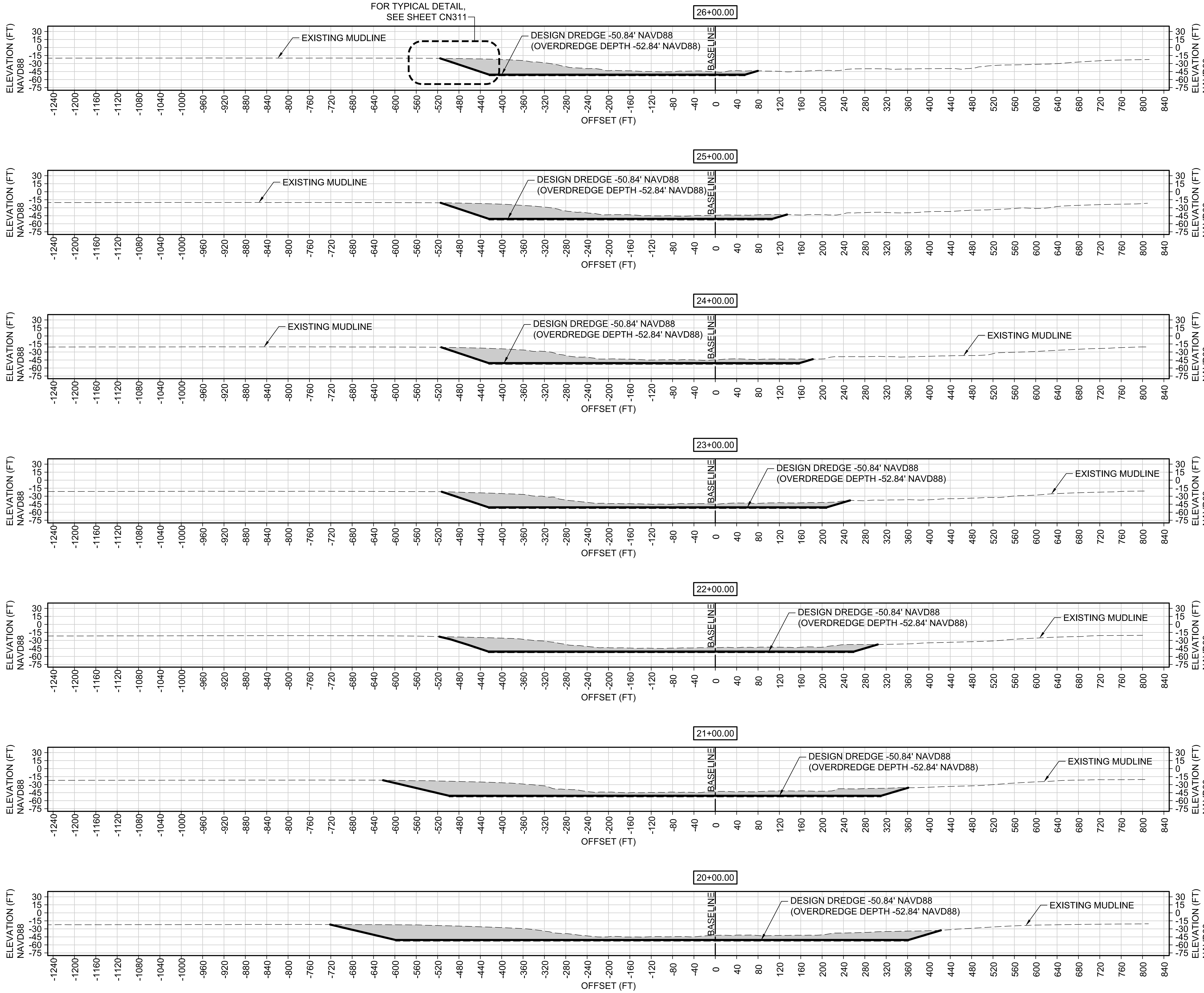
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 3 OF 11)

Date: 2024-01-30			Rev.
M&N Project No. 230329			
Drawing code:			
Drawing Scale: 1:1 (D SHEET)		Plot scale:	
Designed by: PWK	Dsn by: ED	Ckd by: PGV	
Reviewed by: SM			
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL			

moffatt & nichol
2780 LIGHTHOUSE POINT EAST,
STE. D BALTIMORE, MD 21224
410-563-7300

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN303
INDEX: 28 OF 242

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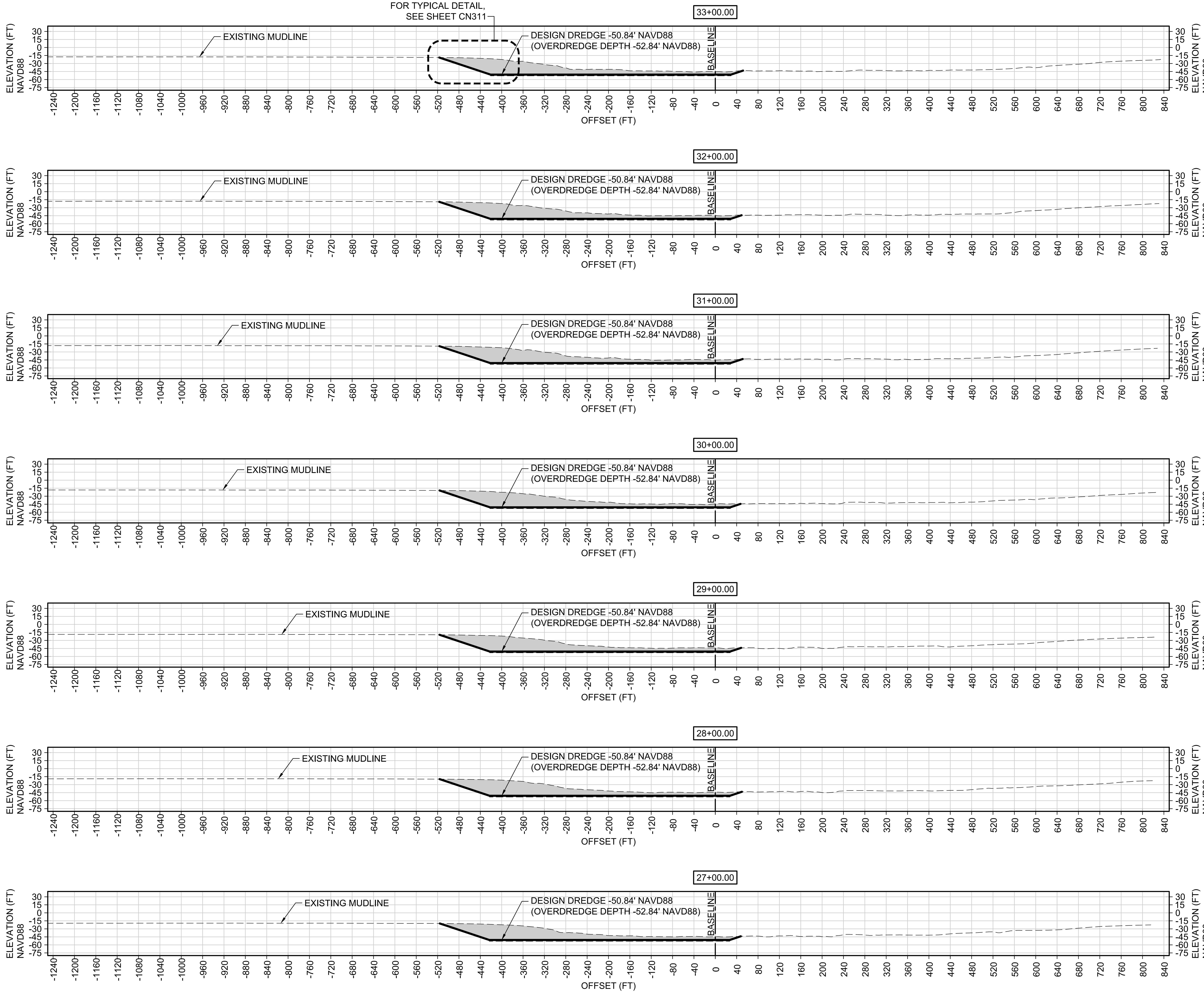

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 4 OF 11)

Designed by: PWK	Date: 2024-01-30	Rev.	
Dwn by: ED	Ckd by: PGV	M&N Project No. 230329	
Reviewed by: SM	Drawing code:		
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale:	Plot scale: 1:1 (D SHEET)	

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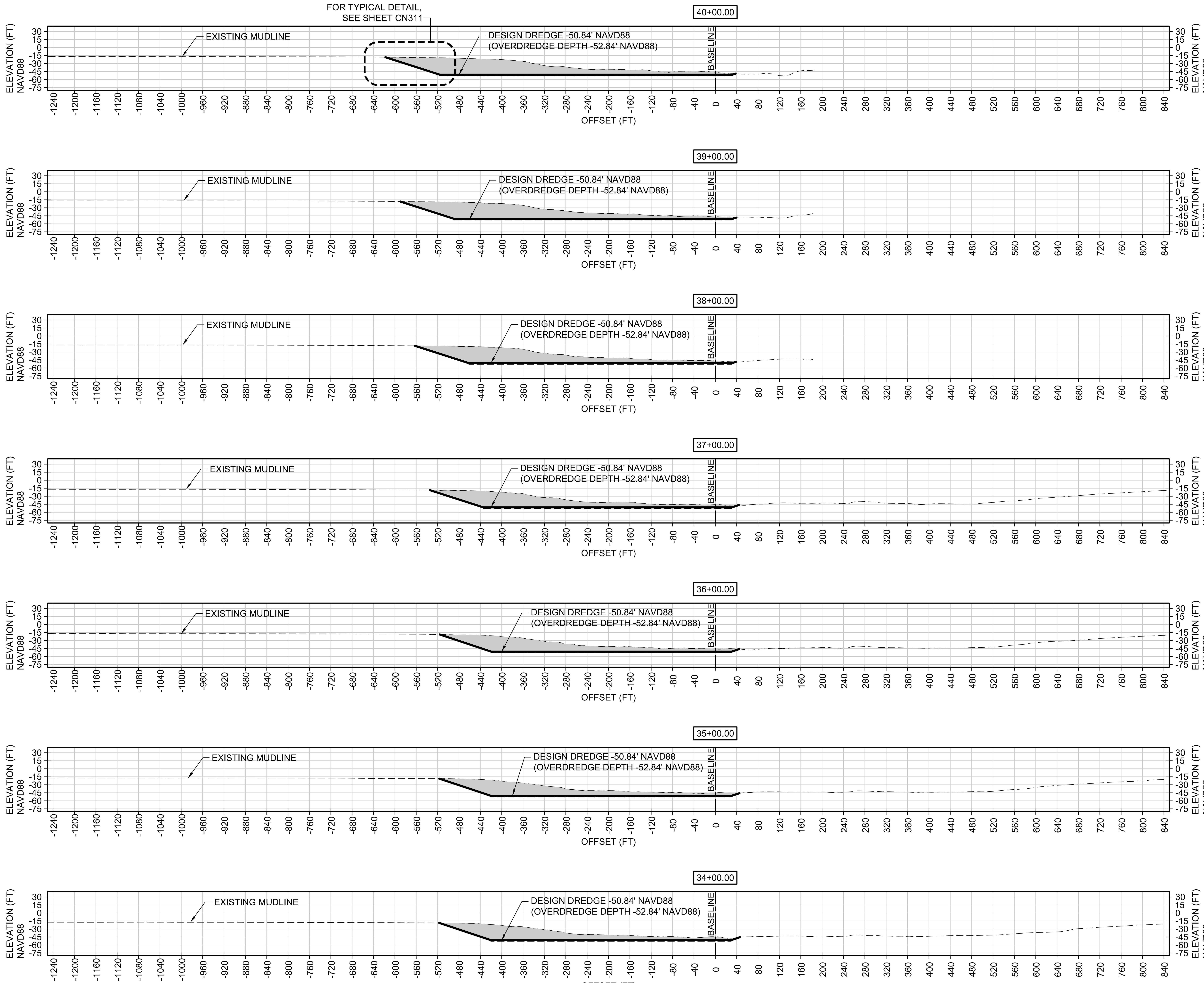
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN304

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 5 OF 11)

Designed by: PWK	Date: 2024-01-30
Dwn by: ED	Ckd by: PGV
M&N Project No. 230329	Rev.
Reviewed by: SM	Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN305
INDEX: 30 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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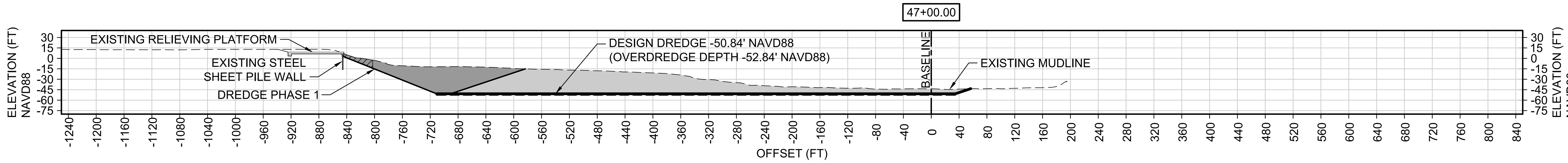

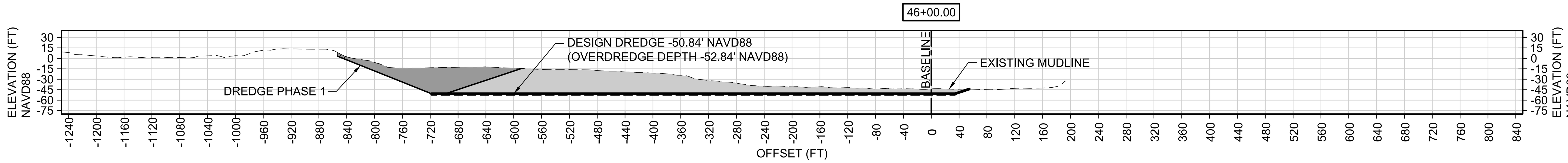

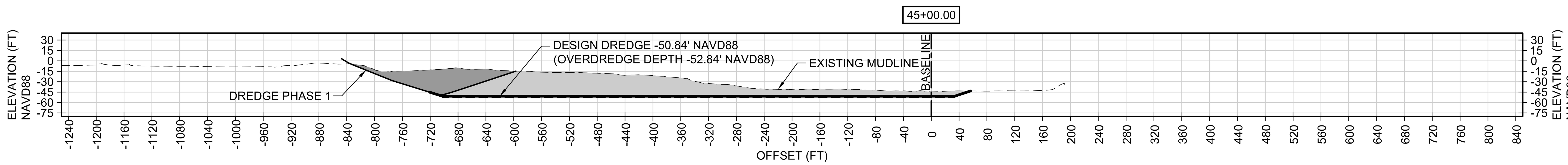

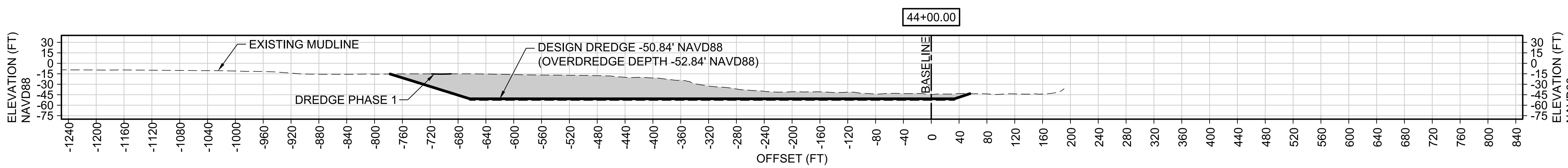

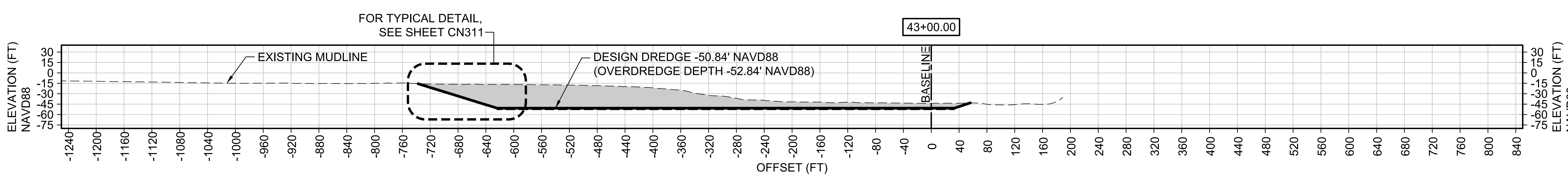

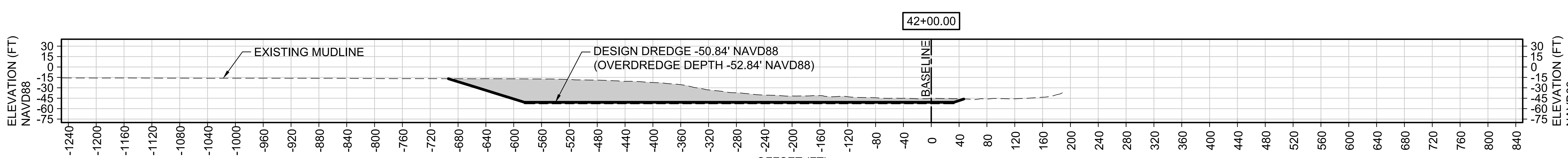

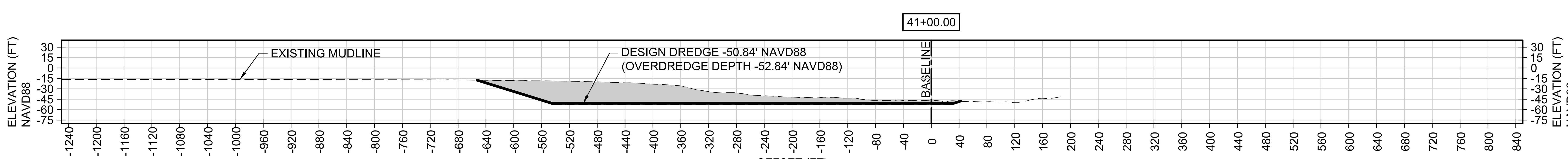

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 6 OF 11)

Rev.
Date: 2024-01-30
M&N Project No. 230329
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: PWK
Dsn by: ED
Ckd by: PGV
Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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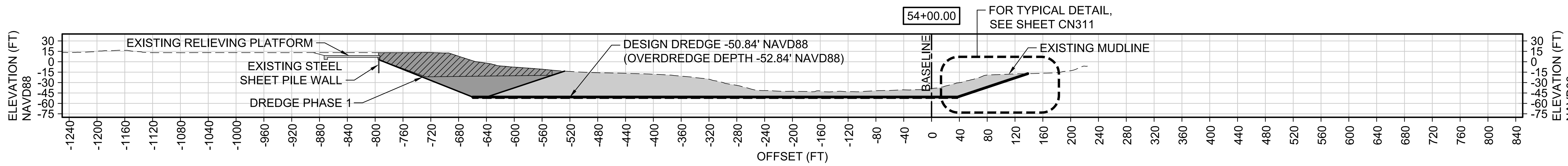
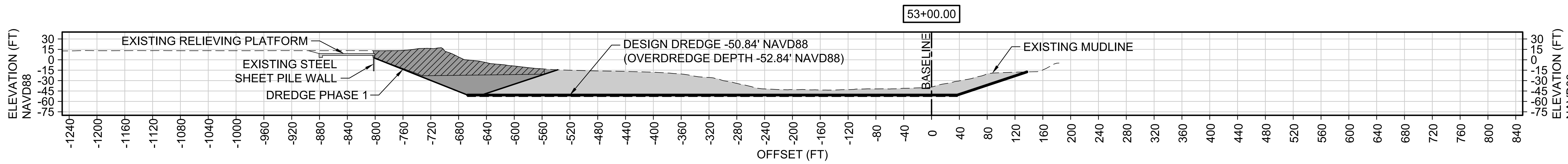
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

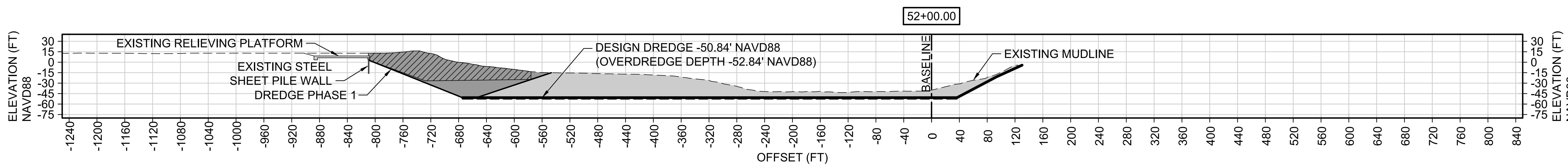
6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

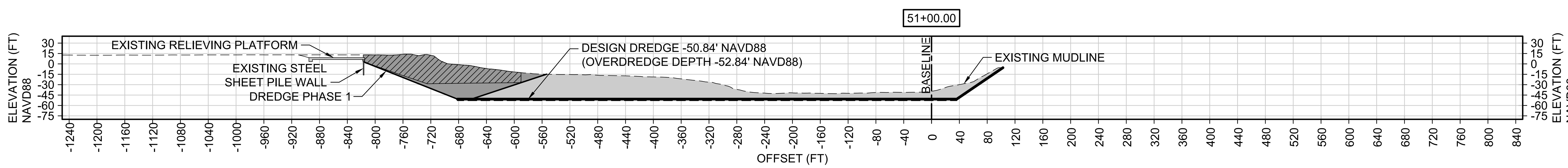
Sheet Reference No.
CN306
INDEX: 31 OF 242

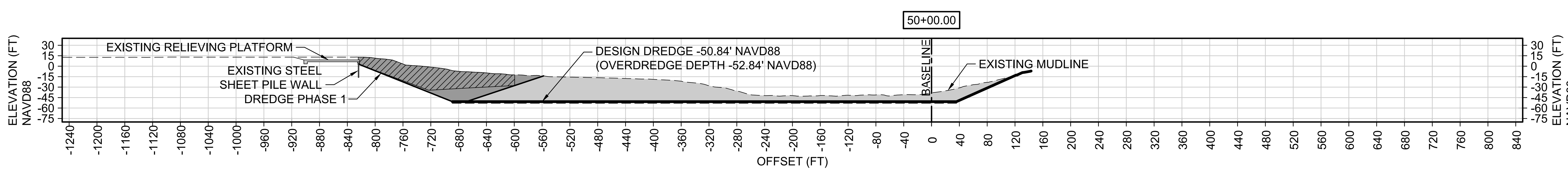
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

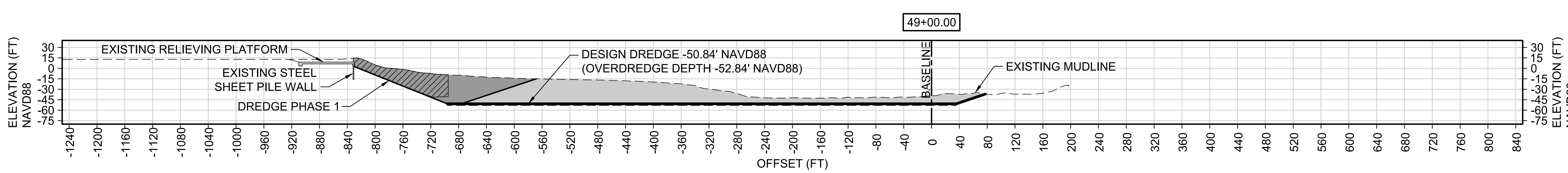


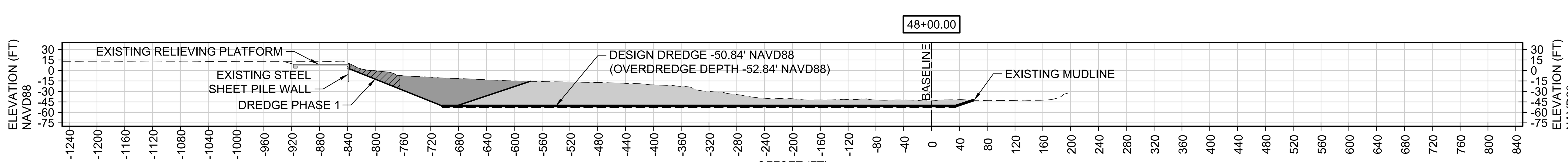












LEGEND:

PHASE 1 DREDGING AREA
PHASE 2 DREDGING AREA
SLAG AREA
DESIGN DEPTH
EXISTING MUDLINE
OVERDREDGE

100' 0' 100' 200'
SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 7 OF 11)

Designed by: PWK | Dwn by: ED | Ckd by: PGV | Reviewed by: SM | Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30 | Rev. | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET)

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SPARROWS POINT CONTAINER TERMINAL

Sheet Reference No.
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INDEX: 32 OF 242

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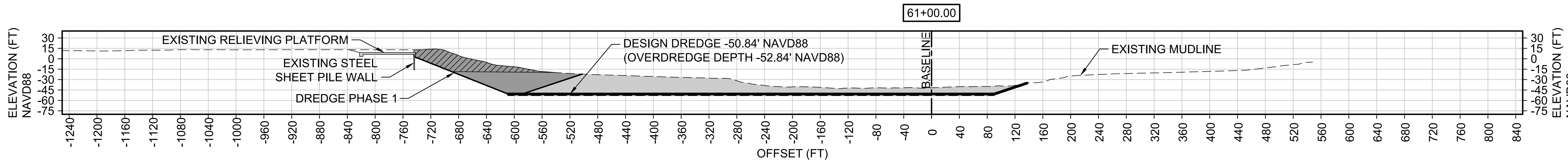

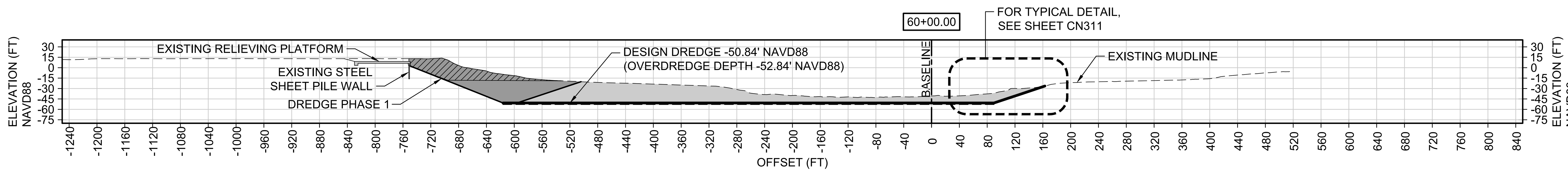

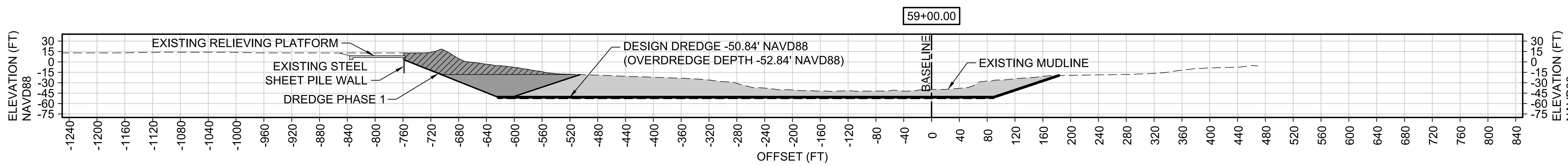

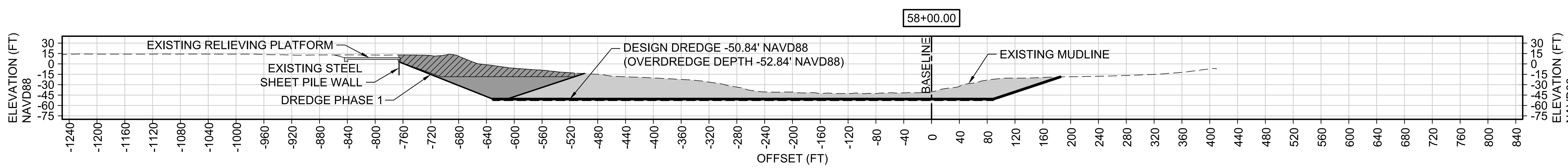

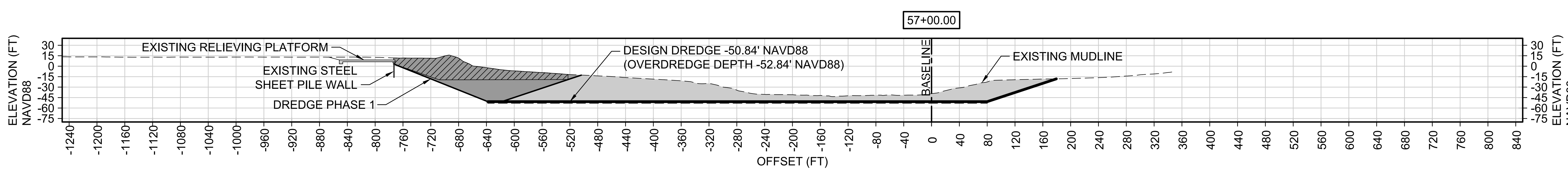

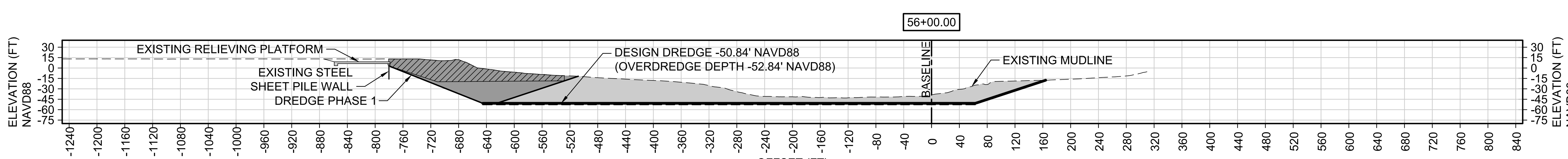

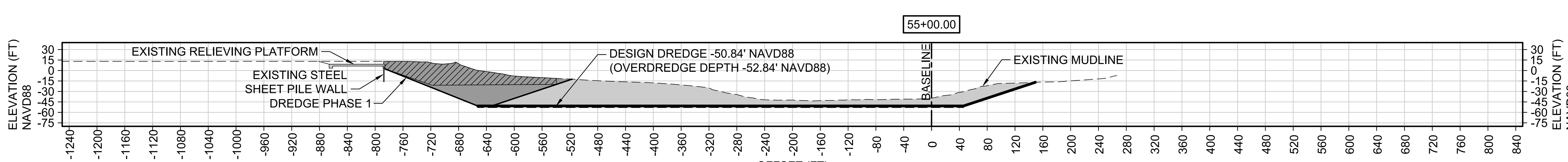

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'
SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 8 OF 11)

Designed by: PWK	Date: 2024-01-30	Rev.
Dwn by: ED	Ckd by: PGV	M&N Project No. 230329
Reviewed by: SM	Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)	

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2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300
6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
CN308
INDEX: 33 OF 242

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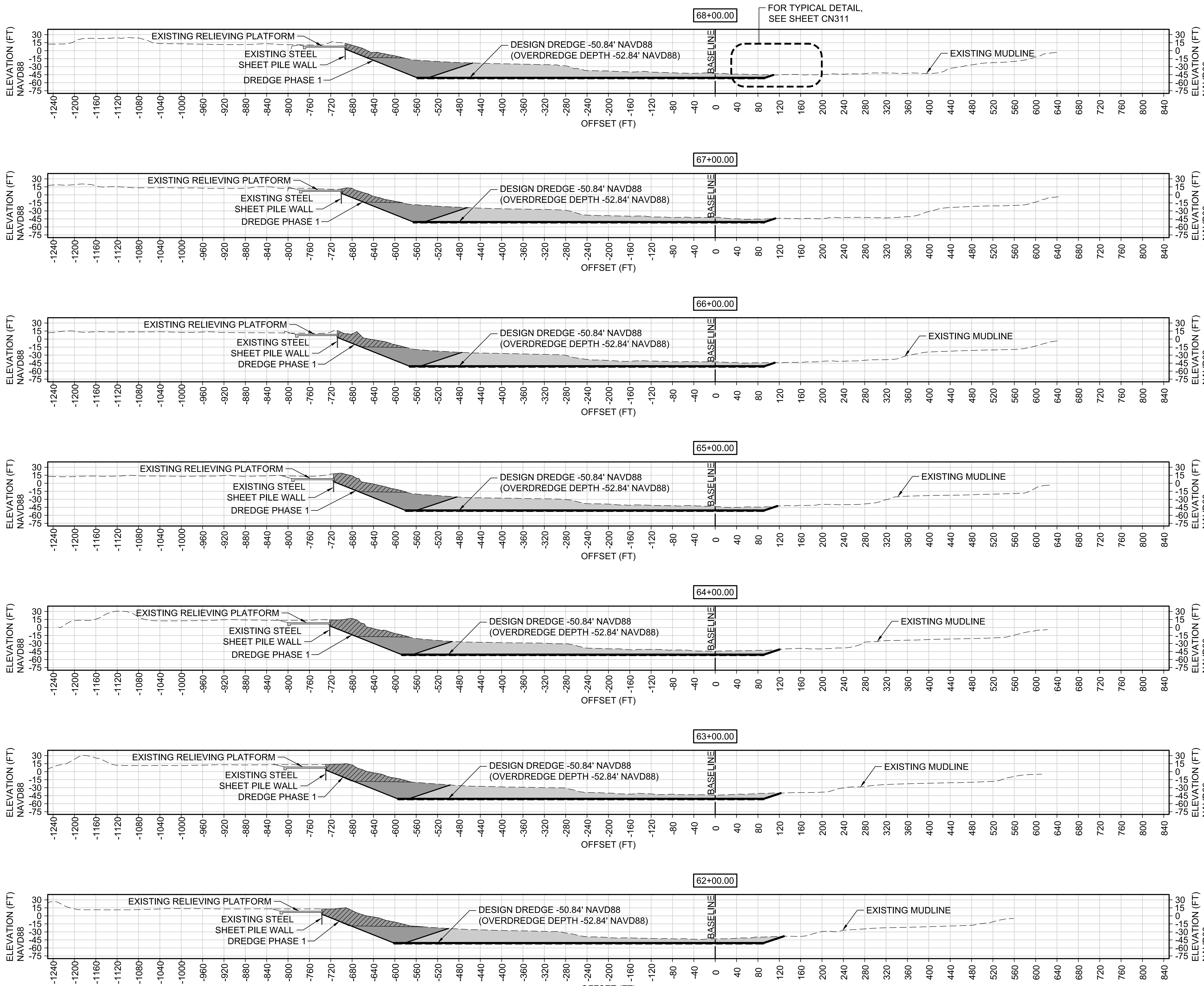

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 9 OF 11)

Designed by: PWK	Date: 2024-01-30	Rev.
Dwn by: ED	Ckd by: PGV	M&N Project No. 230329
Reviewed by:	SM	Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)

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6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN309
INDEX: 34 OF 242

Mark | Description | Date | Appr

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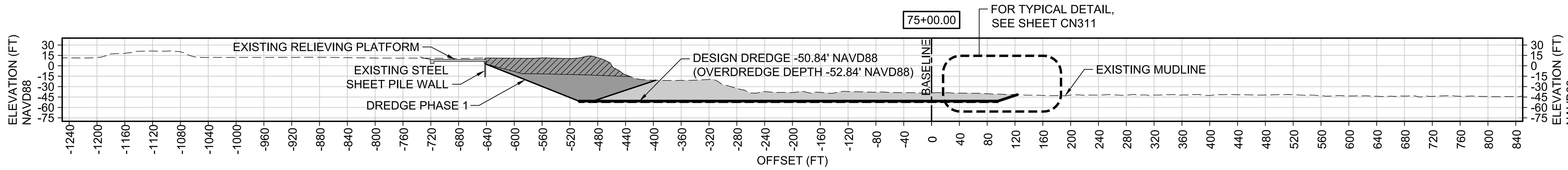
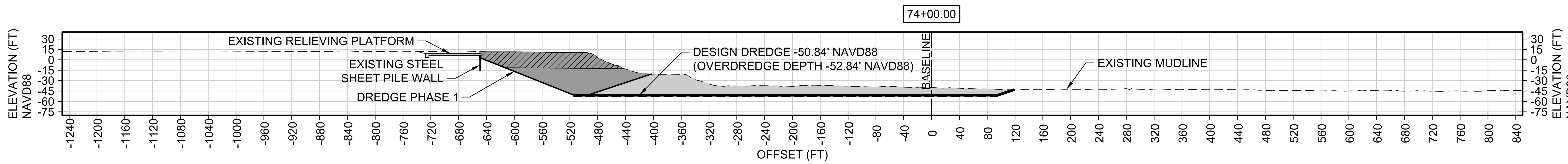
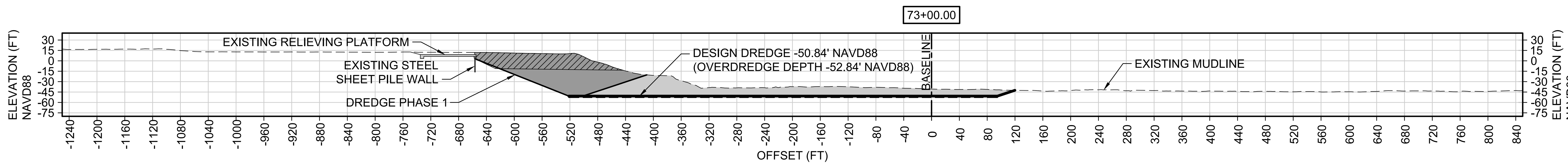
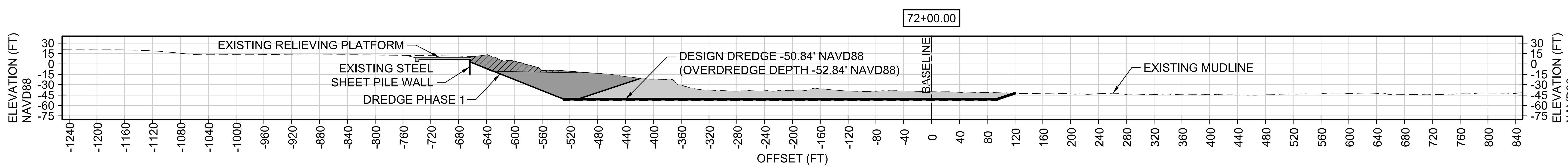
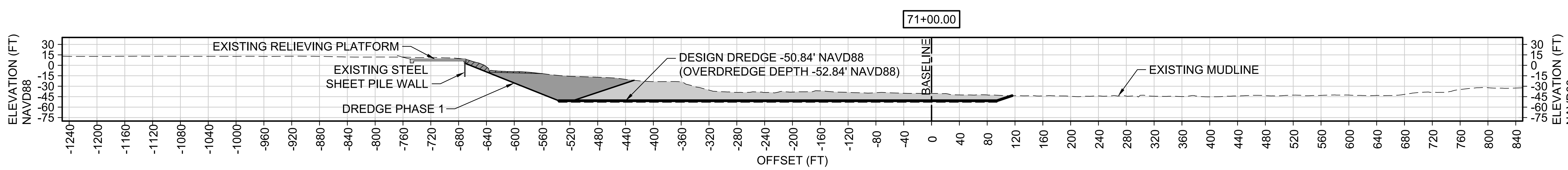
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

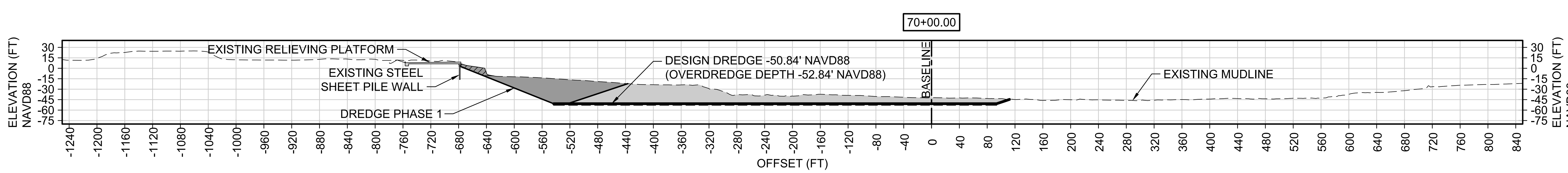


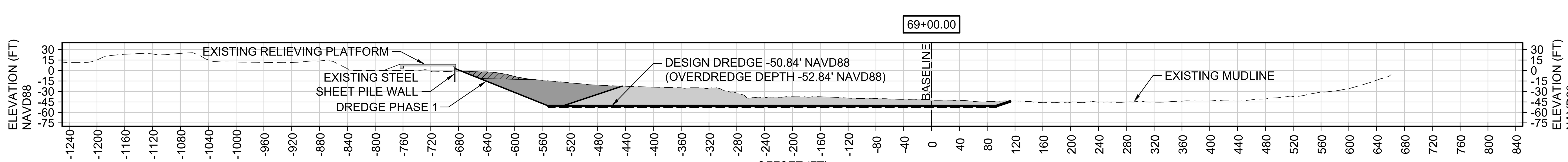












LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 10 OF 11)

Designed by: PWK	Dwn by: ED	Reviewed by:	Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30	M&N Project No. 230329	Drawing code:	Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev.	Ckd by: PGV	SM	

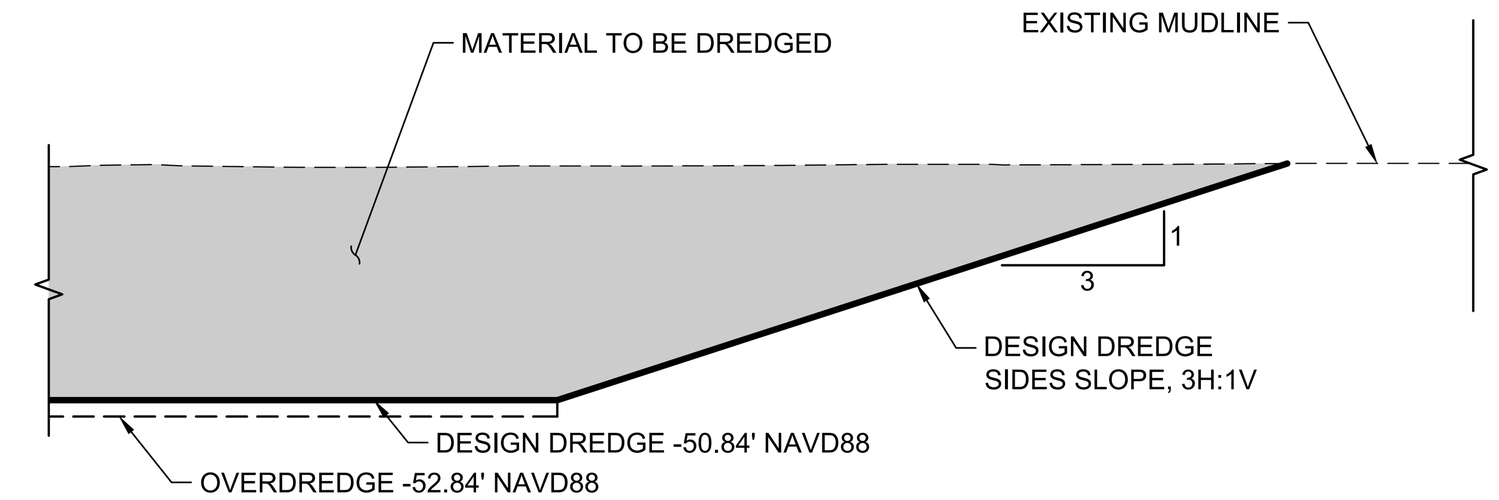
moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULEVARD
SUITE 100
BALTIMORE, MD 21219

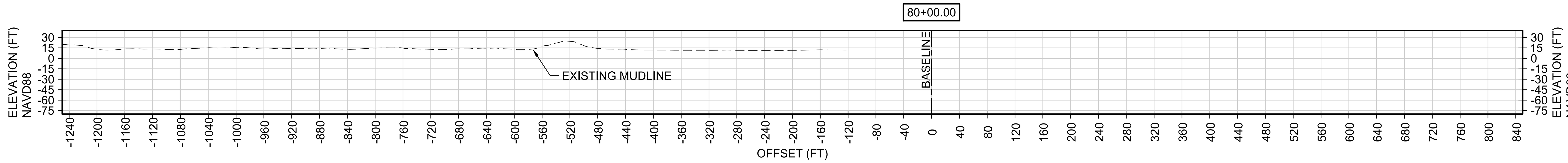
Sheet Reference No.
CN310
INDEX: 35 OF 242

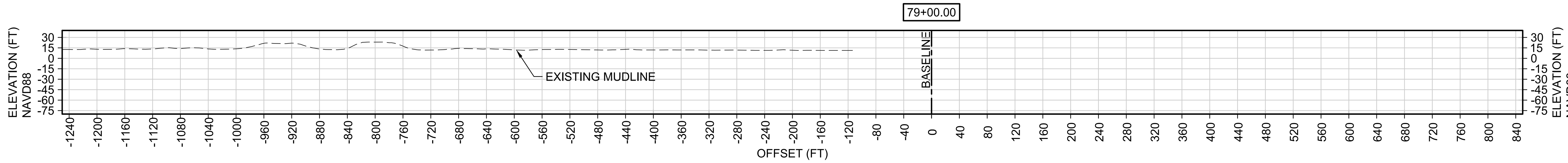
File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329\CN310 ; Plotted: 1/29/2024 6:03 PM by VOELKER, PAUL ; Saved: 1/26/2024 11:58 AM by EDOMINGUEZ

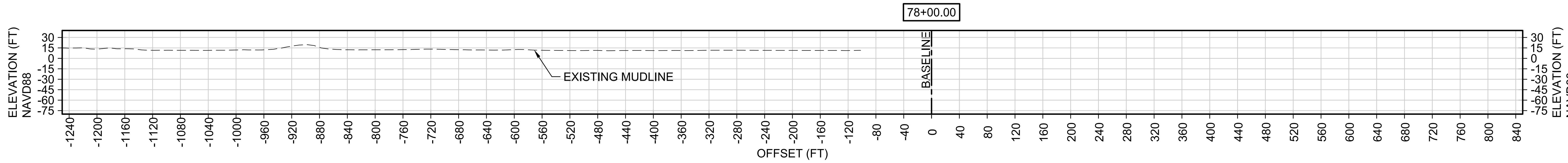
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

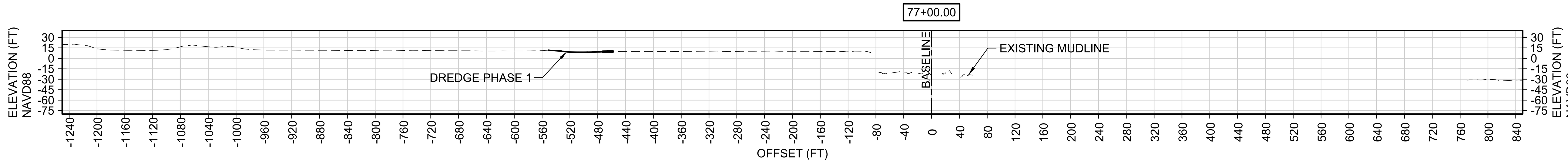


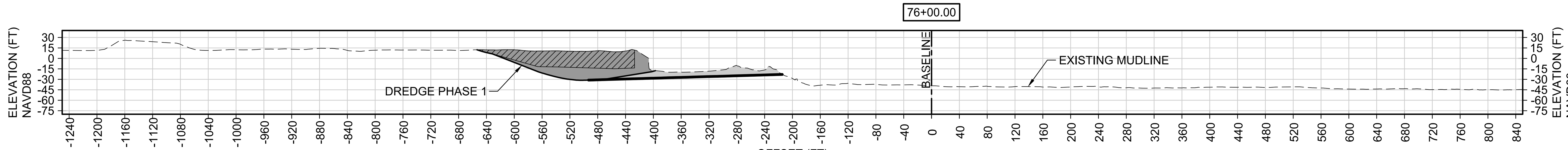
E3
CN311
DETAIL - TYPICAL SIDE SLOPES AND DREDGE
SCALE: 1" = 20'











LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'
SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 11 OF 11)

Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

Designed by: PWK | Dwn by: ED | Ckd by: PGV | Reviewed by: SM | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

moffatt & nichol
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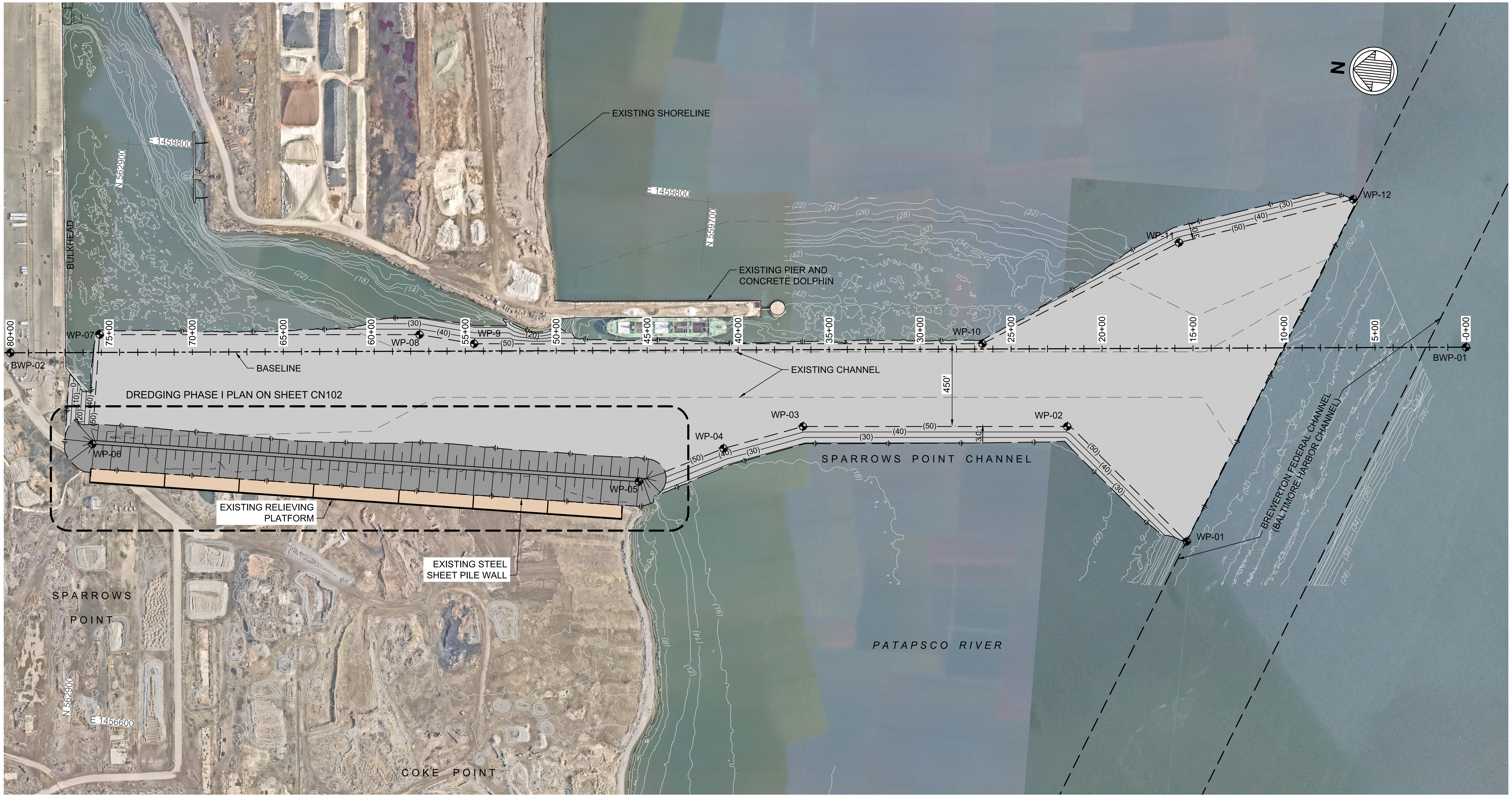
6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN311
INDEX: 36 OF 242

File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329\20CN311; Plotted: 1/29/2024 6:04 PM by VOELKER, PAUL; Saved: 1/26/2024 12:00 PM by EDOMINGUEZ

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Coal Pier Channel DMCF Plans



B1 / CN101 — PLAN - DREDGING GENERAL ARRANGEMENT

SCALE: 1" = 300'

DREDGING CHANNEL WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-01	556896.85	1458202.47
WP-02	557613.46	1458766.30
WP-03	559058.50	1458622.10
WP-04	559480.86	1458458.36
WP-05	559926.17	1458230.66
WP-06	562934.69	1458138.36

DREDGING CHANNEL WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-07	562954.38	1458740.44
WP-08	561205.76	1458915.38
WP-9	560901.83	1458895.46
WP-10	558122.30	1459172.82
WP-11	557102.27	1459832.95
WP-12	556172.88	1460164.75

CHANNEL BASELINE WORKING POINT

WP-##	NORTHING	EASTING	STATION
BWP-01	555475.65	1459417.84	0+00
BWP-02	563432.98	1458592.66	80+00

LEGEND:

- PHASE 1 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- PHASE 2 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- (40) DESIGN DEPTH CONTOURS NAVD88
- (34) EXISTING DEPTH CONTOURS NAVD88
- BASELINE

300' 0' 300' 600'

SCALE: 1"=300'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - DREDGING GENERAL ARRANGEMENT

Date: 2024-01-30
M&N Project No. 230329
Drawing Scale: 1:1 (D SHEET)
Designed by: PWK
Dwn by: ED
Ckd by: PGV
Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
CN101
INDEX: 23 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Attachment B: Input and Output Data from Underwater Noise Modeling

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	207	178	194
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	211		

OTHER INFO: 24" pile

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	11.7	371.7	686.8	8,577.0
Isopleth (feet)	38.3	1,219.5	2,253.4	28,139.6

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.2	27.4	184.8
Isopleth (feet)	0.7	89.8	606.2

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.6	0.3	21.5	1.8	0.2
PTS ONSET (Peak isopleth, feet)	5.2	1.0	70.7	6.1	0.7
PTS ONSET (SEL_{cum} isopleth, meters)	685.9	24.4	817.0	367.1	26.7
PTS ONSET (SEL_{cum} isopleth, feet)	2,250.3	80.0	2,680.4	1,204.2	87.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,847.8	NO LF CET.			
Behavior (RMS isopleth, feet)	6,062.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	207	178	199
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	214		

OTHER INFO	24" pile
NOTES	0
Attenuation	0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	11.7	590.0	735.6	18,478.5	Fishes present
Isopleth (feet)	38.3	1,935.8	2,413.5	60,625.0	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	43.4	398.1	NO SEA TURTLES
Isopleth (feet)	0.7	142.5	1,306.1	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.6	0.3	21.5	1.8	0.2
PTS ONSET (Peak isopleth, feet)	5.2	1.0	70.7	6.1	0.7
PTS ONSET (SEL_{cum} isopleth, meters)	1,088.8	38.7	1,296.9	582.7	42.4
PTS ONSET (SEL_{cum} isopleth, feet)	3,572.1	127.0	4,254.9	1,911.6	139.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,981.1	NO LF CET.			
Behavior (RMS isopleth, feet)	13,061.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Concurrent Marginal Wharf and Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	183	199
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	9		
Number of strikes per pile	800		
Number of strikes per day	7200		
Cumulative SEL at measured distance	222		

OTHER INFO: 36" and 24" piles

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth
		Fish ≥ 2 g	Fish < 2 g	
ISOPLETHS (meters)	18.5	1,584.9	1,584.9	18,478.5
Isopleth (feet)	60.6	5,199.8	5,199.8	60,625.0

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	148.5	398.1
Isopleth (feet)	1.1	487.4	1,306.1

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	3,723.6	132.4	4,435.4	1,992.7	145.1
PTS ONSET (SEL_{cum} isopleth, feet)	12,216.4	434.5	14,551.7	6,537.7	476.0
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,981.1	NO LF CET.			
Behavior (RMS isopleth, feet)	13,061.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	177	195
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	214		

OTHER INFO: 30" pile

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	18.5	587.2	631.0	10,000.0
Isopleth (feet)	60.6	1,926.6	2,070.1	32,808.4

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	43.2	215.4
Isopleth (feet)	1.1	141.8	706.8

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	1,083.6	38.5	1,290.8	579.9	42.2
PTS ONSET (SEL_{cum} isopleth, feet)	3,555.2	126.4	4,234.8	1,902.6	138.5
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	2,154.4	NO LF CET.			
Behavior (RMS isopleth, feet)	7,068.4				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	183	198
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	220		

OTHER INFO: 36" pile

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	18.5	1,584.9	1,584.9	15,848.9
Isopleth (feet)	60.6	5,199.8	5,199.8	51,997.8

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	122.6	341.5
Isopleth (feet)	1.1	402.3	1,120.3

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	3,073.7	109.3	3,661.3	1,644.9	119.8
PTS ONSET (SEL_{cum} isopleth, feet)	10,084.5	358.7	12,012.1	5,396.7	392.9
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,414.5	NO LF CET.			
Behavior (RMS isopleth, feet)	11,202.6				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Mooring Dolphins Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	153
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	3
Duration to drive pile (minutes)	120
Duration of sound production in day	21600
Cumulative SEL at measured distance	196

OTHER INFO 24" pile

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present	BEHAVIOR RMS Isopleth
ISOPLETHS (meters)	15.8
ISOPLETHS (feet)	52.0

SEA TURTLES

NO SEA TURTLES	PTS ONSET SEL_{cum} Isopleth	BEHAVIOR RMS Isopleth
ISOPLETHS (meters)	0.3	0.3
ISOPLETHS (feet)	0.9	1.1

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	6.6	0.6	9.8	4.0	0.3
PTS ONSET (SELcum isopleth, feet)	21.7	1.9	32.0	13.2	0.9
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	153
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	90
Duration of sound production in day	32400
Cumulative SEL at measured distance	198

OTHER INFO 24" pile

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	15.8
ISOPLETHS (feet)	52.0

SEA TURTLES

NO SEA TURTLES	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	0.3
ISOPLETHS (feet)	1.1	1.1

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	8.7	0.8	12.8	5.3	0.4
PTS ONSET (SELcum isopleth, feet)	28.4	2.5	42.0	17.3	1.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	172
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	120
Duration of sound production in day	43200
Cumulative SEL at measured distance	218

OTHER INFO	30" pile
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	292.9
ISOPLETHS (feet)	960.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	7.8	6.3
ISOPLETHS (feet)	25.5	20.7

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	193.7	17.2	286.4	117.8	8.3
PTS ONSET (SELcum isopleth, feet)	635.6	56.3	939.7	386.3	27.1
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	29,286.4	NO LF CET.			
Behavior (RMS isopleth, feet)	96,084.1				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	175
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	180
Duration of sound production in day	64800
Cumulative SEL at measured distance	223

OTHER INFO	36" pile
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	464.2
ISOPLETHS (feet)	1,522.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	16.1	10.0
ISOPLETHS (feet)	53.0	32.8

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	402.3	35.7	594.9	244.6	17.2
PTS ONSET (SELcum isopleth, feet)	1,320.0	117.0	1,951.6	802.3	56.3
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	46,415.9	NO LF CET.			
Behavior (RMS isopleth, feet)	152,283.1				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	202	173	189
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	206		

OTHER INFO 24" pile

NOTES Bubble curtain

Attenuation 5

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	5.4	172.5	318.8	3,981.1	Fishes present
Isopleth (feet)	17.8	566.0	1,045.9	13,061.3	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	12.7	85.8	NO SEA TURTLES
Isopleth (feet)	0.3	41.7	281.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.7	0.1	10.0	0.9	0.1
PTS ONSET (Peak isopleth, feet)	2.4	0.4	32.8	2.8	0.3
PTS ONSET (SEL_{cum} isopleth, meters)	318.4	11.3	379.2	170.4	12.4
PTS ONSET (SEL_{cum} isopleth, feet)	1,044.5	37.1	1,244.2	559.0	40.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	857.7	NO LF CET.			
Behavior (RMS isopleth, feet)	2,814.0				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	202	173	194
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	209		

OTHER INFO: 24" pile

NOTES: Bubble curtain

Attenuation: 5

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	5.4	273.9	341.5	8,577.0	Fishes present
Isopleth (feet)	17.8	898.5	1,120.3	28,139.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	20.2	184.8	NO SEA TURTLES
Isopleth (feet)	0.3	66.1	606.2	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.7	0.1	10.0	0.9	0.1
PTS ONSET (Peak isopleth, feet)	2.4	0.4	32.8	2.8	0.3
PTS ONSET (SEL_{cum} isopleth, meters)	505.4	18.0	602.0	270.4	19.7
PTS ONSET (SEL_{cum} isopleth, feet)	1,658.0	59.0	1,975.0	887.3	64.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,847.8	NO LF CET.			
Behavior (RMS isopleth, feet)	6,062.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	205	172	190
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	209		

OTHER INFO 30" pile

NOTES Bubble curtain

Attenuation 5

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF	PHYSICAL	INJURY	BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	8.6	272.6	292.9	4,641.6	Fishes present
Isopleth (feet)	28.1	894.3	960.8	15,228.3	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	20.1	100.0	NO SEA TURTLES
Isopleth (feet)	0.5	65.8	328.1	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.2	15.8	1.4	0.2
PTS ONSET (Peak isopleth, feet)	3.8	0.7	52.0	4.5	0.5
PTS ONSET (SEL_{cum} isopleth, meters)	503.0	17.9	599.1	269.2	19.6
PTS ONSET (SEL_{cum} isopleth, feet)	1,650.2	58.7	1,965.6	883.1	64.3
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,000.0	NO LF CET.			
Behavior (RMS isopleth, feet)	3,280.8				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN <u>LANDSCAPE</u> TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	205	178	193
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	215		

OTHER INFO: 36" pile

NOTES: Bubble curtain

Attenuation: 5

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	8.6	735.6	735.6	7,356.4	Fishes present
Isopleth (feet)	28.1	2,413.5	2,413.5	24,135.2	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	56.9	158.5	NO SEA TURTLES
Isopleth (feet)	0.5	186.7	520.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.2	15.8	1.4	0.2
PTS ONSET (Peak isopleth, feet)	3.8	0.7	52.0	4.5	0.5
PTS ONSET (SEL_{cum} isopleth, meters)	1,426.7	50.7	1,699.4	763.5	55.6
PTS ONSET (SEL_{cum} isopleth, feet)	4,680.8	166.5	5,575.5	2,504.9	182.4
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Concurrent Marginal Wharf and Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	172	188
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	9		
Number of strikes per pile	800		
Number of strikes per day	7200		
Cumulative SEL at measured distance	211		

OTHER INFO 36" and 24" piles

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	3.4	292.9	292.9	3,414.5
Isopleth (feet)	11.2	960.8	960.8	11,202.6

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.1	27.4	73.6
Isopleth (feet)	0.2	90.1	241.4

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	688.1	24.5	819.6	368.2	26.8
PTS ONSET (SEL_{cum} isopleth, feet)	2,257.4	80.3	2,688.9	1,208.1	88.0
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	735.6	NO LF CET.			
Behavior (RMS isopleth, feet)	2,413.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	196	167	183
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	200		

OTHER INFO: 24" pile

NOTES: Cushion block (wood)

Attenuation: 11

RESULTANT ISOPLETHS (Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	2.2	68.7	126.9	1,584.9	Fishes present
Isopleth (feet)	7.1	225.3	416.4	5,199.8	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.0	5.1	34.1	NO SEA TURTLES
Isopleth (feet)	0.1	16.6	112.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.3	0.1	4.0	0.3	0.0
PTS ONSET (Peak isopleth, feet)	1.0	0.2	13.1	1.1	0.1
PTS ONSET (SEL_{cum} isopleth, meters)	126.7	4.5	151.0	67.8	4.9
PTS ONSET (SEL_{cum} isopleth, feet)	415.8	14.8	495.3	222.5	16.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	341.5	NO LF CET.			
Behavior (RMS isopleth, feet)	1,120.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	196	167	188
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	203		

OTHER INFO: 24" pile

NOTES: Cushion block (wood)

Attenuation: 11

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	2.2	109.0	135.9	3,414.5	Fishes present
Isopleth (feet)	7.1	357.7	446.0	11,202.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.0	8.0	73.6	NO SEA TURTLES
Isopleth (feet)	0.1	26.3	241.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.3	0.1	4.0	0.3	0.0
PTS ONSET (Peak isopleth, feet)	1.0	0.2	13.1	1.1	0.1
PTS ONSET (SEL_{cum} isopleth, meters)	201.2	7.2	239.6	107.7	7.8
PTS ONSET (SEL_{cum} isopleth, feet)	660.1	23.5	786.2	353.2	25.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	735.6	NO LF CET.			
Behavior (RMS isopleth, feet)	2,413.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	166	184
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	203		

OTHER INFO 30" pile

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS (Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	3.4	108.5	116.6	1,847.8	Fishes present
Isopleth (feet)	11.2	356.0	382.5	6,062.5	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	8.0	39.8	NO SEA TURTLES
Isopleth (feet)	0.2	26.2	130.6	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	200.2	7.1	238.5	107.2	7.8
PTS ONSET (SEL_{cum} isopleth, feet)	656.9	23.4	782.5	351.6	25.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	398.1	NO LF CET.			
Behavior (RMS isopleth, feet)	1,306.1				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	172	187
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	209		

OTHER INFO: 36" pile

NOTES: Cushion block (wood)

Attenuation: 11

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF	PHYSICAL	INJURY	BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	3.4	292.9	292.9	2,928.6	Fishes present
Isopleth (feet)	11.2	960.8	960.8	9,608.4	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	22.7	63.1	NO SEA TURTLES
Isopleth (feet)	0.2	74.3	207.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	568.0	20.2	676.6	304.0	22.1
PTS ONSET (SEL_{cum} isopleth, feet)	1,863.5	66.3	2,219.7	997.2	72.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	631.0	NO LF CET.			
Behavior (RMS isopleth, feet)	2,070.1				

Appendix F: Biological Assessment

Draft
National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Assessment for the Sparrows Point Container Terminal Project

Patapsco River, Baltimore County, Maryland

Prepared for

NOAA Fisheries, Habitat and Ecosystem Services Division
Mid-Atlantic Habitat Conservation Branch

Prepared by

US Army Corps of Engineers, Baltimore District

December 2024

Contents

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Acronyms and Abbreviations

°F	degrees Fahrenheit
ASSRT	Atlantic Sturgeon Status Review Team
BMP	Best Management Practices
CBP	Chesapeake Bay Program
CY	cubic yards
dB	decibel(s)
dB re 1 µPa	underwater noise in decibels referenced to a pressure of 1 micropascal
dB re 1 $\mu Pa^2 s$	underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds
DMCF	Dredged Material Containment Facility
DPS	Distinct Population Segment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHWG	Fisheries Hydroacoustic Working Group
MCY	million cubic yards
MDNR	Maryland Department of Natural Resources
mg/L	milligram(s) per liter
MMPA	Marine Mammal Protection Act
MPA	Maryland Port Administration
NEPA	National Environmental Policy Act (NEPA)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NODS	Norfolk Ocean Disposal Site
NTU	nephelometric turbidity units
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEL	probable effects level
ppt	parts per thousand
RMS	room mean square
SAV	submerged aquatic vegetation
SEL	sound effect level
SPCT	Sparrows Point Container Terminal
SSSRT	Shortnose Sturgeon Status Review Team
SVOC	semivolatile organic compound
TIL	Terminal Investments Limited

TPA	Tradepoint Atlantic
TSS	total suspended solids
TTT	Tradepoint TiL Terminal
URI	University of Rhode Island
USDOT	US Department of Transportation
USFWS	US Fish and Wildlife Service
WSDOT	Washington State Department of Transportation

1 Introduction

Pursuant to Section 7(a) of the Endangered Species Act, the US Army Corps of Engineers has prepared a Biological Assessment for all proposed actions that occur within coastal waters of the United States. This assessment is being prepared to address the impacts on protected species of the proposed Sparrow's Point Container Terminal (SPCT) Project to construct a new container terminal (the terminal) in the Port of Baltimore (the Port). The action is proposed by Tradepoint TiL Terminal (TTT), LLC, a joint venture between Tradepoint Atlantic (TPA) and Terminal Investments Limited (TIL).

This Biological Assessment is the result of informal agency consultation between the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS or NOAA Fisheries) and TTT. In June 2023, TTT sent a project introduction letter to NOAA Fisheries providing a project overview and requesting initial agency input. NOAA Fisheries responded confirming the list of federally managed species that may occur within the vicinity of the Proposed Action. TTT also coordinated with NMFS in several Joint Evaluation Committee meetings conducted in 2023 and 2024 to discuss agency comments during preparation of the Draft Environmental Impact Statement (EIS) for the proposed action. Additional virtual calls were held with NMFS Office of Protected Resource in October and November 2024 to further discuss project effects.

This document is consistent with requirements specified in Section 7 of the ESA and serves to request NMFS concurrence on the determinations made in Section 5 of the Biological Assessment. This section (Section 1) includes the introduction, purpose, and need as well as the general project location. The remainder of this Biological Assessment is organized as follows:

- Section 2—Description of the Proposed Action
- Section 3—Description of the Action Area Environment
- Section 4—ESA Protected Species in the Action Area
- Section 5—Effects of the Proposed Action on ESA Listed Species
- Section 6—Potential Avoidance and Minimization
- Section 7—Effects of Climate Change
- Section 8—Determination of the Biological Assessment

TTT has separately coordinated with NMFS to evaluate potential impacts to federally listed species and critical habitats in accordance with Section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act on impacts to essential fish habitat.

1.1 Purpose and Need

The purpose of the Proposed Action is to develop the SPCT, a new terminal and associated facilities that would be located on Coke Point within the Patapsco River in Baltimore County, Maryland. The action would include terminal construction, dredging a new channel to support the terminal, and placement of the dredged material. The applicant's proposed project would address several economic and shipping logistical concerns. The SPCT project would enhance the economic strength of the Port of Baltimore by increasing its overall container capacity. This, along with the on-dock rail and Howard Street Tunnel project, would increase the throughput of containers through the Port. The proposed project would not only provide direct jobs at the project site but would also provide a foundation for sustained regional economic growth within the Port and throughout the region. By strengthening and growing the Port, the project will enhance the United States' supply chain efficiencies and resiliency.

1.2 Project Location

The proposed SPCT would be located in Baltimore County, Maryland, within the Tradepoint Atlantic development on a 330-acre area on the southwest peninsula of Sparrows Point known as Coke Point Peninsula (Coke Point) (Figure 1). The historical uses of this site include coking operations as part of the former Bethlehem Steel Mill. The site is entirely human-made land, which was created by filling in a portion of the Patapsco River with steel mill slag over several decades. Previously developed areas within the site are currently undergoing demolition and razing of structures. Sparrows Point, with its industrial history, is an example of a brownfield. In recent years, Sparrows Point has been undergoing a major redevelopment initiative aimed at transforming the site into a hub for modern industrial and commercial activities. The SPCT project would continue to redevelop the site.

The Action Area for this project includes the area of in-water and upland work (further described in Section 2), including the construction of a dredged material containment facility (DMCF) in the Coal Pier Channel and in the High Head Industrial Basin, as well as use of the transit routes from Sparrows Point through the Patapsco River, Chesapeake Bay and to the Atlantic Ocean for potential disposal of a portion of the dredged material. Details on the Proposed Action are provided in Section 2.

Figure 1. SPCT Project Area

2 Description of the Proposed Action

The proposed terminal would consist of a ±3,000-foot marginal wharf with ship-to-shore cranes, a container yard, gate complex, intermodal/rail yard, and various support structures. To provide vessel access to the wharf, the project would include deepening and widening of the existing Sparrows Point Channel and turning basin, which would require dredging and placement of approximately 4.2 million cubic yards (MCY) of dredged material (Figure 2). The proposed project would include the construction of an offshore DMCF within the Coal Pier Channel to provide placement capacity for a portion of the dredged material. A DMCF in the High Head Industrial Basin will receive additional material placement. This is in an upland area of the Sparrows Point site and does not have ESA species. Additional options for disposal of dredged material that may affect waters with ESA species are also discussed in Section 2.2. Details on each in-water activity are presented below.

2.1 Dredging

The existing Sparrows Point Channel would be widened and deepened to provide vessel access to the terminal, and the entrance would continue to connect to the Brewerton Channel (Figure 2). The Sparrows Point Channel would be dredged using a clamshell bucket on a barge. The entrance would be widened to create a turning basin 1,650 feet in diameter, transitioning gradually to a nominal channel width of 450 feet. The vessels would require a minimum berth pocket width of 250 feet adjacent to the channel. Based on the vessel simulations, additional width was added to provide passing clearance between the existing finger pier and the SPCT berth face. To provide additional passing distance while minimizing additional dredged material volume, the berth face would be angled such that the dredging of the berth and channel is wider at the southern end of the terminal and tapers to the north. The navigable depth would be -50 feet mean lower low water. The maximum proposed dredging depth would be -50 feet mean lower low water plus -2 feet of overdepth allowance. Following construction, maintenance dredging of the Sparrows Point Channel would be required. It is anticipated that maintenance dredging would be required on average once every 10 years with an additional volume of approximately 12,500 cubic yards (CY) per year added to the existing maintenance dredging for Sparrows Point Channel.

The project would require approximately 4.2 MCY of dredging to meet the required design width and depth for the vessels. The 4.2 MCY of dredged material would include 330,000 CY of slag (discussed below) and approximately 3.87 MCY of dredged material that would not be reused elsewhere on-site and would require appropriate placement.

Dredging would occur as designated by the time-of-year restrictions required to protect aquatic life, as determined through consultation with NMFS and the Maryland Department of Natural Resources (MDNR). Dredging would be staged to align with construction phasing and would also be guided by dredged material placement. As noted above, the total dredged material volume would be approximately 4.2 MCY including approximately 3.87 MCY of silt, clay, and sand material and 330,000 CY of slag. Dredging would be performed mechanically using waterborne equipment, a clamshell bucket, and landside equipment, where possible and practical.

Figure 2. SPCT Proposed Action - Terminal and Channel Dredging

Dredging of the wharf area would occur in conjunction with the wharf installation. The first step would be to mechanically excavate in-water slag material from the landside, where practical. The slag would be placed into trucks and transported to a designated on-site stockpiling location for reuse as fill or for dike construction. The remaining slag would be dredged using waterborne equipment, as necessary. The slag would be placed into scows (small barges), transported to shore, mechanically offloaded into trucks, and transported to a designated on-site location for stockpiling and reuse. Dredging of the silt and clay material underneath slag would be performed using waterborne equipment, a clamshell bucket, and landside equipment, where possible and practical. The silt and clay material would be placed into scows and transported to the designated DMCF. The silt and clay material would be mechanically dredged using waterborne equipment and a clamshell bucket. Dredging plans are included in Attachment A.

2.2 Dredged Material Placement

Evaluation of dredged material placement alternatives was conducted by TTT in consultation with the Joint Evaluation Committee in meetings during 2023 and 2024. Numerous placement alternatives were considered and eliminated (Figure 3), while a combination of alternatives was retained and selected as part of the Proposed Action (Figure 3).

2.2.1 Placement Alternatives Considered but Eliminated

The alternatives that were considered but eliminated from consideration include:

- A 100-acre DMCF in the Patapsco River, resulting in a loss of 100 acres of open water. This was eliminated due to agency concern over permanent impacts on the aquatic community.
- An offshore 35-acre DMCF in the Patapsco River (encompassing the Coal Pier Channel), resulting in a loss of 35 acres of open water. The 35-acre concept was further reduced to 19 acres based on combined use of other placement options, including Maryland Port Administration DMCFs and the Norfolk Ocean Disposal Site.
- A DMCF in Coke Point Cove on the west side of Coke Point was considered, but determined not needed, as constructing a DMCF in the Coal Pier Channel would provide more volume for dredged material and avoid loss of the more abundant benthic community within Coke Point Cove.
- Use of an existing DMCF at Hart-Miller Island to place all 4.2 MCY of dredged material from SPCT. This was considered thoroughly and included legislative efforts and a robust public outreach program. The public engagement process revealed long-held community reservations regarding the use of Hart-Miller Island for the placement of dredged material. During this time, TTT was also engaged in discussions with the State Agencies who operate Hart-Miller Island, and these discussions brought forth significant concerns regarding the facility’s readiness to accept dredged material, which introduced considerable risk in achieving the dredged material placement schedule for the project. Ultimately, TTT announced that they had decided to withdraw from the process, expressing concern that the project could affect TPA’s longstanding commitment to community partnerships.
- An upland DMCF at Coke Point was considered. However, constructing an on-land DMCF would limit the constructability and available cargo and container storage space of the proposed SPCT. The viability of the terminal is reliant on the ability to efficiently move goods through the Port and

into the adjacent markets. Losing this location for the buildings would not allow the terminal to function in a way that meets the overall goals of the project.

- Other land-based placement sites in Virigina, New Jersey, and Pennsylvania were considered. All options were either infeasible due to facility limitations, additional transport costs for material, or schedule and economical constraints due to time to transport material (delaying overall dredging operations).

2.2.2 Placement Alternatives Retained with the Proposed Action

The combination of options retained for the Proposed Action represented the most feasible options with the least environmental impacts for dredged material placement and reduced concerns from the community and the regulating agencies. The Proposed Action involves several material placement options (Figure 3):

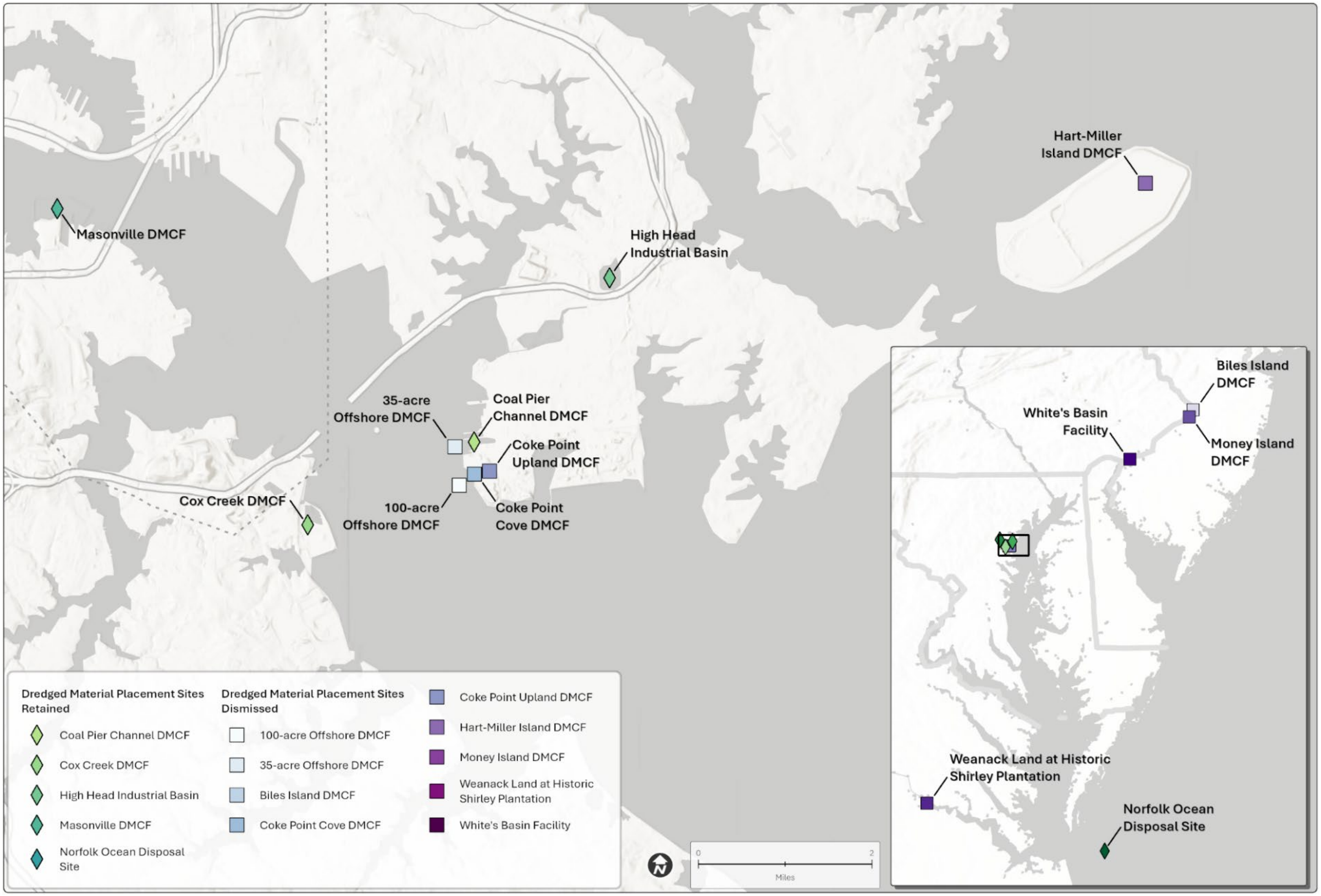
1. Creation of an in-water DMCF at the Coal Pier Channel to contain dredged material
2. Placement of dredged material in the High Head Industrial Basin on TPA property
3. Ocean Placement at the Norfolk Ocean Disposal Site in the Atlantic Ocean
4. Placement at an existing DMCF managed by the Maryland Port Administration (Cox Creek or Masonville)

The Proposed Action could involve a combination of the options listed above. The High Head Industrial Basin does not contain ESA species. Placement of a portion of the dredged material at the Norfolk Ocean Disposal Site or at existing DMCFs would comply with all applicable permits and approvals for those active sites. Therefore, the description of the Proposed Action and analysis later in this Biological Assessment focuses on the placement option of creating an in-water DMCF at the Coal Pier Channel.

A new offshore DMCF would be constructed at the mouth of the Coal Pier Channel, an in-water area along the west shoreline of Coke Point, to provide placement capacity for dredged material (Figure 3). The DMCF would permanently fill approximately 19 acres of tidal waters. A sand dike would be constructed across the mouth of the basin to provide a containment area for dredged material. This sand dike would be built to an elevation of +15 feet and have a 3:1 side slope protected with riprap. It would be constructed on relatively firm foundation material. The upland perimeter dike would be approximately 4 feet high above grade and would be constructed to an elevation of +15 feet. The estimated capacity of this placement area is approximately 750,000 CY.

Dredged material would be mechanically placed into scows, transported to an offloading location, and hydraulically pumped into the Coal Pier Channel DMCF. Water would be withdrawn from the river to be slurried with the dredged material. Once the sediments are hydraulically offloaded into the DMCF, the water would be recirculated/recycled to the maximum extent possible back to the unloader and used for the continued pumping operation to reduce the amount of additional water needed. Recycling water during pumping would reduce the total volume of water requiring discharge from the DMCF to a permitted outfall.

Figure 3. Map of Dredged Material Placement Options Retained and Eliminated



The DMCF perimeter dike would be constructed in phases and the dike material would be placed in phases. Material placement would not exceed the allowable elevation of the DMCF and would maintain a minimum of 2 feet of freeboard. Construction of the DMCF perimeter would be completed in approximately 7 months.

Dredging would be performed in two to three phases, and each phase would be approximately 1 year apart to allow for optimal dewatering and consolidation of the placed material. The volume of dredged material placed into the DMCF for each phase would be appropriate for the DMCF capacity at the time of placement.

2.3 Pile Driving for Terminal Construction

Marine structure design includes an open-type (steel pipe pile-supported) marginal wharf structure, consisting of a steel pipe pile-supported relieving platform integral to the wharf. Piles for the relieving platform would be located on land, not in-water. A pile-supported mooring dolphin would also be installed to allow for safe mooring. Use of a mooring dolphin also minimizes the length of the constructed wharf. The mooring dolphin, accessed by a short catwalk, would be placed at the southern end of the wharf structure, providing a mooring point for vessel mooring lines. Piles for the mooring dolphin and wharf would be located in-water. The wharf would serve as a platform to receive containers offloaded from the vessels. More information on the types and sizes of piles, number of piles to be used and duration of pile driving, and impact on underwater noise is discussed in Section 5. Plans for wharf construction pile driving are included in Attachment A.

3 Description of the Action Area Environment

This section presents a high-level overview of resources and environment within the Action Area, with a focus on resources in or near Sparrows Point as this would be the area of the most direct impacts from the action.

3.1 Sediment

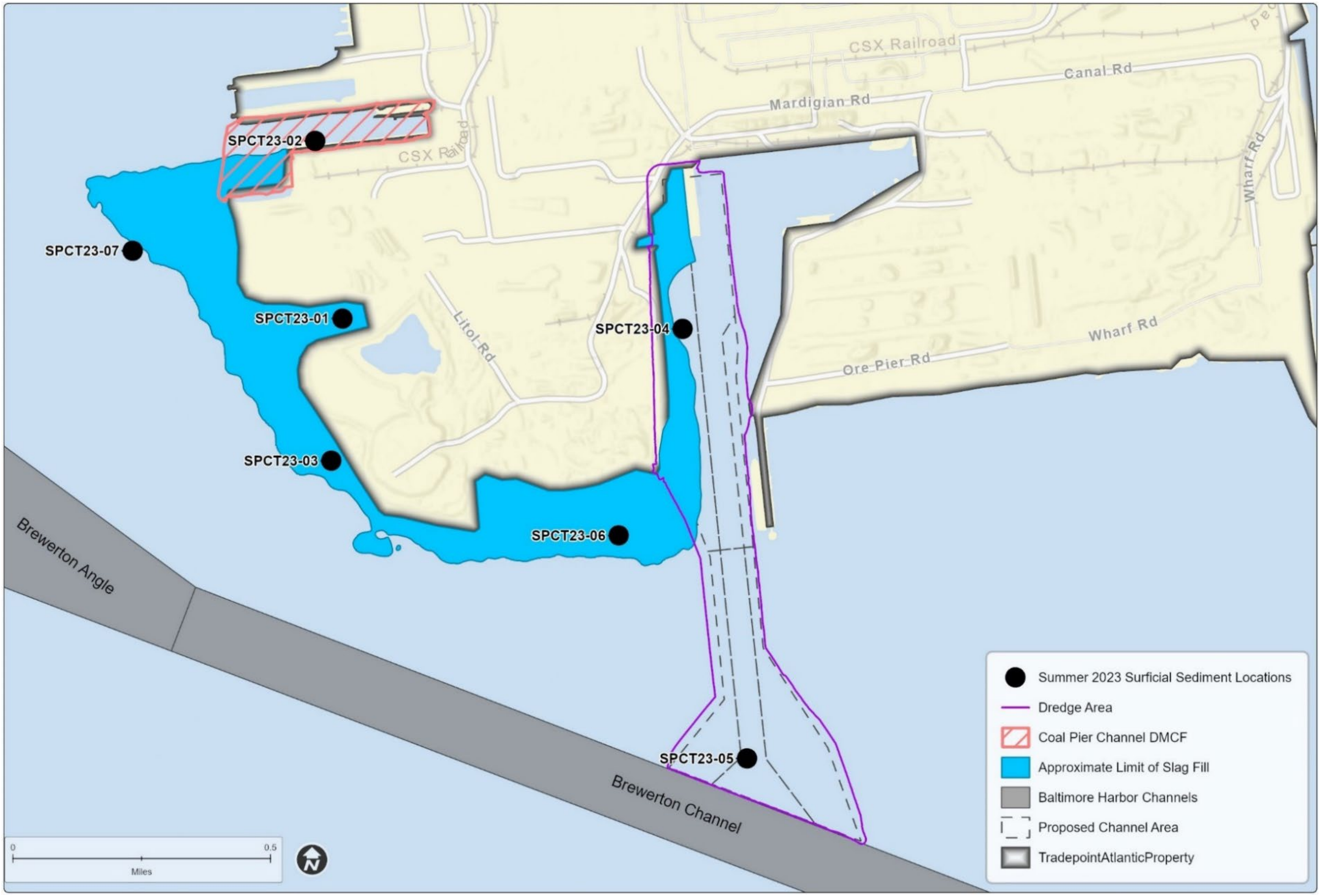
Sediments around Coke Point consist of a soft, fine-grained silty top layer above deep layers of clay and sands. Some surficial sediments along the shoreline of Coke Point contain slag or gravel mixed with the soft, fine-grained sediments from activities on land and from the human-made construction of Coke Point. Within the vicinity of the channel improvements, the silty surface layer overlays deep materials that predominantly consist of native clays in the South Channel and consist of a combination of native clays and sands in the North Channel (Kozera, Inc. 2023; EA Engineering, Science, and Technology, Inc., PBC [EA] 2024a,c).

The column of sediment in the South Channel is uniform with little layering or stratification of material types. Within the deepening area of the South Channel segment, the sediments are primarily comprised of a combination of silt and clay. The column of sediment in the North Channel includes layers of differing material types. Within the deepening area in the North Channel and in the west widener, the silty top materials extend from the sediment surface to varying depths.

Sediments within the Action Area have been the subject of numerous past investigations (EA 2003, 2009, 2010a, 2010b, 2011) as well as recent investigations to support the Proposed Action. The past studies of offshore sediment identified elevated concentration of metals, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). Results of a subsequent risk assessment found that several offshore areas with impacted sediments on the west and south side of Coke Point contribute to elevated risk for human health and ecological communities. These areas are not proposed for dredging. In previous studies, benzene, ethylbenzene, and toluene were detected in the subsurface sediment near the mouth of the Coal Pier Channel, and sheens and hydrocarbon odors were noted in the subsurface samples on the east side of the Coal Pier Channel and at the mouth of the Coal Pier Channel (EA 2009).

For the Proposed Action, surficial sediment quality was evaluated to support assessment of aquatic resources (EA 2024b) (Figure 4). Surface and subsurface sediment was evaluated to support widening and deepening of the SPCT channel and to assess sediment quality with respect to upland placement of the material within an on-site DMCF and potential ocean placement. Around the Coke Point Peninsula, PAHs and metals are the constituents that most frequently exceed probable effects levels (PELs) for aquatic life. While these areas are not proposed for dredging, they serve as impacted habitat for benthic organisms and many smaller fish that are prey for ESA listed species. Collectively, nine metals, 13 individual PAHs, total PAHs, and dioxin toxic equivalency quotients exceeded PELs in the offshore surficial sediments surrounding the peninsula. The highest total PAHs were detected in surficial sediments in Coke Point Cove on the west side (SPCT23-01) and along the southeast side (SPCT23-06) of Coke Point with concentrations in Coke Point Cove approximately 10 times higher than concentrations on the southeast side of the peninsula. The highest concentrations of metals were detected in the nearshore area on the southwest side of Coke Point (SPCT23-03). The location near the Brewerton Channel (SPCT23-05) was furthest offshore and had the fewest PEL exceedances.

Figure 4. Surficial Sediment Sampling Locations for the 2023 Aquatic Resources Studies



Within the Coal Pier Channel, chemical concentrations of six metals (chromium, copper, lead, nickel, silver, and zinc), two PAHs (acenaphthylene and naphthalene), and the dioxin toxicity equivalency quotient in surficial sediments in the central portion of the channel exceeded PEL values (EA 2024a). These sediments will be encapsulated by the Coal Pier Channel DMCF.

Sediments in the southern portion of the main SPCT channel, which is proposed for dredging, are predominantly fine-grained silts and clays. Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, and dioxin/furan congeners were detected most frequently in the sediments. In the northern portion of the channel, sediments are mostly sand and fine-grained silts and clays. Metals, PCBs, PAHs, SVOCs, chlorinated pesticides, dioxin/furan congeners, volatile organic compounds, total petroleum hydrocarbons, and oil and grease were detected most frequently in the sediments.

3.1.1 Water Quality

Surface water provides habitat and resources for fish and wildlife, means for shipping of goods and for transit of people, and a place for recreation and fishing. State of Maryland surface waters affected by the SPCT project are the tidal waters of the Patapsco River in the vicinity of Coke Point and near the mouth of Bear Creek. The tidal waters surrounding the project area and extending eastward into the Upper Chesapeake Bay are classified as Use Class II (Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting) by the Maryland Department of the Environment. The individual designated uses of Use Class II waters include: growth and propagation of fish, other aquatic life, and wildlife; water contact sports; leisure activities involving direct contact with surface water; fishing; agricultural water supply; industrial water supply; propagation and harvesting of shellfish; seasonal migratory fish spawning and nursery use; seasonal shallow-water submerged aquatic vegetation (SAV) use; open-water fish and shellfish use; seasonal deep-water fish and shellfish use; and seasonal deep-channel refuge use.

3.1.1.1 Physical Conditions

Baltimore Harbor includes an approximate 15-statute-mile tidal portion of the Patapsco River with water depths generally less than 20 feet with the exception of the federal navigation channels and other state and private access channels that are dredged to provide safe navigation for waterborne commerce. Surface water circulation and exchange within the harbor are governed by the effects of wind, tides, salinity-based density gradients, and river flows (Garland 1952; Boicourt and Olson 1982). Vertical stratification of the water column is common, particularly in areas of deeper waters (such as the navigation channels) where denser (heavier), saltier and cooler bottom waters move upstream with incoming tides and remain below less dense (lighter) freshwater or low salinity surface waters moving downstream towards the Chesapeake Bay. Due to water column density, salinity stratification, limited vertical mixing, and use of dissolved oxygen by organisms and chemical degradation processes, low dissolved oxygen concentrations in deep bottom waters are often present below the requirements to support aquatic life, particularly in late summer and fall. The severity of this condition in the Patapsco River varies from year to year based on precipitation and freshwater inflow and is most common in deep water areas, including the navigation channels.

Within the SPCT area, Coke Point is surrounded by the Patapsco River to the west and south, and the existing Sparrows Point Channel to the east. Surface water quality in these areas is affected by river flow and precipitation, daily tides, and the groundwater flow patterns under Coke Point. Water depths in the SPCT project area vary and range from less than 2 feet up 15 feet in the nearshore areas, from approximately 15 feet up to 45 feet in the west and south offshore areas, and from approximately 10 feet up to 47 feet in the proposed channel improvements footprint. Water quality measurements recorded in the vicinity of Coke Point during seasonal nutrient surveys in Summer and Fall 2023 and Winter and Spring 2024 (EA 2024a, 2024d, 2024e, 2024f) indicated that water temperature, salinity, pH, and dissolved oxygen varied by season and water depth. Within the project area, salinities are typically classified as oligohaline (≤0.5 to 5 parts per thousand [ppt]) within the winter and spring and as either low mesohaline (≥5 to 12 ppt) or high mesohaline (≥12 ppt to 18 ppt) during the summer and fall. Salinities in the project area ranged from 1.6 to 17.8 ppt with highest salinities measured in summer and fall bottom waters. Water temperature ranged from 41.2 to 81.7 degrees Fahrenheit (°F) with highest and lowest water temperatures measured in summer and winter season surface waters, respectively. Dissolved oxygen ranged from 0.5 to 13.4 milligrams per liter (mg/L) with low dissolved oxygen and hypoxic conditions measured in the summer season bottom waters. pH ranged from 7.1 to 10.2, with highest and lowest pH values measured in the winter and spring/summer, respectively. Turbidity (measured as nephelometric turbidity units [NTUs]) ranged from 1.0 to 32.3 NTU and tended to be higher in bottom waters, regardless of season.

3.1.1.2 Nutrients

Excess nitrogen and phosphorus have been identified as a concern for Baltimore Harbor surface waters, and the inputs and the total maximum daily load for these nutrients are managed and regulated by the Maryland Department of the Environment through the National Pollutant Discharge Elimination System process. Overall in the SPCT area, total nitrogen concentrations were higher in winter and spring (between 1 and 2 mg/L) and lower in summer and fall (less than 1 mg/L). Most nitrogen was present in dissolved form in winter and spring and was as a combination of particulate and dissolved nitrogen in summer and fall. Total phosphorus concentrations were generally higher in summer and fall and varied by sampling location. Most phosphorus was present bound to particulates in fall, winter, and spring; highest dissolved phosphorus was present during summer. Organic carbon concentrations in the SPCT project area surface waters ranged from 2.4 mg/L in winter to 4.4 mg/L in summer.

3.1.1.3 Chemistry

Characterization of surface water chemistry around Coke Point has been investigated through several decades of study of the offshore area. Data collected between 2003 and 2011 were used to model potential risks to human health, fish, benthos, and wildlife and to identify the geographic areas contributing the most to risks. Most chemicals in surface water were either below benchmarks protective of human health or aquatic life or were comparable to concentrations found throughout the Lower Patapsco River. PAHs were the only chemicals identified in surface water as posing potential risks. For aquatic life, PAHs in surface water posed risks in the western and southern offshore areas of Coke Point, while benzene was identified within Coke Point Cove.

3.1.1.4 Surface Water Quality in the Dredging Area and Coal Pier Channel

Seasonal water column measurements collected in 2023 and 2024 in the vicinity of the Sparrows Point Channel indicated a stratified water column with respect to salinity at both locations (approximately 30 feet and 45 feet deep, respectively). The combined seasonal data for these locations indicated that salinity ranged from approximately 2 to 11 ppt in surface waters and from approximately 5 to 18 ppt in bottom waters throughout the year. Water column stratification with hypoxic conditions (low dissolved oxygen concentrations) was present in bottom waters in the summer at both locations. Seasonal water column measurements collected in 2023 and 2024 from the Coal Pier Channel indicated a uniform water column with respect to water temperature and pH. Higher salinities in bottom waters were measured in summer, fall, and winter. Hypoxic conditions were present in the bottom waters during the summer sampling event; dissolved oxygen was measured at a concentration of 1.3 mg/L at a bottom depth of approximately 22 feet. Concentrations of nutrients in surface water were consistent with those described for the overall surface waters adjacent to Coke Point. Historical surface water samples collected at two locations in the Coal Pier Channel DMCF footprint indicated that PAHs in surface waters exceeded ecological risk benchmarks (EA 2011).

3.1.2 Biological Resources

The discussion of biological resources for this Biological Assessment focuses primarily on those resources within waters within the immediate Action Area and provides a high-level overview. Detailed seasonal reports for aquatic resource studies conducted for the Proposed Action can be provided to NMFS upon request (EA 2024b, 2024c, 2024d, 2024e, 2024f).

3.1.2.1 Benthos

Within the larger Chesapeake Bay region, the abundance, species diversity, and biomass of many benthic species has declined over the past 40 years, with significant decline in these metrics and the overall benthic community score noted in sampling stations in the Baltimore Harbor (Versar, Inc. 2017). The decline in these community metrics at the Baltimore Harbor stations has been attributed to seasonal hypoxic (low oxygen in bottom waters) conditions. Benthic fauna samples were collected as part of aquatic studies for the Proposed Action and the community health determined at sample locations throughout the SPCT area using the Chesapeake Bay Benthic Index of Biotic Integrity. Two sample locations were within the SPCT dredging area and one within the Coal Pier Channel (Figure 5).

Benthic habitat within the dredging area and Coal Pier Channel was classified as high mesohaline mud, with salinity between 12 and 18 ppt and more than 40% silt-clay content. Across all sampling locations, 22 unique benthic macroinvertebrate taxa were collected. Of these, nine taxa were polychaetes (bristle worms), five were bivalves (clams and mussels), and three were crustaceans. The remaining taxa included ribbon worms, segmented worms, and snails. Only one taxon was collected within the Coal Pier Channel and no taxa were collected from the southernmost sampling location within the dredging footprint. However, the northern portion of the dredging footprint had four taxa collected. Benthic abundance was lowest within Coal Pier Channel (6.8 organisms per square meter) compared to Coke Point Cove to the south which had 13,170 organisms per square meter. Overall community Benthic Index of Biotic Integrity scores classified all sample locations as either degraded or severely degraded, except for the benthic community along the southeast shoreline of Coke Point, which met restoration goals and will not be disturbed. The benthic community in the Coal Pier Channel was classified as degraded and the community in the dredging area was classified as severely degraded.

Figure 5. Benthic Fauna Sampling Locations

3.1.2.2 General Fish Community

The Chesapeake Bay supports 348 species of fish at some point in their life cycle (NMFS 2024a). The distribution of fish populations is dependent upon water quality factors (temperature, pH, salinity), larval recruitment, availability of prey species (fish and benthic organisms), and migration patterns (Lippson and Lippson 1994). Atlantic menhaden (*Brevoortia tyrannus*) has been the top fishery in the Chesapeake Bay for several decades with over 150,000 metric tons caught per year. The striped bass (*Morone saxatilis*) fishery stocks suffered a decline during the 1970s and 1980s due to overfishing and are in the recovery process. Although not currently overfished, stocks remain low, largely due to loss of spawning habitat and pollution in the Chesapeake Bay (Chesapeake Bay Program [CBP] 2020). Important predator fish species (including those that are part of commercially significant fisheries) rely on smaller prey species, such as bay anchovy (*Anchoa mitchilli*), Atlantic menhaden, and American shad (*Alosa sapidissima*) (Zastrow and Houde 1991, CBP 2020). Sturgeon (both Atlantic and Shortnose) have the potential to be present in the SPCT area. Habitat requirements for these ESA species, as well as discussion of presence in the Action Area is presented in Section 4.

The fish community within and adjacent to the SPCT area varies by season and water depth. A summary of the individual fish collected during aquatic surveys for the Proposed Action is provided in Table 1. The highest number of unique species was observed in the summer with 17 unique species (1,772 individual fish) collected in the waters in and around the SPCT project area. During the fall collections, the number of unique and total number of individual fish collected declined to nine unique species and 818 individual fish. In the winter, even fewer unique species and individual fish were captured in the vicinity of the project area (three unique species and 12 individual fish for all locations combined). The following spring (2024), 5,629 total fish were captured with most of the individuals collected along the southern shoreline of Coke Point and downstream of the project area. Within the SPCT dredging area (Figure 6), the total number of fish captured in all seasons was 1,293, largely Atlantic silverside, bay anchovy, herring sp., and Atlantic croaker.

Based on the seasonal survey data, fish assemblages and abundance in habitats in and around the SPCT project appear to be highly driven by seasonal water temperature and salinity. In the spring, hypoxia was only present at sampling location 5 (downstream of the SPCT project area), which had the lowest bottom dissolved oxygen and bottom temperature. Low dissolved oxygen during the summer months in the deeper water areas may also affect fish distribution, as pelagic species are mobile and will avoid areas area with low dissolved oxygen. Fish moving upstream from the Chesapeake Bay can thrive in the higher summer salinities and move downstream away from the project area as the salinity and water temperature decrease throughout the water column in the late fall and winter months.

Figure 6. Fish Survey Locations

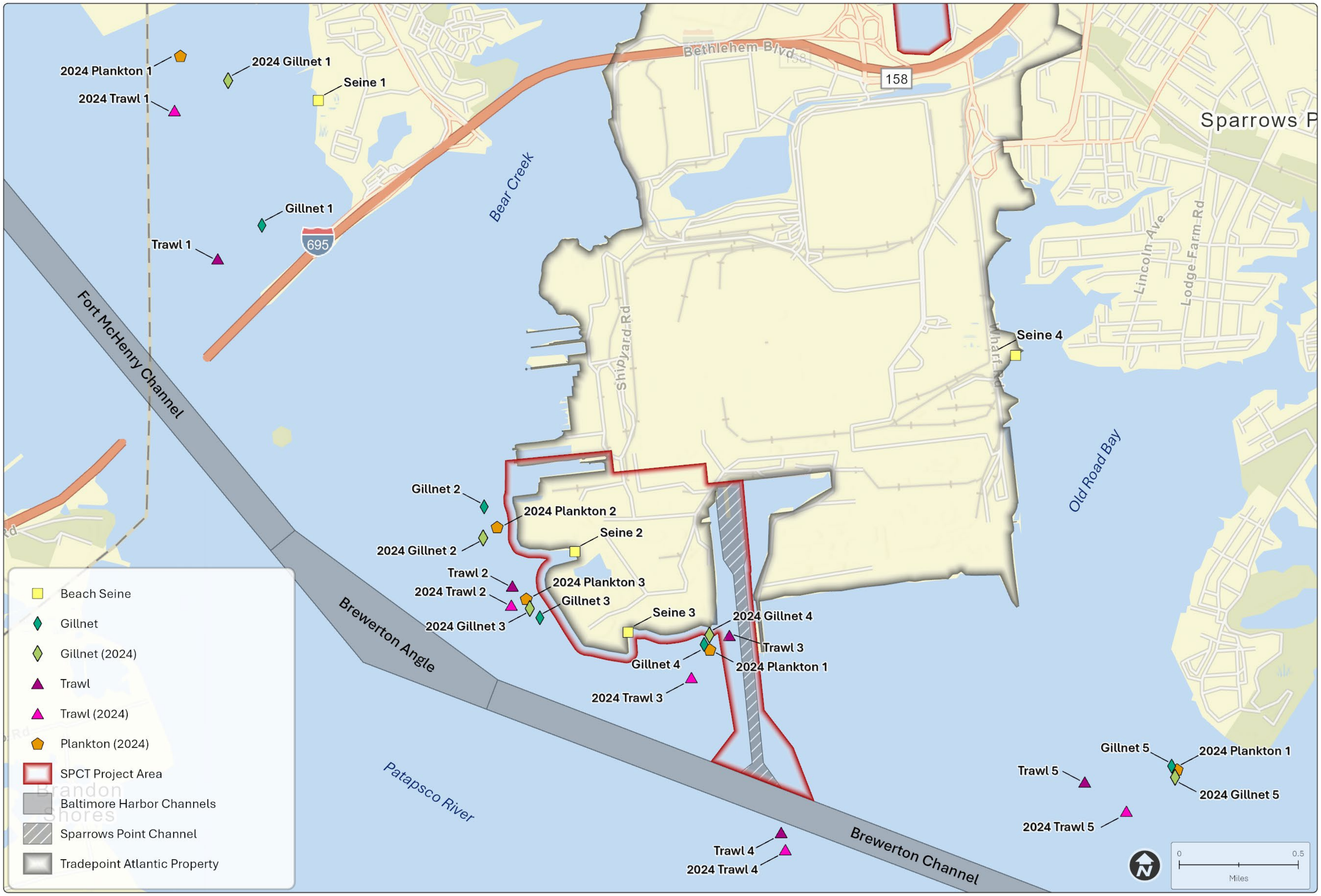


Table 1. Summary of Individual Fish Collected by Each Method per Season

Fish Species	Sampling Method and Season										
	Beach Seine			Gillnet				Bottom Trawl			
	Summer	Fall	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring
Atlantic croaker (Micropogonias undulatus)	6	0	72	2	0	0	0	26	2	3	342
Atlantic menhaden (Brevoortia tyrannus)	195	0	0	74	0	0	9	4	0	1	0
Atlantic silverside (Menidia menidia)	755	539	263	0	0	0	0	0	0	0	0
Banded killifish (Fundulus diaphanus)	1	7	5	0	0	0	0	0	0	0	0
Bay anchovy (Anchoa mitchilli)	6	78	557	0	0	0	0	379	151	8	231
Bluefish (Pomatomus saltatrix)	0	0	0	3	0	0	0	0	0	0	0
Blueback herring (Alosa aestivalis)	0	3	0	0	0	0	1	0	0	0	2
Gizzard shad (Dorosoma cepedianum)	5	0	0	1	4	0	3	0	0	0	0
Herring (Alosa spp.)	0	0	4,662	0	0	0	0	0	0	0	0
Hogchoker (Trinectes maculatus)	0	0	0	0	0	0	0	1	0	0	1
Inland silverside (Menidia beryllina)	4	0	61	0	0	0	0	0	0	0	0
Northern pipefish (Syngnathus fuscus)	0	0	0	0	0	0	0	1	0	0	0
Pipefish species	1	0	0	0	0	0	0	0	0	0	0
Pumpkinseed sunfish (Lepomis gibbosus)	22	0	0	0	1	0	0	0	0	0	0
Spot (Leiostomus xanthurus)	0	0	0	4	0	0	8	170	0	0	1
Striped bass (Morone saxatilis)	1	0	0	10	0	0	2	0	0	0	0
Striped killifish (Fundulus majalis)	0	33	8	0	0	0	0	0	0	0	0
Summer flounder (Paralichthys dentatus)	0	0	0	0	0	0	0	3	0	0	0
Weakfish (Cynoscion regalis)	0	0	0	2	0	0	0	3	0	0	0
White perch (Morone americana)	74	3	1	0	0	0	0	19	0	0	19
Total individuals	**1,070**	**660**	**5,629**	**96**	**5**	**0**	**23**	**606**	**153**	**12**	**596**

3.1.2.3 Other Protected and Special Status Species

In addition to ESA species (discussed in Section 4), the SPCT area may support other protected species under Section 7(a)(2) of the Endangered Species Act, as well as the bottlenose dolphin. TTT is consulting the NMFS Office of Protected Resources regarding these species. State listed special status species are also potentially present in the Action Area. Four species including a turtle and three mussels are on the Maryland Department of Natural Resources List of Rare, Threatened, and Endangered Species of Baltimore County (MDNR 2021) as in Baltimore County and five species are on the MDNR in need of conservation list (MDNR 2016). Through environmental review, it was determined the MDNR List of Rare, Threatened and Endangered Species were unlikely to be in the project area due to habitat requirements. Table 2 lists the species that have potential to be in the project area from the in need of conservation list.

Table 2. Aquatic Species in Need of Conservation in Baltimore County in the SPCT Project Area

Species	State Status or Rank	Required Habitat	Potentially Present in SPCT Project Area?
American shad (*Alosa sapidissima*)	In need of conservation	Spawn in freshwater tributaries of Chesapeake Bay.	Yes; suitable habitat for foraging is available.
Atlantic menhaden (*Brevoortia tyrannus*)	In need of conservation	Found in all salinity zones within the Chesapeake Bay.	Yes; found in project area fish surveys.
Hickory Shad (*Alosa mediocris*)	In need of conservation	Spawn in freshwater tributaries of estuaries and bays	Yes; suitable habitat for foraging is available.
Striped bass (*Morone saxatilis*)	In need of conservation	Found in fresh or salt water in estuaries and bays	Yes; found in project area fish surveys.
Yellow Perch (*Perca flavescens*)	In need of conservation	Found in brackish waters of Chesapeake Bay.	Yes; suitable habitat is available.

Sources: MDNR 2016

3.1.3 Hydrodynamics

The Action Area near Sparrows Point is adjacent to and within the mainstem of the Patapsco River about 6 miles south of Baltimore Harbor. The tides in Baltimore Harbor are characterized as semi-diurnal with two high tides and two low tides per day. Spring and neap tides are experienced in Baltimore Harbor in two-week cycles where the tide range is largest during spring tides and smallest during neap tides. The mean tide range reported at the Fort McHenry tide gauge (NOAA CO-OPS Station 8574680) is relatively low at 1.15 feet, which results in low current velocities throughout the harbor. Modeled tidal currents under existing conditions were evaluated and assessed near Sparrows Point for the Proposed Action. The highest current speeds (0.25 to 0.41 knots) were modeled in the Brewerton Channel adjacent to Sparrows Point. Tidal current velocities measured at the southwest corner of Sparrows Points, as well as between Fort Carroll and the former Key Bridge site were between 0.20 to 0.33 knots. The lowest modeled current velocities were within the L-shaped basin at Sparrows Point and were less than 0.02 knots. The modeled current velocities were generally higher during flood tides than during ebb tides.

4 ESA Species in the Action Area

Consultation with NMFS pursuant to Section 7(a) of the ESA was initiated in 2023 during the National Environmental Policy Act (NEPA) process. The applicant consulted NMFS's ESA Section 7 Mapper (NMFS 2022e), an online mapping tool, which indicated that Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) and Shortnose Sturgeon (I) may be present in the SPCT project area. In a letter dated February 16, 2024, NMFS identified the two sturgeon species plus four federally listed sea turtle species under its jurisdiction that may occur in the waters in or adjacent to the SPCT project area (NMFS 2024c; Table 3); the project area does not contain any designated critical habitat. Federally protected species can also fall under the jurisdiction of US Fish and Wildlife Service (USFWS); however, no aquatic species under USFWS jurisdiction are potentially present with the Action Area.

Detailed descriptions for each ESA species including habitat descriptions, natural history and stock status are described below. Per consultation with NMFS, bottlenose dolphins should be considered in the Biological Assessment for the Proposed Action. As such, information on the habitat and documented usage of the Action Area is also included in this section.

4.1 Atlantic Sturgeon

The Atlantic Sturgeon is one of two subspecies of *A. oxyrinchus*, the other being the Gulf sturgeon, *A. o. desotoi*. Atlantic Sturgeon populations occur along the eastern coast of North America from Hamilton Inlet, Labrador, Canada, to Cape Canaveral, Florida. An anadromous species, Atlantic sturgeon spawn in freshwater of tidal-affected rivers that are part of a coastal estuary. Tagging records and the relatively low rate of gene flow observed provide evidence that Atlantic sturgeon return to their natal river to spawn (Atlantic Sturgeon Status Review Team (ASSRT) 2007). NOAA Fisheries has delineated US populations of Atlantic sturgeon into five Distinct Population Segments (DPSs) – the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic. Effective 6 April 2012, NOAA Fisheries listed the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs as endangered, and the Gulf of Maine DPS as threatened. While individuals from the Chesapeake Bay DPS are the most likely to be present, fish from all five DPSs may occur within the Action Area. NOAA Fisheries developed a recovery outline to commence the recovery planning process for Atlantic sturgeon (NOAA Fisheries Protected Resources 2018). In this section, general information for all DPSs life history and habitat requirements are discussed, as well as information specific to the individuals from all DPSs that may utilize the Chesapeake Bay, including documented observations of Atlantic sturgeon within the Action Area.

Table 3. ESA Species Potentially Present in the SPCT Project Area

Species	ESA Status	Life Stage(s)/Behavior/Locations	Distinct Population Segment (DPS)	Time(s) of Year Potentially in Area	Federal Register	Recovery Plan
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)	E (GOM DPS status is T)	Adults, subadults, and juveniles / migrating and foraging / throughout Chesapeake Bay	All DPSs (adults / subadults) Chesapeake Bay DPS (juveniles)	3/15 – 11/30 (adults/subadults) 1/1 – 12/31 (juveniles)	77 FR 5880 and 77 FR 5914; CH 82 FR 39160	N/A
Shortnose Sturgeon (*Acipenser brevirostrum*)	E	Adults / migrating and foraging / throughout Chesapeake Bay	N/A	3/01 – 11/30	32 FR 4001	NMFS 1998
Loggerhead Sea Turtle (*Caretta caretta*)	T	Adults and juveniles / migrating and foraging / Massachusetts (S of Cape Cod) through Virginia	Northwest Atlantic	5/1 – 11/30	76 FR 58868	NMFS and USFWS 2008
Green Sea Turtle (*Chelonia mydas*)	T	Adults and juveniles / migrating and foraging / Massachusetts (S of Cape Cod) through Virginia	North Atlantic	5/1 – 11/30	81 FR 20057	NMFS and USFWS 1991
Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)	E	Adults and juveniles / migrating and foraging / Massachusetts (S of Cape Cod) through Virginia	N/A	5/1 – 11/30	35 FR 18319	NMFS et al. 2011
Leatherback Sea Turtle (*Dermochelys coriacea*)	E	Adults and juveniles / migrating and foraging / Massachusetts (S of Cape Cod) through Virginia	N/A	5/1 – 11/30	35 FR 8491	NMFS and USFWS 1992

Notes:

DPS = Distinct Population Segment

USFWS = US Fish and Wildlife Service

T = Threatened, E = Endangered, ESA = Endangered Species Act, DPS = Distinct Population Segment; GOM = Gulf of Maine

4.1.1 Life History and Habitat Requirements

Atlantic Sturgeon are estuarine dependent anadromous fish that can live an average of 60 years (ASSRT 2007). Atlantic Sturgeon are bottom feeders and can be present in freshwater, marine, and estuarine systems in various life cycles. Atlantic Sturgeon require freshwater habitat to spawn with fast flowing water and hard substrates (NMFS 2017, ASSRT 2007). Spawning occurs in natal rivers, with females producing between 400,000 to 4 million eggs (Hilton et al. 2016). Water temperature plays a critical role in spawning and in the mid-Atlantic, spawning typically occurs between April and Map (Hilton et al. 2016). Once hatched, larvae remain demersal on the hard bottom substrate until the post yolk sac larvae stage, when they drift downstream and settle on the river bottom to forage (Kynard and Horgan 2002). Young-of-year and juvenile Atlantic Sturgeon reside in lower salinity areas of their natal rivers or estuary (Hilton et al. 2016). Older juveniles become more salt tolerant and can utilize higher salinity areas. Juveniles consume benthic invertebrates as well as insect larvae and small aquatic insects. Juvenile sturgeon will remain in their natal estuary for several years before migrating to the open ocean in the sub-adult stage (ASSRT 2007, Dadswell 2006, Hilton et al. 2016). Migrating and foraging juveniles typically use main river channels deep enough where water is continuously flowing, which ensures growth and development of juveniles (NFMS 2019).

Subadults inhabit a marine environment and once reaching the adult stage, they stay in marine or estuarine waters with depths less than 160 feet until they are ready to spawn. Subadult and adult Atlantic Sturgeon consume benthic macroinvertebrates and crustaceans, as well as smaller fish (ASSRT 2007, Savoy 2007). During fall and winter, Atlantic Sturgeon will move into deeper waters for overwintering, including waters off the coast of Virginia and North Carolina, while many groups move around within different areas of the mid-Atlantic Bight (Erickson et al. 2011). Adults and subadults opportunistically forage the full extent of rivers, preferring the salt front areas and main channels where there is continuous flow to support staging, resting, and full passage (NMFS 2019).

4.1.2 Atlantic Sturgeon in the Chesapeake Bay

The Chesapeake Bay DPS of Atlantic Sturgeon includes Atlantic Sturgeon spawned in the watersheds that drain into the Chesapeake Bay and into coastal waters (including bays and sounds) from the Delaware-Maryland border at Fenwick Island to Cape Henry, Virginia, as well as Atlantic Sturgeon held in captivity that are progeny of such fish (50 Code of Federal Regulations 224.101).

Atlantic Sturgeon are present in the waters of the Chesapeake Bay and its adjacent bays and tributaries. Atlantic Sturgeon are born in freshwater, move to estuarine waters to grow and mature, migrate to the sea, and return to freshwater areas to spawn (NMFS 2023a). Spawning within the Chesapeake Bay occurs largely in Virginia tributaries (James River) (Secor 2002), outside of the project area and larger Baltimore Harbor area. Due to the habitat and salinity in project area, spawning and early life stages are not expected to occur (NMFS 2024b). Atlantic Sturgeon typically require lower salinities for spawning in natal rivers. Juveniles and adults may be transient in the project area, but typically stay near their natal rivers or migrate to the open ocean. Only subadult and adult Atlantic Sturgeon could occur within the Patapsco River area. Subadult Atlantic Sturgeon behavior in the Chesapeake Bay is similar to the adults and they will be present in the Bay from late March (Balazik and Musick 2015) through November and could utilize the full extent of the bay while also migrating and foraging the Chesapeake's tributaries (Horne and Stence 2016).

This species had historically large populations throughout the Chesapeake Bay; however, their populations have declined largely due to heavy fishing and degradation of spawning and nursery habitat (Virginia Institute of Marine Science 2009). Atlantic Sturgeon are also listed as endangered by MDNR.

4.2 Shortnose Sturgeon

Shortnose Sturgeon is federally listed as endangered throughout its range and listed as endangered by MDNR. NMFS implemented a recovery plan for Shortnose Sturgeon in 1998 (NMFS 1998). Shortnose Sturgeon are fish that occur in rivers and estuaries along the East Coast of the United States and Canada (Shortnose Sturgeon Status Review Team [SSSRT] 2010). In this section, life history, habitat requirements, information specific to the Chesapeake Bay populations, including documented observations of Shortnose Sturgeon within the Action Area are discussed.

4.2.1 Life History and Habitat Requirements

Shortnose Sturgeon are slow growing and late maturing, often living beyond 40 years. Yolk-sac larvae of Shortnose Sturgeon can drift with river currents and are typically concentrated near the spawning area for the first month. Shortnose Sturgeon utilize most of a river system but often remain in important resting and feeding aggregations for extended time periods (Hastings et al. 1987, Kieffer and Kynard 1993 SSRT 2010). Adults have varying migratory patterns that often depend on the river system. Shortnose Sturgeon migrate from overwintering locations upstream to spawning grounds during the spring in northern rivers and in late winter/early spring in southern rivers (Dadswell 1979, Kynard 1997). Spawning areas are typically located in the farthest upstream reach of rivers with no barriers (SSSRT 2010). Shortnose Sturgeon move from spawning areas downstream to foraging areas in low-salinity bottom waters of estuaries for much of the year (SSRT 2010). They feed on a variety of benthic organisms including mollusks, crustaceans, and worms. Individuals in the Chesapeake Bay spend most of the year in the lower part of the river in which they were born, migrating to deeper waters in winter (CBP 2024). Due to the habitat and salinity in the project area, spawning and early life stages are not expected to occur (NMFS 2024a).

4.2.2 Shortnose Sturgeon in Chesapeake Bay

Unfavorable water conditions, such as low oxygen, pollution, and habitat alteration, have caused significant declines in the Chesapeake Bay population.

Transient adult Shortnose Sturgeon could be present in the waters of the Chesapeake Bay and adjacent bays and tributaries to opportunistically forage; however, historical studies have indicated that Shortnose Sturgeon in the Chesapeake Bay are rare with only one individual observed in the lower Chesapeake Bay and just over 70 in the upper Chesapeake Bay over ten years (1996 through 2006) (Balazik 2017). The most recent report of a Shortnose Sturgeon in the lower Chesapeake Bay and tributaries was a catch in the Potomac River near the Chain Bridge in April 2021 (Blankenship 2021). Additionally, a study was conducted in the upper Chesapeake Bay mainstem, lower Susquehanna River, and C and D Canal during 1998 and 2000 during NMFS review of the Baltimore Harbor and Channels Federal Navigation Project. This involved bottom gillnetting 19 locations within the upper Chesapeake Bay and did not capture any sturgeon (SSRT 2010). While some foraging may occur in the Potomac River, no spawning in the Chesapeake Bay or tributaries has been documented (SSRT 2010). Various life stage individuals could be present along the transport routes from the SPCT area to either the Norfolk Ocean Disposal Site (NODS) or a Maryland Port Administration (MPA) DMCF.

4.3 Sea Turtles

Four species of ESA-listed threatened or endangered sea turtles under NMFS jurisdiction are seasonally present in Chesapeake Bay —Northwest Atlantic Ocean DPS of loggerhead sea turtle (*Caretta caretta*; threatened), North Atlantic DPS of green sea turtle (*Lepidochelys kempii*; threatened), Kemp's ridley sea turtle (*Lepidochelys kempii*; endangered), and leatherback sea turtle (*Dermochelys coriacea*; endangered) (NMFS 2024a).

Sea turtle species share similar habitats and are widely distributed throughout their range occupying vast open ocean habitat and inshore areas. Juvenile sea turtles live a pelagic existence before returning inshore as they mature. The primary diet of sea turtles can vary by species and includes marine vegetation, benthic invertebrates, and other small marine animals (NMFS 2023b). Although some sea turtle individuals have been observed as far north as Maine, the Chesapeake Bay is typically the northernmost limit for their range (Funk 2020).

According to the NMFS Biological Opinion prepared for the Nice Bridge Project on the Potomac River, the most abundant species in the Chesapeake Bay is loggerhead sea turtle followed by Kemp's ridley sea turtles. Distribution and abundance models by Duke University suggest that Kemp's ridley are abundant near the mouth of the Chesapeake Bay (DiMatteo & Sparks 2023 as cited in NMFS 2023c). Green sea turtles are also present and leatherback sea turtles also occur less frequently, in the Chesapeake Bay.

The Chesapeake Bay is an important developmental and foraging habitat for sea turtles in the summer months (Evans et al. 1997; Litwiler and Insley 2014), but sea turtles are not likely to be as far north in the Chesapeake Bay as the SPCT project area, due to lower salinity waters. Loggerheads, leatherback, and green sea turtles are typically found in the Chesapeake Bay in Maryland in the southern portions of the state near Worcester County (MDNR 2016, 2024c, 2024d, 2024e. 2024f). Kemp's ridley turtles use eelgrass beds in the lower portions of the Chesapeake Bay during summer months (CBP 2024c).

In the project area (and larger Baltimore Harbor), suitable vegetation and salinity for sea turtles is not available. For this reason, only those impacts on sea turtles associated with increased vessel traffic in the Lower Chesapeake Bay (where barges and other vessels may be transiting to the project area) and from the SPCT project area to the NODS are the impacts evaluated in this Biological Assessment.

4.4 Bottlenose Dolphin

The Bottlenose Dolphin (*Tursiops truncatus*) is not protected under the ESA but is protected under the Marine Mammal Protection Act (MMPA). Bottlenose Dolphins thrive in temperate or tropical marine waters and estuaries of temperate waters (NMFS 2024b) and are able to use the lower reaches of rivers (CBP 2024d). Bottlenose dolphins are abundant along the Virginia coast and within the Chesapeake Bay. They consume fish, squid, and small crustaceans. There are various North Atlantic Stocks, many of which are designated as depleted under the MMPA.

According to consultation with NMFS Office of Protected Resources in November 2024, Bottlenose Dolphins have the potential to be present as transient individuals in the lower Patapsco River of the Action Area and the transit route from SPCT to MPA DMCFs. They have a higher likelihood of occurrence along the southern and lower Chesapeake Bay transit route to the NODS in the Atlantic Ocean. They can be found in the lower Chesapeake Bay, most typically in the summer. Bottlenose dolphins primarily use the lower Chesapeake Bay in the summer with most usage near the James and

Elizabeth Rivers in Virginia. They are seen annually in Virginia from April through November with approximately 65 strandings occurring each year (Barco and Swingle 2014, Engelhaupt 2016). Dolphins are commonly sighted in areas far south of the SPCT area including the mouths of the Potomac and Rappahannock Rivers (Bay Journal 2021). The most robust sighting data near the mouth of the Patapsco River and within the entire Chesapeake Bay is based on citizen science, where reports are logged via the Dolphin Watch app supported by University of Maryland, Center for Environmental Science. These data are available from 2017 through 2022. Annual sightings have increased. The increase in annual sightings could be a result of an increase in dolphin movements within the region and/or an increase in public awareness and use of the app to log sightings. The highest recorded number of dolphin sightings within the entire Chesapeake Bay was 500 individuals in July 2022. There have been only 1 to 2 sightings per summer month in the Patuxent River between 2017 and 2022; however, this is likely an underestimate as data are dependent upon citizen reporting. Sightings are less frequent farther north in the Patapsco River and Baltimore Harbor areas and typically occur when these waters have higher than normal salinity in the summer months. Recent observations near the project area include a single dolphin using waters in the Inner Harbor (9 miles north of SPCT; ABC Baltimore 2023) and at the mouth of the Patapsco River (approximately 5 miles south of SPCT; The Washington Post 2018).

5 Effects of the Proposed Action on ESA Species

In-water construction activities for the proposed action will comply with any applicable environmental windows for sensitive species to be determined by NMFS. This section includes a summary of impacts on federally managed fish species and their life stages (as identified in Table 1) and the designated ESA species in the Proposed Action Area. The analysis focuses on impacts that reduce the quality or quantity of habitat for ESA species or pose a direct risk of physical injury. Not all stressors listed below are evaluated for every ESA species. Species evaluated for impacts from each stressor are listed in parentheses after the stressor.

The impacts evaluated for ESA species are:

- **Underwater Noise** from pile driving (both Sturgeon species and Bottlenose Dolphin)
- **Turbidity** from channel dredging, pile driving, and DMCF construction (both Sturgeon species and Bottlenose Dolphin)
- **Habitat Alteration** from channel dredging and DMCF construction (both Sturgeon species)
- **Vessel Traffic** from construction, dredged material transport, and long-term use of the SPCT (both Sturgeon species, Bottlenose Dolphin, and Sea Turtles); and
- **Impingement and Entrainment** from hydraulic operations for offloading dredged material (both Sturgeon species).

5.1 Underwater Noise from Pile Driving

Noise impacts from anthropogenic sources (e.g., in-water construction activities such as pile driving) have the potential to impact fish and other marine species that rely on hearing underwater to forage, communicate, detect predators, and navigate (NMFS 2022a). Receptor response to noise varies by the types and characteristics of the noise source, distance from the source, water depth, receptor sensitivity, and temporal scale. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by either mobile or stationary sources.

5.1.1 Noise Impact Types and Scenario Overview

Construction activities that could generate noise with the potential to impact fish and marine mammals are associated with the construction of the SPCT terminal. These activities include:

1. Installation of steel pilings during construction of the marginal wharf with piling diameters of 24, 30, and 36 inches
2. Installation of steel pilings during construction of mooring dolphins with piling diameters of 24 inches
3. Water-based near-shore demolition activities before construction of the terminal
4. Potential concurrent construction of the marginal wharf and mooring dolphins

During construction, the noise generated by pile driving could rise to the level of affecting sturgeon and dolphins as driving can produce loud, impulsive sound waves. Other activities such as dredging or vessel traffic would produce some noise, but not at levels that would impact fish. Activities involving driving of piles are the scenarios that were modeled to assess underwater noise impacts on fish.

The details on the pile driving activities for each construction scenario are summarized in Table 4. During the terminal design process, measures to reduce the overall number of piles necessary for the terminal wharf structure were used to the extent practicable.

Table 4. In-water Pile Driving Activities

Activity	Approximate Activity Duration (days)	Average Number of Piles Installed per Day	Number and Diameter of Steel Piles	Method of Pile Driving
Wharf piling installation	243	6	150 24-inch piles 600 30-inch piles 600 36-inch piles	Impact and vibratory
Mooring dolphin piling installation	20	3	60 24-inch piles	Impact and vibratory
Concurrent wharf piling and mooring dolphin piling installation	20	9	120 36-inch piles (maximum expected for wharf piling) 60 24-inch piles	Impact and vibratory
Water-based demolition	20	NA	Varied	Vibratory

Acoustic thresholds for the onset of underwater acoustic impacts from pile driving activities were calculated for fish and dolphins in the project area using the Optional Multi-Species Pile Driving Calculator Tool, VERSION 1.2-Multi-Species: 2022, provided on the NMFS website (NMFS 2022b). General assumptions were used in the model with the best available project information and technical guidance to estimate the impacts of underwater sound on fishes. More specific assumptions associated with each scenario are discussed below.

Both vibratory and impact hammers are proposed to be used to install piles for the terminal construction. Impact pile driving produces intense, broadband (a sound signal that includes acoustic energy across a wide range of frequencies), impulsive sounds in which the sound pressure is very large at the instant of the impact and then decays rapidly with distance; the duration of the peak pressure pulse is usually only a few milliseconds (University of Rhode Island [URI] 2017). The majority of energy in pile impact pulses is at frequencies between 100 and 400 hertz (Hz) (Matuschek and Betke 2009).

Vibratory pile driving produces a continuous sound with peak pressures lower than those observed in pulses generated by impact pile driving. Sound signals generated by vibratory pile driving usually consist of a low fundamental frequency of 20 to 40 Hz (URI 2017). Low-frequency signals produce long sound wavelengths. These long-wavelength signals encounter fewer suspended particles as they pass through the water and thus their energy is absorbed more slowly (Hatch and Wright 2007). As a result, low-frequency signals travel farther than higher-frequency signals. Therefore, noise produced by a vibratory hammer can travel farther in water than noise produced by an impact hammer, despite having a lower peak pressure at the source.

5.1.2 Noise Modeling Considerations and Inputs

5.1.2.1 Geographic Range of Noise Impacts

The geographic extent of underwater noise impacts from pile driving is dependent on factors such as the type of pile driving equipment, length of time spent pile driving, and environmental conditions. The extent to which fishes and marine mammals (including dolphins) react to sound varies among species, their life stage, inter- and intra-specific interactions, and other environmental conditions. Guidelines on the impact of impulsive sounds on the behavior of fishes are found in the *National Marine Fisheries Service: Summary of Endangered Species Act Acoustic Thresholds (Marine Mammals, Fishes, and Sea Turtles)*, specifically the 2008 Fisheries Hydroacoustic Working Group (FHWG) criteria (FHWG 2008). Non-injury behavioral responses of fishes range from strong avoidance by virtually all individuals to tolerance and habituation (Anderson 1990; Fiest 1992). It is anticipated that impacts from noise sources would be the same for all fish species (less than and greater than 2 grams) potentially present within the project area. All fish species in the area could potentially use the pelagic and bottom habitat near the sound source, and there are no data indicating that a particular fish species would be more sensitive to impulsive sound than another.

5.1.2.2 Fish Physiology and Morphology

Though the injury criteria distinguish between fish of different sizes (fish weighing less than 2 grams and those weighing 2 grams or more), the criteria do not distinguish between fish of different hearing sensitivity. However, criteria are expected to be conservative and protective of pelagic and demersal fish potentially present within the project area. It is worth noting that the hearing sensitivity of fish varies by species and has been linked to morphology, specifically the presence of a swim bladder, the proximity of the swim bladder to the ear, and the presence of adaptations that link the swim bladder to the ear. Fish with swim bladders closest to the ear and those with specialized adaptations are most sensitive to sound since they are stimulated by sound pressure via the gas within the swim bladder as well as by particle motion, whereas fish without swim bladders and fish without swim bladders near the ear are only stimulated by particle motion (Popper and Hawkins 2019).

Within the different morphological groups, hearing sensitivity also varies by species; for example, black sea bass (*Centropristis striata*), is fairly sensitive to sound compared to related species (Stanley et al. 2020). Several species of clupeid fishes are able to detect and respond to ultrasonic sounds, likely due to an ear specialization unique to clupeids (Popper et al. 2004). Clupeid fishes are of particular concern given proximity of the site to migratory corridors for anadromous herrings. Blueback herring (*Alosa aestivalis*), unidentified herring species, Atlantic menhaden (*Brevoortia tyrannus*), and gizzard shad (*Dorosoma cepedianum*), all clupeid fishes, were found during surveys, indicating that fish with high hearing sensitivity may be in the project area during pile driving. Though given the sensitivity to underwater sound, it is still anticipated that these fish would be protected using the FHWG criteria.

Bottlenose dolphins are in the mid-frequency cetacean functional hearing group with an estimated auditory bandwidth of 150 Hz – 160 kHz (Southhall et al. 2007). Bottlenose Dolphins may have an echolocation range of 100 to 600 meters in ocean environments.

5.1.2.3 Acoustic Thresholds – Fish and Dolphins

The calculations from the NMFS Multi-Species Pile Driving Calculator Tool were used to create a multi-ring buffer of isopleths (i.e., sound contours) diminishing in 1 decibel (dB) increments from the sound source. These thresholds are the lowest level where injury could occur (FHWG 2008) and are used to indicate the distance from the noise source where fishes and dolphins are anticipated to potentially be exposed to injury or disturbance.

The modeled fish and marine mammal thresholds for physical injury and behavioral disturbance were used to determine the distances to onset of physical injury and behavioral disturbances (Tables 5 and 6). Thresholds for behavioral disturbance were available only for all marine mammals in the Multi-Species Tool, while physical injury thresholds were available for mid-frequency cetaceans which include dolphins. Physical injuries to fish from noise sources can include inner ear tissue damage and hearing loss (Casper et al. 2013) and rupture or damage to the swim bladder (California Department of Transportation [Caltrans] 2020). Behavioral disturbances include showing a brief awareness of the sound, small movements, or escape responses to move away from the noise source entirely (URI 2017). Thresholds for these effects are measured by evaluating the cumulative sound exposure level over the duration of a noise event (SEL_{cum}), the maximum instantaneous sound pressure over the duration of a noise event (SPL_{peak}), and the root mean square (RMS) pressure.

The NMFS Multi-Species Tool for modeling underwater noise impacts was also used to estimate the impacts of construction activities on bottlenose dolphins that could be in the project area. Table 6 shows guidance to onset to noise levels for the onset of physical injury and behavioral disturbance in marine mammals (including dolphins).

The intensity of pile driving noise is greatly influenced by factors such as the types of piles and hammers and the physical environment in which the driving activity takes place. Since site-specific sound monitoring data are not available, reasonable noise source levels that would be likely to result from pile driving during construction, or proxy sound levels, from the NMFS calculator were selected (Table 5). Proxy sound levels were selected based on the pile size and type. When possible, sound levels from water depths similar to the maximum water depth expected in SPCT project area (-52 feet following dredging for SPCT) were selected. However, the sources of the available monitoring data vary and values from shallower water depths were used in sound modeling when values from deeper water depths were not available.

Different types of sound pressure effects can cause different reasonable noise source levels that may result from pile driving. The peak pressure effect occurs from impact driving, as opposed to vibratory driving, which creates a more constant sound pressure with no peak decibel level. The peak effect from impact driving is the greatest value of the sound signal and is measured in dB re 1 µPa (underwater noise in decibels referenced to a pressure of 1 micropascal) used to specify the intensity of sound underwater (NMFS 2022c). The RMS pressure effect is the average intensity of the sound signal over time, which is applied to both impact and vibratory driving. The sound effect level (SEL) is the measure of energy that considers both the level and duration of exposure to the sound (Table 5) (NMFS 2022c). SEL is measured in units of dB re 1 μPa^2 s (underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds).

Table 5. Underwater Noise Modeling Inputs

Pile Type/Activity	Installation Method	Maximum Number of Hammers Used Concurrently	Impact Driving Strikes per Pile1	Vibratory Driving Estimated Minutes Time to Drive Each Pile2 (minutes)	Peak (dB re 1 μPa)	SEL (dB re 1 μPa² s)	RMS3 (dB re 1 μPa)	Proxy Value Water Depth (feet)	Proxy Value Source4
24-inch wharf piling	Vibratory	3	NA	90	NA	NA	153	9.8	Caltrans 2020
	Impact	3	600	NA	207	178	199	49	Caltrans 2015
30-inch wharf piling	Vibratory	3	NA	120	NA	NA	172	26 to 36	Caltrans 2020
	Impact	3	750	NA	210	177	195	9.8	Caltrans 2015
36-inch wharf piling	Vibratory	3	NA	180	NA	NA	175	16	Caltrans 2015
	Impact	3	900	NA	210	183	198	33	Caltrans 2015
24-inch mooring dolphin piling	Vibratory	1	NA	120	NA	NA	153	9.8	Caltrans 2020
	Impact	1	600	NA	207	178	194	49	Caltrans 2015
Concurrent 36-inch wharf and 24-inch mooring dolphin piling5	Vibratory	4	NA	120	NA	NA	175	16	Caltrans 2020
	Impact	4	800	NA	210	183	199	33	Caltrans 2015
Water-based demolition6	Vibratory	2	NA	NA	NA	NA	180	16	Caltrans 2020

Notes:

1. Strikes per pile for impact driving and time to drive each pile for vibratory pile driving estimated based on the driving logs of recent projects. For the concurrent scenario, a weighted average based on average piles per day was used to estimate values.

2. For water-based demolition, activity types and durations may vary. Modeling assumed constant use of both vibratory hammers during work hours (10 hours).

3. The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently, as per guidelines in the Washington State Department of Transportation Biological Assessment Preparation Manual (WSDOT 2020; described in Section 4.8.2.2). To determine the full range of noise levels, underwater noise modeling for wharf piling activities assumed that each of the hammers would be driving the same pile size.

4. Proxy values selected from Optional Multi-Species Pile Driving Calculator Tool, VERSION 1.2-Multi-Species: 2022 (NMFS 2022b).

5.Proxy values for Peak and SEL values in the concurrent scenario defaulted to the larger values between the two pile sizes and are based on 36-inch piles. Calculation of RMS for multiple impact hammers followed methodology above.

6. As pile types are unknown for water-based demolition, modeling used the maximum RMS proxy value for vibratory pile driving.

NA = not applicable; SEL = sound exposure level; RMS = root mean square; dB re 1 μPa = underwater noise in decibels referenced to a pressure of 1 micropascal; dB re 1 μPa²s = underwater noise in decibels referenced to a pressure of 1 micropascal squared seconds

Table 6. **Fish and Marine Mammal Impact Pile Driving Injury Guidance**

Fish Weight	Onset of Physical Injury		Onset of Behavioral Disturbance
	SEL_{cum}	SPL_{peak}	RMS
Fishes weighing 2 grams or more	187 dB	206 dB	150 dB
Fishes weighing 2 grams or less	183 dB	206 dB	150 dB
Mid-frequency cetaceans	185 dB	230 dB	--
All marine mammals	--	--	160 dB

5.1.2.4 Sound Proxy Values

The maximum number of hammers for each activity associated with the construction of the terminal is included in Table 5. The RMS proxy values are based on the noise of a single hammer and have been adjusted to account for multiple impact hammers being used concurrently. The Washington State Department of Transportation Biological Assessment Preparation Manual (Washington State Department of Transportation [WSDOT] 2020) presents the rules for combining noise levels. To combine noise levels, only the three loudest pieces of equipment are considered. The two lower noise levels are combined first and then the result is combined with the loudest noise level. For each activity in Table 5, the noise levels for each hammer are assumed to be the same. To combine noise from two pieces of equipment that are within 0 to 1 dB of each other, 3 dB is added to the higher value to combine noise levels. To add the third piece of equipment to the combined noise level (now 3 dB greater), 2 dB is added to the combined noise level. Thus, for two hammers being used concurrently, 3 dB was added to the RMS proxy value, and for three or five hammers being used, 5 dB was added to the RMS proxy value. The underwater noise modeling for wharf piling installation assumed that the hammers would be driving to the same pile size to determine the worst-case (highest) noise levels.

Also presented in Table 5, the impact pile driving RMS proxy value for 24-inch piles is greater than that for the larger pile types and the SEL proxy value for 24-inch piles is greater than that for 30-inch piles. Larger piles are associated with higher recorded underwater sound levels (Jimenez et al. 2020). However, underwater sounds are influenced by more than the type of hammer and pile. The physical environment of the site, including temperature, water depth (pressure), salinity, and presence of obstacles, can influence sound. Generally, sound travels faster in warmer, deeper water with higher salinity (Sinay 2024). Temperature and salinity measurements were not given for the proxy values, but the sound levels for the different piles were recorded in different water depths. Underwater sound is dependent on pressure, which varies with depth. At greater water depths, pressure increases, which compresses the water molecules and increases the speed of sound (Sinay 2024).

5.1.2.5 Sound Attenuation

A sound reduction measure was included in the modeling for noise impacts from SPCT construction. The NMFS Multi-Species Tool used for noise modeling does not include a sound reduction for use of a cushion block but does include a 5 dB reduction for use of a bubble curtain surrounding the work area. A cushion block is frequently used during pile driving to reduce sound propagation. TPA evaluated recent studies and reports along with recently accepted sound reductions for modeling fish impacts for wharf construction projects in the Philadelphia area.

The Washington Department of Transportation (WSDOT 2006a) conducted a study to evaluate the effectiveness of wood, micarta, and nylon cushion blocks in reducing underwater sound during the driving of 12-inch diameter steel pipe piles generation (Molnar et al. 2020). A range of decibel reduction for wood cushion blocks was reported to be between 11 and 26 dB (WSDOT 2006b as cited in Caltrans 2009). The range of 11 to 26 dB reduction for wood cushion blocks originated from a technical report that measured sound levels during pile driving using different cap materials (Laughlin 2006). The study is limited and included use of a wood cushion block while pile driving one 12-inch diameter standard steel pile and one 12-inch pile with 1.5-foot-wide interlocking steel 'wings' at two different water depths at the Cape Disappointment boat launch facility near Ilwaco, Washington (Laughlin 2006). At least two recent ESA Biological Opinions from NMFS Greater Atlantic Regional Fisheries Office (NMFS 2022c, 2022d) contained noise modeling for impacts from wharf construction projects in the Philadelphia area. For these biological opinions, the parameters used in the acoustic calculator tool included proxy sound levels with a 11 dB attenuation to account for a cushion block, the most conservative reduction in the range presented in Caltrans 2009.

Based on the understanding of the NMFS Multi-Species tool's conservative sound reduction allowance for attenuation measures, guidance documents on the effectiveness of different attenuation measures including cushion blocks, and recent biological NMFS consultations for similar projects, the following sound reductions were utilized in the noise modeling for this project:

1. Sound attenuation of 5 dB with use of a bubble curtain during impact pile driving; and
2. Sound attenuation of 11 dB with use of a wood cushion block during impact pile driving.

The noise level parameters were decreased by 5 and 11 dB for modeling impact pile driving thresholds with the effective use of a bubble curtain or wood cushion block for the largest noise producing activity. This decibel reduction applies only to the use of an impact hammer for driving piles, as cushion blocks are not used on vibratory hammers. As discussed during recent consultation with NMFS in November 2024, TTT presents the result of both modeling a 5- and 11-dB reduction, with the understanding that in-field verification of the cushion block would need to be completed in coordination with NMFS.

5.1.3 Noise Modeling Impacts to Fish

The results presented in this Biological Assessment show the distances to the following impacts:

1. Onset of behavioral disturbance from a vibratory hammer with no sound reduction measure for each activity;
2. Physical injury and behavioral disturbance from an impact hammer with no sound reduction measure;
3. Physical injury and behavioral disturbance from an impact hammer with the use of a bubble curtain (-5db) for the largest noise producing activity only (concurrent wharf and mooring dolphin piling installation).
4. Physical injury and behavioral disturbance from an impact hammer with the use of a cushion block (-11db) for the largest noise producing activity only (concurrent wharf and mooring dolphin piling installation).

Noise modeling results are presented in figures based on two in-water sound source locations for the SPCT pile driving activities — one location within the embayment on the east side of Coke Point and one location outside the embayment on the south tip of the Coke Point peninsula. While noise impacts without sound attenuation are presented below and in Table 5, figures presented in this document represent concurrent wharf and mooring dolphin piling installation via impact driving with a bubble curtain and cushion block (modeled separately) as well as the maximum distance to behavioral disturbance due to vibratory driving during water-based demolition (since no mitigation is applied to vibratory driving). This construction scenario produced the largest sound impacts in the model. Results for the additional construction activities with lesser noise impacts (raw model outputs) are included in Attachment B.

5.1.3.1 Noise Impacts to Fish without Sound Attenuation Measures

Marginal Wharf Pilings

Wharf pilings are 24, 30, and 36 inches in diameter (Table 4). As summarized in Table 7, the largest maximum distance to peak onset (SPLpeak) of physical injury in any size fishes is 61 feet (approximately 0.01 mile) for impact driving of a 30- or 36-inch steel pipe. The maximum distance to cumulative (SELcum) of physical injury is within 5,200 feet (approximately 1 mile) for any size fish is based on 36-inch steel pipe. Data used to develop the proxy sound values were from different water depths. The distance for behavioral disturbance in any size fishes from impact driving of wharf piles is largest for the driving of 24-inch piles (60,625 feet or 11.5 miles). Sound behaves differently at varying depths; therefore, depending on the water depth, a larger sound impact may not always be correlated to a larger diameter pile. For vibratory impact, the distance to onset of behavioral disturbances for fishes increases with increasing pile size.

Mooring Dolphin Pilings

Mooring dolphin pilings are 24-inch steel pipes driven by both impact and vibratory hammers. The distance to peak onset (SPL_{peak}) of physical injury in any size fish is 38 feet or less than 0.01 mile (Table 7). The distance to cumulative (SEL_{cum}) of physical injury is within 1,220 feet (approximately 0.2 mile) for fish larger than 2 grams and within 2,253 feet (approximately 0.4 mile) for fish weighing less than 2 grams. Behavioral disturbance occurs within 28,140 feet (approximately 5.3 miles) regardless of fish weight. For vibratory driving, behavioral disturbance occurs within 52 feet for any size fish.

Concurrent Wharf Piling and Mooring Dolphin Piling

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area. A 20-day period for concurrent activities is used to estimate when both wharf piling and mooring dolphin piling may occur simultaneously (Table 4), and it is assumed that the maximum wharf piling size (36 inches) is what will be installed during the concurrent activities. For concurrent impact driving, the distance to peak onset (SPL_{peak}) of physical injury in any size fish is within 61 feet (approximately 0.01 mile) (Table 7). For injury from concurrent impact driving, the maximum distance for physical injury for any size fish is within 5,200 feet (approximately 1 mile), while the onset for distance for behavioral disturbance for any size fish is within 60,625 feet (11.5 miles). For concurrent vibratory driving, behavioral disturbance occurs within 1,523 feet (approximately 0.3 mile) for any size fish.

Concurrent wharf and mooring dolphin piling installation and water-based demolition activities were modeled for a vibratory hammer. For behavioral disturbance, the maximum distance to onset of impact is 3,281 feet from the sound source from in-water demolition; concurrent wharf and mooring dolphin piling installation would have a maximum distance of 1,523 feet. For activities inside and near the mouth of the embayment, the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 12,000- and 10,700- feet wide where fish could transit and avoid noise impact, respectively. Because no sound attenuation was modeled for vibratory pile driving, distances to impacts remain the same regardless of mitigation used and are shown in Figures 7 and 8.

In-Water Demolition

Precise activities and pile sizes to be removed during water-based demolition are yet to be determined and would be finalized closer to project construction. For modeling, it is assumed that only vibratory impacts would be produced during removal of existing in-water structures. Modeling predicts that fishes of any size may experience behavioral disturbance within a distance of 3,281 feet (approximately 0.6 mile) from demolition activities (Table 7). This activity has the largest potential area of behavioral disturbance from removal of in-water structures using vibratory hammers. No sound mitigation was modeled for vibratory hammer use.

5.1.3.2 Noise Impacts to Fish with Sound Attenuation of 5db (bubble curtain)

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area (section 4.1.3.1). This scenario was modeled again with use of a 5db sound reduction for a bubble curtain (Table 8).

For the concurrent wharf and mooring dolphin piling installation with a bubble curtain (-5db), the distance to the peak onset of physical injury for any size fishes is 28 feet and the distance to the onset of physical injury is 2,414 feet. Behavioral disturbance onset occurs within 28,139 feet from either sound source location. For pile driving activities occurring inside and outside the embayment (Figures 9 and 10), the noise impact distance would not leave a zone of passage during pile driving activities.

5.1.3.3 Noise Impacts to Fish with Sound Attenuation of 11db (cushion block)

The model indicates that concurrent 36-inch wharf piling and 24-inch mooring dolphin piling installation has the largest potential noise impact area (section 4.1.3.1). This scenario was modeled again with use of a 11db sound reduction for a bubble curtain (Table 8).

For the concurrent wharf and mooring dolphin piling installation with a cushion block, the distance to the peak onset of physical injury for any size fish is 11 feet and the distance to the onset of physical injury is 961 feet. Behavioral disturbance onset occurs within 11,203 feet (or 2.1 miles) from either sound source location. For pile driving activities occurring inside the embayment (Figure 11), the noise impact distance would leave a zone of passage in the mainstem of the Patapsco River approximately 4,000 feet wide where fish could transit and avoid noise impact. A zone of passage approximately 2,000 feet wide would be present when pile driving activities occur closer to the mouth of the embayment (Figure 12). In addition to use of a cushion block to reduce sound propagation, a soft-start (gradual startup of impact pile driving) may be used to produce small sound waves that would encourage fish to move away from the project area before pile driving begins. Construction on the south end of Coke Point (outside of the embayment) may be phased to avoid impact driving of steel piles during the time-of-year restriction window for fish based on agency guidance.

Table 7. Maximum Distances to Fish Sound Thresholds from Impulsive Sources (without sound attenuation)

Activity	Pile Count and Size/Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance[1] (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)		
		150 dB RMS (any size fish)	150 dB RMS (any size fish)	206 dB SPL_{peak} (any size fish)	187 dB SEL_{cum} (fish greater than 2 grams)	183 dB SEL_{cum} (fish less than 2 grams)
Wharf piling	150, 24-inch steel pipe piles	52	60,625	38	1,936	2,414
Wharf piling	600, 30-inch steel pipe piles	961	32,808	61	1,927	2,070
Wharf piling	600, 36-inch steel pipe piles	1,523	51,998	61	5,200	5,200
Mooring dolphin piling	60, 24-inch steel pipe piles	52	28,140	38	1,220	2,253
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	60,625	61	5,200	5,200
In-water demolition	Varied	3,281	NA	NA	NA	NA

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for fish.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

Figure 7. Maximum Distance to Noise Impacts from Vibratory Hammer – Wharf Construction Within Turning Basin

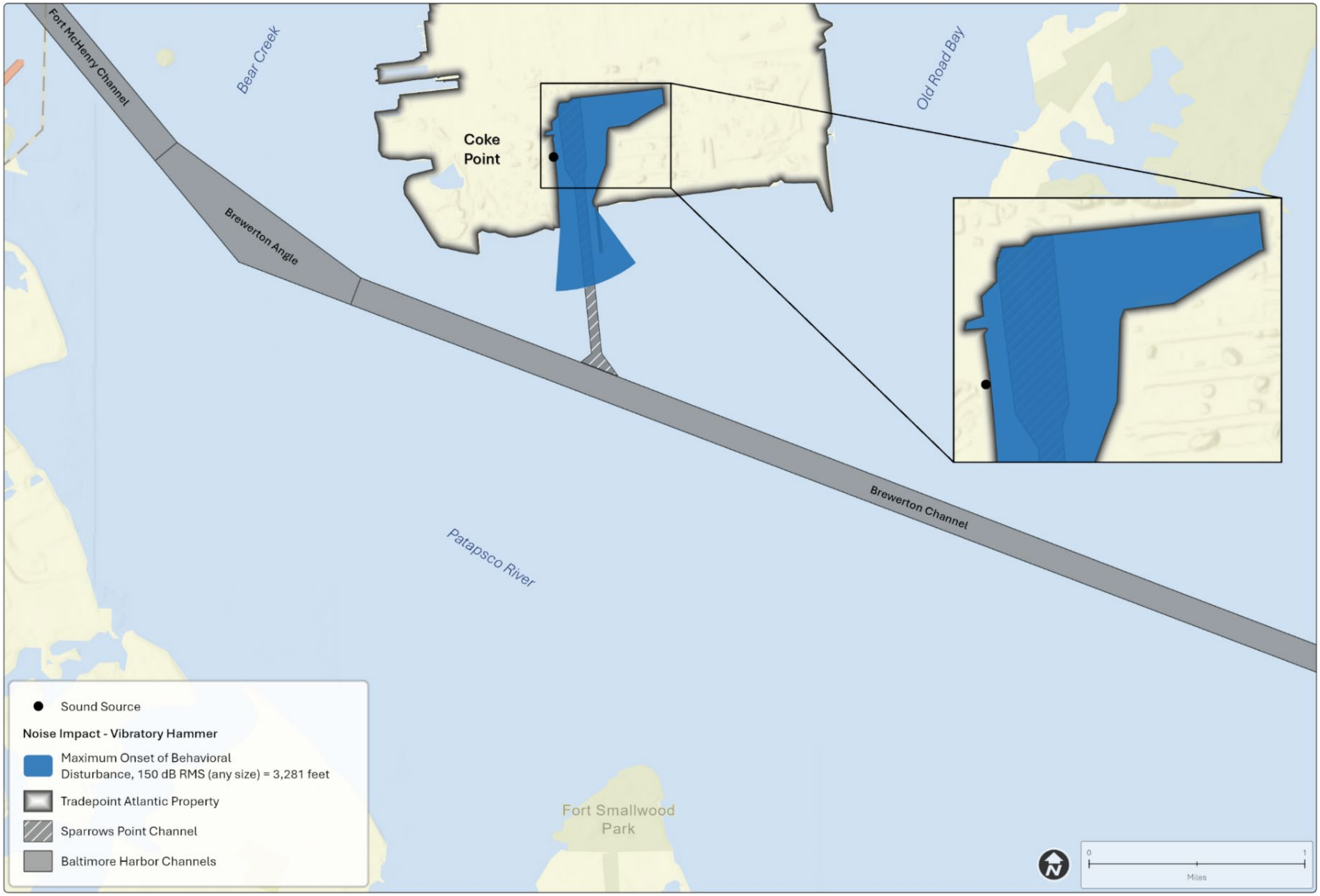


Figure 8. Maximum Distance to Noise Impacts from Vibratory Hammer – Wharf Construction at Southern Point Outside of Turning Basin

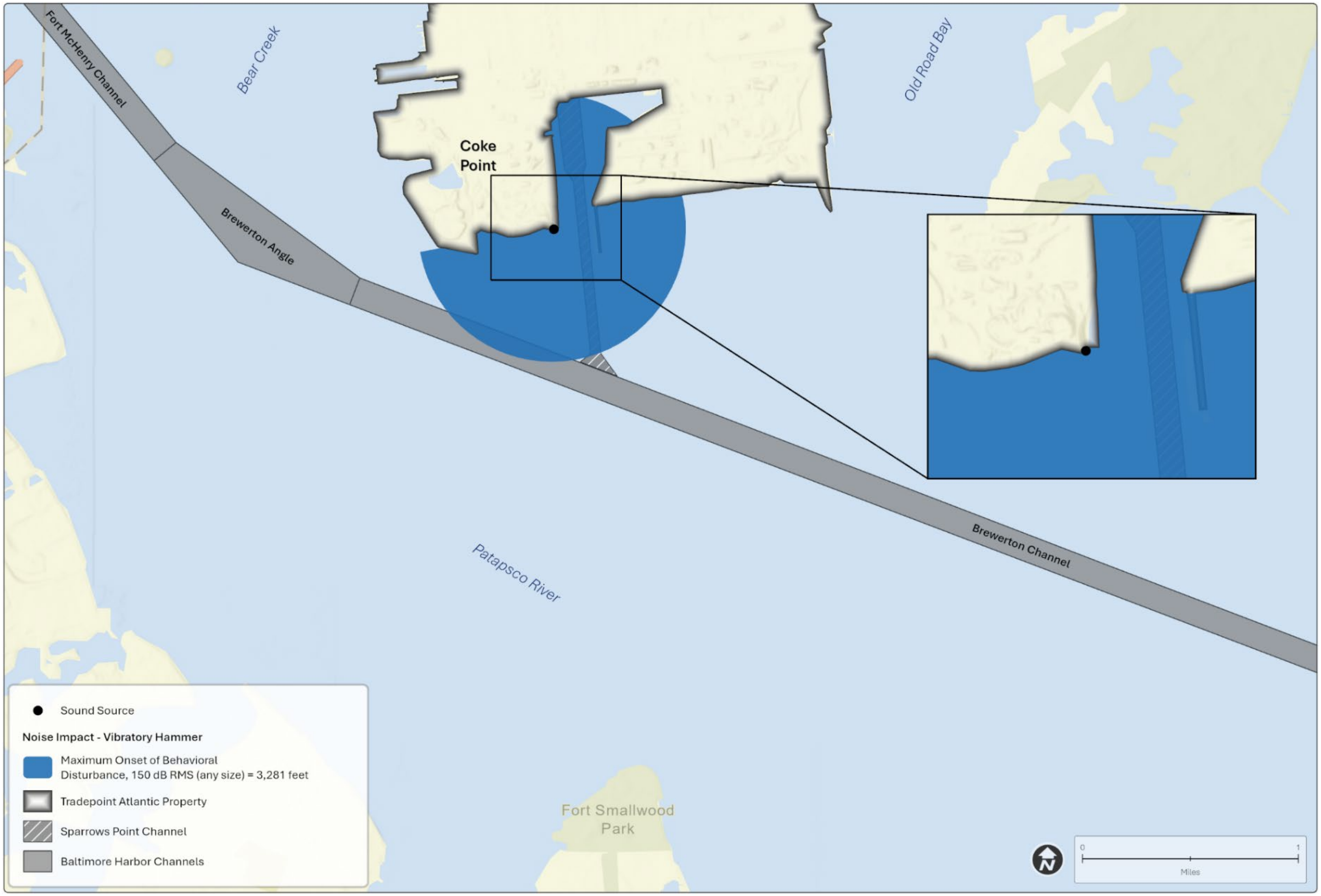


Table 8. Maximum Distances to Fish Sound Thresholds from Impulsive Sources for the Largest Noise Producing Activity with Sound Attenuation

Activity	Pile Count and Size/Type	Vibratory Hammer Distance to Onset of Behavioral Disturbance[1] (feet)	Impact Hammer Distance to Onset of Behavioral Disturbance (feet)	Impact Hammer Distance to Onset of Physical Injury (feet)		
		150 dB RMS (any size fish)	150 dB RMS (any size fish)	206 dB SPL_{peak} (any size fish)	187 dB SEL_{cum} (fish greater than 2 grams)	183 dB SEL_{cum} (fish less than 2 grams)
Concurrent wharf and mooring dolphin piling (no attenuation)	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	60,625	61	5,200	5,200
Concurrent wharf and mooring dolphin piling with 5db attenuation	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	28,139	28	2,414	2,414
Concurrent wharf and mooring dolphin piling with 11db attenuation	120, 36-inch steel pipe piles[2] 60, 24-inch steel pipe piles	1,523	11,203	11	961	961

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for fish. Sound attenuation not applied to vibratory driving.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

NA = not applicable

Figure 9. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction Within Turning Basin with -5db Sound Attenuation

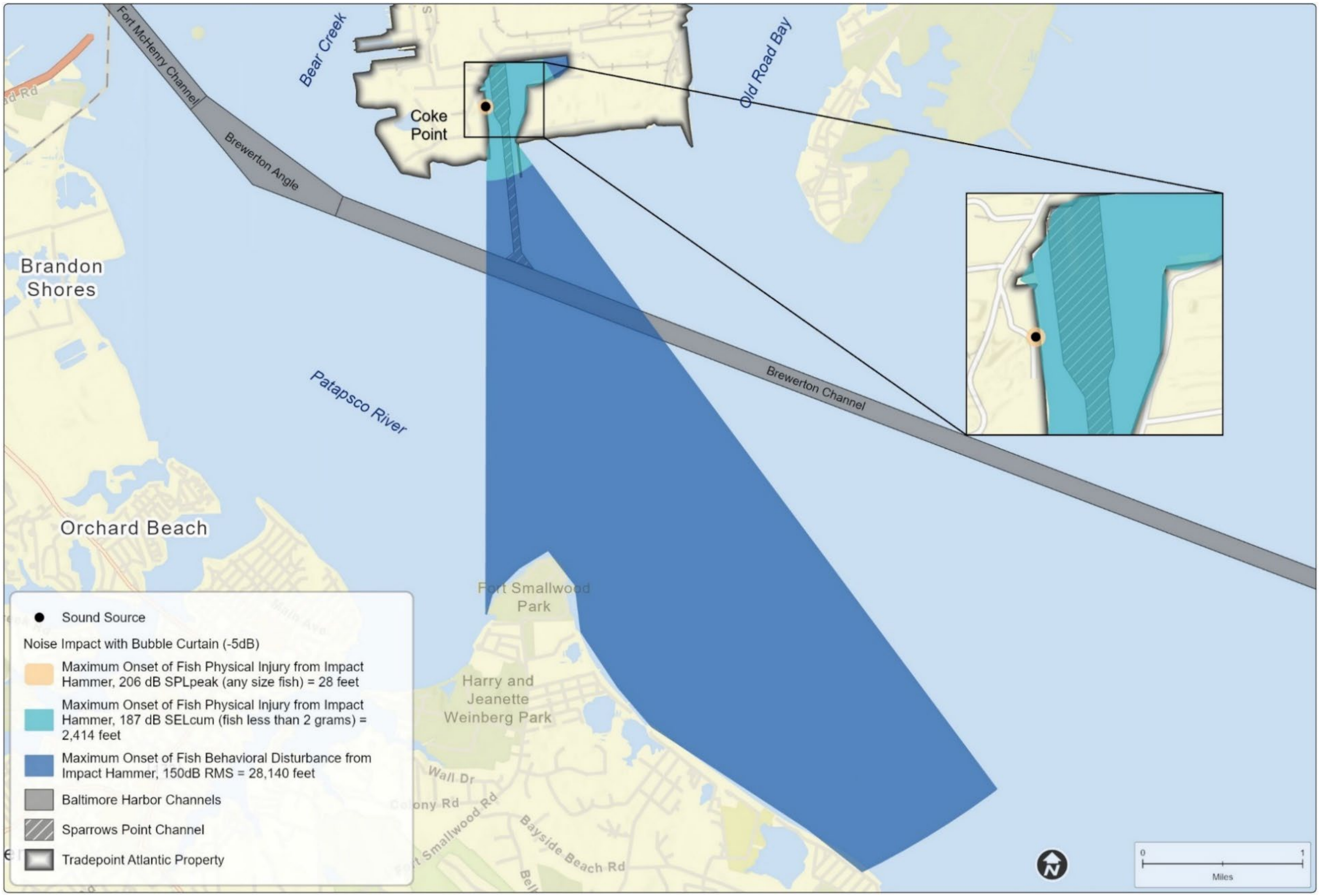


Figure 10. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -5db Sound Attenuation

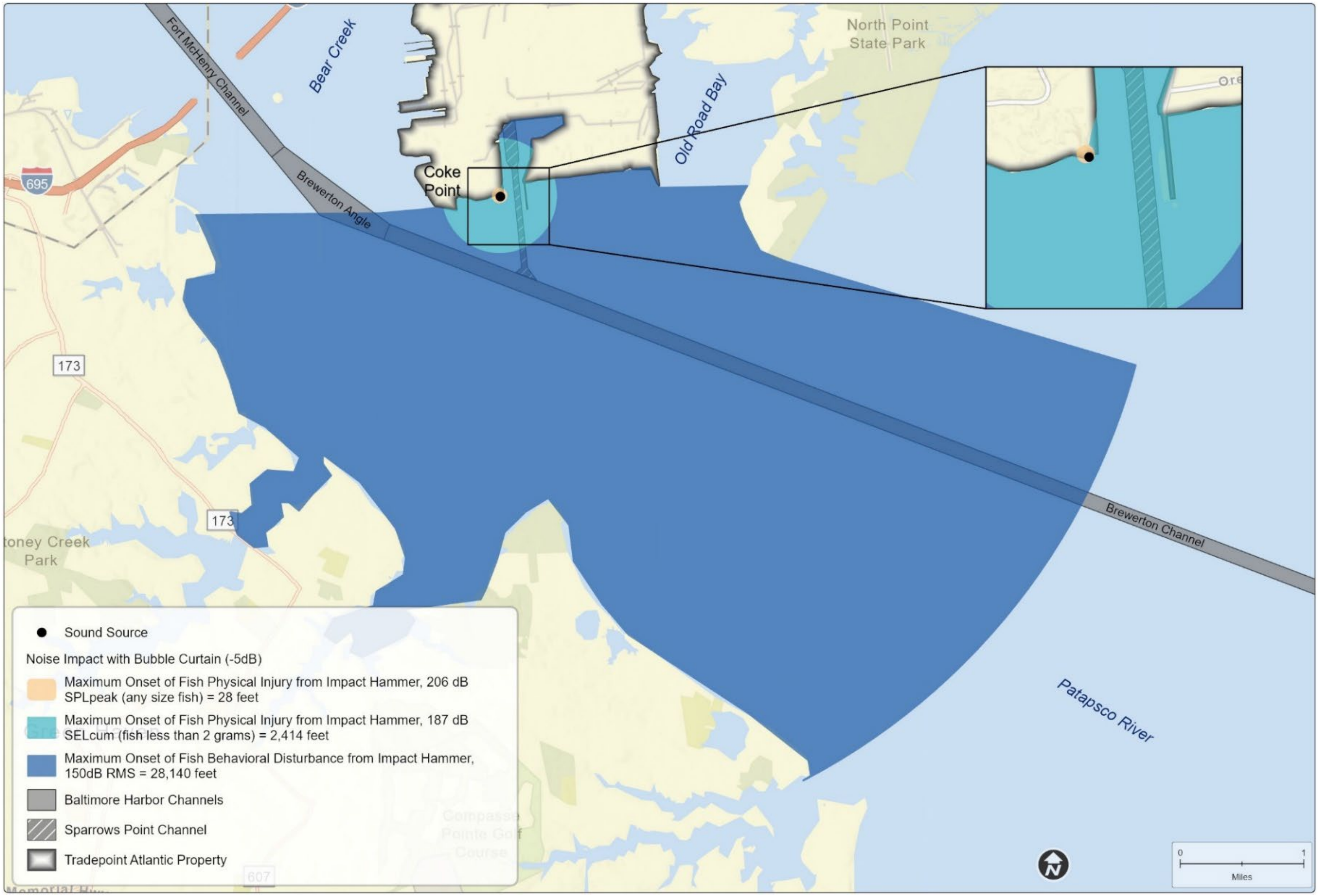


Figure 11. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction Within Turning Basin with -11db Sound Attenuation

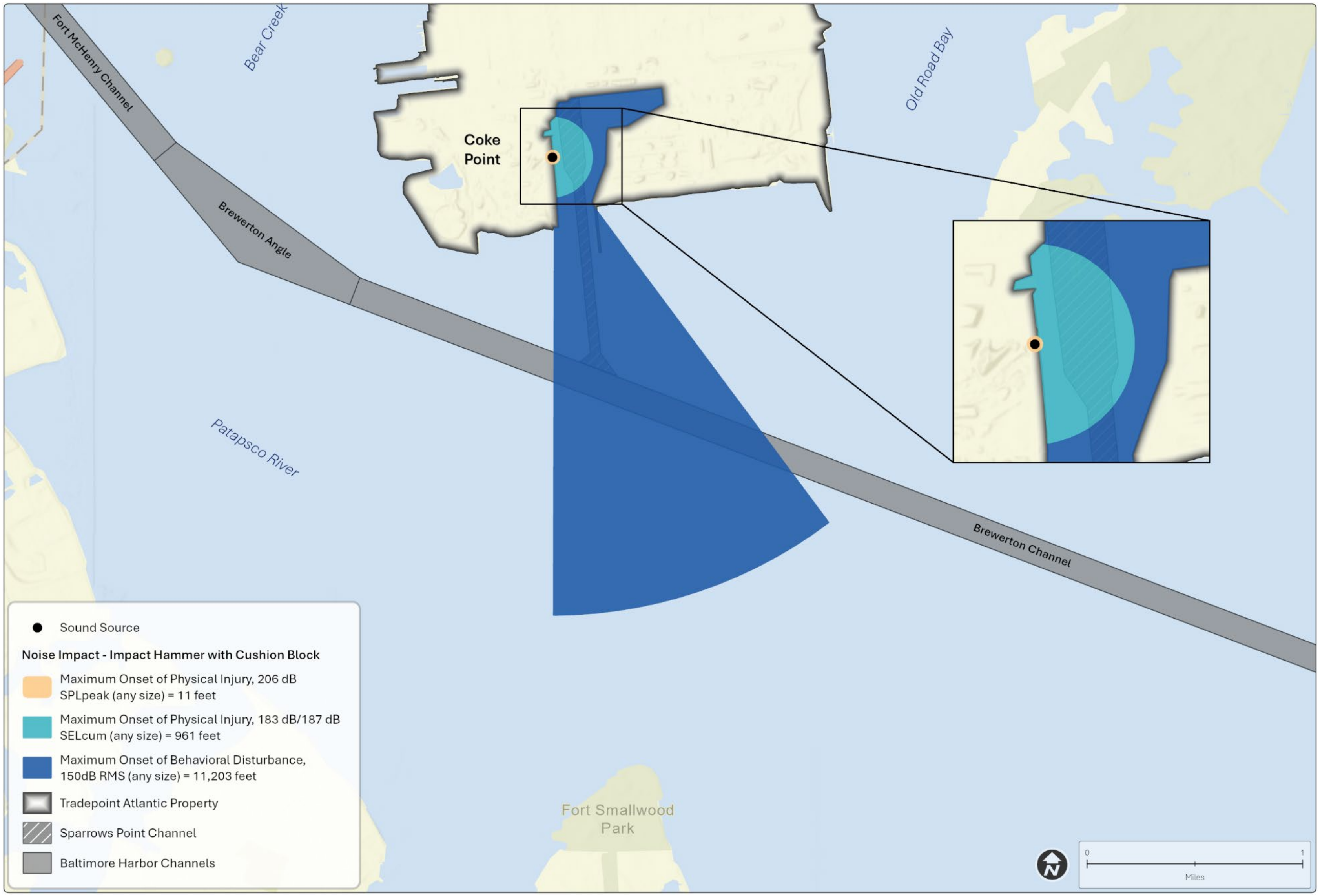
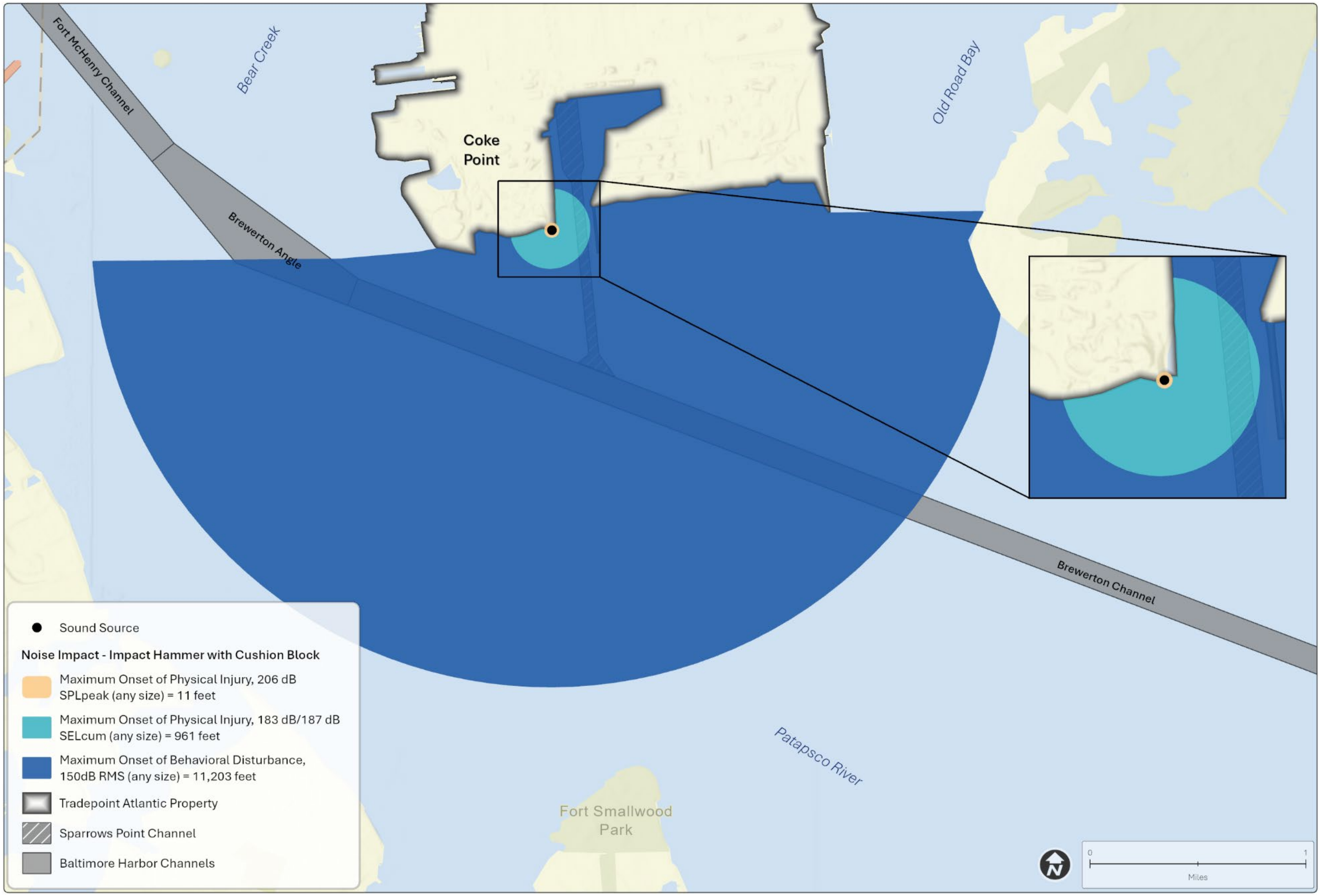


Figure 12. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -11db Sound Attenuation



5.1.4 Noise Impacts to Dolphins

Assuming a 5B reduction in sound from a bubble curtain and an 11 dB reduction in sound mitigation provided by use of the wood cushion block for impact pile driving the anticipated zones of impact for injury and behavior disturbance (applied to the largest noise producing activity, concurrent wharf piling and mooring dolphin) are found in Table 9 and shown in Figures 13 through 16.

5.1.4.1 Sound Attenuation of 5 dB

The maximum distance to onset of physical injury from impact driving occurs at 0.7 feet from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation (Figure 13) for the highest sound wave and 202 feet over the course of the sound event. The maximum distance on onset of behavioral disturbance from impact driving occurs at 6,202 feet.

Distances of behavioral effects from vibratory pile driving are largest from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation (152,283 feet or 28 miles) and for physical injury from vibratory driving, distances are largest during water-based demolition activities (270 feet). Sound attenuation measures are not applied to vibratory driving.

5.1.4.2 Sound Attenuation of 11 dB

The maximum distance to onset of behavioral disturbance for marine mammals (including dolphins) from an impact hammer (with a cushion block for sound attenuation reduction) is 2,414 feet from the installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation for the highest sound wave and 80 feet over the course of the sound event. The maximum distance to onset of physical injury from impact driving occurs at 0.3 feet from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation.

Distances of behavioral effects from vibratory pile driving are largest from both installation of a 36-inch wharf piling and concurrent wharf and mooring dolphin piling installation (152,283 feet or 28 miles) and for physical injury from vibratory driving, distances are largest during water-based demolition activities (270 feet). Sound attenuation measures are not applied to vibratory driving.

Table 9. Maximum Distances to Marine Mammals Sound Thresholds from Impulsive Sources for the Largest Noise Producing Activity with Sound Attenuation (where applicable)

Activity	Pile Count and Size/Type	Distance to Onset of Behavioral Disturbance for All Marine Mammals (including dolphins) (feet)		Distance to Onset of Physical Injury for Mid-Frequency Cetacean (feet)		
		Impact Hammer 160 dB RMS	Vibratory Hammer 120 dB RMS	Impact Hammer 230 dB SPL_{peak}	Impact Hammer 185 dB PTS SEL_{cum}	Vibratory Hammer 198 dB PTS SEL_{cum}
Wharf piling	150, 24-inch steel pipe piles	2,414	5,200	0.2	24	3
Wharf piling	600, 30-inch steel pipe piles	7,068	96,084	2	126	56
Wharf piling	600, 36-inch steel pipe piles	2,070	152,283	0.3	66	117
Mooring dolphin piling	60, 24-inch steel pipe piles	1,120	5,200	0.2	15	2
Concurrent wharf and mooring dolphin piling	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	13,061	152,283	1.5	435	142
Concurrent wharf and mooring dolphin piling (5 dB attenuation)	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	6,062	152,283	0.7	202	142
Concurrent wharf and mooring dolphin piling (11 dB attenuation)	120, 36-inch steel pipe piles[1] 60, 24-inch steel pipe piles	2,414	152,283	0.3	80	142
Water-based demolition	Varied	NA	328,084	NA	NA	270

Notes:

1. For vibratory pile driving, only behavioral thresholds exist for marine mammals. Sound attenuation not applied to vibratory driving.

2. For concurrent wharf and mooring dolphin piling installation, it is unknown which size piles will be installed at that time and the maximum size for wharf pile installation was assumed. The average daily pile installation rate for the wharf piling activity (6 piles per day) was assumed to estimate the number of wharf piles that would be installed in this 20-day time period.

NA = not applicable

PTS = permanent threshold shift

Figure 13. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction Within Turning Basin with -11db Sound Attenuation (Dolphins)

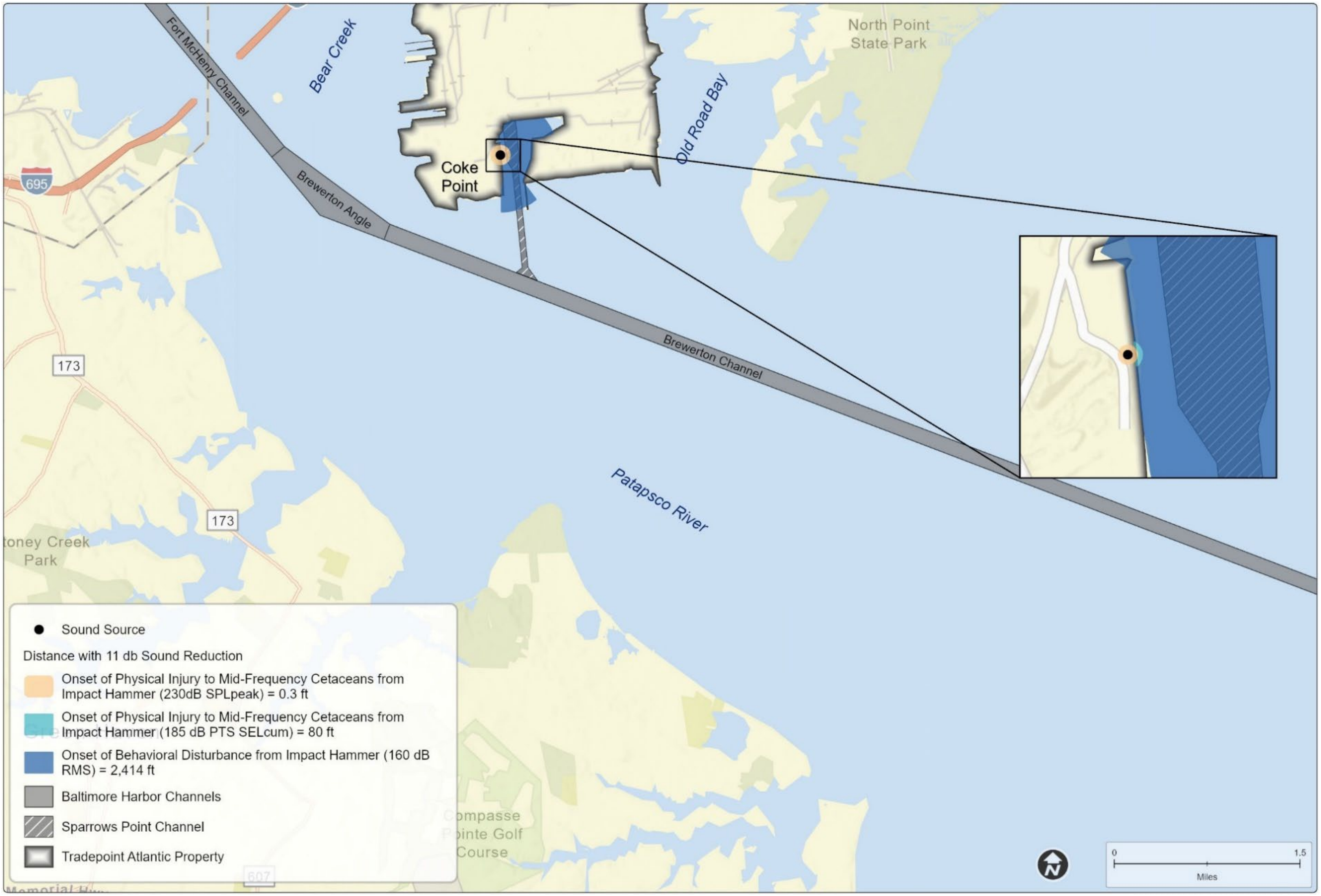


Figure 14. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -11db Sound Attenuation (Dolphins)

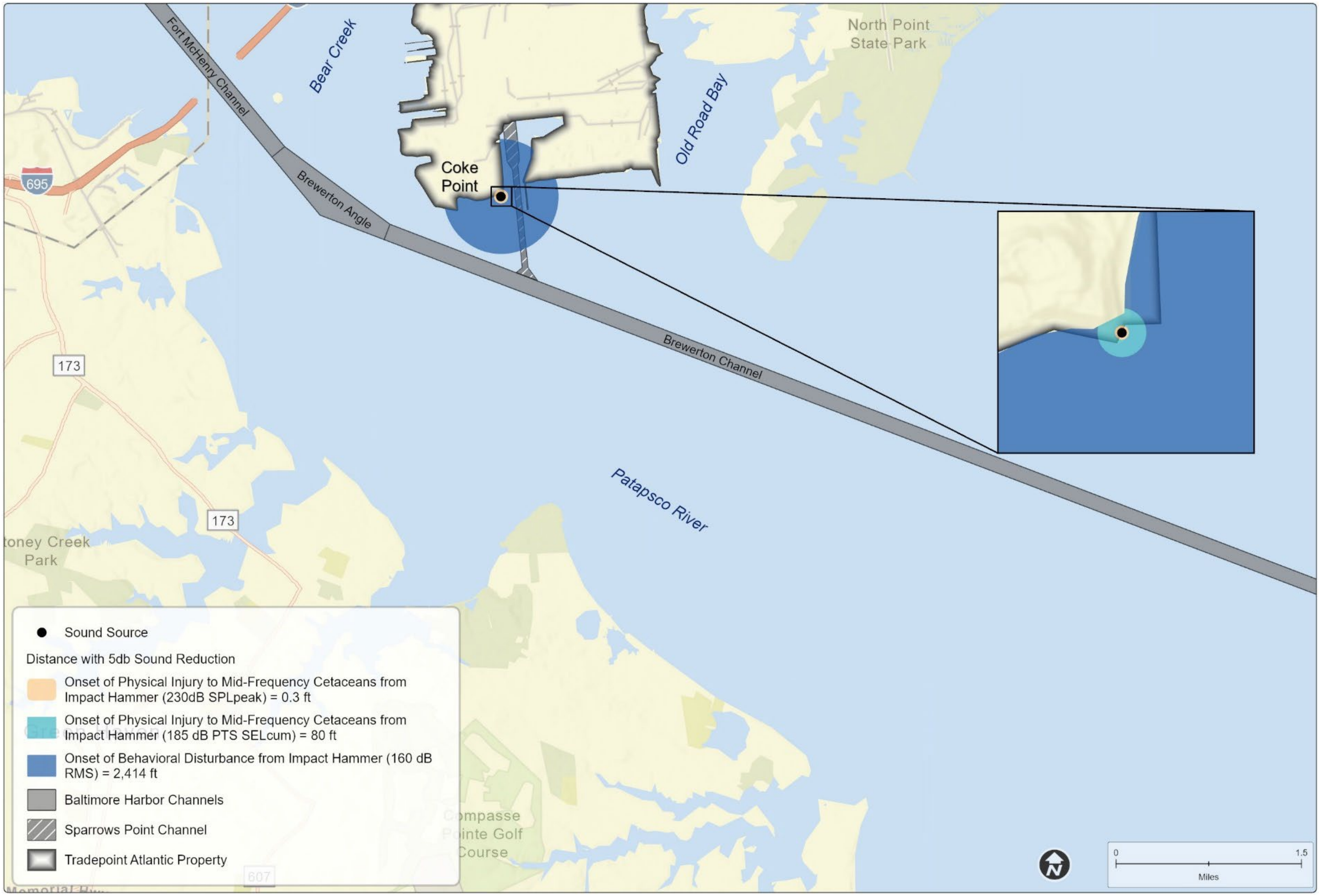


Figure 15. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction Within Turning Basin with -5db Sound Attenuation (Dolphins)

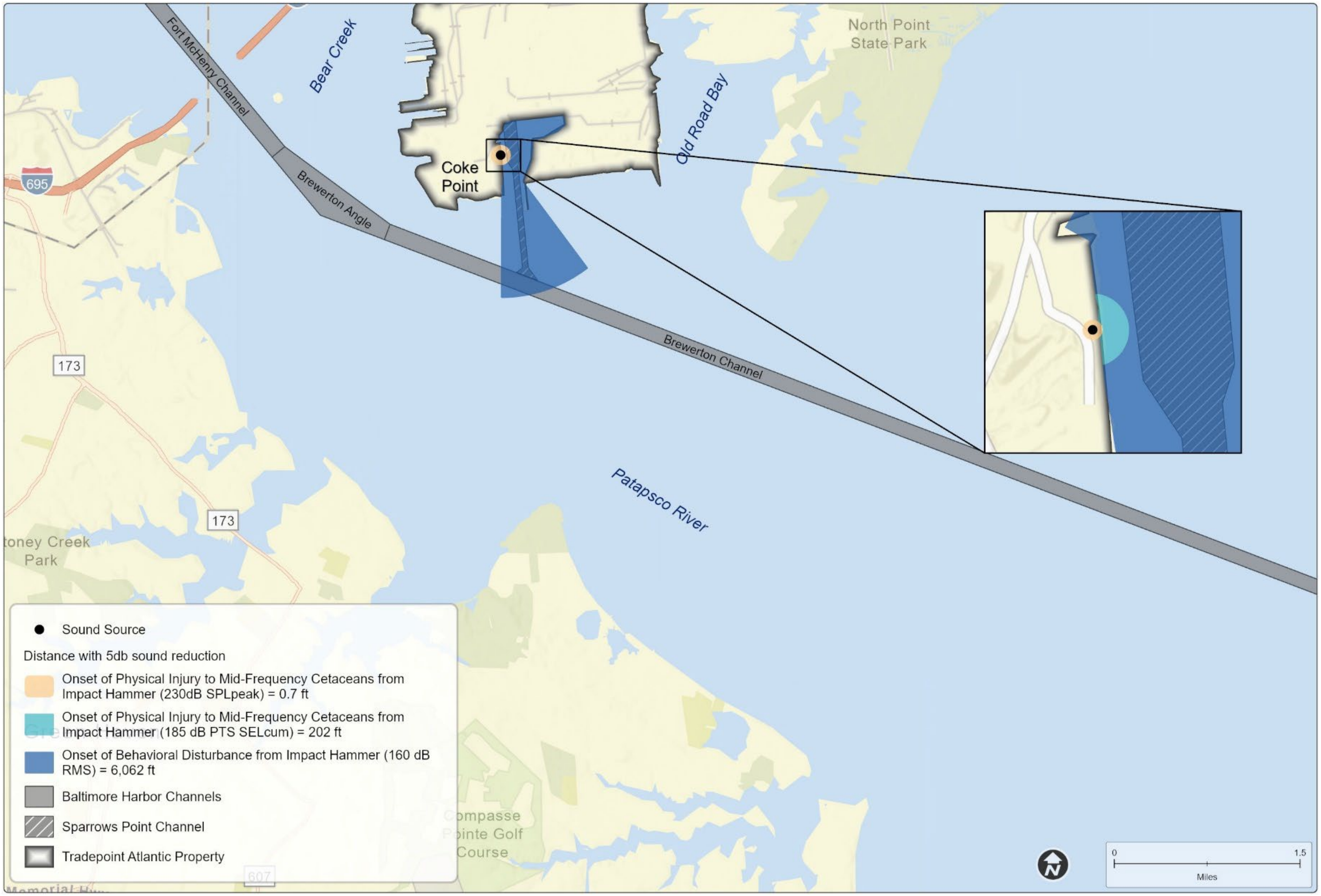
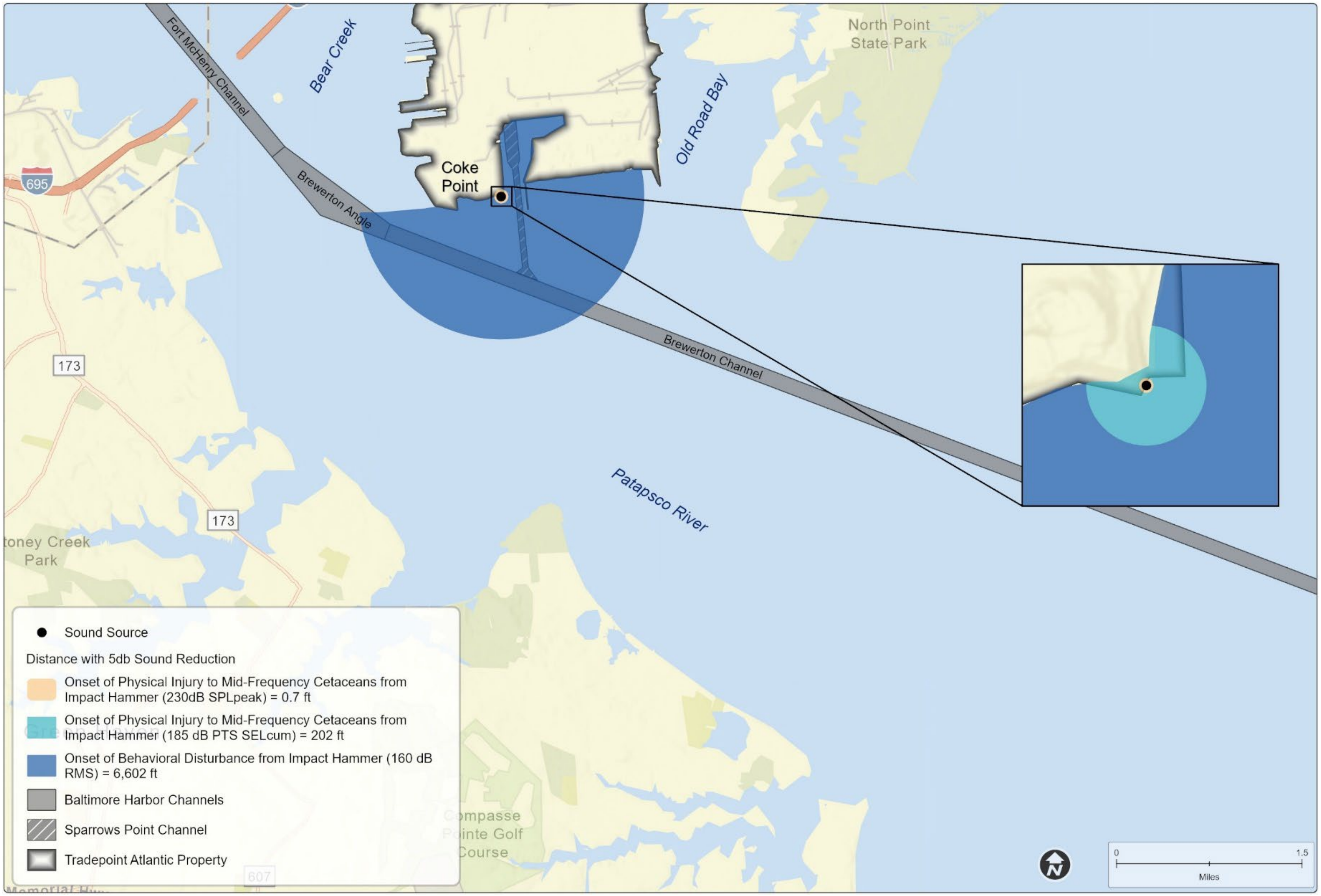


Figure 16. Maximum Distance to Noise Impacts from Impact Hammer – Wharf Construction at Southern Point Outside of Turning Basin with -5db Sound Attenuation (Dolphins)



5.1.5 Summary of Noise Impacts

For fish, the largest noise producing activity without any sound reduction results in a maximum noise impact distance that spans with width of the Patapsco River in the SPCT area. TTT is coordinating with NMFS on use of sound attenuation measures to reduce sound impacts on fishes and dolphins. As recommended in the NMFS Multi-Species Model, a conservative 5db reduction for a bubble curtain was modeled. Use of this reduction does not allow for a zone of passage in the river where fish could avoid the sound generated from the SPCT construction. For dolphins, a 5 dB reduction would allow a zone of passage. TTT is working with NMFS on appropriate best management practices (BMPs) for minimizing impacts to dolphins during times of year when they may be present.

Based on the guidance in recent reports and approved Biological Opinions (NMFS 2022c, d) use of an 11 dB reduction for a cushion block would allow passage for fish to avoid sound impacts from pile driving occurring both in the embayment and toward the southern extent of Coke Point closer to the Patapsco main stem. TTT will continue to consult with NMFS on verification methods to ensure the 11db reduction is achieved and a zone of passage during the spring migration period is present during construction.

5.2 Water Column Turbidity

Turbidity is measured in the field in NTU. Water with higher turbidity will often have higher concentrations of total suspended solids (TSS), which can be measured in samples sent to a laboratory. Although there are natural contributors to turbidity within a water body (e.g., storm events, plankton blooms), construction activities such as dredging can increase turbidity. Turbidity from dredging and wharf construction and from the Coal Pier Channel DMCF construction has the potential to impact ESA species. For the purposes of the evaluation of impacts from turbidity, DMCF construction includes construction of the enclosure dike. Impacts to ESA species from habitat alteration due to material placement within the DMCF are discussed in section 5.3.

5.2.1 Turbidity from Dredging and Wharf Construction (Pile Driving)

NMFS has estimated TSS concentrations associated with certain in-water activities, including mechanical dredging of fine-grained material, based on numerous studies in the greater Atlantic region. Based on these studies, elevated suspended sediment concentrations at several hundreds of mg/L above background may be present near the bucket but would settle rapidly within a 2,400-foot radius of the dredge location. Based on the extremely low currents within the embayment the turbidity radius is expected to be significantly less within the embayment. The TSS levels expected for mechanical dredging (up to 445.0 mg/L) are below those shown to have adverse effects on fish (typically up to 1,000 mg/L; see summary of scientific literature in Burton 1993; Wilber and Clarke 2001). Turbid conditions during dredging can be controlled to minimize impacts on fish by using BMPs and completing activities during times of year when certain species are less active within the project area.

For pile driving, NMFS has estimated TSS concentrations associated with the disruption of bottom sediments from this activity based on a study performed in the Hudson River. Elevated TSS concentrations of approximately 5.0 to 10.0 mg/L above background levels were produced within approximately 300 feet (91 meters) of the pile being driven (Federal Highway Administration 2012).

Based on the data from the studies noted above, the maximum expected distance for movement of resuspended sediment from the dredging and pile driving operations would affect a portion of the total width of the Patapsco River (2,400 feet [0.4 mile] or 17.1 % of the total 14,000 feet [2.6 miles] of available river width). The expected distance of movement of resuspended sediment is less than half the distance to the end of the southern shore of the Sparrows Point peninsula in either direction. Any resuspended sediment will remain well within the industrial shoreline of the TPA property.

5.2.1.1 Eggs and Larvae

Eggs and larvae of Atlantic Sturgeon and Shortnose Sturgeon would not be present in the Patapsco River, as this is not a spawning river for either species. Habitat conditions do not support this life stage. Therefore, turbidity from the Proposed Action would have no effect on sturgeon eggs or larval stages.

5.2.1.2 Juveniles and Adults

Impacts from suspended sediments due to dredging on juveniles and adults would be likely short-term and temporary, as individuals would be able to move away from the dredging areas. It is possible that transient migrating and foraging individuals may be present for either Sturgeon species, although documentation as far north in the Chesapeake Bay as SPCT is infrequent. Studies have shown that sturgeon may alter their normal movements due to suspended sediments, but juvenile and adult sturgeon are anticipated to swim through sediment plumes to avoid the area (NMFS 2023d).

Time-of-year restrictions on dredging would also reduce impacts on adult and juvenile sturgeon individuals if they are present in the project dredging area. Dredging BMPs, such as use of an environmental bucket, could also be implemented to minimize impacts related to resuspended sediment. Based on sediment plume studies in similar environments, it is anticipated that the maximum movement of any resuspended sediment from the dredging operations would temporarily reduce the quality of foraging habitat in a portion of the Patapsco River. Sufficient areas of similar pelagic or demersal habitat are present for use by juvenile and adult individuals outside of and adjacent to the direct dredging area. There is also similar available habitat outside of the project work area within the river covering about 4 miles (or 22,000 feet) from the former Key Bridge eastward to Rock Point.

5.2.1.3 Bottlenose Dolphin

Studies have found that high levels of turbidity can decrease the visual hunting ability of the Bottlenose Dolphin, reducing their ability to find prey, as well as make it more difficult to navigate increasing the risk of collision with obstacles (Cockcroft et al. 1991, McBride-Kebert and Tom 2021). Because Bottlenose Dolphins are infrequently documented as far north in the Patapsco River as the SPCT area, it is unlikely that individuals would be present to be impacted by turbidity from the Proposed Action. Given the width of the river in this area, any transient individuals would have sufficient area to avoid suspended sediment. Exact levels of TSS that impact Bottlenose Dolphins (and other marine mammals) is not known.

5.2.2 Turbidity from DMCF Construction

Placement of material to build the sand enclosure dike for the Coal Pier Channel DMCF could cause temporary turbidity in surrounding waters from both sand placement through the water column and disturbance of existing bottom sediments from sand placement overtop. The alignment of the dike across the opening of the Coal Pier Channel is approximately 660 linear feet. Once the perimeter dike is completed (approximately 7 months), dredged material would be placed inside the enclosed DMCF, filling 19 acres of open water. This habitat alteration impact is discussed in section 5.3.

Sand is a coarser-grained material that settles out of the water column faster than finer-grained material, resulting in suspended sediment remaining in the water column in a localized area for a short duration. BMPs would be utilized to limit the amount of suspended sediment escaping the immediate placement area (see Section 7).

5.2.2.1 Eggs and Larvae

Eggs and larvae of Atlantic Sturgeon and Shortnose Sturgeon would not be present in the Patapsco River, as this is not a spawning river for either species. Habitat conditions do not support this life stage. Therefore, turbidity from the Proposed Action would have no effect on sturgeon eggs or larval stages.

5.2.2.2 Juveniles and Adults

Sturgeon species may exhibit behavioral and physiological effects when exposed to increased turbidity levels of 1,000 mg/L above ambient conditions for more than two weeks (NMFS 2023d). Turbidity will temporarily decrease the quality of foraging habitat for sturgeon within the Action area. Turbidity level at the bucket (maximum levels from mechanical dredging) are expected to be well below 1,000 mg/L, as noted in Section 5.2.1. above. However, the mobile life stages of Atlantic Sturgeon (juvenile, subadult, and adult) and Shortnose Sturgeon (adult) potentially present in the area would be able to move away from the construction area to avoid these impacts from turbidity. It is unlikely that impacts on Atlantic and Shortnose Sturgeon would rise above minor and short term from the minor changes to the water column. Any turbidity resulting from pumping the dredged material into the DMCF would be contained within the dike and would not impact the surrounding habitat for ESA or special status species.

Placement of the sand could also disturb existing sediments at the mouth of Coal Pier Channel. The movement of the bottom sediments during placement of the sand would be limited due to the shallow sediment depth, the small size of the dike, and the proximity to the shoreline. Depending on site conditions, BMPs to reduce sediment resuspension (e.g., turbidity curtain) could be employed (see Section 6). Therefore, sediments resuspended during dike construction would be expected to be minimal. Given that the material to create the perimeter dike would be sand and the soft sediments underlying the Coal Pier Channel are shallow, the impacts would be limited to temporary and localized effects on the water column during construction, having minimal impact on fish species.

5.2.2.3 Bottlenose Dolphin

Effects from turbidity from DMCF construction would be the same as those described above in section 5.2.1.

5.2.3 Biological Assessment Determination – Turbidity

Turbidity resulting from dredging, pile driving, and DMCF construction has the potential to temporarily reduce the quality of foraging habitat for transient sturgeon or Bottlenose Dolphins utilizing the SPCT area, with the largest impacts occurring to juvenile life stages of sturgeon. However, due to the temporary nature of turbidity and the use of BMPs during operations, turbidity from the Proposed Action **may affect, but is not likely to adversely affect** Atlantic Sturgeon and Shortnose Sturgeon as the impact would be insignificant (too small to be meaningfully measured or detected).

5.3 Habitat/Bottom Alteration

5.3.1 Habitat Alteration from Dredging and Wharf Construction

Removal of the river bottom sediments from dredging to deepen and widen the channel would create deeper water habitat which is more prone or subject to low dissolved oxygen conditions in the summer months within and adjacent to the existing Sparrows Point Channel. Wharf construction would also cause shading of some existing open water habitat. The river bottom in the action area is a soft-bottom environment, comprised mainly of silt and clay and deeper sand in the north portion of the channel; no SAV is present.

5.3.1.1 Eggs and Larvae

Eggs and larvae of Atlantic Sturgeon and Shortnose Sturgeon would not be present in the Patapsco River, as this is not a spawning river for either species. Habitat conditions do not support this life stage. Therefore, habitat alteration from the Proposed Action would have no effect on sturgeon eggs or larval stages.

5.3.1.2 Juveniles and Adults

The removal of bottom sediment resulting from channel dredging would impact any juveniles and adult sturgeon that would be directly utilizing sediment bottom for foraging in the dredging footprint. Dredging would result in a loss of the benthic community currently within the area, reducing foraging opportunities for sturgeon species. With deepening of the channel, the potential for water column stratification would increase, resulting in lower dissolved oxygen concentrations in deep bottom water, particularly in the summer months. This could also affect fish usage of bottom waters, as they will avoid waters that do not contain enough oxygen. This would also reduce potential prey sources for sturgeon and special status species that consume benthic organisms.

Additionally, dredging the channel to attain the preferred alignment for the wharf would include removal of existing shoreline, resulting in the creation of approximately 6.3 acres of new open water habitat. Construction of the wharf would result in shading approximately 8.9 acres of open water habitat — 3.3 acres of existing open water and 5.6 acres of new open water habitat. Shading of these areas would impact benthic and water column productivity. Installation of the mooring dolphin and wharf pilings would result in the permanent loss of 0.2 acres of bottom habitat. These habitat changes would cause localized impacts on benthic organisms and prey thus impacting any foraging sturgeon in the project area.

5.3.2 Habitat Alteration from Material Placement in the DMCF

Dredged material placement within a constructed DMCF at Coal Pier Channel would result in a loss of 19 acres of open water. It is also possible, but not likely, that individual adults and juveniles within the footprint would be trapped within the enclosed DMCF. Migrating and foraging sturgeon typically utilize main river channels with water deep enough to ensure continuous flow to support both growth of juveniles and staging and resting areas for adults and subadults. It is therefore unlikely that suitable habitat for the lifestages of sturgeon potentially present in the Action Area is available within the Coal Pier Channel.

The DMCF would also bury the benthic organisms within its footprint, removing the benthic communities as a possible food source for sturgeon species. Although the Coal Pier Channel has a degraded benthic community and sediment contamination, it is utilized by fish year round (EA 2024b to f). These impacts directly reduce the quantity of habitat within the Action Area.

5.3.2.1 Bottlenose Dolphin

While transient Bottlenose Dolphins have been documented in the Patapsco River, it is not anticipated that dolphins would reside within the project area, as typical higher salinity habitat is not available. Given the width of the river in the SPCT area, it is expected that transient dolphins would utilize the main river channel for any opportunistic foraging. Therefore, the loss of 19 acres of open water within the more isolated Coal Pier Channel is not expected to adversely affect Bottlenose Dolphin individuals within the area.

5.3.3 Biological Assessment Determination- Habitat Alteration

Habitat alteration resulting from wharf construction would have insignificant impacts on ESA species. Habitat alteration in the dredging area due to the deepening of the channel would reduce the quality of bottom habitat by reducing the likelihood of a benthic community re-establishing; however, this area is not expected to support foraging ESA species. Creation of the Coal Pier Channel DMCF would directly reduce the quantity of habitat in the Action Area by filling 19 acres of open water within an area that is isolated from the main river channel which is more suitable habitat for ESA species. As such, habitat alteration from the Proposed Action **may affect, but is not likely to adversely affect** ESA species as the impact would be insignificant (too small to be meaningfully measured or detected).

5.4 Impingement/Entrainment

ESA species (Atlantic and Shortnose Sturgeon) could potentially be caught by the equipment used to mechanically dredge the SPCT channel and to hydraulically offload the material to a DMCF. Juvenile and adult fish can potentially become impinged or entrained (depending upon size and life stage) in the clamshell dredge bucket, although this is expected to be infrequent. Capture by clamshell dredge bucket is uncommon and would only impact fish that spend most of their time on the seafloor and unable to move away from the operation; any adult or juvenile sturgeon may feed on benthic organisms but would also be utilizing other water column areas and likely be able to avoid the bucket. When surface water is pumped to slurry dredged material for hydraulic offloading, fish may become caught on the pipe screen (depending upon the size of the fish and the size of the openings of any fish screen that may be used on the pipe) or be pulled into the pipe past the screen. Eggs and larvae would be the life stages most susceptible to entrainment in the hydraulic pipe, however these life stages would not be present in the dredging area. It should be noted that any hydraulic pumping operation would comply with requirements from MDNR and/or NMFS to reduce impingement/entrainment impacts, which may include using an intake screen with a specific size mesh openings and limiting intake velocities.

5.4.1 Biological Assessment Determination- Impingement/Entrainment

Impingement or entrainment of ESA species from SPCT operations is possible, however given the size and life stages of sturgeon that could be present in the project area, it is unlikely that individuals would be subject to impingement or entrainment. This impact is not expected to be able to be meaningfully measured or detected and could be alleviated with modifications (fish screens), impingement or entrainment from the Proposed Action **may affect, but is not likely to adversely affect** ESA species as the impact would be insignificant.

5.5 Vessel Traffic

The SPCT project area is located within the Port, which is in the top 20 ports in the United States by tonnage and number of vessels handled annually (US Department of Transportation [USDOT] 2024a), including a variety of ship types (e.g., bulk carriers, general cargo ships, tankers, container ships). More than 2,500 vessels called on the Port in 2021 (USDOT 2024b). Vessel traffic is analyzed as a potential stressor to ESA species during both construction and long-term operation of SPCT.

5.5.1 Construction Vessel Traffic

5.5.1.1 Sturgeon

The proposed project would result in minor and temporary increases in vessel traffic as the vessels transit around the project site and to and from the project site to the NODS or to existing MPA DMCFs. In the immediate project area, there would be a small increase in vessel activity, likely not more than 10 vessels operating at any one time, which will not significantly increase vessel usage of the area. Impacts to sturgeon resulting from increased vessel traffic can include bottom disturbance from mooring or propeller wake. Additionally, collision with vessels could be a source of anthropogenic mortality and injury for aquatic species as a result of being struck by boat hulls or propellers (Brown and Murphy, 2010). The vessels that will be used to transport sediment from the dredging area to the DMCF or other disposal areas include tugboats and bottom dump scow barges. The vessels will likely travel at speeds of no more than 10 knots to minimize risks of strikes along the transport routes. During dredging and material offloading to the Coal Pier Channel DMCF, there could be minor and temporary bottom disturbances including spud piles into the sediment to hold barges in position, temporary piles to serve as moorings for barges, and anchors and mooring balls/lines to also serve as temporary moorings for barges.

5.5.1.2 Dolphin and Sea Turtles

While vessel strikes with marine mammals and turtles are possible, strikes are a rare cause of injury or mortality. The minimal increase in vessels during SPCT construction would not be expected to increase the risk of strikes with marine mammals or bottlenose dolphins. Vessel strikes remain a relatively rare cause of mortality to sea turtles and an increase in vessel traffic in the action area would not necessarily translate into an increase in vessel strike events. Most collisions with sea turtles are found to be from recreational boat traffic as these are often traveling at higher speeds in waterways (National Research Council 1990) and the speed of the vessel (Hazel et al. 2007, Sapp 2010). Sea turtles are thought to be able to avoid injury from slower moving vessels because they may be able to maneuver and avoid the vessel (Sapp 2010 as cited in NMFS 2023).

During transport of the material from SPCT to the NODS, there would be a slightly higher risk of vessel traffic impacts to Bottlenose Dolphins or sea turtles. The type of vessel traffic impact is expected to be similar to those already present in these trafficked routes.

Overall, the addition of project vessels during construction would be intermittent, temporary, and restricted to the project area on any given day so that any increased effects from vessels to ESA species would be too small to be meaningfully measured or detected.

5.5.2 Long-term Operations Vessel Traffic

Once constructed, operation of the SPCT would increase vessel traffic by approximately 500 vessels per year, an increase of approximately 20% over the Port calls logged in 2021 (USDOT 2024abl). Sturgeon would be expected to move away from the areas of the activity or access to foraging or migrating areas would not be impacted. Adding these project vessels to the existing baseline is not likely to increase the risk that any vessel in the area will affect ESA species on a yearly basis.

5.5.3 Biological Assessment Determination- Vessel Traffic

Because the SPCT is in a heavily utilized area of the Port, because the long-term operation increases vessels by only 20% above the current usage, and the minimal risk of a vessel impacting ESA species, vessel traffic from the Proposed Action **may affect, but is not likely to adversely affect** ESA species as the impact would be insignificant.

6 Potential Avoidance and Minimization

Multiple potential avoidance and minimization measures are being considered for the Proposed Action to reduce overall impacts on the aquatic environment. Those which apply to ESA species are briefly described in Table 10. These measures are considered potential measures that would be finalized following completion of the project design and construction sequencing. Use of any of these measures (or a combination of measures) would be stipulated as permit conditions by regulatory agencies.

Table 10. List of Potential Avoidance and Minimization Measures to Reduce Impacts on ESA Species

Potential Avoidance/Minimization Measure	Potential Benefit to ESA Species
Follow time-of-year restrictions (if required by regulatory agencies) for pile driving and dredging	Avoids impacts sensitive life stages of ESA species and other aquatic resources.
Implement BMPs for Bottlenose Dolphin, if required by NMFS	Minimizes impacts to transient dolphins in the area.
Use a “soft start” method for impact hammer during pile driving	Creates a warning for mobile ESA species to move away from the project area
Use a cushion block and/or bubble curtain during impact driving of piles	Reduces the intensity and distance for underwater noise propagation.
Limit the daily window for pile driving activities to 10 to 12 hours or less of daytime operations	Reduces duration of noise impacts on ESA species
Use a vibratory hammer (if/where feasible) followed by use of an impact hammer for individual piles	Reduces the duration of the underwater noise created by impact hammer.
Operate construction vessels in adequate water depths. Use shallow draft vessels that maximize the navigational clearance between the vessel and the bottom in shallow areas.	Avoids propeller scour or grounding in ESA species habitat.
For pile removal activities, cut the existing pile(s) at the mudline (where possible) to avoid sediment re-suspension during extraction.	Reduces turbidity impacts on ESA species.
Surround the area of demolition, pile removal, and (as applicable) other bottom disturbing construction activities with a full-height, weighted turbidity curtain in areas where sediment contaminants may be present at concentrations of concern.	Minimizes potential for sediments to be resuspended and leave the immediate vicinity and impact ESA species.
Use an environmental-type bucket where feasible and where necessary based on sediment chemical data to minimize sediment release from the bucket while ascending through the water column.	Reduces water column turbidity impacts on ESA species.

Potential Avoidance/Minimization Measure	Potential Benefit to ESA Species
Implement operational controls during dredging. These may include: 1. Perform dredging such that the dredge bucket is not overfilled on each deployment, reducing release of sediment. 2. Control the ascent of the bucket in the water column to minimize incidental release while moving through the water column. 3. Control the descent of the bucket to minimize hard contact with the bottom and resuspension of sediment upon bucket contact. 4. Prohibit dragging of the dredge bucket along the sediment surface.	Reduces water column turbidity impacts on ESA species.
Place dredged material in a barge or scow in a manner that maintains sufficient freeboard to eliminate the potential for material leaving/spilling from the barge during transport to the material offloading or placement area.	Reduces water column turbidity impacts on ESA species.

7 Effects of Climate Change

Climate change in the Patapsco River and Baltimore Harbor area is affecting sea level, the severity and frequency of precipitation events, and the probability of extreme heat. Global Mean Sea Level scenarios are projections used to estimate potential future sea level rise based on different greenhouse gas emission pathways, climate sensitivities, and ice sheet dynamics. The five scenarios are categorized as *low*, *intermediate-low*, *intermediate*, *high*, and *extreme*. By 2100, regional sea level is expected to rise by 3.9 feet under the *intermediate* scenario, and by 5.2 under the *intermediate high* scenario, whereas the global sea level is expected to rise 3.3 and 4.9 feet, respectively (Sweet et al. 2022). The Coastal Vulnerability Index is a tool used to assess the vulnerability of coastal areas to the effects of sea level rise and other coastal hazards. It integrates multiple physical and environmental factors (e.g., geomorphology, tide range, wave height, relative sea level rise) to provide a relative measure of risk for different sections of the coastline. Although the project area is subject to sea level rise, coastal vulnerability in the Sparrows Point area is considered low (US Geological Survey 2024).

It is not anticipated that the effects of climate change would amplify or exacerbate the adverse effects (as described in section 4) of the proposed action on ESA species. The actions would be not likely to adversely affect ESA and would not be increased due to effects of sea level rise that are already occurring and projected to occur. These effects can include increased water temperatures, acidification of waters, or change in flow regimes.

8 Determination of the Biological Assessment

Because of the nature and magnitude of the impacts considered wholistically, TTT has determined that the stressors of the Proposed Action may affect but are not likely to adversely affect ESA species. This determination is made largely from the fact that although the project will result in permanent habitat alteration (from channel deepening) and permanent habitat loss (from DMCF construction in open water), the ESA species potentially present in the project area would be transient and are unlikely to utilize those areas given the more suitable habitat in the adjacent main river channel and any impacts would be insignificant to these populations. As discussed in section 6, significant effort was put forth in determining the least environmentally impactful dredged material placement option that still achieved project goals. Additionally, the channel dredging footprint was modified during the project design to minimize the footprint to the maximum extent while still providing safe passage for navigation.

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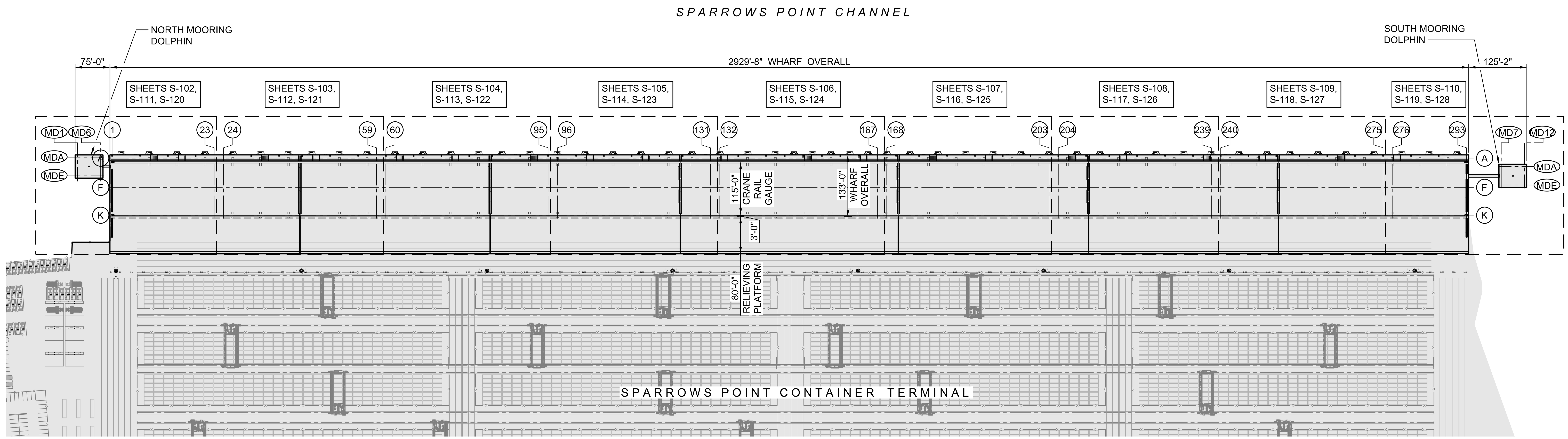
Attachment A: 30% Design Plans for Channel Dredging, Pile Driving, Wharf Construction, and Coal Pier Channel DMCF Construction

Note: Some materials in this appendix are not fully Section 508 compliant.

Wharf Pile Plans



B1 / S-101 PLAN - STRUCTURAL GENERAL ARRANGEMENT AND KEY
SCALE: 1"=120'

120' 0' 120' 240'
SCALE: 1"=120'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - STRUCTURAL GENERAL ARRANGEMENT AND KEY

Date: 2024-01-30
Rev.:
M&N Project No.: 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:
Designed by: IS
Ckd by: IS
Dwn by: RG
Reviewed by: GS
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

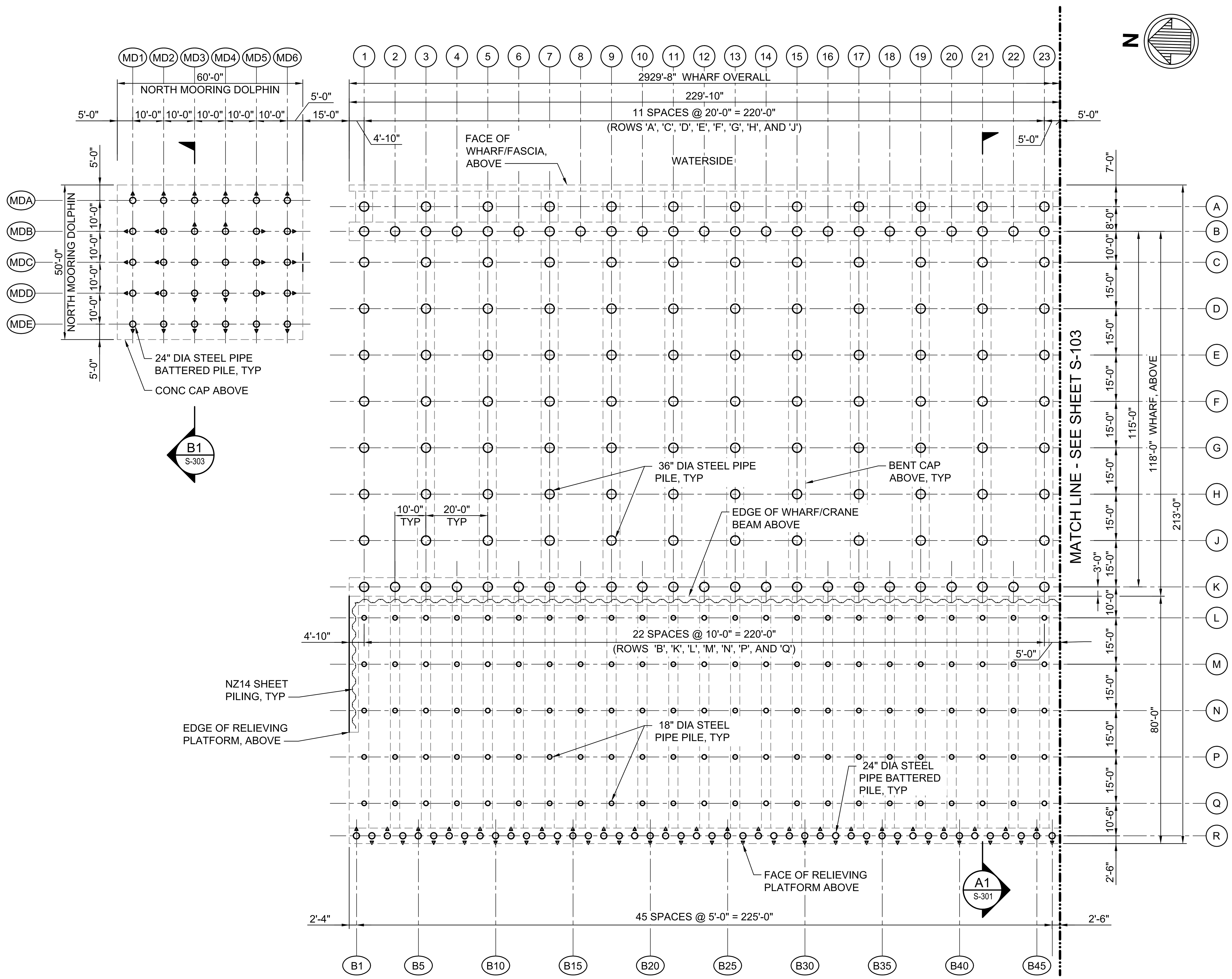
moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

SPARROWS POINT CONTAINER TERMINAL
6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

SEAL

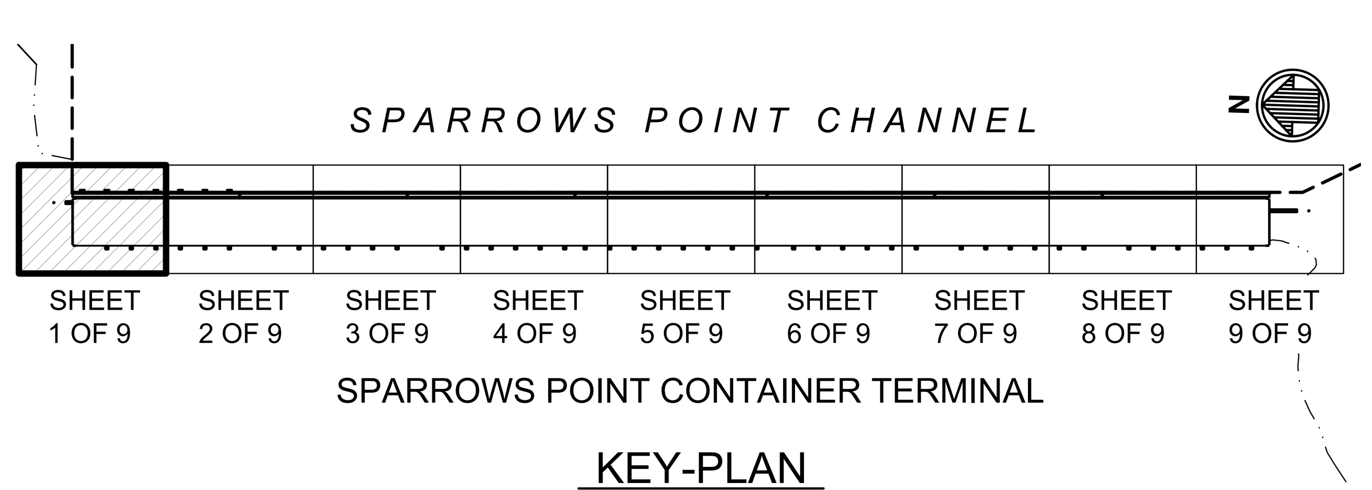
I, MEHEDI RASHID, HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. #####
EXPIRATION DATE: ##/##/202#

Sheet Reference No.
S-101
INDEX: 136 OF 242



B1 S-102 PLAN - PILE (SHEET 1 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 1 OF 9)

Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: 1:1 (D SHEET) | Plot scale: | Rev.

Designed by: IS | Chk'd by: IS | Dwn by: RG | Reviewed by: GS | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

moffatt & nichol
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410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-102
INDEX: 137 OF 242

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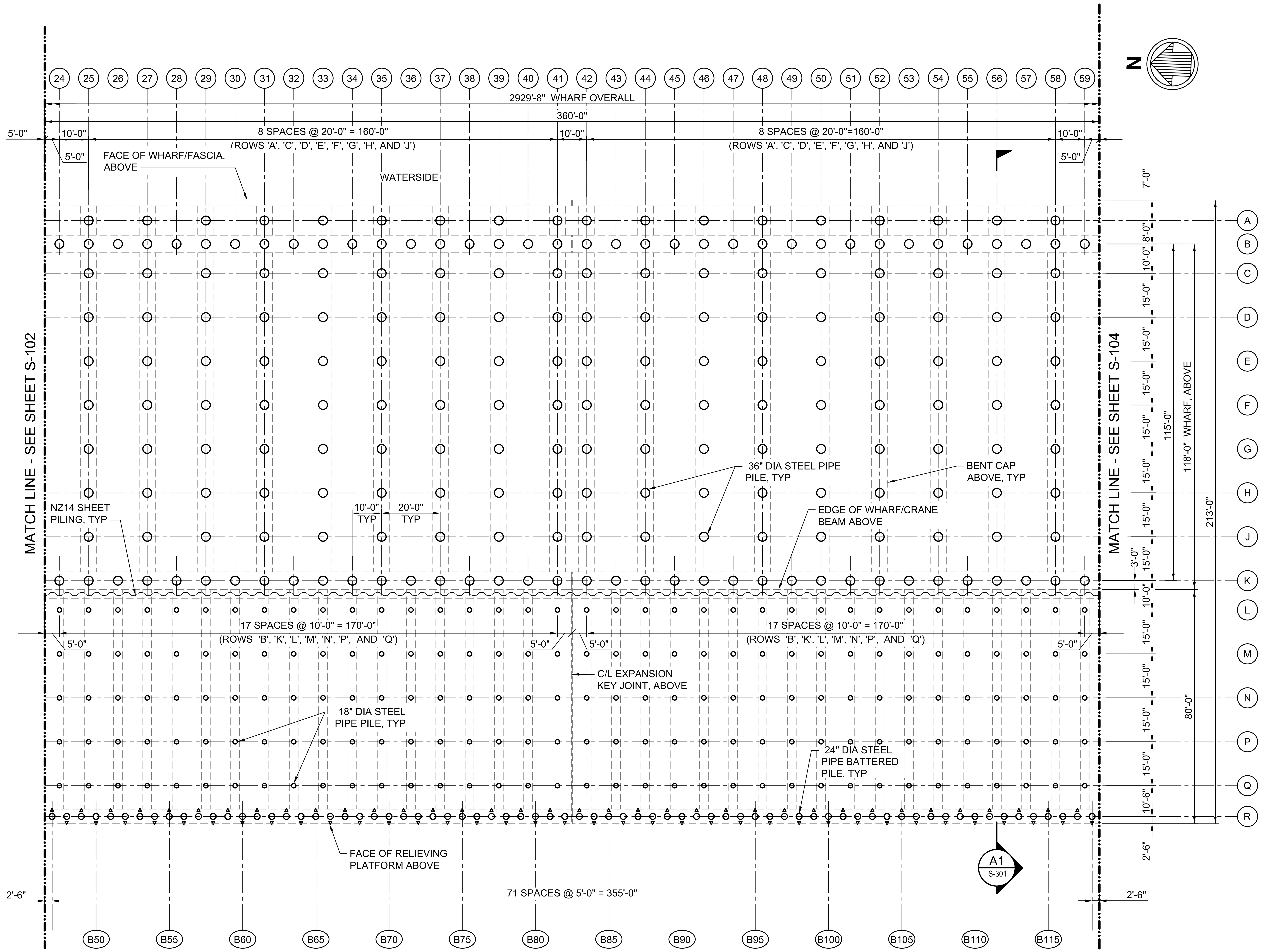
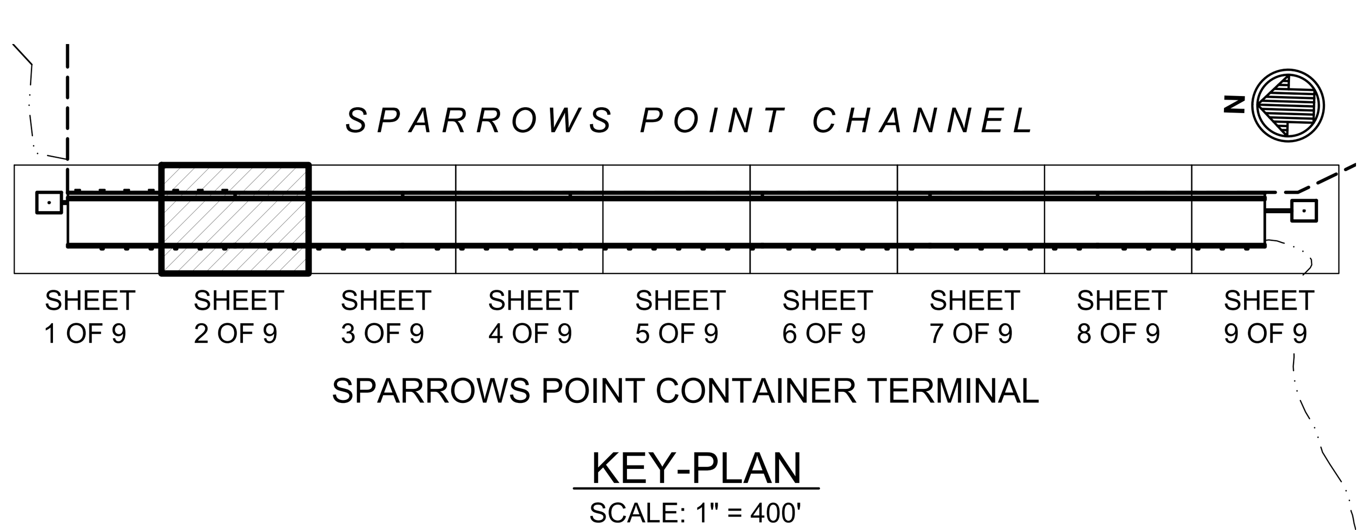


B1 S-103 PLAN - PILE (SHEET 2 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
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PLAN - PILE (SHEET 2 OF 9)

Rev.: | Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: 1:1 (D SHEET) | Plot scale:

Designed by: IS | Dwn by: RG | Ckd by: IS | Reviewed by: GS | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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6995 BETHLEHEM BOULEVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
S-103

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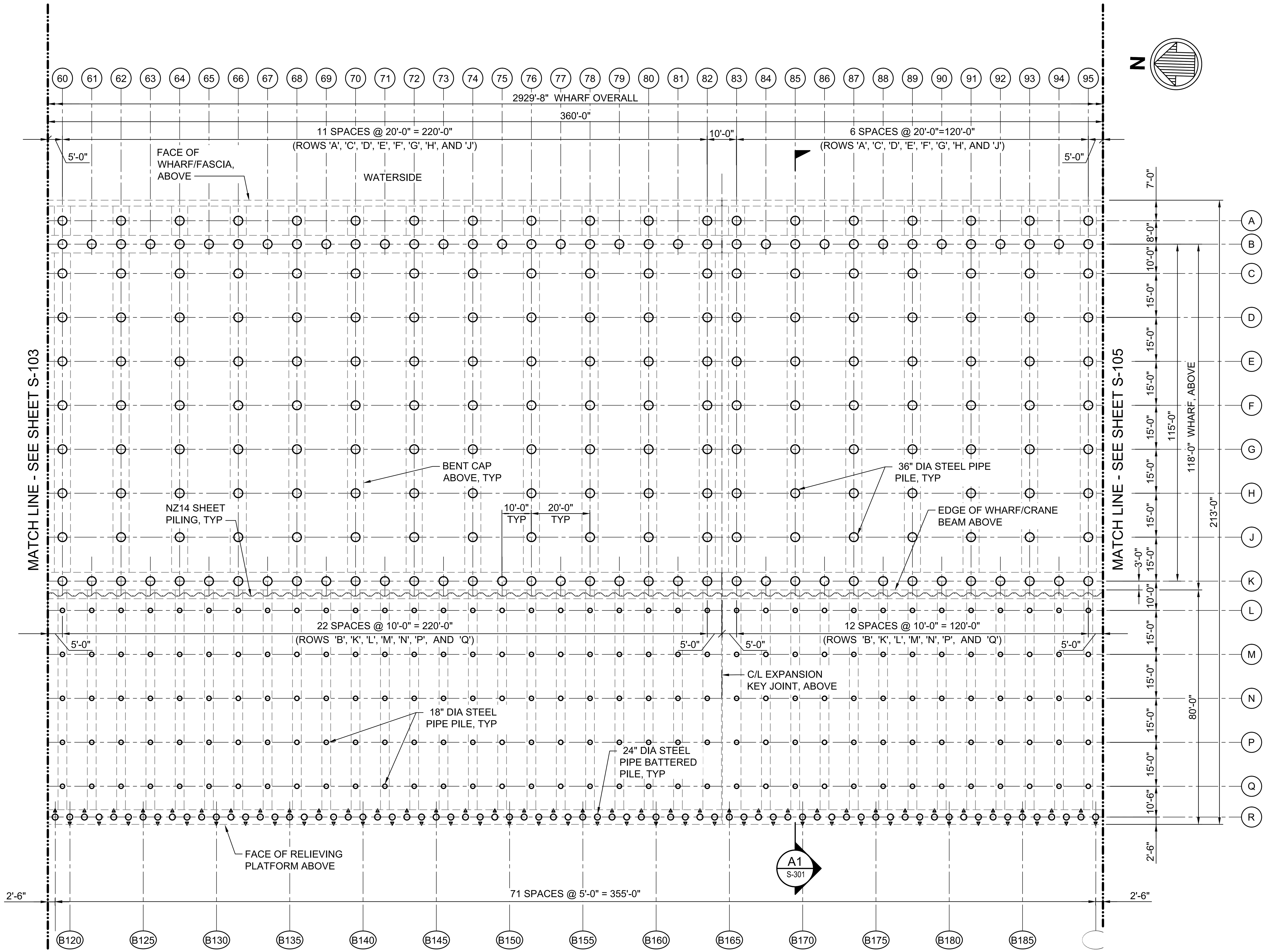
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 S-104 PLAN - PILE (SHEET 3 OF 9)
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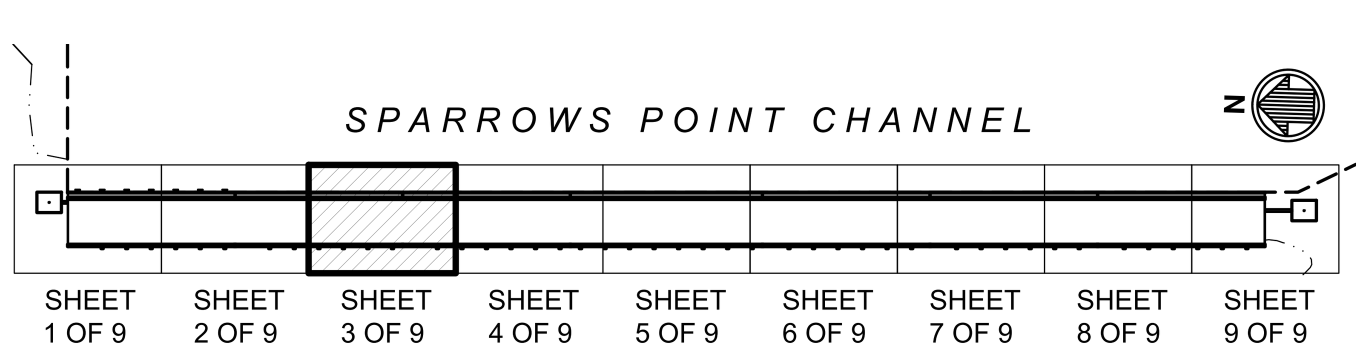

KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
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PLAN - PILE (SHEET 3 OF 9)

Designed by: IS | Dwn by: RG | Reviewed by: GS | Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

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SPARROWS POINT CONTAINER TERMINAL

Sheet Reference No.
S-104
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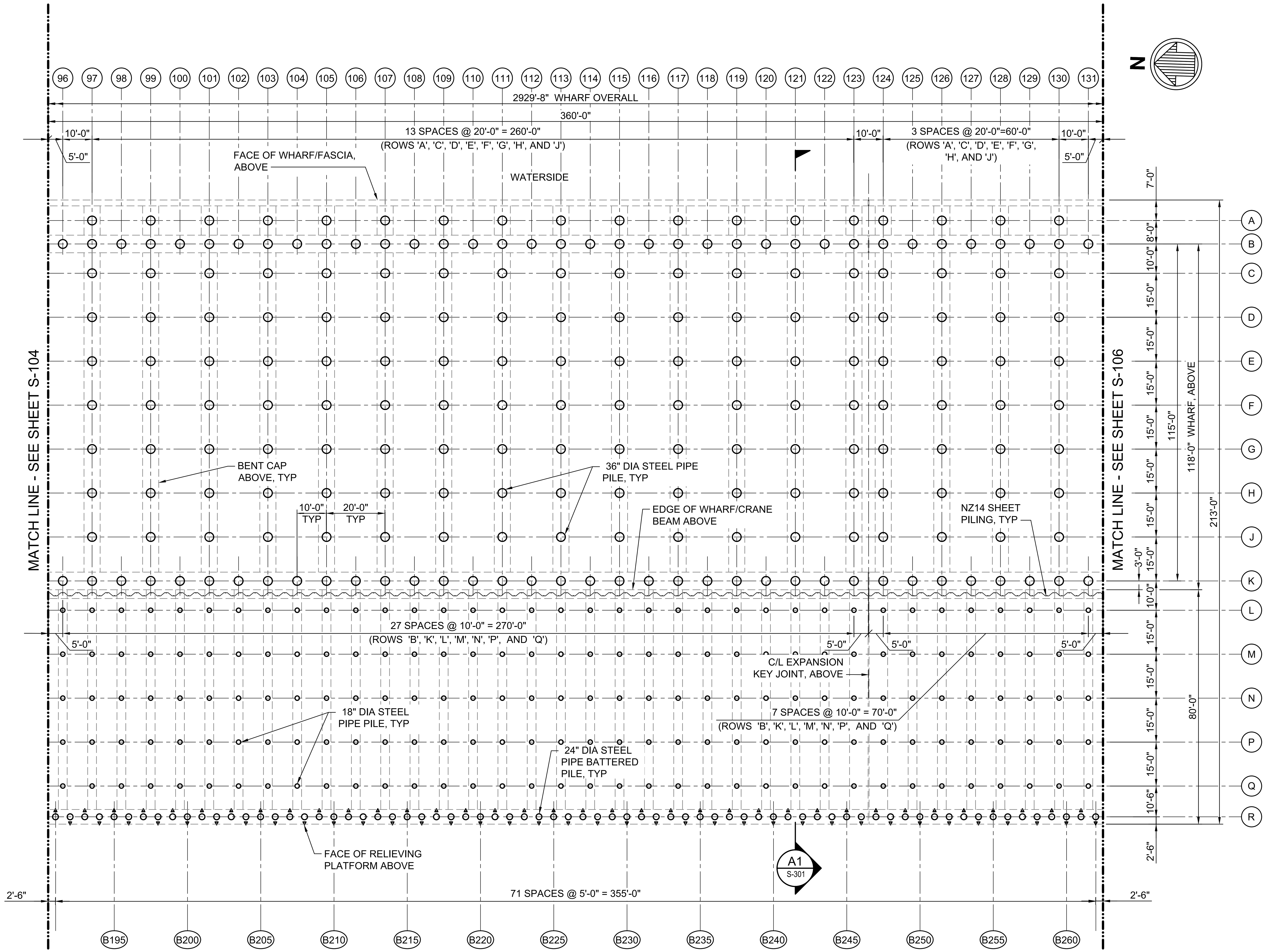
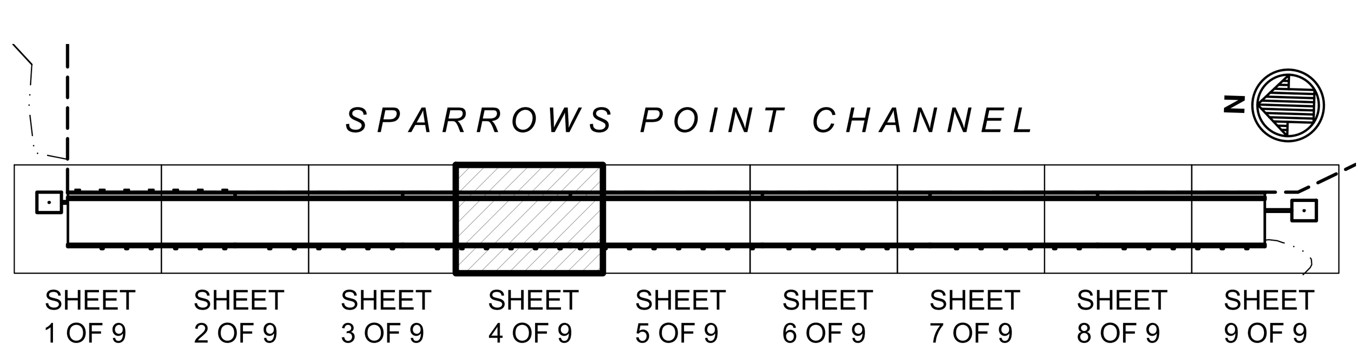


B1 S-105 PLAN - PILE (SHEET 4 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 4 OF 9)

Date: 2024-01-30	Rev.
M&N Project No. 230329	
Drawing code:	
Drawing Scale: Plot scale: 1:1 (D SHEET)	
Designed by: IS	Dsn by: RG	Ckd by: IS
Reviewed by: GS	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	

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410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-105
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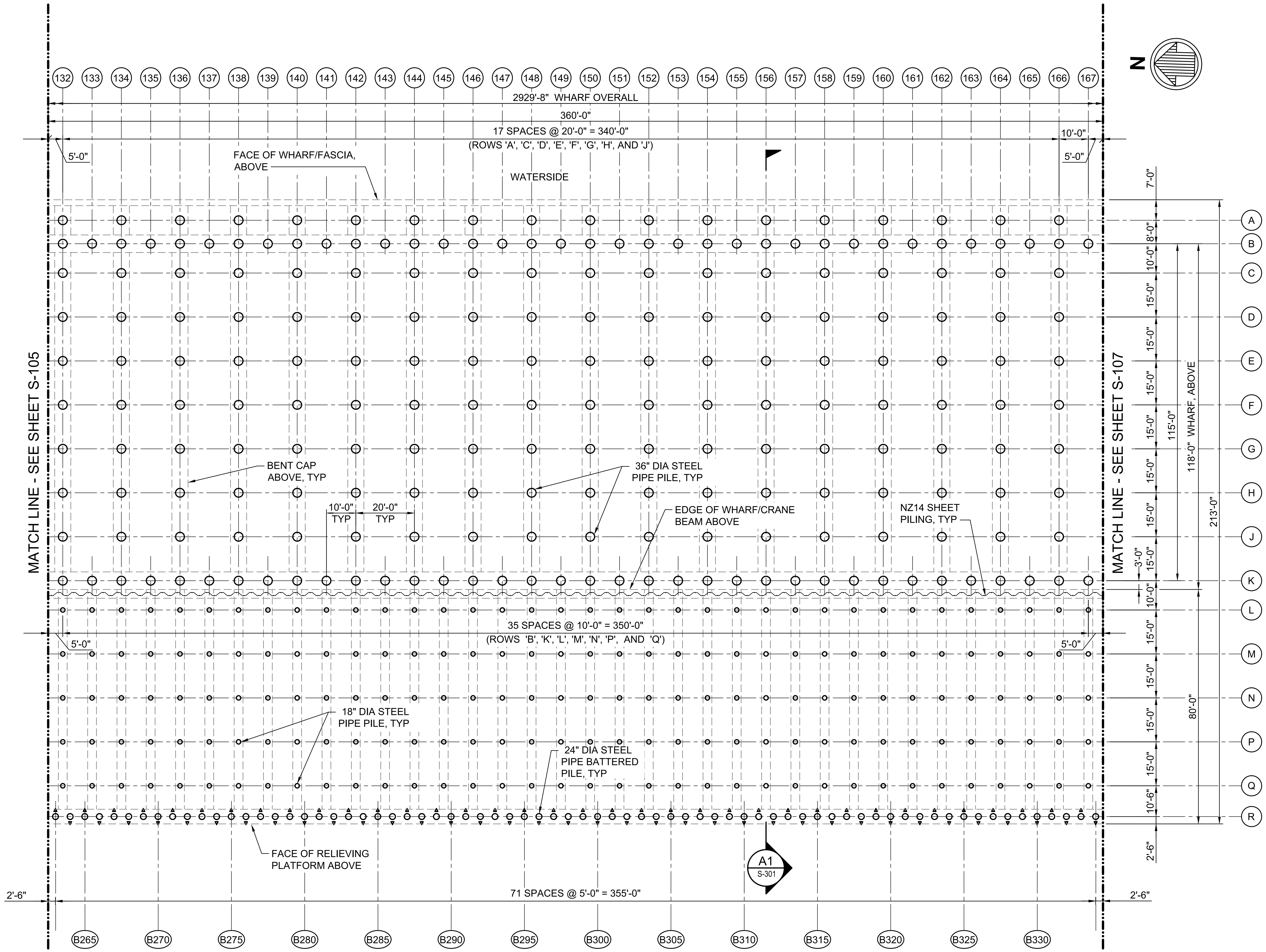

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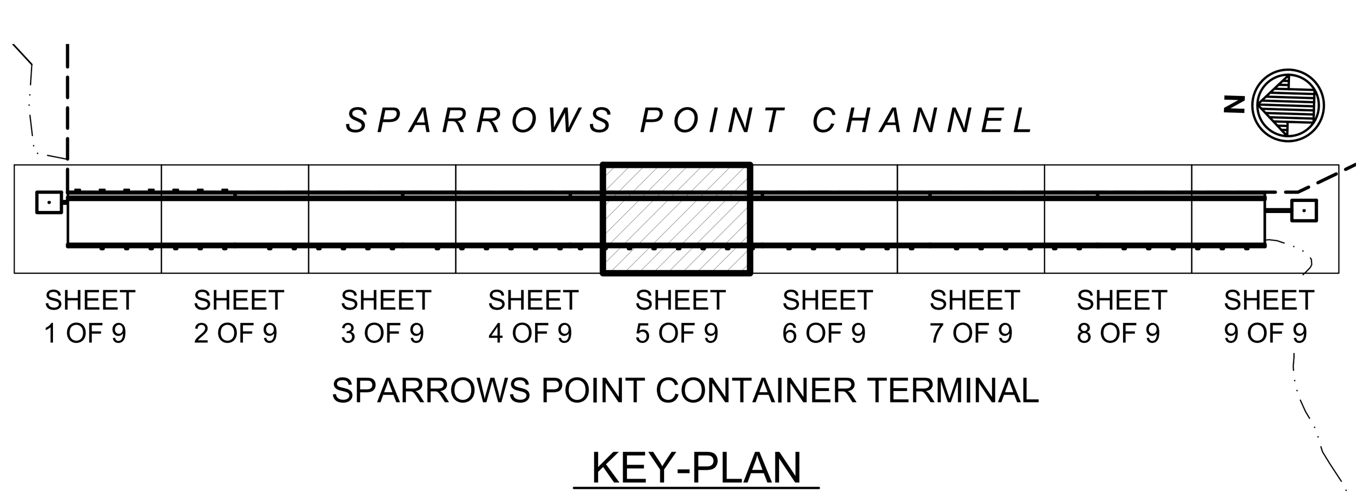
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 5 OF 9)

Designed by: IS	Date: 2024-01-30
Dwn by: RG	Ckd by: IS
M&N Project No. 230329	Rev.
Reviewed by: GS	Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: 1:1 (D SHEET)
	Plot scale:

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Sheet Reference No.
S-106
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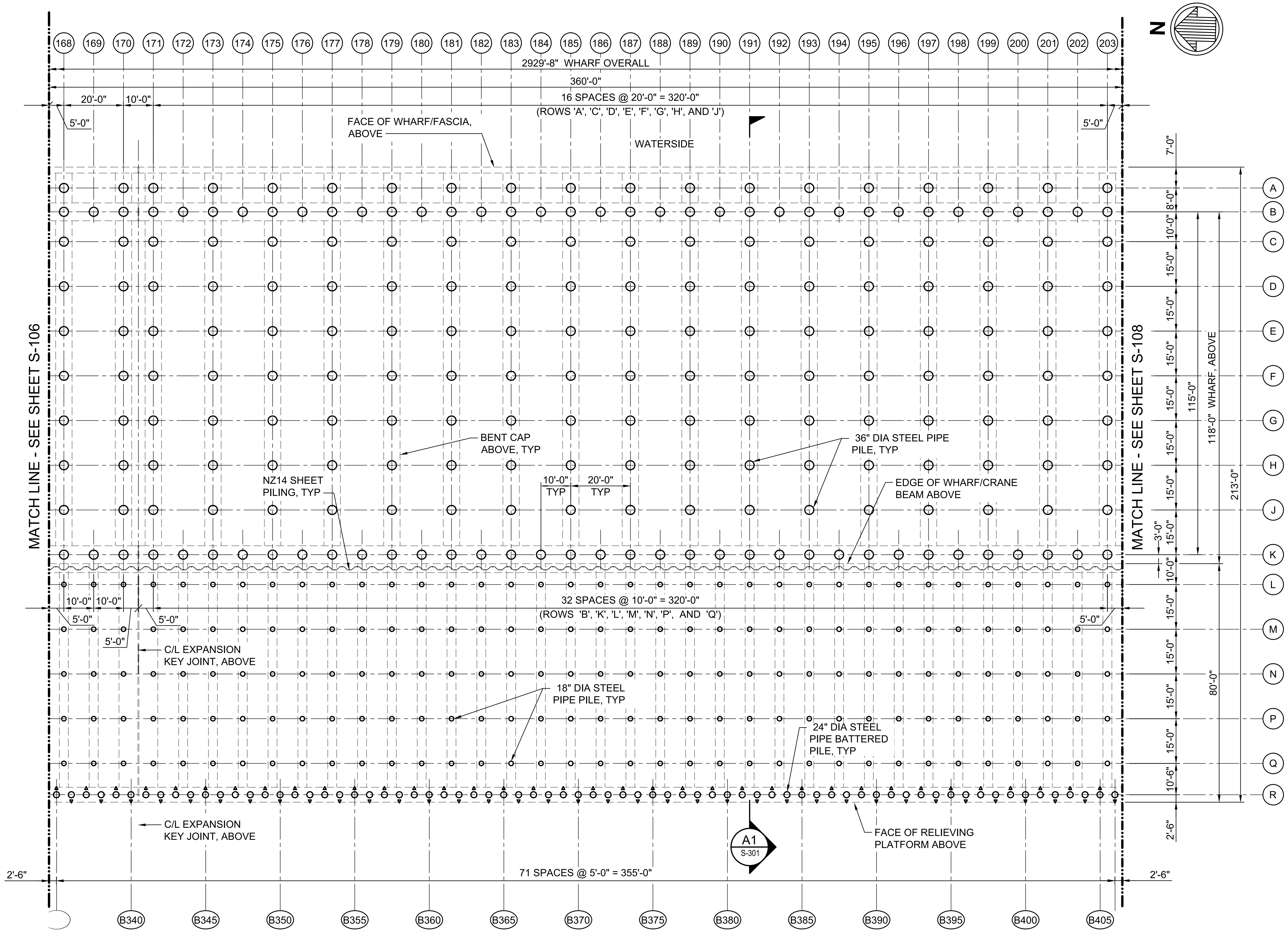
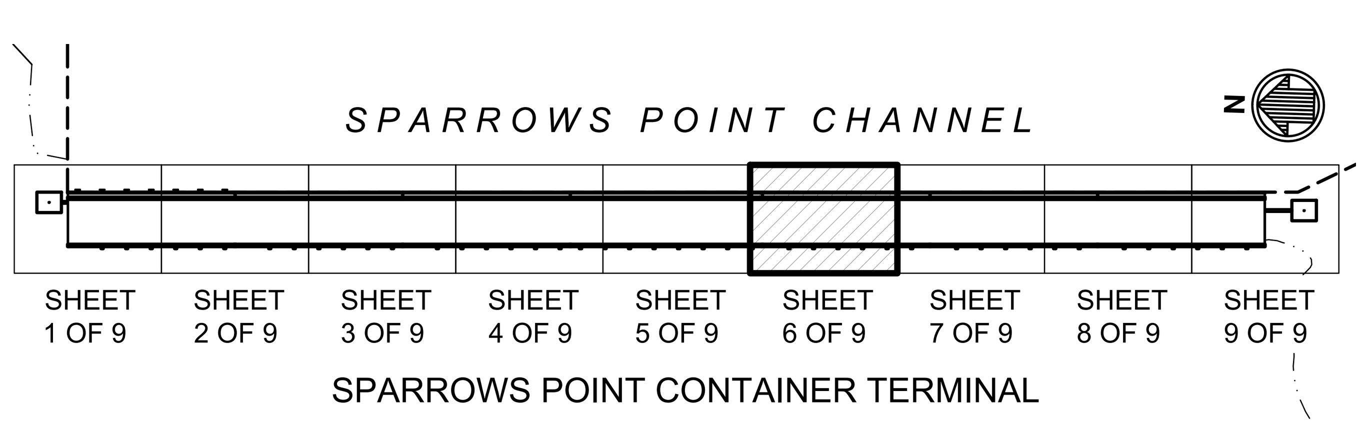


B1 S-107 PLAN - PILE (SHEET 6 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 6 OF 9)

Designed by: IS	Date: 2024-01-30
Dwn by: RG	Chk'd by: IS
M&N Project No. 230329	Rev.
Reviewed by: GS	Drawing code:
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)

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2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
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SPARROWS POINT CONTAINER TERMINAL
6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-107
INDEX: 142 OF 242

File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329S-107; Plotted: 1/30/2024 6:17 PM by VOELKER, PAUL; Saved: 1/26/2024 10:27 AM by RGERCHIKOVA

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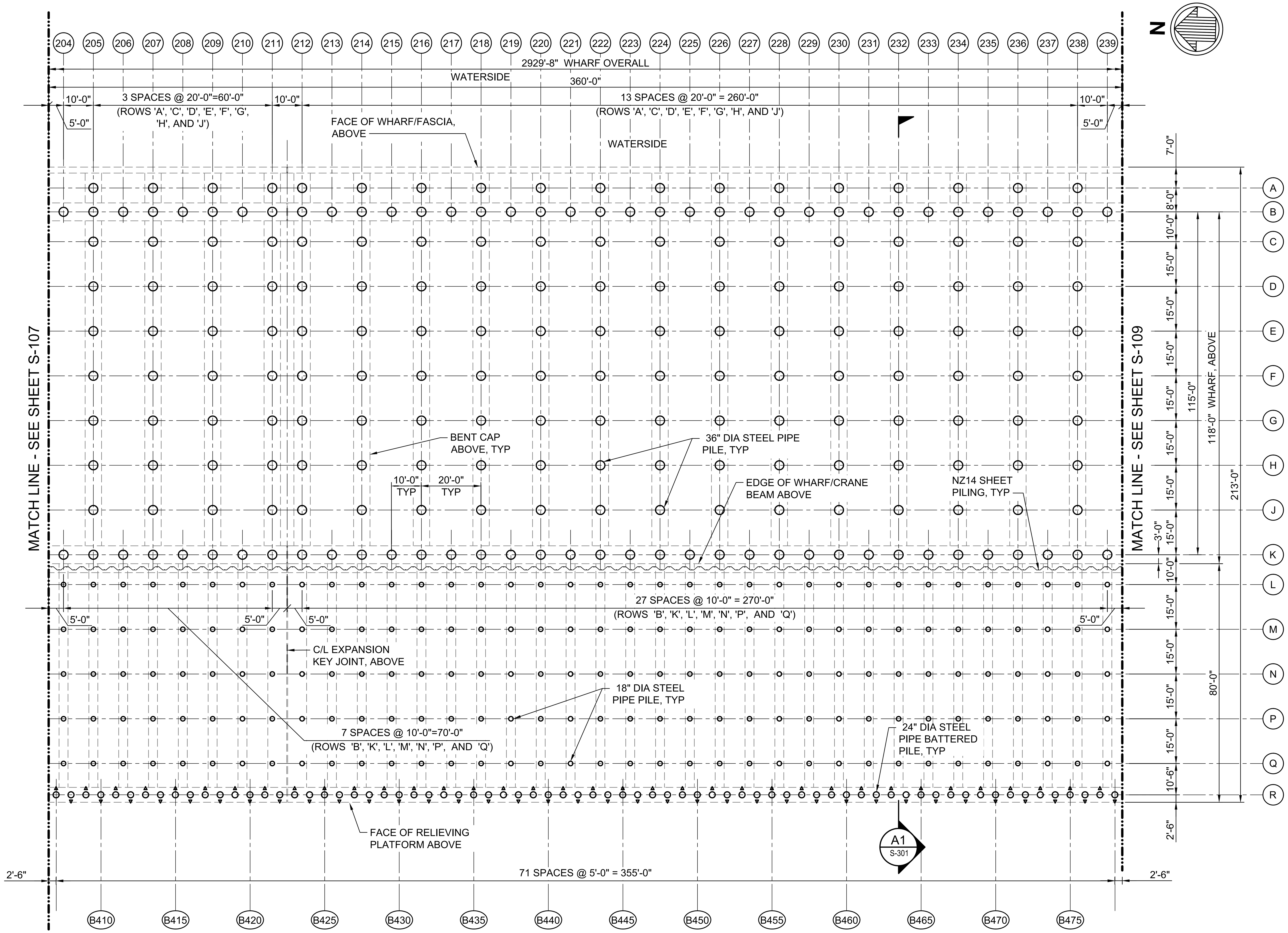
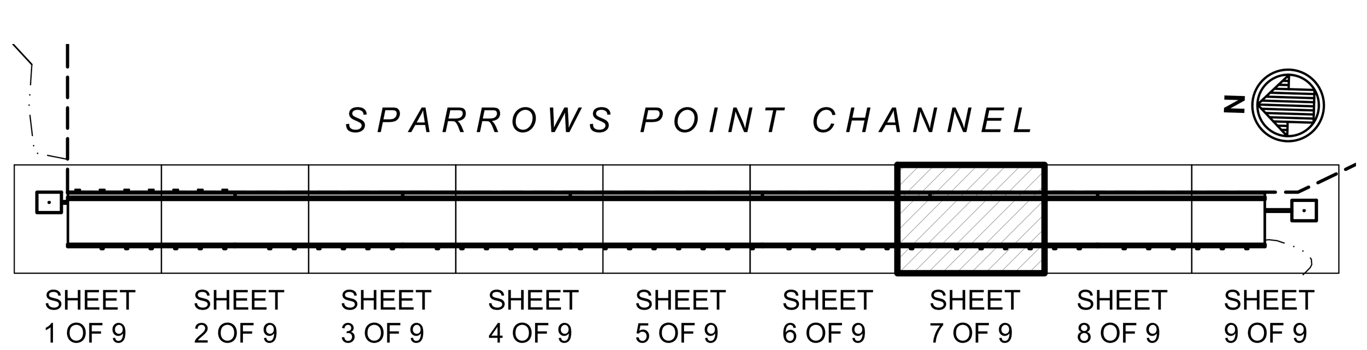


B1 S-108 PLAN - PILE (SHEET 7 OF 9)

SCALE: 1" = 20'



KEY-PLAN

SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE
(SHEET 7 OF 9)

Designed by: IS	Date: 2024-01-30
Dwn by: RG	Chk'd by: IS
Reviewed by: GS	M&N Project No. 230329
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale: 1:1 (D SHEET)

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2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
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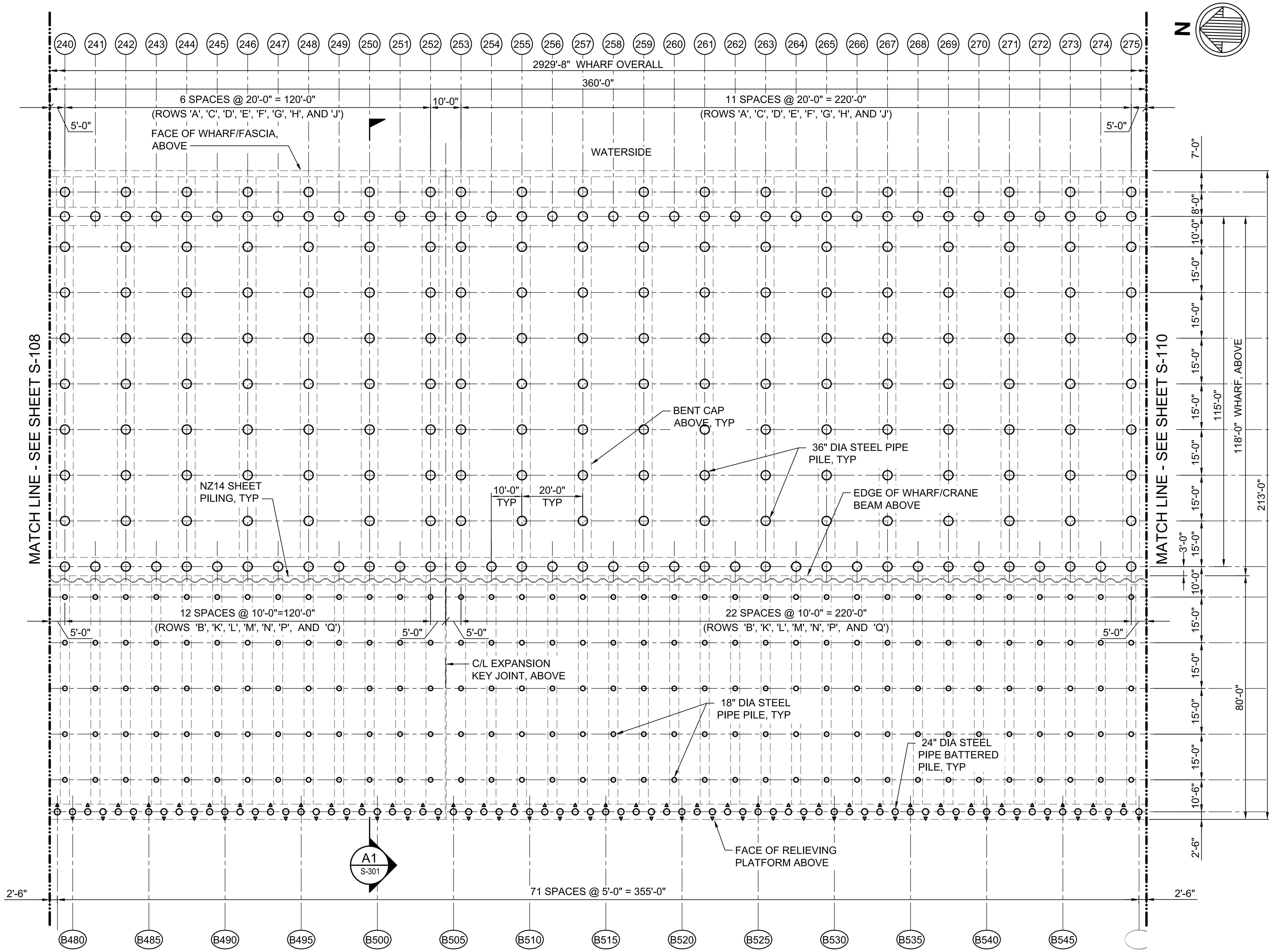
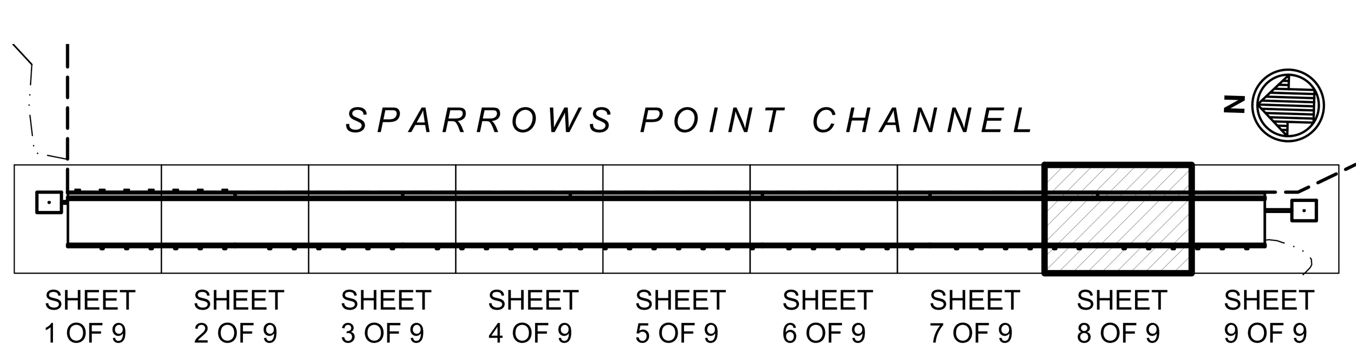
6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
S-108
INDEX: 143 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 S-109 PLAN - PILE (SHEET 8 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 8 OF 9)

Designed by: IS	Date: 2024-01-30	Rev.	
Dwn by: RG	Ckd by: IS	M&N Project No. 230329	
Reviewed by: GS		Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL		Drawing Scale:	Plot scale: 1:1 (D SHEET)

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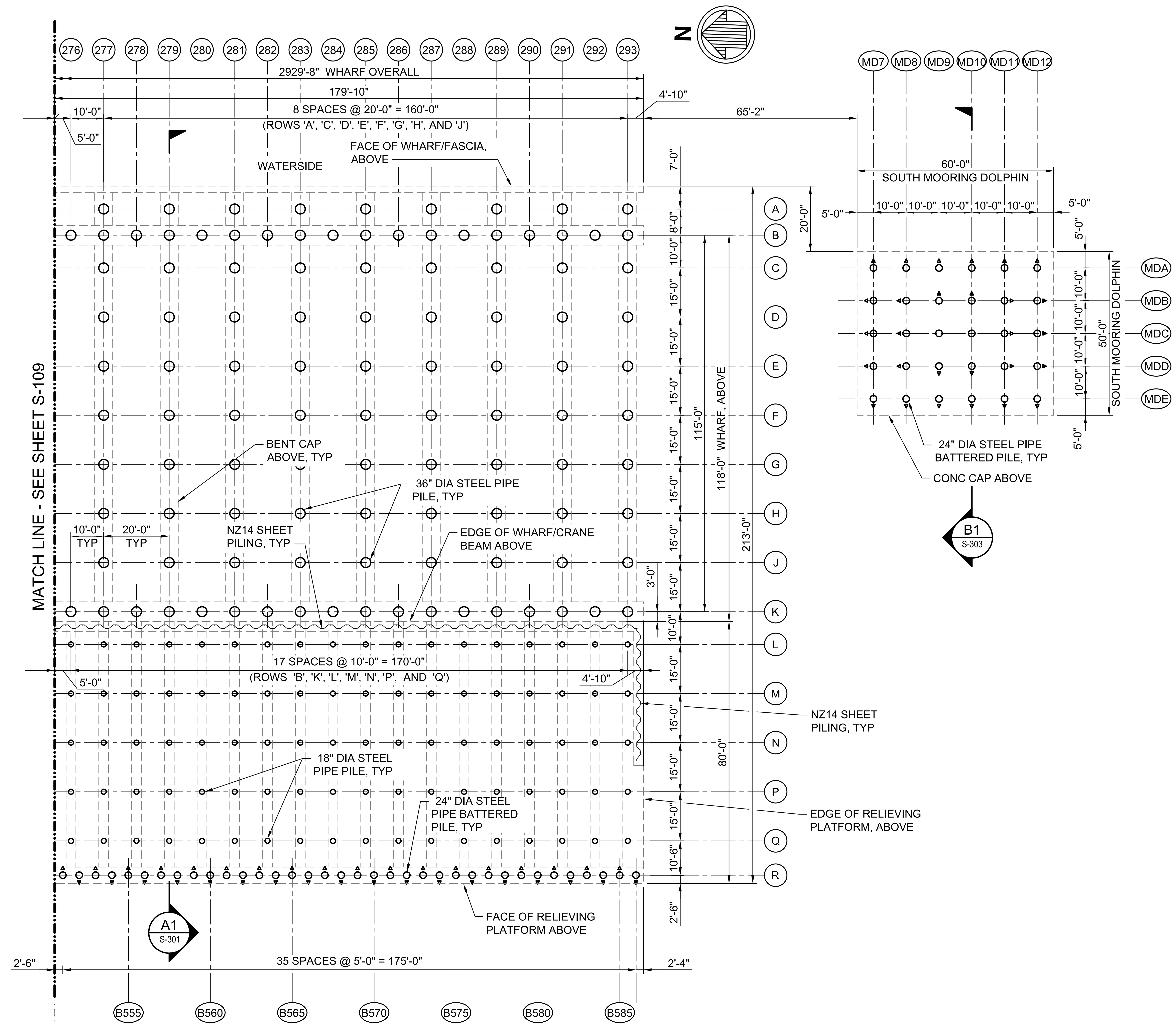
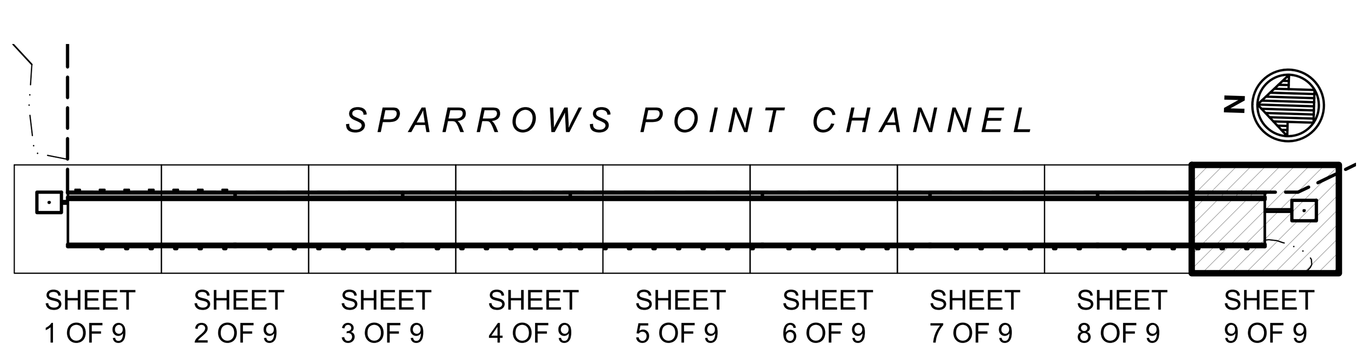
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
S-109
INDEX: 144 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 S-110 PLAN - PILE (SHEET 9 OF 9)
SCALE: 1" = 20'



KEY-PLAN
SCALE: 1" = 400'

20'-0" 0'-0" 20'-0" 40'-0"
SCALE: 1"=20'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - PILE (SHEET 9 OF 9)

Rev.
Date: 2024-01-30
M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:
Designed by: IS
Dwn by: RG
Ckd by: IS
Reviewed by: GS
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
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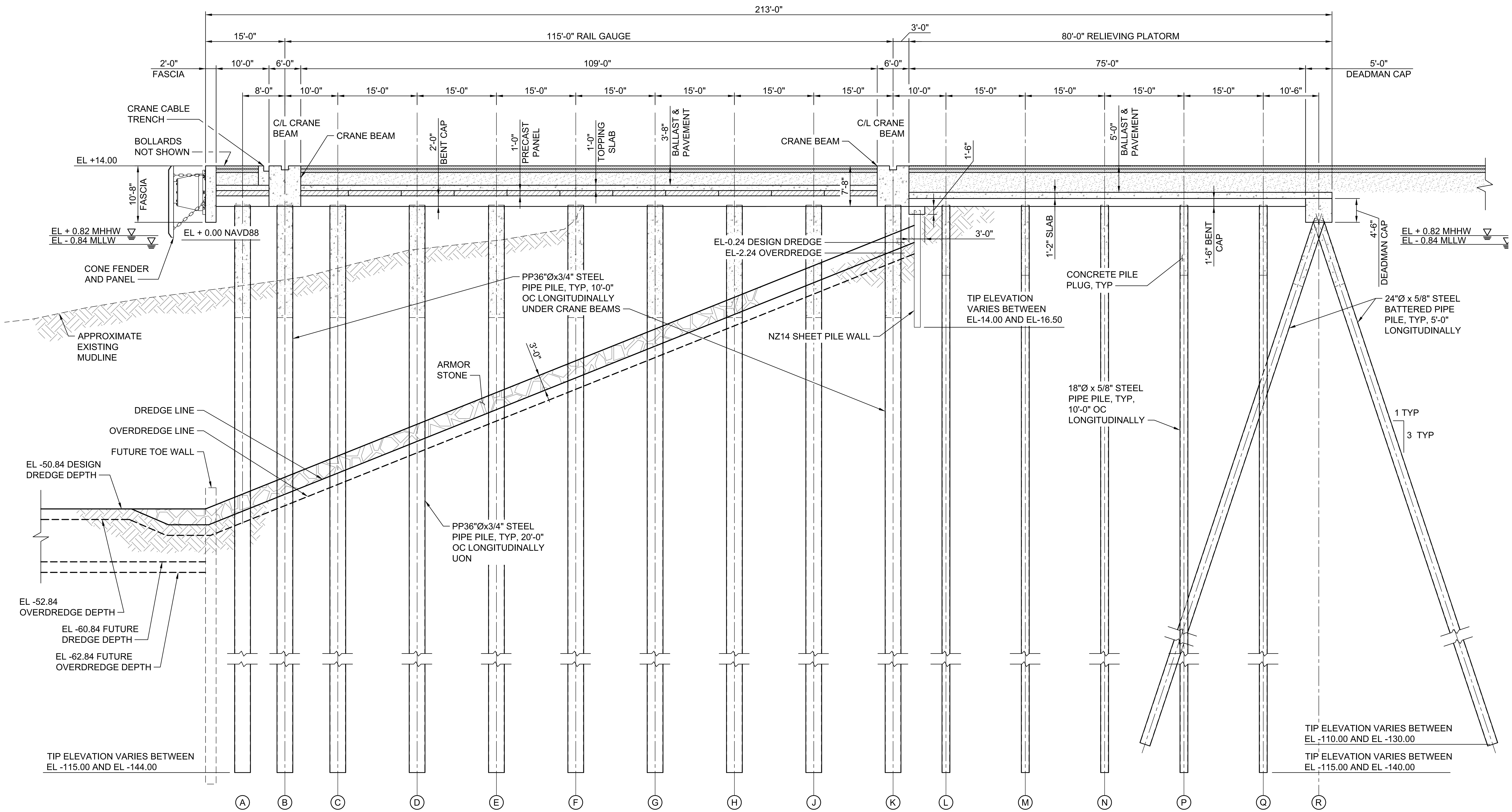
6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
S-110
INDEX: 145 OF 242

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1 S-301 SECTION - TYPICAL WHARF (SHEET 1 OF 2)

SCALE: 1" = 10'

NOTE:

ALL ELEVATIONS ARE BASED ON NAVD88 DATUM.

SPARROWS POINT CONTAINER TERMINAL
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BALTIMORE MARYLAND 21219

SECTION - TYPICAL WHARF (SHEET 1 OF 2)

Rev.	Date: 2024-01-30	M&N Project No. 230329	Drawing code:	Drawing Scale: 1:1 (D SHEET) Plot scale:
Designed by: IS	Ckd by: IS	Dwn by: RG	Reviewed by: GS	Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

SPARROWS POINT CONTAINER TERMINAL

Mark | Description | Date | Appr

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Sheet Reference No.
S-301
INDEX: 164 OF 242

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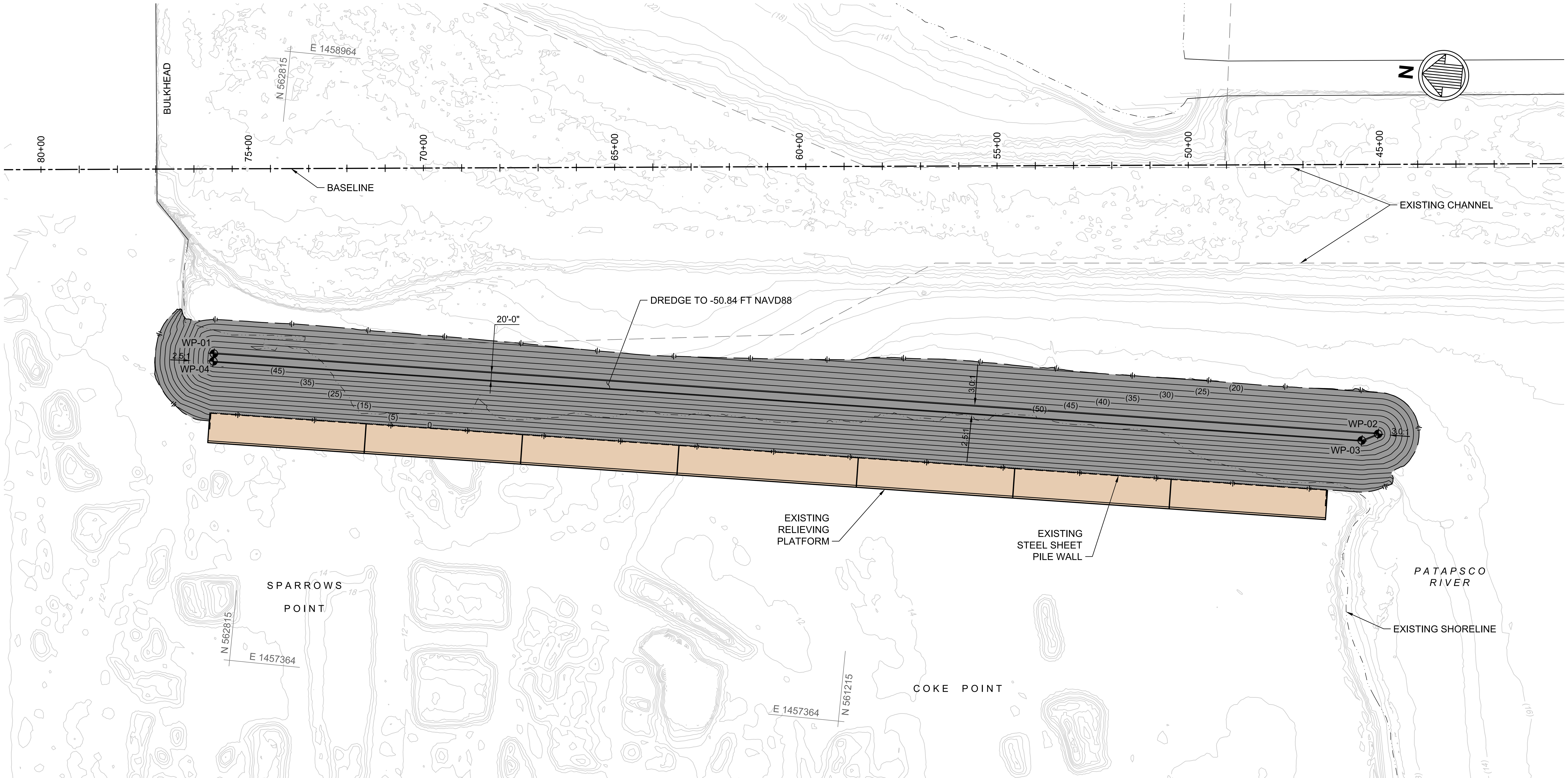
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Channel Dredging Plans



C1 CN101 PLAN - DREDGING PHASE 1
SCALE: 1" = 150"

DREDGING PHASE 1 WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-01	562935.30	1458158.35
WP-02	559885.09	1458251.93
WP-03	559926.17	1458230.66
WP-04	562934.69	1458138.36

LEGEND:

- PHASE 1 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- (40) DESIGN DEPTH CONTOURS NAVD88
- (34) EXISTING DEPTH CONTOURS NAVD88
- BASELINE

150' 0' 150' 300'
SCALE: 1"=150'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
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BALTIMORE MARYLAND 21219

PLAN - DREDGING PHASE 1

Date: 2024-01-30
M&N Project No. 230329
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Designed by: PWK
Dwn by: ED
Ckd by: PGV
Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD SUITE 100 BALTIMORE, MD 21219

Sheet Reference No.
CN102
INDEX: 24 OF 242

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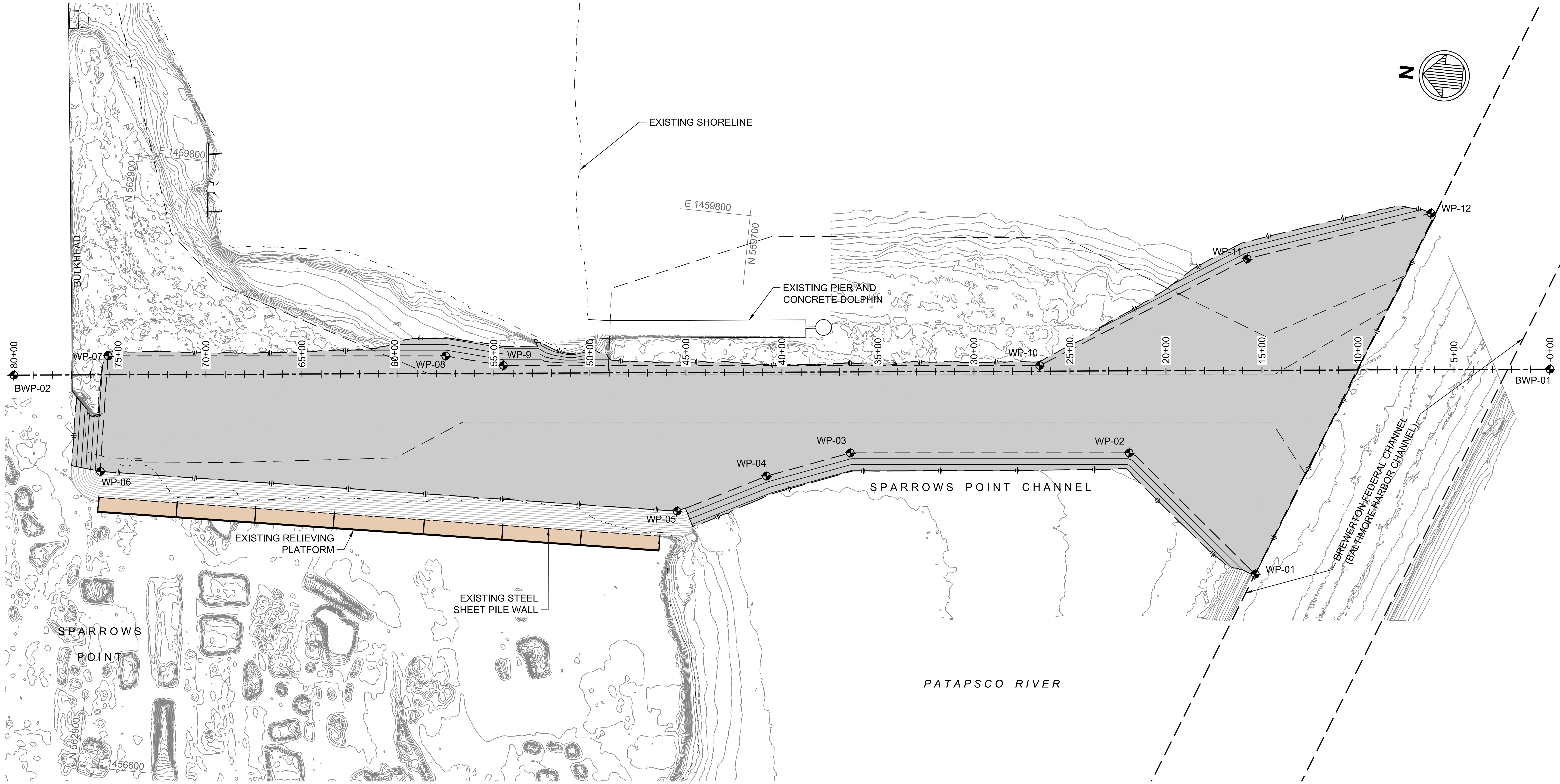
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



C1
CN101

PLAN - DREDGING PHASE 2

SCALE: 1" = 300'

DREDGING CHANNEL WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-01	556896.85	1458202.47
WP-02	557613.46	1458766.30
WP-03	559058.50	1458622.10
WP-04	559480.86	1458458.36
WP-05	559926.17	1458230.66
WP-06	562934.69	1458138.36

DREDGING CHANNEL WORKING POINTS TABLE

WP-##	NORTHING	EASTING
WP-07	562954.38	1458740.44
WP-08	561205.76	1458915.38
WP-9	560901.83	1458895.46
WP-10	558122.30	1459172.82
WP-11	557102.27	1459832.95
WP-12	556172.88	1460164.75

LEGEND:

- EXISTING PHASE 1 DREDGE AREA.
- PHASE 2 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- (40) DESIGN DEPTH CONTOURS NAVD88
- (34) EXISTING DEPTH CONTOURS NAVD88
- BASELINE

300' 0' 300' 600'

SCALE: 1"=300'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark | Description | Date | Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - DREDGING PHASE 2

Designed by: PWK | Date: 2024-01-30 | Rev.
Dwn by: ED | Ckd by: PGV | M&N Project No. 230329
Reviewed by: SM | Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL | Drawing Scale: | Plot scale: 1:1 (D SHEET)

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN103
INDEX: 25 OF 242

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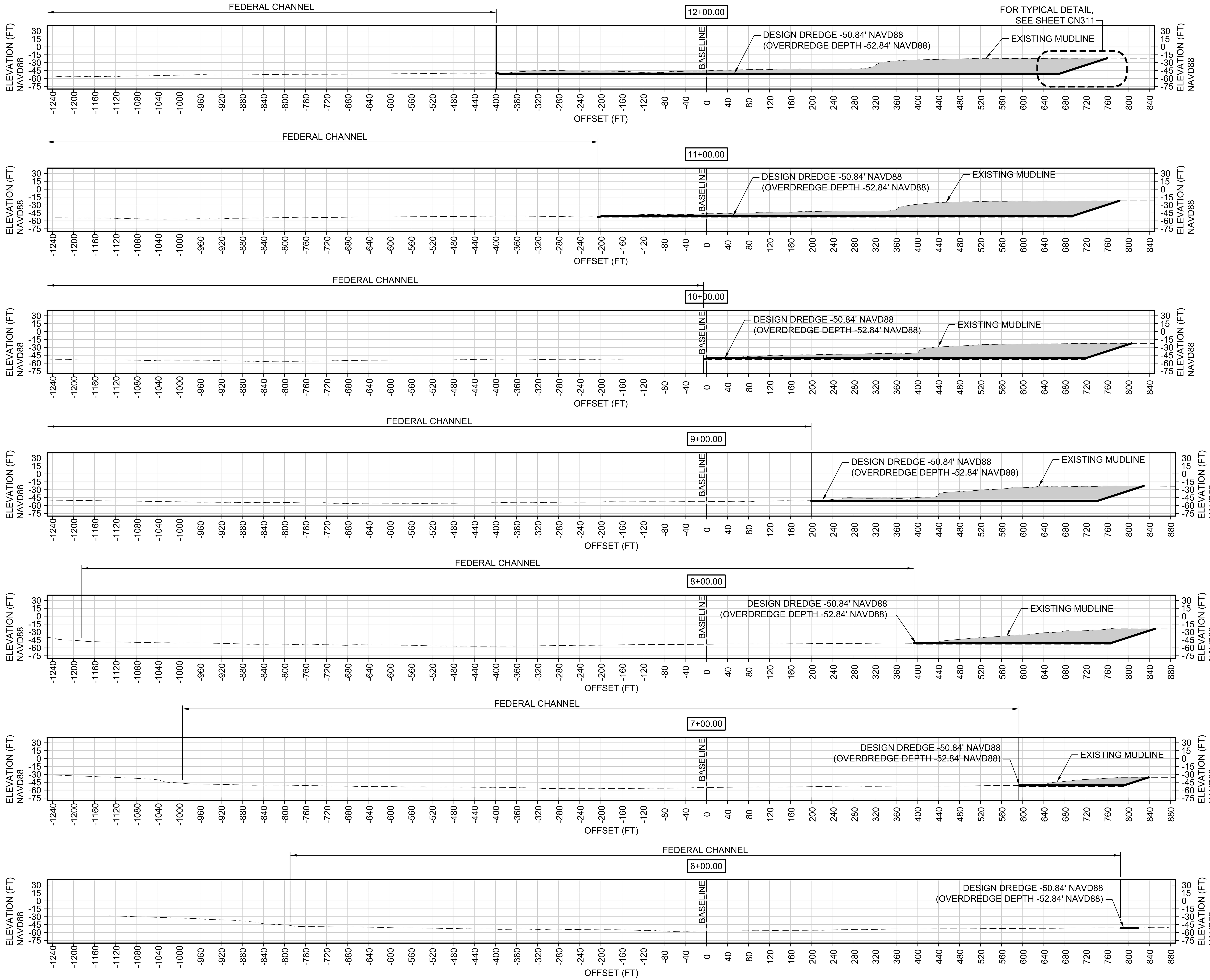
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 1 OF 11)

Designed by: PWK	Date: 2024-01-30
Dwn by: ED	Ckd by: PGV
M&N Project No. 230329	Rev.
Reviewed by: SM	Drawing code:
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL	Drawing Scale:
Plot scale: 1:1 (D SHEET)	

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STE. D BALTIMORE, MD 21224
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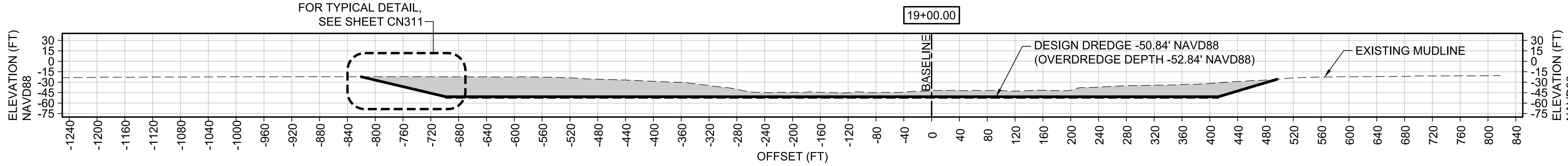
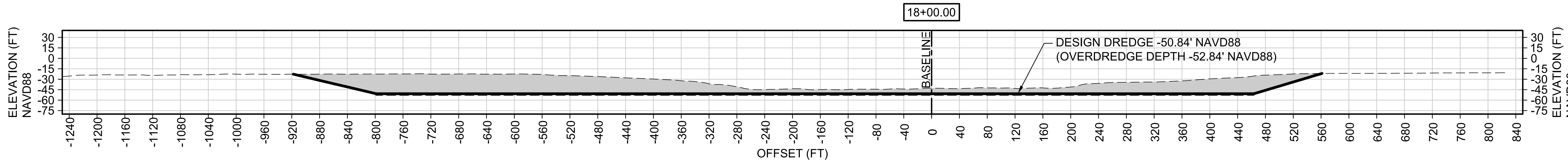
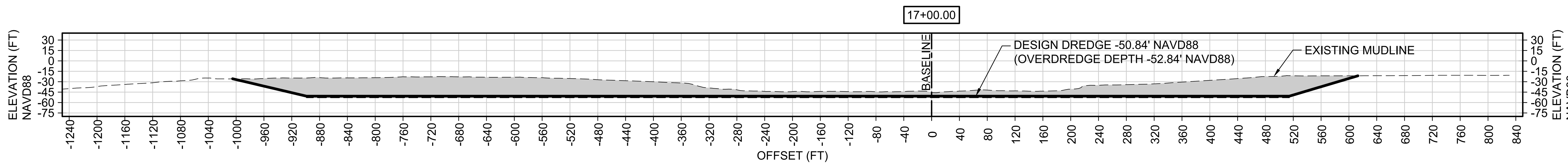
SUITE 100
BALTIMORE, MD 21219

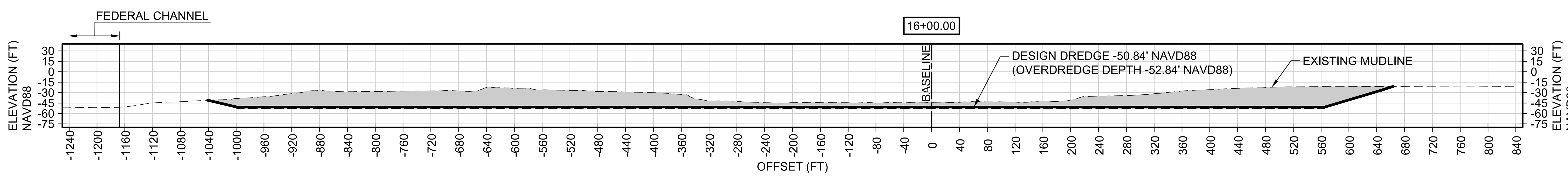
Sheet Reference No.
CN301
INDEX: 26 OF 242

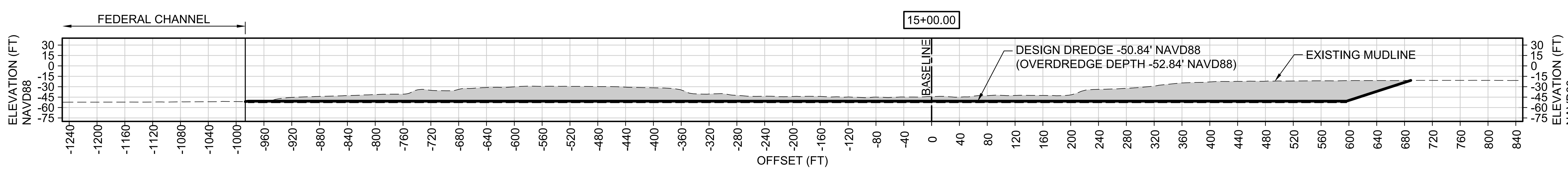
FOR TYPICAL DETAIL, SEE SHEET CN311

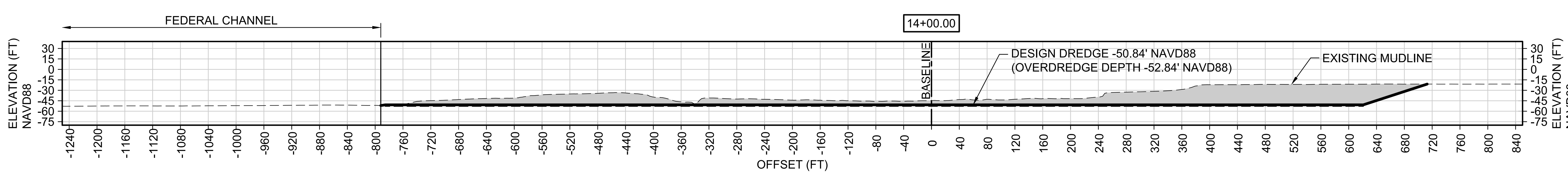


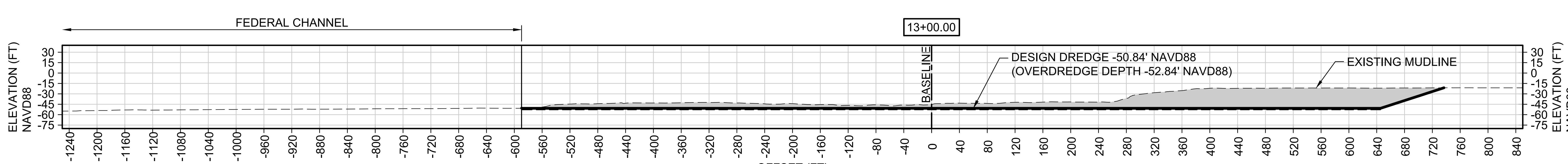












LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 2 OF 11)

Rev.: | Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET)

Designed by: PWK | Dwn by: ED | Ckd by: PGV | Reviewed by: SM | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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SPARROWS POINT CONTAINER TERMINAL

Sheet Reference No.
CN302
INDEX: 27 OF 242

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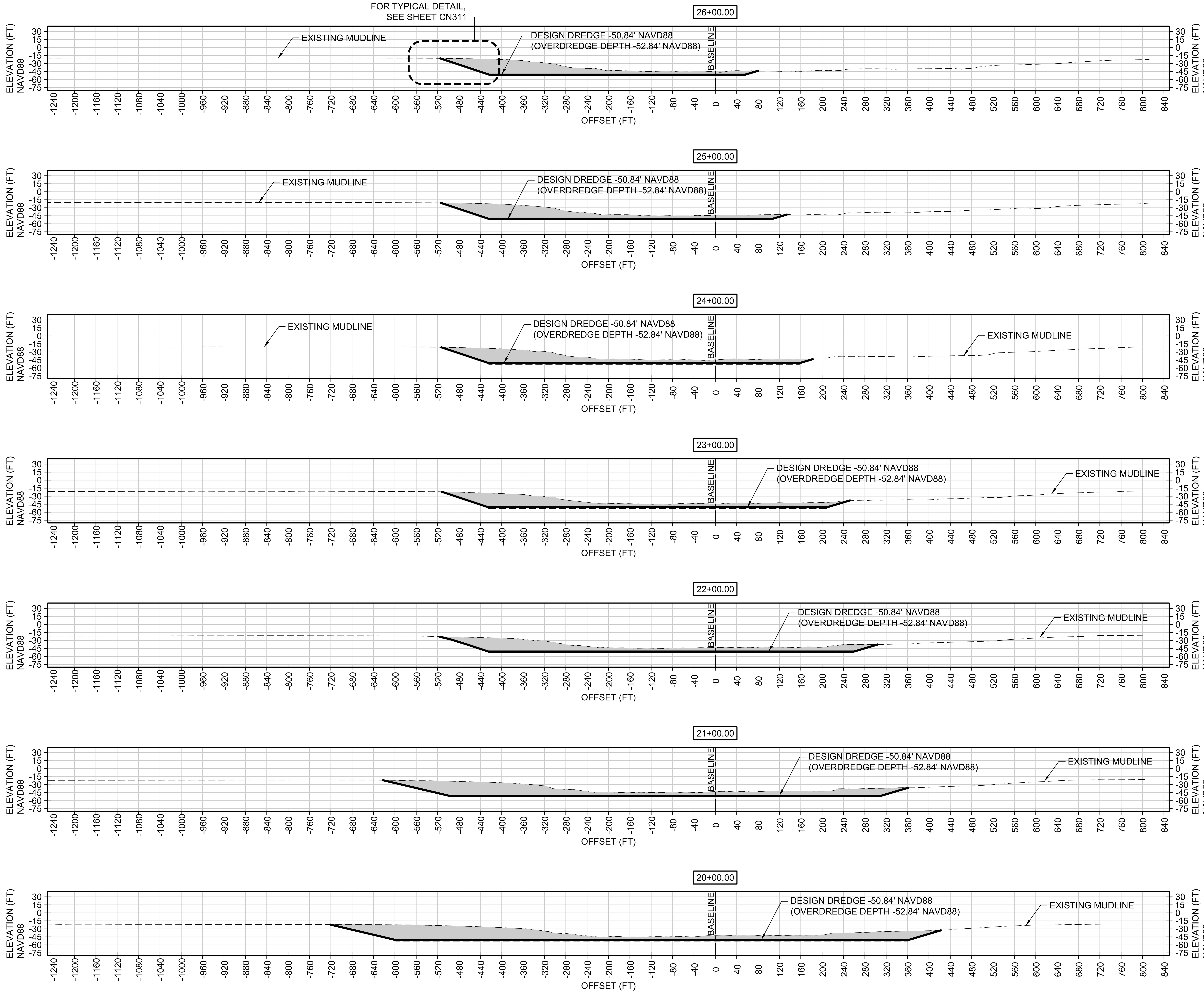
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 3 OF 11)

Rev.:
Date: 2024-01-30
M&N Project No.: 230329
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: PWK
Dwn by: ED
Ckd by: PGV
Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL

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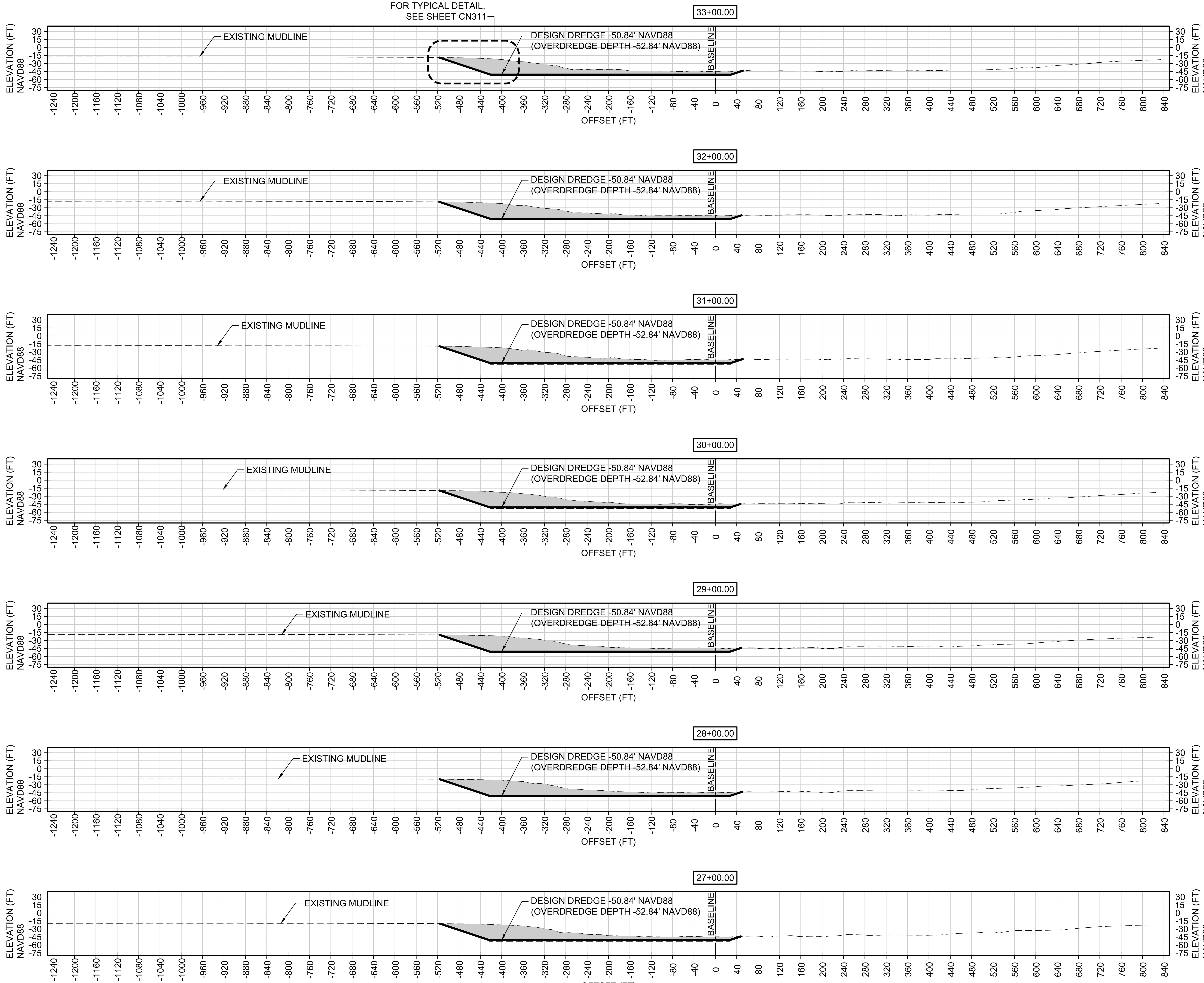
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN303
INDEX: 28 OF 242

File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329\CN303 ; Plotted: 1/29/2024 5:59 PM by VOELKER, PAUL ; Saved: 1/26/2024 11:10 AM by EDOMINGUEZ



LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 4 OF 11)

Designed by: PWK	Date: 2024-01-30	Rev.	
Dwn by: ED	Chk'd by: PGV	M&N Project No. 230329	
Reviewed by: SM		Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL		Drawing Scale:	Plot scale: 1:1 (D SHEET)

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Sheet Reference No.
CN304
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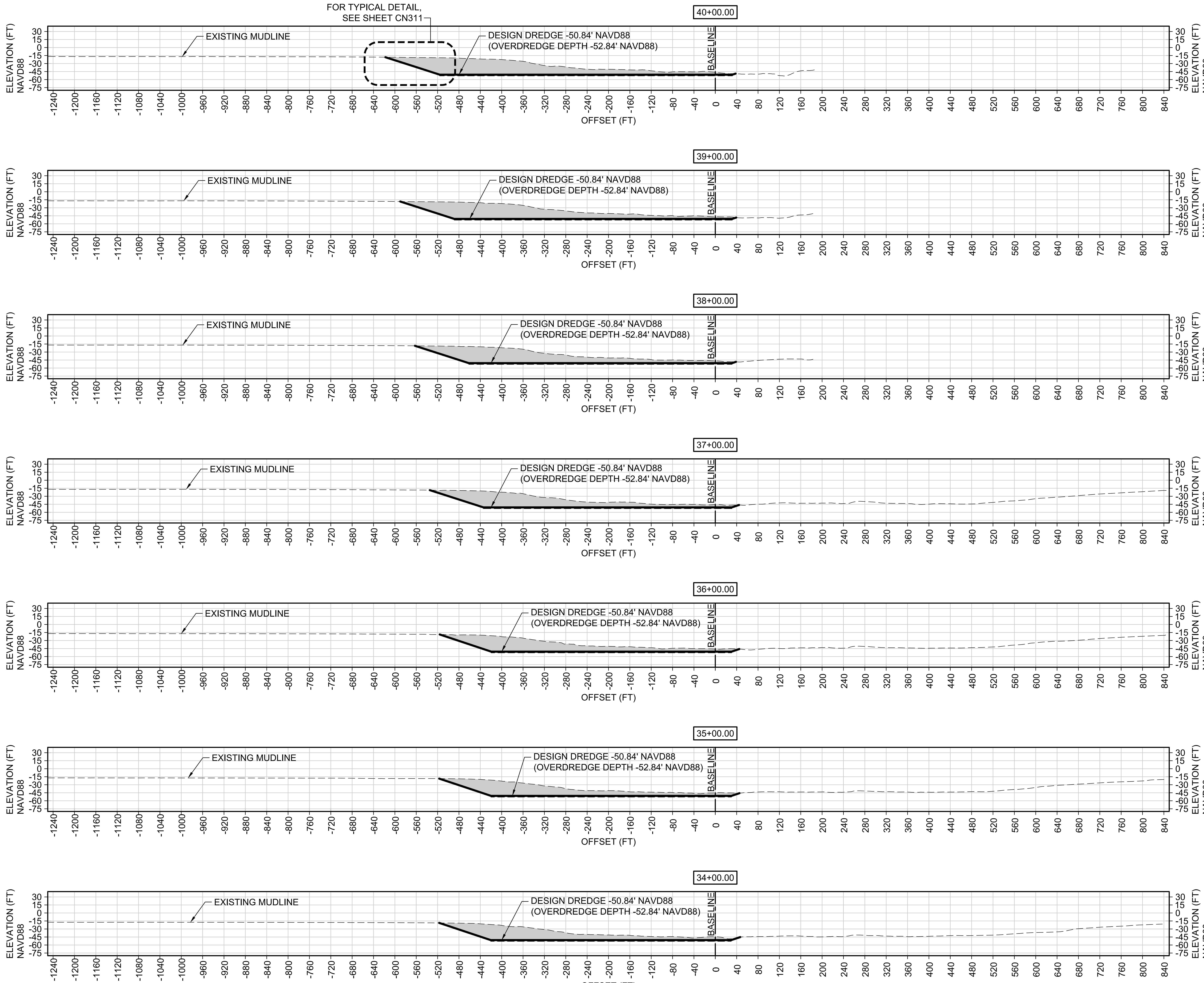

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

SPARROWS POINT CONTAINER TERMINAL
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BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 5 OF 11)

Designed by: PWK	Date: 2024-01-30
Rev.	
Dwn by: ED	Ckd by: PGV
M&N Project No. 230329	
Reviewed by: SM	Drawing code:
Submitted by: ERIC D. SMITH, MOFFATT & NICHOL	Drawing Scale:
Plot scale: 1:1 (D SHEET)	

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SUITE 100
BALTIMORE, MD 21219

Sheet
Reference No.
CN305

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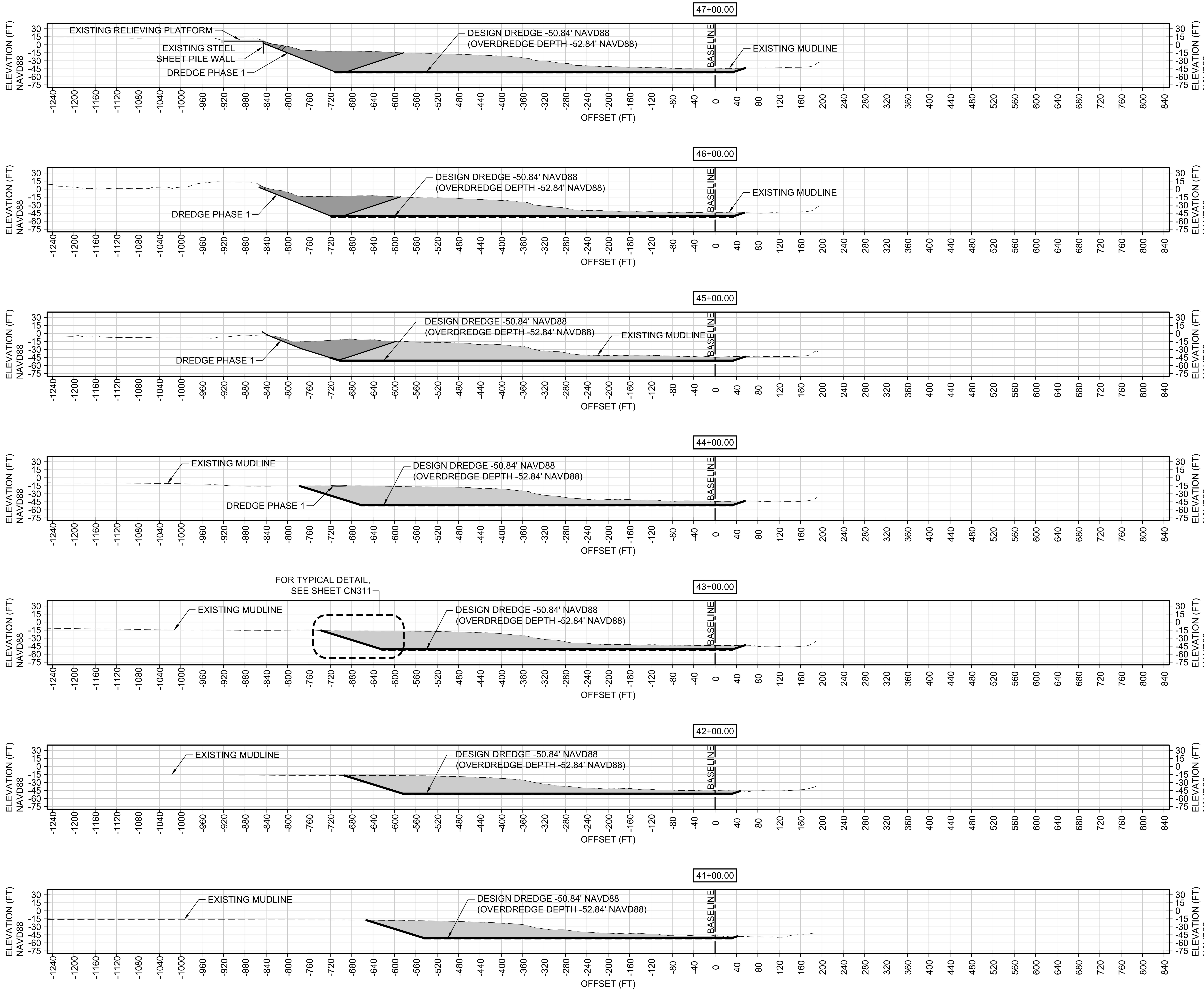

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 6 OF 11)

Designed by: PWK	Dwn by: ED	Ckd by: PGV	Reviewed by: SM
Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Date: 2024-01-30	M&N Project No. 230329	Plot scale: 1:1 (D SHEET)

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Sheet Reference No.
CN306
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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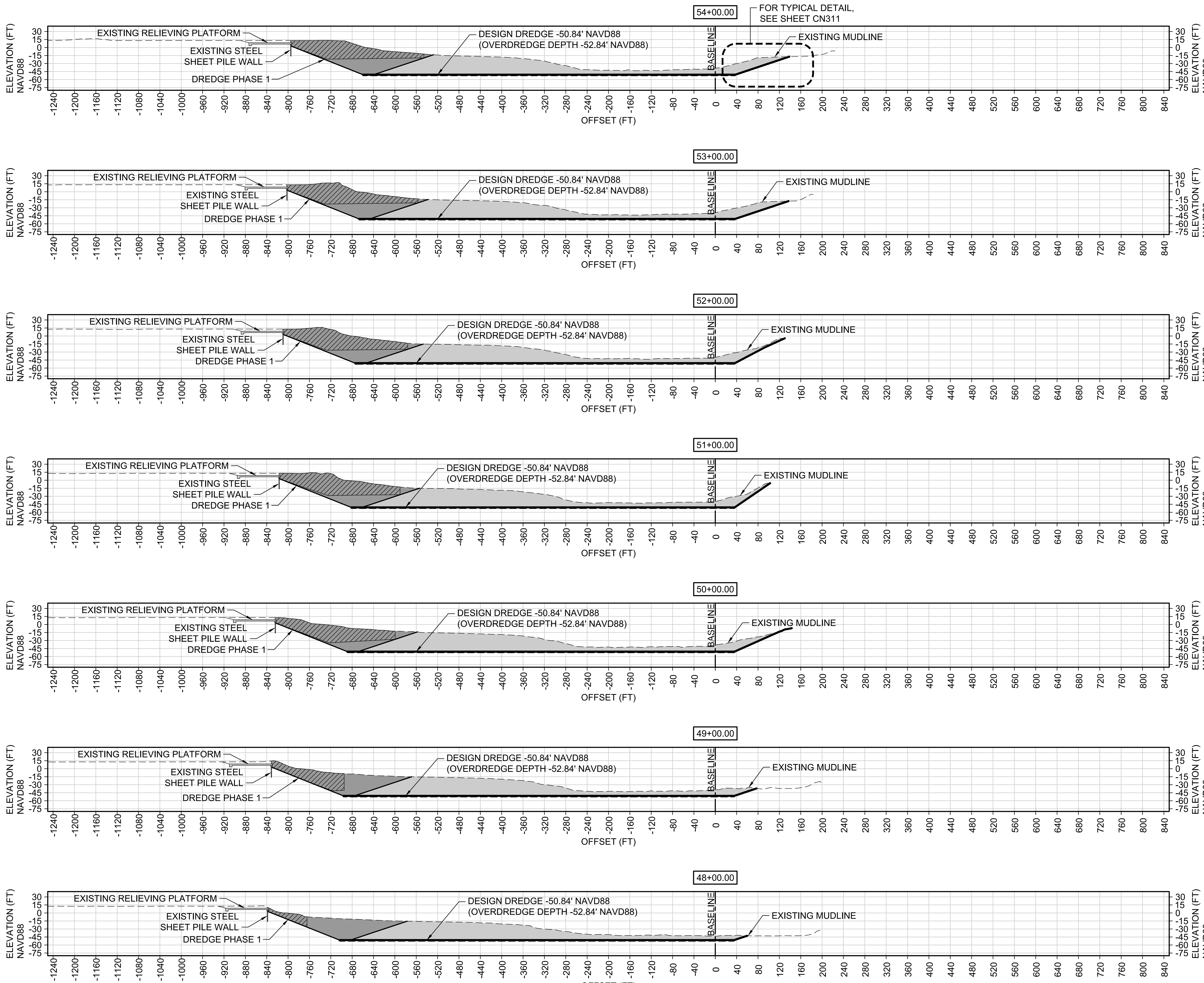

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 7 OF 11)

Rev.	Date: 2024-01-30	M&N Project No. 230329	
Designed by: PWK	Dwn by: ED	Ckd by: PGV	Drawing code:
Reviewed by: SM	Submitted by: ERIC D. SMITH MOFFATT & NICHOL	Drawing Scale:	Plot scale: 1:1 (D SHEET)

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Sheet Reference No.
CN307
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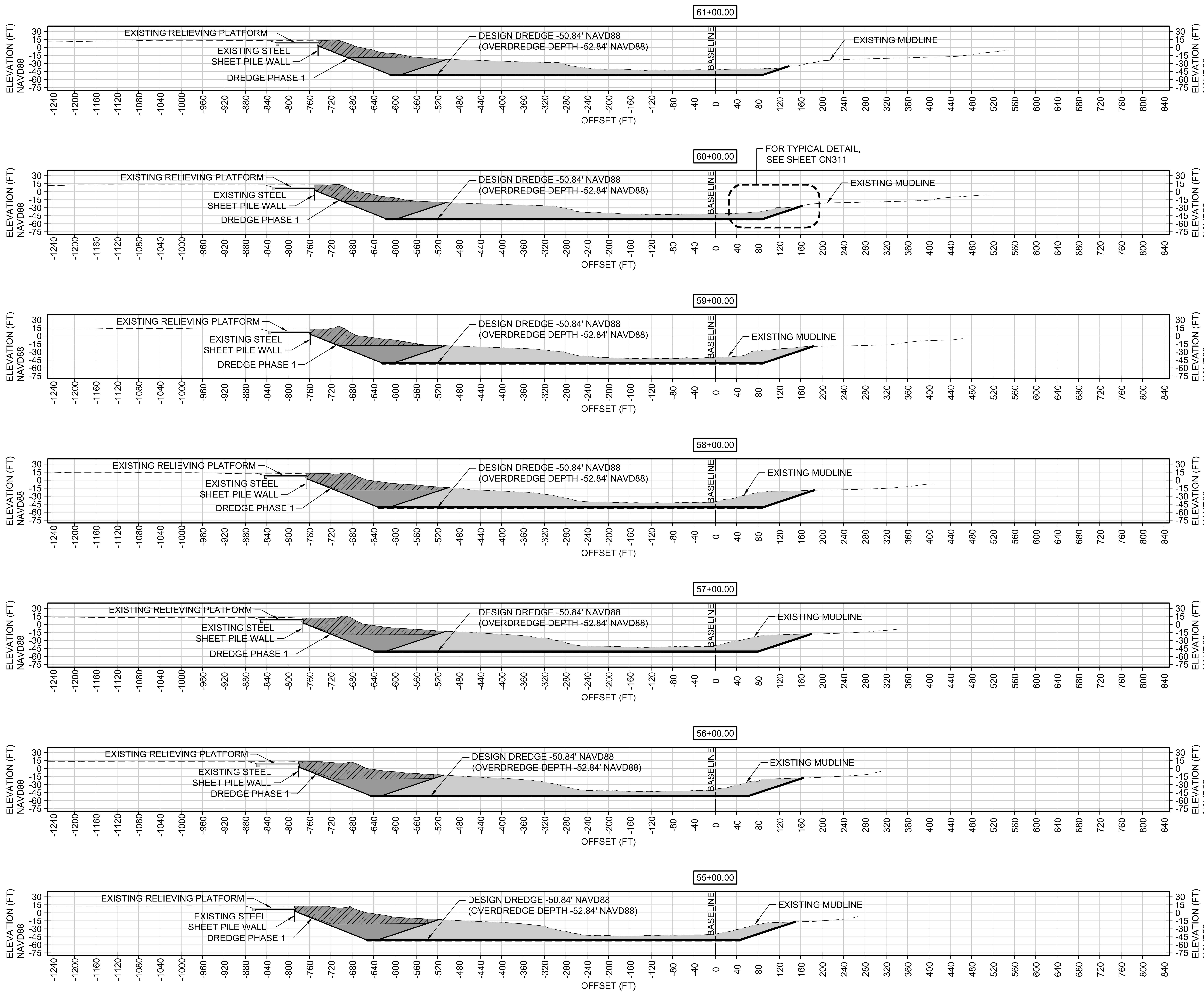

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 8 OF 11)

Designed by: PWK		Date: 2024-01-30	Rev.
Dwn by: ED	Ckd by: PGV	M&N Project No. 230329	
Reviewed by: SM		Drawing code:	
Submitted by: ERIC D. SMITH MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

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SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN308

INDEX: 33 OF 242

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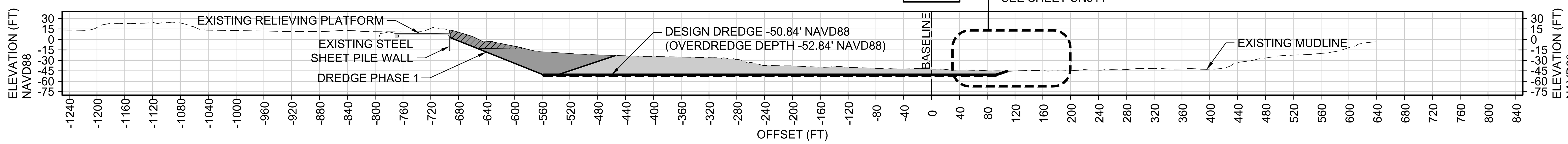

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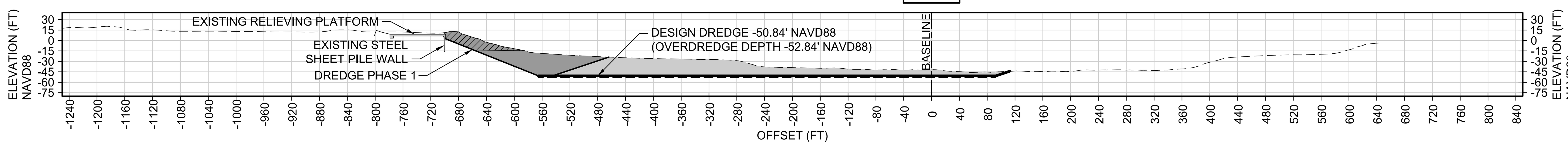

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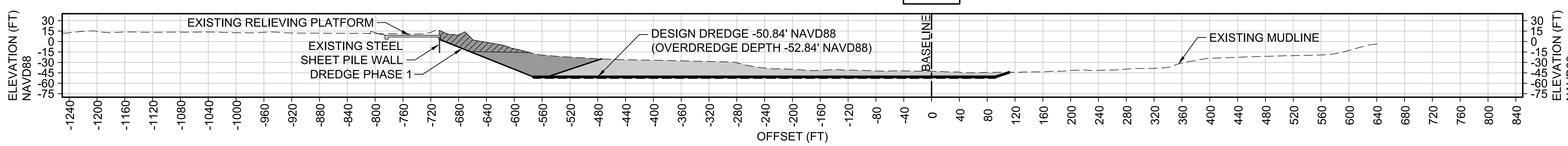

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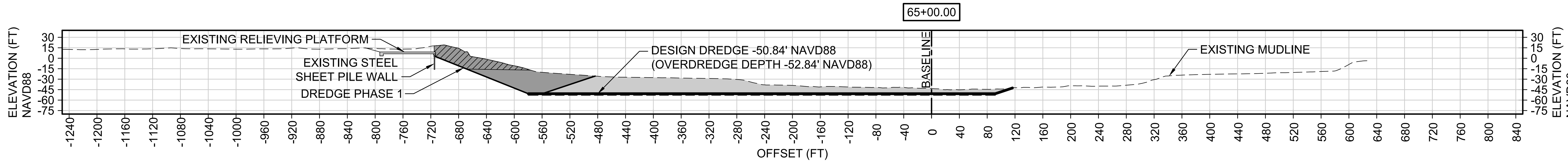

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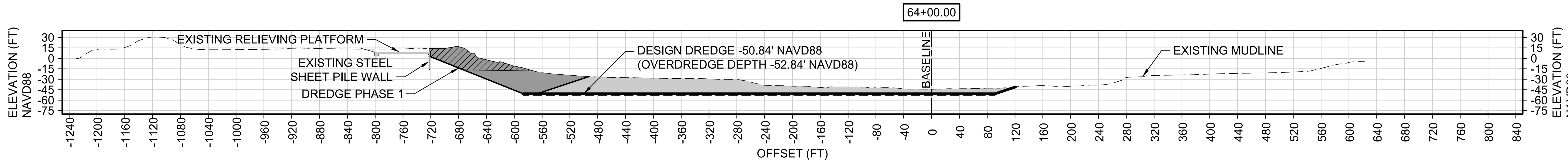

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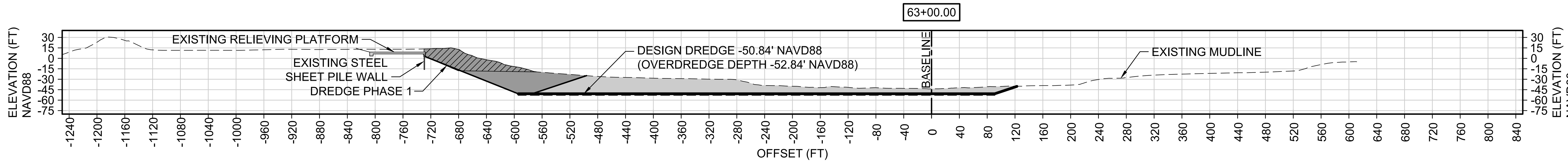

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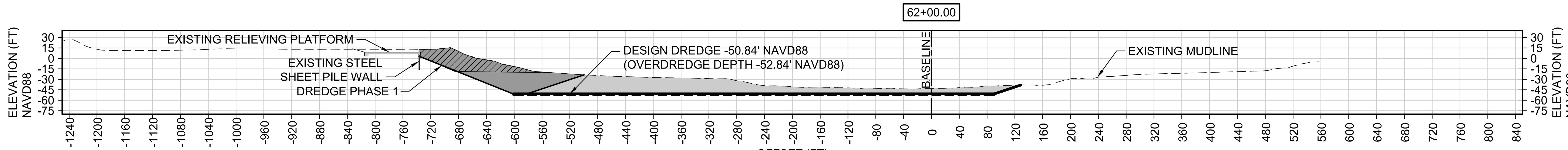

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING (SHEET 9 OF 11)

Designed by: PWK | Dwn by: ED | Chk'd by: PGV | Reviewed by: SM | Submitted by: ERIC D. SMITH MOFFATT & NICHOL

Date: 2024-01-30 | M&N Project No. 230329 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (D SHEET) | Rev.

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Sheet Reference No.
CN309
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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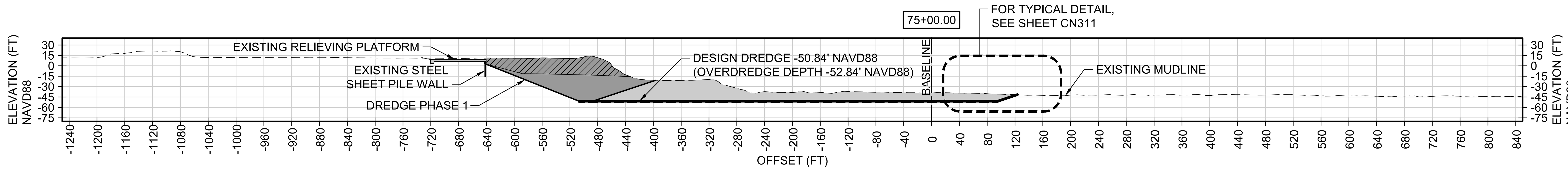

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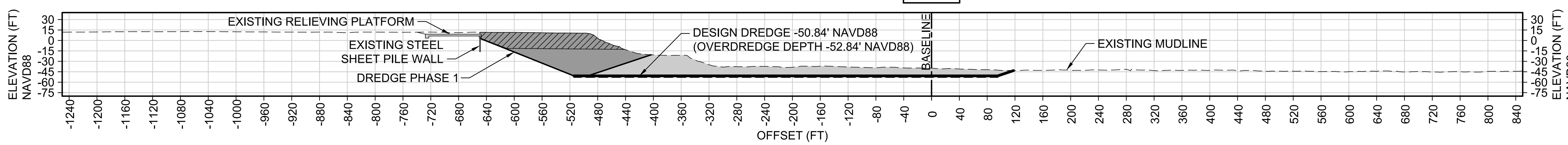

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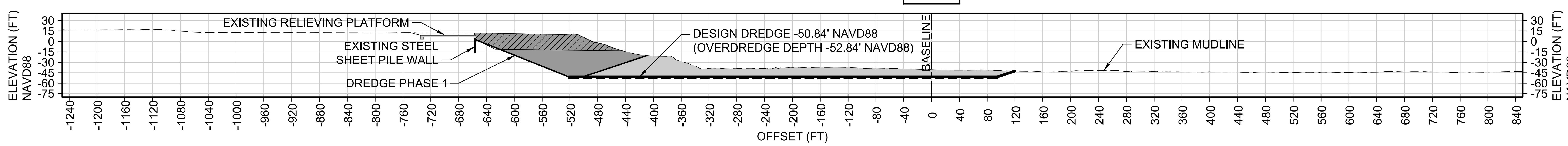

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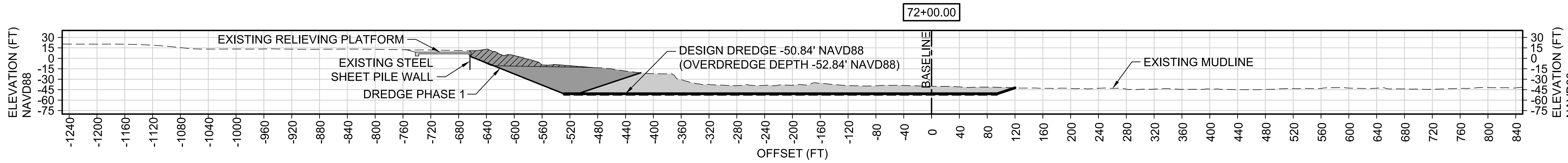

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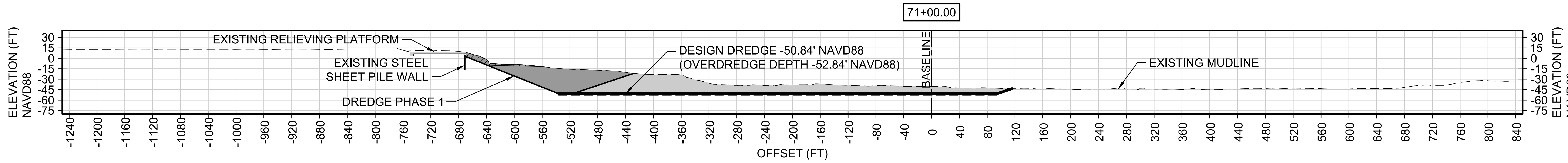

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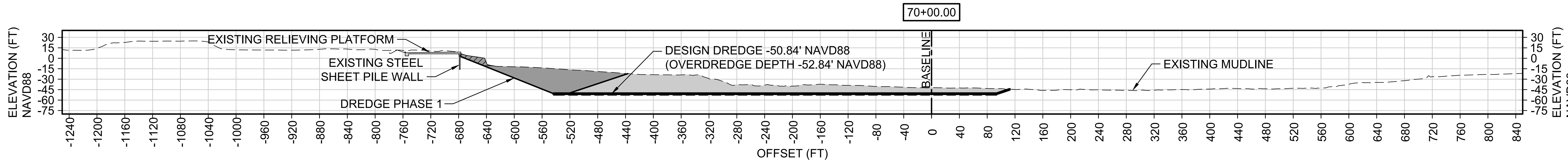

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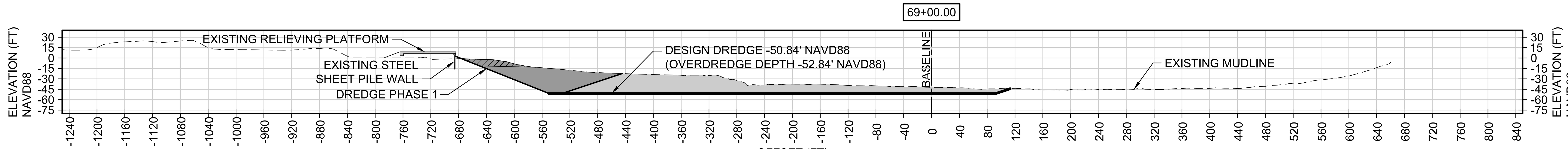

LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'
SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr.

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 10 OF 11)

Designed by: PWK	Dwn by: ED	Reviewed by:	Submitted by: ERIC D. SMITH MOFFATT & NICHOL
	Ckd by: PGV	SM	
Date: 2024-01-30	M&N Project No. 230329	Drawing code:	Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev.			

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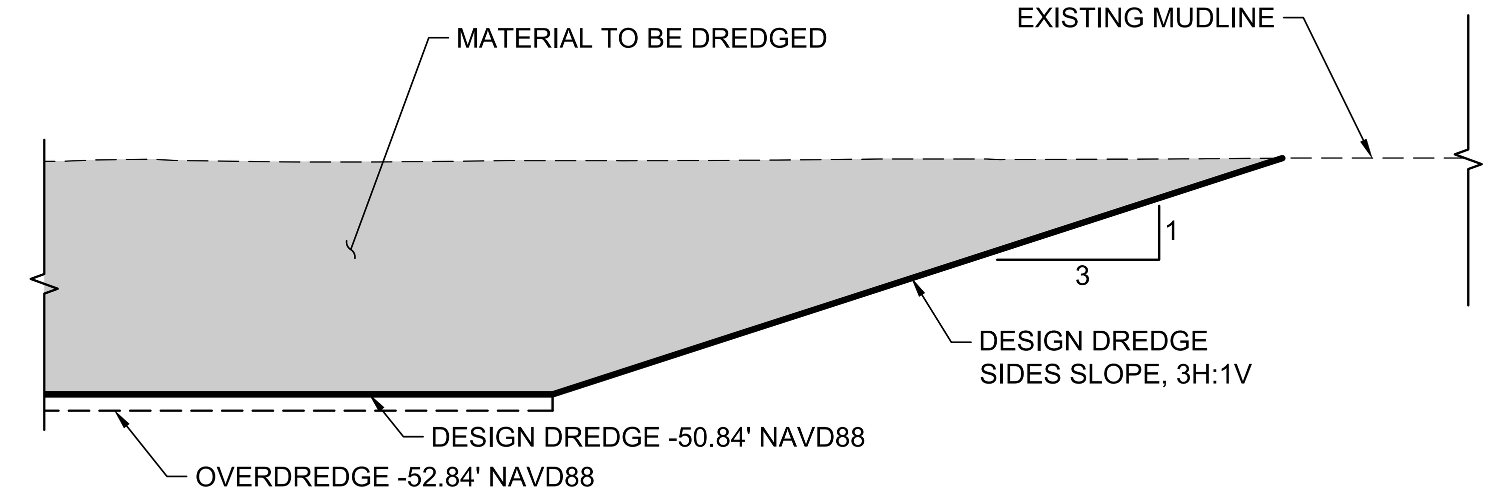
6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

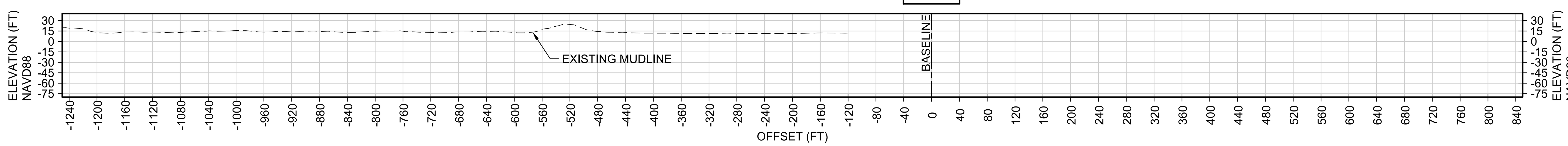
Sheet Reference No.
CN310

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

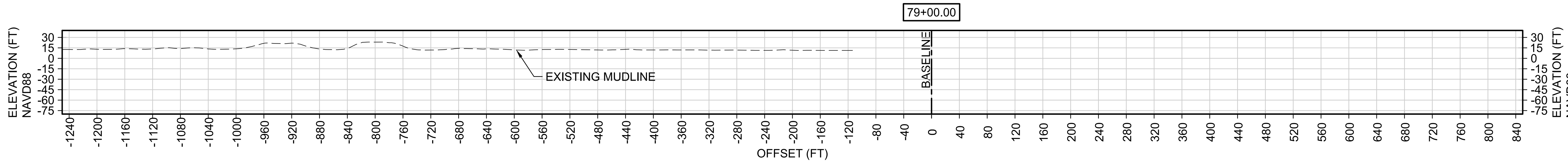


E3
CN311
DETAIL - TYPICAL SIDE SLOPES AND DREDGE
SCALE: 1" = 20'

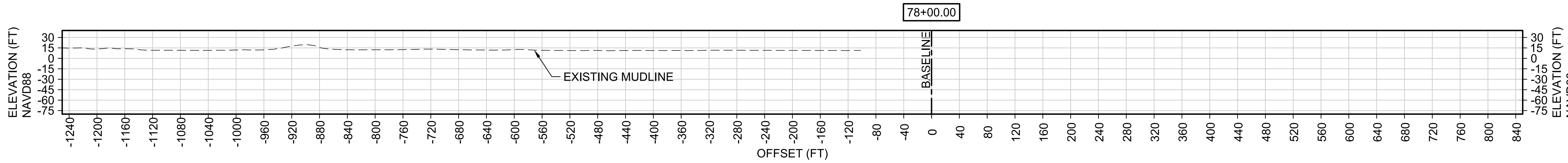
80+00.00



79+00.00



78+00.00



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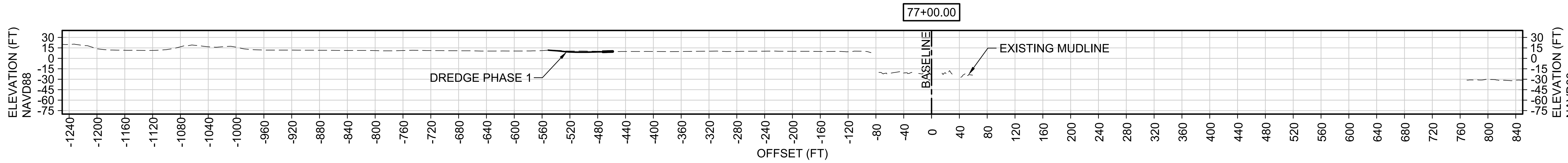

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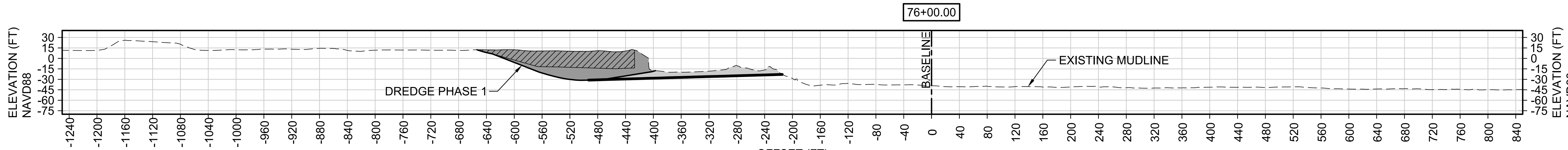


LEGEND:

- PHASE 1 DREDGING AREA
- PHASE 2 DREDGING AREA
- SLAG AREA
- DESIGN DEPTH
- EXISTING MUDLINE
- OVERDREDGE

100' 0' 100' 200'

SCALE: 1"=100'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

Mark	Description	Date	Appr

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

SECTIONS - DREDGING
(SHEET 11 OF 11)

Designed by: PWK | Dwn by: ED | Reviewed by: | Submitted by: ERIC D. SMITH MOFFATT & NICHOL
Ckd by: PGV | SM
Date: 2024-01-30 | Rev.
M&N Project No. 230329
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

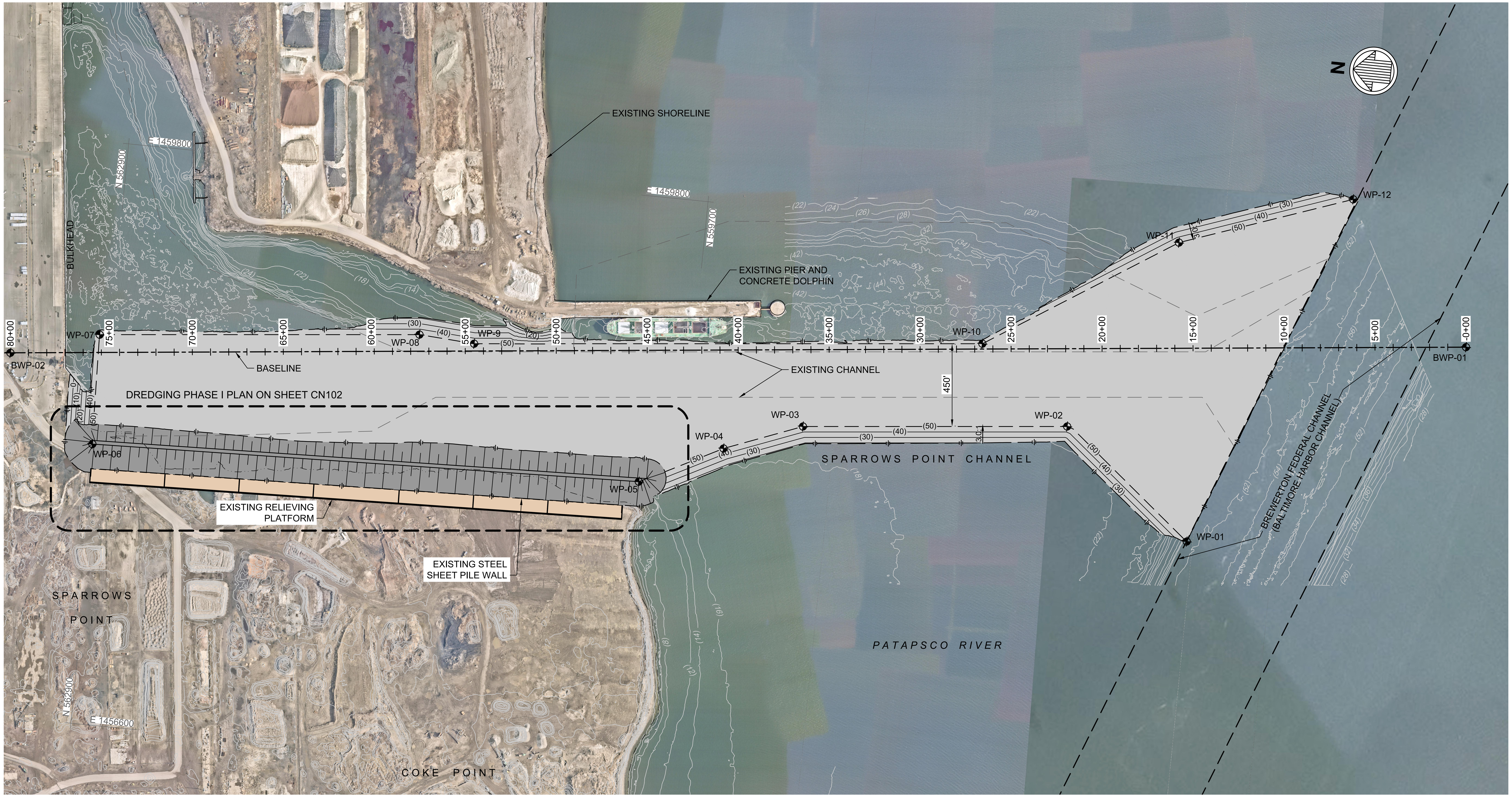
SPARROWS POINT CONTAINER TERMINAL

Sheet
Reference No.
CN311
INDEX: 36 OF 242

File: Q:\BAL\230329\20 CADD_Active_SheetSet\230329CN311; Plotted: 1/29/2024 6:04 PM by VOELKER, PAUL; Saved: 1/26/2024 12:00 PM by EDOMINGUEZ

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Coal Pier Channel DMCF Plans



B1 CN101 PLAN - DREDGING GENERAL ARRANGEMENT
SCALE: 1" = 300'

DREDGING CHANNEL WORKING POINTS TABLE		
WP-##	NORTHING	EASTING
WP-01	556896.85	1458202.47
WP-02	557613.46	1458766.30
WP-03	559058.50	1458622.10
WP-04	559480.86	1458458.36
WP-05	559926.17	1458230.66
WP-06	562934.69	1458138.36

DREDGING CHANNEL WORKING POINTS TABLE		
WP-##	NORTHING	EASTING
WP-07	562954.38	1458740.44
WP-08	561205.76	1458915.38
WP-9	560901.83	1458895.46
WP-10	558122.30	1459172.82
WP-11	557102.27	1459832.95
WP-12	556172.88	1460164.75

CHANNEL BASELINE WORKING POINT			
WP-##	NORTHING	EASTING	STATION
BWP-01	555475.65	1459417.84	0+00
BWP-02	563432.98	1458592.66	80+00

LEGEND:

- PHASE 1 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- PHASE 2 DREDGING AREA, AREA TO BE DREDGED TO -50.84 NAVD88, DEPTH WITH SIDE SLOPES AS SHOWN.
- (40) DESIGN DEPTH CONTOURS NAVD88
- (34) EXISTING DEPTH CONTOURS NAVD88
- BASELINE

300' 0' 300' 600'
SCALE: 1"=300'

30% DESIGN SUBMITTAL
ISSUED: 2024-01-30
NOT TO BE USED FOR CONSTRUCTION

SPARROWS POINT CONTAINER TERMINAL
TRADEPOINT TIL TERMINAL LLC
BALTIMORE MARYLAND 21219

PLAN - DREDGING GENERAL ARRANGEMENT

Designed by: PWK | Date: 2024-01-30 | Rev.
Drn by: ED | Chk'd by: PGV | M&N Project No. 230329
Reviewed by: SM | Drawing code:
Submitted by: ERIC D. SMITH MOFFATT & NICHOL | Drawing Scale: 1:1 (D SHEET) | Plot scale:

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D BALTIMORE, MD 21224
410-563-7300

6995 BETHLEHEM BOULVARD
SUITE 100
BALTIMORE, MD 21219

Sheet Reference No.
CN101
INDEX: 23 OF 242

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Attachment B: Input and Output Data from Underwater Noise Modeling

Note: Some materials in this appendix are not fully Section 508 compliant.

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	207	178	194
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	211		

OTHER INFO 24" pile

NOTES 0

Attenuation 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF	PHYSICAL INJURY		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	11.7	371.7	686.8	8,577.0	Fishes present
Isopleth (feet)	38.3	1,219.5	2,253.4	28,139.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	27.4	184.8	NO SEA TURTLES
Isopleth (feet)	0.7	89.8	606.2	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.6	0.3	21.5	1.8	0.2
PTS ONSET (Peak isopleth, feet)	5.2	1.0	70.7	6.1	0.7
PTS ONSET (SEL_{cum} isopleth, meters)	685.9	24.4	817.0	367.1	26.7
PTS ONSET (SEL_{cum} isopleth, feet)	2,250.3	80.0	2,680.4	1,204.2	87.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,847.8	NO LF CET.			
Behavior (RMS isopleth, feet)	6,062.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	207	178	199
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	214		

OTHER INFO	24" pile
NOTES	0
Attenuation	0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	11.7	590.0	735.6	18,478.5	Fishes present
Isopleth (feet)	38.3	1,935.8	2,413.5	60,625.0	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	43.4	398.1	NO SEA TURTLES
Isopleth (feet)	0.7	142.5	1,306.1	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.6	0.3	21.5	1.8	0.2
PTS ONSET (Peak isopleth, feet)	5.2	1.0	70.7	6.1	0.7
PTS ONSET (SEL_{cum} isopleth, meters)	1,088.8	38.7	1,296.9	582.7	42.4
PTS ONSET (SEL_{cum} isopleth, feet)	3,572.1	127.0	4,254.9	1,911.6	139.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,981.1	NO LF CET.			
Behavior (RMS isopleth, feet)	13,061.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Concurrent Marginal Wharf and Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	183	199
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	9		
Number of strikes per pile	800		
Number of strikes per day	7200		
Cumulative SEL at measured distance	222		

OTHER INFO: 36" and 24" piles

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS (Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	18.5	1,584.9	1,584.9	18,478.5
Isopleth (feet)	60.6	5,199.8	5,199.8	60,625.0

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	148.5	398.1
Isopleth (feet)	1.1	487.4	1,306.1

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	3,723.6	132.4	4,435.4	1,992.7	145.1
PTS ONSET (SEL_{cum} isopleth, feet)	12,216.4	434.5	14,551.7	6,537.7	476.0
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,981.1	NO LF CET.			
Behavior (RMS isopleth, feet)	13,061.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	177	195
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	214		

OTHER INFO	30" pile
NOTES	0
Attenuation	0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	18.5	587.2	631.0	10,000.0	Fishes present
Isopleth (feet)	60.6	1,926.6	2,070.1	32,808.4	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.3	43.2	215.4	NO SEA TURTLES
Isopleth (feet)	1.1	141.8	706.8	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	1,083.6	38.5	1,290.8	579.9	42.2
PTS ONSET (SEL_{cum} isopleth, feet)	3,555.2	126.4	4,234.8	1,902.6	138.5
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	2,154.4	NO LF CET.			
Behavior (RMS isopleth, feet)	7,068.4				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	210	183	198
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	220		

OTHER INFO: 36" pile

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	18.5	1,584.9	1,584.9	15,848.9	Fishes present
Isopleth (feet)	60.6	5,199.8	5,199.8	51,997.8	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.3	122.6	341.5	NO SEA TURTLES
Isopleth (feet)	1.1	402.3	1,120.3	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	2.5	0.5	34.1	2.9	0.3
PTS ONSET (Peak isopleth, feet)	8.2	1.5	112.0	9.6	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	3,073.7	109.3	3,661.3	1,644.9	119.8
PTS ONSET (SEL_{cum} isopleth, feet)	10,084.5	358.7	12,012.1	5,396.7	392.9
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	3,414.5	NO LF CET.			
Behavior (RMS isopleth, feet)	11,202.6				

VIBRATORY PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Mooring Dolphins Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	153
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	3
Duration to drive pile (minutes)	120
Duration of sound production in day	21600
Cumulative SEL at measured distance	196

OTHER INFO	24" pile
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	15.8
ISOPLETHS (feet)	52.0

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	0.3
ISOPLETHS (feet)	0.9	1.1

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	6.6	0.6	9.8	4.0	0.3
PTS ONSET (SELcum isopleth, feet)	21.7	1.9	32.0	13.2	0.9
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

VIBRATORY PILE DRIVING REPORT

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

VERSION 1.2-Multi-Species: 2022

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	153
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	90
Duration of sound production in day	32400
Cumulative SEL at measured distance	198

OTHER INFO	24" pile
NOTES	extra information
Attenuation	0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	15.8
ISOPLETHS (feet)	52.0

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	0.3
ISOPLETHS (feet)	1.1	1.1

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	8.7	0.8	12.8	5.3	0.4
PTS ONSET (SELcum isopleth, feet)	28.4	2.5	42.0	17.3	1.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

VIBRATORY PILE DRIVING REPORT

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

VERSION 1.2-Multi-Species: 2022

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	172
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	120
Duration of sound production in day	43200
Cumulative SEL at measured distance	218

OTHER INFO 30" pile

NOTES extra information

Attenuation 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	292.9
ISOPLETHS (feet)	960.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	7.8	6.3
ISOPLETHS (feet)	25.5	20.7

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	193.7	17.2	286.4	117.8	8.3
PTS ONSET (SELcum isopleth, feet)	635.6	56.3	939.7	386.3	27.1
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	29,286.4	NO LF CET.			
Behavior (RMS isopleth, feet)	96,084.1				

VIBRATORY PILE DRIVING REPORT

PRINT IN **LANDSCAPE** TO CAPTURE ENTIRE SCREEN

VERSION 1.2-Multi-Species: 2022

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

SPCT Marginal Wharf Piling

PROJECT INFORMATION	RMS
Sound pressure level (dB)	175
Distance associated with sound pressure level (meters)	10
Transmission loss constant	15
Number of piles per day	6
Duration to drive pile (minutes)	180
Duration of sound production in day	64800
Cumulative SEL at measured distance	223

OTHER INFO: 36" pile

NOTES: extra information

Attenuation: 0

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

Fishes present

	BEHAVIOR
	RMS Isopleth
ISOPLETHS (meters)	464.2
ISOPLETHS (feet)	1,522.8

SEA TURTLES

NO SEA TURTLES

	PTS ONSET	BEHAVIOR
	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	16.1	10.0
ISOPLETHS (feet)	53.0	32.8

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (SELcum isopleth, meters)	402.3	35.7	594.9	244.6	17.2
PTS ONSET (SELcum isopleth, feet)	1,320.0	117.0	1,951.6	802.3	56.3
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	46,415.9	NO LF CET.			
Behavior (RMS isopleth, feet)	152,283.1				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	202	173	189
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	206		

OTHER INFO 24" pile

NOTES Bubble curtain

Attenuation 5

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	5.4	172.5	318.8	3,981.1	Fishes present
Isopleth (feet)	17.8	566.0	1,045.9	13,061.3	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	12.7	85.8	NO SEA TURTLES
Isopleth (feet)	0.3	41.7	281.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.7	0.1	10.0	0.9	0.1
PTS ONSET (Peak isopleth, feet)	2.4	0.4	32.8	2.8	0.3
PTS ONSET (SEL_{cum} isopleth, meters)	318.4	11.3	379.2	170.4	12.4
PTS ONSET (SEL_{cum} isopleth, feet)	1,044.5	37.1	1,244.2	559.0	40.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	857.7	NO LF CET.			
Behavior (RMS isopleth, feet)	2,814.0				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	202	173	194
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	209		

OTHER INFO 24" pile

NOTES Bubble curtain

Attenuation 5

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	5.4	273.9	341.5	8,577.0	Fishes present
Isopleth (feet)	17.8	898.5	1,120.3	28,139.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	20.2	184.8	NO SEA TURTLES
Isopleth (feet)	0.3	66.1	606.2	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.7	0.1	10.0	0.9	0.1
PTS ONSET (Peak isopleth, feet)	2.4	0.4	32.8	2.8	0.3
PTS ONSET (SEL_{cum} isopleth, meters)	505.4	18.0	602.0	270.4	19.7
PTS ONSET (SEL_{cum} isopleth, feet)	1,658.0	59.0	1,975.0	887.3	64.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,847.8	NO LF CET.			
Behavior (RMS isopleth, feet)	6,062.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	205	172	190
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	209		

OTHER INFO: 30" pile

NOTES: Bubble curtain

Attenuation: 5

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	8.6	272.6	292.9	4,641.6	Fishes present
Isopleth (feet)	28.1	894.3	960.8	15,228.3	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	20.1	100.0	NO SEA TURTLES
Isopleth (feet)	0.5	65.8	328.1	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.2	15.8	1.4	0.2
PTS ONSET (Peak isopleth, feet)	3.8	0.7	52.0	4.5	0.5
PTS ONSET (SEL_{cum} isopleth, meters)	503.0	17.9	599.1	269.2	19.6
PTS ONSET (SEL_{cum} isopleth, feet)	1,650.2	58.7	1,965.6	883.1	64.3
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,000.0	NO LF CET.			
Behavior (RMS isopleth, feet)	3,280.8				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	205	178	193
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	215		

OTHER INFO: 36" pile

NOTES: Bubble curtain

Attenuation: 5

RESULTANT ISOPLETHS (Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	8.6	735.6	735.6	7,356.4	Fishes present
Isopleth (feet)	28.1	2,413.5	2,413.5	24,135.2	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.2	56.9	158.5	NO SEA TURTLES
Isopleth (feet)	0.5	186.7	520.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.2	15.8	1.4	0.2
PTS ONSET (Peak isopleth, feet)	3.8	0.7	52.0	4.5	0.5
PTS ONSET (SEL_{cum} isopleth, meters)	1,426.7	50.7	1,699.4	763.5	55.6
PTS ONSET (SEL_{cum} isopleth, feet)	4,680.8	166.5	5,575.5	2,504.9	182.4
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	1,584.9	NO LF CET.			
Behavior (RMS isopleth, feet)	5,199.8				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Concurrent Marginal Wharf and Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	172	188
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	9		
Number of strikes per pile	800		
Number of strikes per day	7200		
Cumulative SEL at measured distance	211		

OTHER INFO 36" and 24" piles

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	3.4	292.9	292.9	3,414.5	Fishes present
Isopleth (feet)	11.2	960.8	960.8	11,202.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	27.4	73.6	NO SEA TURTLES
Isopleth (feet)	0.2	90.1	241.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	688.1	24.5	819.6	368.2	26.8
PTS ONSET (SEL_{cum} isopleth, feet)	2,257.4	80.3	2,688.9	1,208.1	88.0
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	735.6	NO LF CET.			
Behavior (RMS isopleth, feet)	2,413.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Mooring Dolphins Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	196	167	183
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	3		
Number of strikes per pile	600		
Number of strikes per day	1800		
Cumulative SEL at measured distance	200		

OTHER INFO 24" pile

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth
ISOPLETHS (meters)	2.2	68.7	126.9	1,584.9
Isopleth (feet)	7.1	225.3	416.4	5,199.8

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.0	5.1	34.1
Isopleth (feet)	0.1	16.6	112.0

NO SEA TURTLES

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.3	0.1	4.0	0.3	0.0
PTS ONSET (Peak isopleth, feet)	1.0	0.2	13.1	1.1	0.1
PTS ONSET (SEL_{cum} isopleth, meters)	126.7	4.5	151.0	67.8	4.9
PTS ONSET (SEL_{cum} isopleth, feet)	415.8	14.8	495.3	222.5	16.2
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	341.5	NO LF CET.			
Behavior (RMS isopleth, feet)	1,120.3				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	196	167	188
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	600		
Number of strikes per day	3600		
Cumulative SEL at measured distance	203		

OTHER INFO 24" pile

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth: Fish ≥ 2 g	SEL_{cum} Isopleth: Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	2.2	109.0	135.9	3,414.5	Fishes present
Isopleth (feet)	7.1	357.7	446.0	11,202.6	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.0	8.0	73.6	NO SEA TURTLES
Isopleth (feet)	0.1	26.3	241.4	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.3	0.1	4.0	0.3	0.0
PTS ONSET (Peak isopleth, feet)	1.0	0.2	13.1	1.1	0.1
PTS ONSET (SEL_{cum} isopleth, meters)	201.2	7.2	239.6	107.7	7.8
PTS ONSET (SEL_{cum} isopleth, feet)	660.1	23.5	786.2	353.2	25.7
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	735.6	NO LF CET.			
Behavior (RMS isopleth, feet)	2,413.5				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	166	184
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	750		
Number of strikes per day	4500		
Cumulative SEL at measured distance	203		

OTHER INFO 30" pile

NOTES Cushion block (wood)

Attenuation 11

RESULTANT ISOPLETHS
(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth	
		Fish ≥ 2 g	Fish < 2 g		
ISOPLETHS (meters)	3.4	108.5	116.6	1,847.8	Fishes present
Isopleth (feet)	11.2	356.0	382.5	6,062.5	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	8.0	39.8	NO SEA TURTLES
Isopleth (feet)	0.2	26.2	130.6	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	200.2	7.1	238.5	107.2	7.8
PTS ONSET (SEL_{cum} isopleth, feet)	656.9	23.4	782.5	351.6	25.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	398.1	NO LF CET.			
Behavior (RMS isopleth, feet)	1,306.1				

IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

SPCT Marginal Wharf Piling

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	199	172	187
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	15		
Number of piles per day	6		
Number of strikes per pile	900		
Number of strikes per day	5400		
Cumulative SEL at measured distance	209		

OTHER INFO: 36" pile

NOTES: Cushion block (wood)

Attenuation: 11

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth Fish ≥ 2 g	SEL_{cum} Isopleth Fish < 2 g	RMS Isopleth	
ISOPLETHS (meters)	3.4	292.9	292.9	2,928.6	Fishes present
Isopleth (feet)	11.2	960.8	960.8	9,608.4	

SEA TURTLES

	PTS ONSET		BEHAVIOR	
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth	
ISOPLETHS (meters)	0.1	22.7	63.1	NO SEA TURTLES
Isopleth (feet)	0.2	74.3	207.0	

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.5	0.1	6.3	0.5	0.1
PTS ONSET (Peak isopleth, feet)	1.5	0.3	20.7	1.8	0.2
PTS ONSET (SEL_{cum} isopleth, meters)	568.0	20.2	676.6	304.0	22.1
PTS ONSET (SEL_{cum} isopleth, feet)	1,863.5	66.3	2,219.7	997.2	72.6
	ALL MM	NO MF CET.	NO HF CET.	NO PHOCIDS	NO OTARIIDS
Behavior (RMS isopleth, meters)	631.0	NO LF CET.			
Behavior (RMS isopleth, feet)	2,070.1				

Appendix G: Draft Environmental Impact Statement Distribution List

APPENDIX G: DRAFT ENVIRONMENTAL IMPACT STATEMENT DISTRIBUTION LIST

The Notice of Availability for this Draft Environmental Impact Statement will be distributed to the following Federal and State legislative representatives, agencies, Tribes, and organizations.

Federal Agencies

National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS)
NMFS-Habitat and Ecosystems Services Division (HESD)
NMFS-Office of Protected Resources (PRD)
US Environmental Protection Agency (USEPA)
US Fish and Wildlife Service (USFWS)
US Coast Guard (USCG)
US Army Corps of Engineers Civil Works Division

Federally Recognized Tribes

Delaware Nation
Delaware Tribe of Indians
Eastern Shawnee Tribe of Oklahoma
Pamunkey Tribe

State Agencies / Governments

Baltimore County
Critical Area Commission for the Chesapeake and Atlantic Coast Bays (CAC)
Maryland Board of Public Works (BPW)
Maryland Department of Natural Resources (MDNR)
Maryland Department of the Environment (MDE)
Maryland Historical Trust (MHT)
Maryland Port Administration (MPA)

ELECTED OFFICIALS

US Senate

Angela Alsobrooks
Ben Cardin

US House of Representatives

Kweisi Mfume
John Sarbanes

Maryland House of Delegates

Brian Chisholm
Luke Clippinger
Mark Edelson
Robin Grammer
Nicholaus Kipke
Robbyn Lewis
Robert Long
Ric Metzgar
Rachel Munoz
Gary Simmons

Maryland Senate

Bill Ferguson
Clarence Lam
Johnny Salling
Bryan Simonaire

Baltimore City Mayor

Brandon Scott

Baltimore County Executive

Johnny Olszewski, Jr.

Baltimore County Council

Todd Crandell

Baltimore City Council

Zeke Cohen
Phylicia Porter

Anne Arundel County Executive

Steuart Pittman

Anne Arundel County Council

Peter Smith
Nathan Volke

Community Organizations

Chesapeake Gateway Chamber of Commerce
Dundalk Chamber of Commerce
Essex Middle River Civic Association
Fort Howard Community Association
Greater North Point Association, Inc.

Millers Island Edgemere Business Association
North Point Peninsula Council, Inc.
Northpoint Village Civic Association
Old Bay Marina
P-12 Alliance
Rockaway Beach / Turkey Point Improvement Association
Turner Station Conservation Teams
Watersedge Community Association
Weaver's Marine
Wells-McComas Civic Association

Tradepoint Atlantic Tenants

Adrian Steel of Maryland
Aluma Systems
APS Stevedoring
A.R. Wakefield Logistics
Arnold Packaging
Atlantic Forest Products - Office
Beazer Homes
BMW
Brand Safway
C. Steinweg Group
Carter Machinery
CCBC
Chaney Enterprises
Chesapeake Specialty Products
Continuum Transportation Services
DCA1 - Amazon
DCA6 - Amazon
Denny's
Dunavant
East Coast Warehouse
Eastern Metal Recycling
Erickson Senior Living
FedEx Ground
Floor and Décor
Gotham Greens
Hale Transport
Harley Davidson
Home Depot FDC
Home Depot MDC

Imerys
INEOS
Integrated Salt Products
Intralox
K & K Painting
Lafarge
Life Science Logistics
Marine: Port Logistics Center II
Marmiro Stones
McCormick
MTN6 - Amazon
Niagara Bottling
North Point Yacht Club
Orstead
Perdue
Pleasant Yacht Club
Pompeian
Popeyes
Royal Farms
S.H. Bell Company
Schneider
Skanska USA Civil Southeast
Smiths Detection
Starbucks
STG Logistics
Tarpon Towers
UMMS
Under Armour
Underwood Energy
US Wind
Volkswagen
White Marsh Transport
Windspeed Logistics
Workwear Outfitters

Tradepoint Atlantic Neighboring Property Owners

17 Christina Ct LLC
4601 NPB Holdings LLC
8911 Bethlehem Blvd I LLC and 8911 Bethlehem Blvd II LLC
Aging Barns LLC
AMG Resources Corp

Amtrol Water Technology LLC
Baltimore County Maryland
Baltimore County Maryland
BANP LLC
Beazer Homes LLC
CDL Land Holdings LLC
CRD Golf LLC
CSP Property Holdings Inc
Erasmus Properties (Reservoir Rd) Business Trust
Erasmus Properties Business Trust
F2 LLC
Loders Croklaan USA LLC
Merritt / Bavar - Grays Rd LLC
Millers Island Propeller Inc
Mukta 2500 Properties Inc
North Point Property Owner LLC
International Union of Operating Engineers Local 37 Training School
Reservoir Warehouse LLC
Rukert Lazaretto Corporation
Sweetheart Properties LLC
Wheeler Properties LLC

Appendix H: Coastal Zone Management Act Evaluation

SPARROWS POINT CONTAINER TERMINAL
PORT OF BALTIMORE

December 19, 2024

Danielle Spendiff
Federal Consistency Coordinator
Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard
Baltimore, MD 21230-1708

RE: Coastal Zone Management Act Consistency Determination, Sparrows Point Container Terminal Project

Tradepoint TiL Terminal, LLC is submitting a Coastal Zone Management Act Consistency Determination for the Sparrows Point Container Terminal (SPCT) Project. SPCT has previously submitted a Joint Permit Application for this project, Maryland Department of the Environment (MDE) tracking number 23-WL-0862 and US Army Corps of Engineers (Corps) tracking number NAB-2023-61200.

Attached herein is the required information noted in the MDE Maryland Coastal Zone Management Program Enforceable Policies. The Draft Environmental Impact Statement for the SPCT project includes supporting information and is incorporated by reference.

If you have any questions or require additional information, please contact the undersigned at 410-382-6667 or Ms. Peggy Derrick with EA Engineering at 410-329-5126. Thank you for your attention to this matter.

Sincerely,
Tradepoint TiL Terminal, LLC

Tom Caso
Project Manager

Cc: Maria Teresi, Corps (via email maria.teresi@usace.army.mil)
Joe Davia, Corps (via email joe.davia@usace.army.mil)
Nicole Nasteff, Corps (via email Nicole.nasteff@usace.army.mil)

COASTAL ZONE MANAGEMENT ACT EVALUATION

Introduction

This report provides an evaluation of the Coastal Zone Management Act (CZMA) for the Sparrows Point Container Terminal (SPCT) project to construct a new container terminal (the terminal) in the Port of Baltimore (the Port). The proposed terminal would consist of a +/- 3,000-foot marginal wharf with ship-to-shore cranes, a container yard, gate complex, intermodal/rail yard, and various support structures. To provide vessel access to the wharf, the project would include deepening and widening of the existing Sparrows Point Channel and turning basin, which would require dredging and placement of approximately 4.2 million cubic yards of dredged material. The proposed project would include the construction of an offshore dredged material containment facility (DMCF) in Coal Pier Channel adjacent to Coke Point and an upland DMCF on TPA property at High Head Industrial Basin, as well as use of existing permitted DMCFs managed by Maryland Port Administration (MPA) (Cox Creek and Masonville DMCFs), and an ocean placement site (Norfolk Ocean Disposal Site [NODS]).

This analysis and the corresponding Draft Environmental Impact Statement serve as documentation that the proposed action is in full compliance with the CZMA.

Location

The proposed SPCT would be located in Baltimore County, Maryland on a 330-acre area on the southwest peninsula of Sparrows Point known as Coke Point Peninsula (Coke Point) along the Patapsco River and a 71-acre area in the northern area of Sparrows Point. The SPCT project area includes Coke Point, the Sparrows Point Channel out to the juncture with the Brewerton Channel, the High Head Industrial Basin, and the area offshore the west side of Coke Point. The project also includes the placement of dredged material at permitted facilities (MPA DMCFs and NODS) outside of the SPCT project area.

Federal Coastal Zone Management Act, 16 U.S.C. 1451 et seq.

The Federal Coastal Zone Management Act of 1972, as amended in 1990, aims to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone" (CZMA 1972). Section 307 of CZMA, or the "federal consistency" provision, gives states a voice in federal agency coastal actions through the National Coastal Zone Management Program. The National Oceanic and Atmospheric Administration (NOAA) is responsible for approving the coastal management programs.

The CZMA requires that all federal agency actions, licenses, or permits or federal financial activities with reasonably foreseeable effects on the land, water, or natural resources of the coastal zone be conducted in a manner consistent with the enforceable policies of a state's coastal management program approved by NOAA. In Maryland, the Coastal Consistency review is intended to ensure that federal actions are consistent with Maryland's Coastal Zone Management Program (CZMP) enforceable policies.

To implement the CZMA and establish procedures for compliance with its federal consistency provisions, NOAA promulgated regulations in 15 CFR Part 930. As per 15 CFR 930.37, a federal agency may use its NEPA documents as a vehicle for its consistency determination.

Maryland Coastal Zone Management Program

The coastal zone of Maryland includes the water and submerged lands in the Chesapeake Bay, Atlantic Coastal Bays, and Atlantic Ocean three miles out into the ocean. It also includes the lands to the inland boundaries of Maryland's 16 coastal counties and Baltimore City that border the Atlantic Ocean, Chesapeake Bay and the Potomac River up to the District of Columbia. Maryland's CZMP was approved by NOAA in 1978. On October 4, 2024, Maryland submitted a Program Change Request to NOAA to align the program with changes to underlying state laws, policy language, and citations. In Maryland, the Maryland Department of Natural Resources oversees the CZMP.

Findings of the Coastal Zone Consistency Evaluation

This assessment was completed to determine if the proposed SPCT development would be carried out in a manner fully consistent with the enforceable policies of Maryland's CZMP. Table H-1 provides an overview of how the proposed action complies with all CZMA Enforceable Policies. The completed CZMA Enforceable Policy forms relevant to the project are also included in this appendix.

Table H-1. CZMA Enforceable Policies and Status of Compliance

Title of Enforceable Policy	Status of Compliance
Core Policies	Full. See appended form.
The Chesapeake and Atlantic Coastal Bays Critical Area	Full. See appended form.
Tidal Wetlands	Full. See appended form.
Non-Tidal Wetlands	Not Applicable.
Forests	Not Applicable.
Historical and Archaeological Sites	Not Applicable.
Living Aquatic Resources	Full. See appended form.
Mineral Extraction	Not Applicable.
Electrical Generation and Transmission	Not Applicable.
Tidal Shore Erosion Control	Full. See appended form.
Oil and Natural Gas Facilities	Not Applicable.
Dredging and Disposal of Dredged Material	Full. See appended form.
Navigation	Full. See appended form.
Transportation	Not Applicable.
Agriculture	Not Applicable.
Development	Full. See appended form.
Sewage Treatment	Not Applicable.

Core Policies – Supplemental Information

Page 15, Flood Hazards & Community Resilience Policy 2f – Prohibition of Construction or Substantial Improvements in 100-Year Floodplain.

Supplemental information is from the *Basis of Design and Design Criteria for the Sparrows Point Container Terminal* (Moffatt & Nichol 2024)

Sea Level Rise

An evaluation was made for sea level rise and storm flooding effects in the project vicinity. Sea level rise effects are based on current Maryland state guidance, Sea-level Rise Projections for Maryland 2018 (Boesch et al. 2018), with reference to the 2022 guidance (2022) for using the 2018 projections (Moffatt & Nichol 2024). Storm flooding effects are incorporated based on the US Army Corps of Engineers (Corps) North Atlantic Coast Comprehensive Study (Corps 2015).

Two different approaches are followed to estimate a minimum grade level for the Sparrows Point project.

- Semi-deterministic Analysis: This represents a “typical” approach to Sea Level Rise, superimposing a design Sea Level Rise offset with benchmark flood levels (e.g., 100-year flood).
- Probabilistic Analysis: The approach for probabilistic analysis is based on Oskamp et al. (2022).

Design water level for year 2100 is recommended to be +12 feet NAVD88 (Moffatt & Nichol 2024).

The design top-of deck elevation for the container wharf shall be +14.0 feet NAVD88 to mitigate the risk of surge inundation over the design life of the project, which provides 2 feet freeboard over the future design still water elevation.

References

Boesch, D.F., W.C. Boicourt, R.I. Cullather, T. Ezer, G.E. Galloway Jr., K.H. Johnson, K.H. Kilbourne, et al. 2018. *Sea-level Rise: Projections for Maryland*. Cambridge, MD: University of Maryland Center for Environmental Science.

Moffatt & Nichol. 2024. *Basis of Design and Design Criteria for the Sparrows Point Container Terminal*. January 2024.

Oskamp, J.A., J.D. Martin, E.D. Smith, and A.M. Forbes. 2022. *A Probabilistic Framework for Climate Change in Design.* PORTS Conference Proceedings. Honolulu, Hawaii: American Society of Civil Engineering.

US Army Corps of Engineers (Corps). 2015. *North Atlantic Coast Comprehensive Study: Resilient Adaption to Increasing Risk.* United States Army Corps of Engineers.

Coastal Zone Management Program - Core Policies Checklist

Name of Project:

Sparrows Point Container Terminal

5.1. CORE POLICIES

5.1.1. Quality of Life

Quality of Life Policy 1- Air Quality. It is State policy to maintain that degree of purity of air resources which will protect the health, general welfare, and property of the people of the State. MDE (C9) Md. Code Ann., Envir. §§ 2-102 to -103.

Select appropriate response:

- (●) Project will be consistent with Air Quality policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

During construction, NOx emissions will exceed the 50 tpy NOx threshold (the General Conformity de minimis threshold) requiring mitigation. TPA is working with lead agencies to evaluate mitigation including potentially purchasing off-site NOx credits from the MDE permanent credit bank. Emissions of other criteria pollutants, including VOC, PM10, PM2.5, and SO2, would be minor impacts.

Quality of Life Policy 2 – Noise. The environment shall be free from noise which may jeopardize health, general welfare, or property, or which degrades the quality of life. MDE (C9) COMAR 26.02.03.02.

Select appropriate response:

- (●) Project will be consistent with Noise policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Peak sustained and periodic noise levels for dredging, construction, and operations would reach over 90 dBA (up to 101 dBA in some cases) at a 50-ft range, but would attenuate to acceptable residential levels (65 dBA) within 3,200 feet or less. (closest residences more than 8,000 ft from the project area).

Quality of Life Policy 3– Protection of State Wild Lands. The unique ecological, geological, scenic, and contemplative aspects of State wild lands shall not be affected in a manner that would jeopardize the future use and enjoyment of those lands as wild. DNR (C7) Md. Code Ann., Nat. Res. §§ 5-1201, -1203.

Select appropriate response:

- ○ Project will be consistent with State Wild Lands Protection policy.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No State Wild Lands will be impacted by the proposed project. The SPCT project is in the vicinity of North Point State Park but no impacts to the park are anticipated.

Quality of Life Policy 4 – Protection of State Lands & Cultural Resources. The safety, order, and natural beauty of State parks and forests, State reserves, scenic preserves, parkways, historical monuments and recreational areas shall be preserved. DNR (B1) Md. Code. Ann., Nat. Res. § 5-209.

Select appropriate response:

- ● Project will be consistent with Protection of State Lands & Cultural Resources policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Coordination with the Maryland Historical Trust is complete for the main project but is ongoing for mitigation activities. Based on this consultation, the DMCF was designed to avoid locations with potential cultural resources. Consultation is ongoing regarding potential mitigation sites.

Quality of Life Policy 5 – Natural Character & Scenic Value of Rivers & Waterways. The natural character and scenic value of a river or waterway must be given full consideration before the development of any water or related land resources including construction of improvements, diversions, roadways, crossings, or channelization. MDE/DNR (C7) Md. Code Ann., Nat. Res. § 8-405; COMAR 26.17.04.11.

Select appropriate response:

- ● Project will be consistent with policy protecting Natural Character & Scenic Value of Rivers & Waterways.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A viewshed analysis was completed for the project. The project will result in some changes to the viewshed from the Patapsco River, especially for boaters on the river. Viewshed analyses were completed for communities with sightlines to the project, minimal changes to the viewshed would be detectable from nearby and adjacent communities.

Coastal Zone Management Program - Core Policies Checklist

Quality of Life Policy 6 –Natural Flow of Scenic & Wild Rivers. A dam or other structure that impedes the natural flow of a scenic or wild river may not be constructed, operated, or maintained, and channelization may not be undertaken, until the applicant considers alternatives less harmful to the scenic and wild resource. Construction of an impoundment upon a scenic or wild river is contrary to the public interest, if that project floods an area of unusual beauty, blocks the access to the public of a view previously enjoyed, or alters the stream's wild qualities. MDE/DNR (C7) Md. Code Ann., Nat. Res. § 8-406; COMAR 26.17.04.11.

Select appropriate response:

- ○ Project will be consistent with policy protecting Natural Flow of Scenic & Wild Rivers.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project will not impact Maryland Scenic or Wild Rivers.

Quality of Life Policy 7 – Atlantic Coast Development. Any land clearing, construction activity, or the construction or placement of permanent structures is prohibited within the Beach Erosion Control District except the construction and installation of a qualified submerged renewable energy line, if the project does not result in any significant permanent environmental damage to the Beach Erosion Control District and is not constructed or installed within the Assateague State Park, and any project or activity specifically for storm control, beach erosion and sediment control, or maintenance projects designed to benefit the Beach Erosion Control District. MDE/DNR (B1) Md. Code Ann., Nat. Res. § 8-1102.

Select appropriate response:

- ○ Project will be consistent with policy ensuring Environmentally Beneficial Atlantic Shoreline Development.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The proposed project is not located in a Beach Erosion Control District.

Quality of Life Policy 8 – Integrity & Natural Character of Assateague Island. Activities which will adversely affect the integrity and natural character of Assateague Island will be inconsistent with the State's Coastal Management Program, and will be prohibited. MDE/DNR (B1) Md. Code. Ann., Nat. Res. §§ 5-209, 8-1102.

Select appropriate response:

- ○ Project will be consistent with policy protecting the Integrity & Natural Character of Assateague Island.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The proposed project is not on Assateague Island.

Quality of Life Policy 9 – Public Outreach. An opportunity for a public hearing shall be provided for projects in non-tidal waters that dredge, fill, bulkhead, or change the shoreline; construct or reconstruct a dam; or create a waterway, except in emergency situations. MDE (A3) COMAR 26.17.04.13A.

Select appropriate response:

- ● Project will be consistent with Public Outreach policy for relevant projects.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The Corps initiated public scoping in 2023, held two public scoping meetings in January 2024, and solicited public comment. The Draft EIS will also be made available for public review and comment and the review period will include a public hearing. Comments on the Draft EIS will be considered when preparing the Final EIS and the Record of Decision. Additionally the applicant has a robust community outreach program.

Quality of Life Policy 10 – Erosion & Sediment Control. Soil erosion shall be prevented to preserve natural resources and wildlife; control floods; prevent impairment of dams and reservoirs; maintain the navigability of rivers and harbors; protect the tax base, the public lands, and the health, safety and general welfare of the people of the State, and to enhance their living environment. MDA (C4) Md. Code Ann., Agric. § 8-102(d).

Select appropriate response:

- ● Project will be consistent with Erosion & Sediment Control policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project will include erosion and sediment controls as part of construction BMPs and under the Maryland NPDES Program and project permit.

Quality of Life Policy 11 – Safeguards for Outer Continental Shelf Development. Operations on the Outer Continental Shelf must be conducted in a safe manner by well-trained personnel using technology, precautions, and techniques sufficient to prevent or minimize the likelihood of blowouts, loss of well control, fires, spillages, physical obstruction to other users of the waters or subsoil and seabed, or other occurrences which may cause damage to the environment or property, or which may endanger life or health. (B2) Md. Code Ann., Envir. §§ 17-101 to -403; COMAR 26.24.01.01; COMAR 26.24.02.01, .03; COMAR 26.24.05.01.

Select appropriate response:

- ○ Project will be consistent with policy ensuring Safeguards for Outer Continental Shelf Development.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The proposed SPCT project does not occur in the Outer Continental Shelf.

5.1.2. Waste & Debris Management

Waste & Debris Management Policy 1 – Hazardous Waste Management. Controlled hazardous substances may not be stored, treated, dumped, discharged, abandoned, or otherwise disposed anywhere other than a permitted controlled hazardous substance facility or a facility that provides an equivalent level of environmental protection. MDE (D4) Md. Code Ann., Envir. § 7-265(a).

Select appropriate response:

- (●) Project will be consistent with Hazardous Waste Management policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

In the event of an accidental hazardous waste release actions will be taken to address immediate threats to human health or the environment caused by the release and would be in line with COMAR and Resource Conservation and Recovery Act (RCRA).

Waste & Debris Management Policy 2 – Hazardous Waste Management in Port of Baltimore. A person may not introduce in the Port of Baltimore any hazardous materials, unless the cargo is properly classed, described, packaged, marked, labeled, placarded, and approved for highway, rail, or water transportation. MDOT (D3) COMAR 11.05.02.04A.

Select appropriate response:

- (●) Project will be consistent with Hazardous Waste Management in Port of Baltimore policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT is within the Port of Baltimore; once operational, hazardous materials transported to the site will be properly described, packaged, marked, labeled, placarded, and approved for highway, rail, or water transportation in accordance with all applicable laws and regulations.

5.1.3. Water Resources Protection & Management

Water Resources Protection & Management Policy 1 – Pollution Discharge Permit. No one may add, introduce, leak, spill, or emit any liquid, gaseous, solid, or other substance that will pollute any waters of the State without State authorization. MDE (A5) Md. Code Ann., Envir. §§ 4-402, 9-101, 9-322.

Select appropriate response:

- (●) Project will be consistent with water policy requiring a Pollution Discharge Permit.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project will require numerous permits. Applications will be submitted for NPDES, Section 401 water quality certification, water appropriation or use, dam safety, and other applicable permits. The applicant will comply with the permit requirements to protect waters of the state.

Water Resources Protection & Management Policy 2 – Protection of Designated Uses. All waters of the State shall be protected for water contact recreation, fish, and other aquatic life and wildlife. Shellfish harvesting and recreational trout waters and waters worthy of protection because of their unspoiled character shall receive additional protection. MDE (A1) COMAR 26.08.02.02.

Select appropriate response:

- (●) Project will be consistent with Protection of Designated Uses policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project area is an industrially-developed area with substantial navigation and shipping activities, and recreational boating. The project will require a Clean Water Act 404(b)(1) evaluation, Section 401 Water Quality Certification, and other applicable permits. The applicant will comply with the permit requirements to protect waters of the state

Water Resources Protection & Management Policy 3 – Prohibition of Harmful Toxic Impacts. The discharge of any pollutant which will accumulate to toxic amounts during the expected life of aquatic organisms or produce deleterious behavioral effects on aquatic organisms is prohibited. MDE (A4) COMAR 26.08.03.01.

Select appropriate response:

- (●) Project will be consistent with water policy Prohibiting Harmful Toxic Impacts.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Activities under the project will be completed in compliance with the NPDES permit and BMPs will be put in place during dredging and in-water work to minimize the release of sediment and contaminants. Dredging will remove sediment with legacy contaminants, and development of the DMCFs will encapsulate existing sediments with elevated concentrations of contaminants. Sediment sample analysis report are available upon request.

Water Resources Protection & Management Policy 4 – Pre-Development Discharge Permit Requirement. Before constructing, installing, modifying, extending, or altering an outlet or establishment that could cause or increase the discharge of pollutants into the waters of the State, the proponent must hold a discharge permit issued by the Department of the Environment or provide an equivalent level of water quality protection. MDE (D6) Md. Code Ann., Envir. § 9-323(a).

Select appropriate response:

- (●) Project will be consistent with water policy requiring a Pre-Development Discharge Permit.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

All discharges will be in compliance with the site's existing NPDES permit and any subsequent modifications to the existing permits, and in accordance with the 401 Water Quality Certificate.

Water Resources Protection & Management Policy 5 – Use of Best Available Technology or Treat to Meet Standards. The use of best available technology is required for all permitted discharges into State waters, but if this is insufficient to comply with the established water quality standards, additional treatment shall be required and based on waste load allocation. MDE (D4) COMAR 26.08.03.01C.

Select appropriate response:

- (●) Project will be consistent with Use of Best Available Technology or Treat to Meet Standards water policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Proposed discharges associated with the construction and operation of the elements of this project have been thoroughly described and impacts analyzed in section 4.6.2 of the DEIS. Appropriate permits will be obtained for construction and operation and the applicant will comply with permit conditions.

Water Resources Protection & Management Policy 6 – Control of Thermal Discharges. Thermal discharges shall be controlled so that the temperature outside the mixing zone (50 feet radially from the point of discharge) meets the applicable water quality criteria or discharges comply with the thermal mixing zone criteria. MDE (D4) COMAR 26.08.03.03C.

Select appropriate response:

- ○ Project will be consistent with Control of Thermal Discharges water policy.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project will not require any control of thermal discharges.

Water Resources Protection & Management Policy 7 – Pesticide Storage. Pesticides shall be stored in an area located at least 50 feet from any water well or stored in secondary containment approved by the Department of the Environment. MDA (C4) COMAR 15.05.01.06.

Select appropriate response:

- ○ Project will be consistent with Pesticides Storage water policy.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No pesticide application or storage is anticipated as part of this project.

Water Resources Protection & Management Policy 8 – Stormwater Management. Any development or redevelopment of land for residential, commercial, industrial, or institutional purposes shall use small-scale non-structural stormwater management practices and site planning that mimics natural hydrologic conditions, to the maximum extent practicable. Development or redevelopment will be consistent with this policy when channel stability and 100 percent of the average annual predevelopment groundwater recharge are maintained, nonpoint source pollution is minimized, and structural stormwater management practices are used only if determined to be absolutely necessary. MDE (C9) Md. Code Ann., Envir. § 4-203; COMAR 26.17.02.01, .06.

Select appropriate response:

- [x] Project will be consistent with Stormwater Management policy.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Proposed discharges associated with the construction and operation of the elements of this project have been thoroughly described and impacts analyzed in section 4.6.2 of the DEIS. Appropriate permits will be obtained for construction and operation and the applicant will comply with permit conditions (see Appendix A for permits required).

Water Resources Protection & Management Policy 9 – Unpermitted Dumping of Used Oil. Unless otherwise permitted, used oil may not be dumped into sewers, drainage systems, or any waters of the State or onto any public or private land. MDE (D4) Md. Code Ann., Envir. § 5-1001(f).

Select appropriate response:

- [x] Project will be consistent with Unpermitted Dumping of Used Oil water policy.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No unpermitted dumping of oil will occur. Project BMPs include a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Water Resources Protection & Management Policy 10 – Toxicity Monitoring. If material being dumped into Maryland waters or waters off Maryland's coastline has demonstrated actual toxicity or potential for being toxic, the discharger must perform biological or chemical monitoring to test for toxicity in the water. MDE (A5) COMAR 26.08.03.07(D); COMAR 26.08.04.01.

Select appropriate response:

- [x] Project will be consistent with Toxicity Monitoring water policy.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No materials will be deposited into open water. The Coal Pier Channel DMCF will be contained, sediments proposed for placement in the Coal Pier Channel DMCF have been tested to document suitability for placement in the DMCF. The DMCF will encapsulate sediments with legacy contaminants and eliminate toxicity exposure pathways. Construction will include BMPs for in-water work and will be implemented in accordance with applicable permit conditions.

Water Resources Protection & Management Policy 11 – Public Outreach. Public meetings and citizen education shall be encouraged as a necessary function of water quality regulation. MDE (A2) COMAR 26.08.01.02E(3).

Select appropriate response:

- (●) Project will be consistent with Public Outreach water policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

As the lead federal agency, the Corps hosted two public scoping meetings in 2024. Two public hearings will be held as part of the public review of the EIS. Additionally, the applicant has a robust community outreach program.

Water Resources Protection & Management Policy 12 - No Adverse Impact from Water Appropriation. Any water appropriation must be reasonable in relation to the anticipated level of use and may not have an unreasonable adverse impact on water resources or other users of the waters of the State. MDE (C9) COMAR 26.17.06.02.

Select appropriate response:

- (●) Project will be consistent with policy ensuring No Adverse Impact from Water Appropriations.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A Water Appropriation and Use Permit will be needed for the slurry of dredged material for offloading/pumping to upland DMCFs. Slurry water will be recycled to the maximum extent practicable. The use of surface waters and the volume of water withdrawn from Bear Creek and the Patapsco River would comply with conditions of a Water Appropriation and Use Permit issued by MDE.

5.1.4. Flood Hazards & Community Resilience

Flood Hazards & Community Resilience Policy 1 – No Adverse Impact. Projects in coastal tidal and non-tidal flood plains which would create additional flooding upstream or downstream, or which would have an adverse impact upon water quality or other environmental factors, are contrary to State policy. MDE (C2) Md. Code Ann., Envir. § 5-803; COMAR 26.17.05.04A.

Select appropriate response:

- (●) Project will be consistent with No Adverse Impact flood hazard policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A flood hazard analysis was conducted as part of the DEIS. The Coal Pier Channel DMCF may create slightly increased flood heights immediately adjacent to the dike, but these will be minimal, limited to the DMCF and will not impact the flood vulnerability of the surrounding community.

Flood Hazards & Community Resilience Policy 2 – Non-Tidal Waters and Non-Tidal Floodplains. The following policies apply to projects in non-tidal waters and non-tidal floodplains, but not non-tidal wetlands. MDE (C2) COMAR 26.17.04.01, .07,.11.

Flood Hazards & Community Resilience Policy 2a – 1-Foot Freeboard Above 100-year Flood. Proposed floodplain encroachments, except for roadways, culverts, and bridges, shall be designed to provide a minimum of 1 foot of freeboard above the elevation of the 100-year frequency flood event. In addition, the elevation of the lowest floor of all new or substantially improved residential, commercial, or industrial structures shall also be at least 1 foot above the elevation of the 100-year frequency flood event.

Select appropriate response:

- (●) Project will be consistent with policy requiring a 1-Foot Freeboard Above 100-Year Flood for Construction in flood hazard areas.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project was designed to account for sea level rise and floodplain concerns. The required 1-foot freeboard above the 100-year floodplain will be met.

Flood Hazards & Community Resilience Policy 2b – Stability of Unlined Earth Channels. Proposed unlined earth channels may not change the tractive force associated with the 2-year and the 10-year frequency flood events, by more than 10 percent, throughout their length unless it can be demonstrated that the stream channel will remain stable.

Select appropriate response:

- ○ Project will be consistent with policy ensuring Stability of Unlined Earth Channels.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project does not include the development of any unlined earth channels.

Flood Hazards & Community Resilience Policy 2c – Stability of Lined Channels. Proposed lined channels may not change the tractive force associated with the 2-year and the 10-year frequency flood events, by more than 10 percent, at their downstream terminus unless it can be demonstrated that the stream channel will remain stable.

Select appropriate response:

- ○ Project will be consistent with policy ensuring Stability of Lined Channels.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project does not include the development of any lined stream channels.

Flood Hazards & Community Resilience Policy 2d – Prohibition of Dam Construction in High Risk Areas. Category II, III, or IV dams may not be built or allowed to impound water in any location where a failure is likely to result in the loss of human life or severe damage to streets, major roads, public utilities, or other high value property.

Select appropriate response:

- ○ Project will be consistent with policy Prohibiting Dam Construction in High Risk Areas.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The development of the DMCFs under the SPCT project will not result in the development of dams used for water impoundments. The dikes for the Coal Pier DMCF and the High Head DMCF are considered dams and would be subject to permitting and inspection by MDE's Dam Safety Program. The volume of dredged material placed will be appropriate to the DMCF capacity at the time of placement, will not exceed the allowable elevation of the DMCF, and will maintain 2 ft of freeboard. The DMCFs are not in a location that poses a risk to surrounding communities or utilities.

Flood Hazards & Community Resilience Policy 2e – Prohibition of Projects That Increase Risk Unless Mitigation Requirements Are Met. Projects that increase the risk of flooding to other property owners are generally prohibited, unless the area subject to additional risk of flooding is purchased, placed in designated flood easement, or protected by other means acceptable to the Maryland Department of the Environment.

Select appropriate response:

- (●) Project will be consistent with policy Prohibiting Projects That Increase Flood Risk Unless Mitigation Requirements Are Met.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The proposed Coal Pier Channel DMCF will not impact the flood vulnerability of the surrounding community or other properties.

Flood Hazards & Community Resilience Policy 2f – Prohibition of Construction or Substantial Improvements in 100-Year Floodplain. The construction or substantial improvement of any residential, commercial, or industrial structures in the 100-year frequency floodplain and below the water surface elevation of the 100-year frequency flood may not be permitted. Minor maintenance and repair may be permitted. The modifications of existing structures for flood-proofing purposes may be permitted. Flood-proofing modifications shall be designed and constructed in accordance with specifications approved by the Maryland Department of the Environment.

Select appropriate response:

- (●) Project will be consistent with policy Prohibiting Construction or Substantial Improvements in 100-Year Floodplain.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

For this project, only the Coal Pier DMCF and wharf would be located within the 100-year floodplain. All other facilities would be located outside the 100-year floodplain. Both the Coal Pier DMCF and the wharf have been designed to be resilient and to be flood-proof.

Flood Hazards & Community Resilience Policy 2g – Channelization Is Discouraged.
Channelization shall be the least favored flood control technique.

Select appropriate response:

- ○ Project will be consistent with policy Discouraging Channelization.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No channelization for flood control is proposed as part of the SPCT project. The existing Sparrows Point Channel will be expanded for navigation safety.

Flood Hazards & Community Resilience Policy 2h – Preference of Multi-Purpose Use Projects, Project Accountability, & 50% Reduction in Damages. Multiple purpose use shall be preferred over single purpose use, the proposed project shall achieve the purposes intended, and, at a minimum, project shall provide for a 50 percent reduction of the average annual flood damages.

Select appropriate response:

- ● Project will be consistent with policy that ensures a Preference to Multi-Purpose Use Projects, Project Accountability & 50% Reduction in Damages.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

see attached supplemental information

Flood Hazards & Community Resilience Policy 3 – Development-Related Runoff Restrictions for the Gwynne Falls and Jones Falls Watersheds. Development may not increase the downstream peak discharge for the 100-year frequency storm event in the following watersheds and all their tributaries: Gwynns Falls in Baltimore City and Baltimore County; and Jones Falls in Baltimore City and Baltimore County. MDE (C2) COMAR 26.17.02.07.

Select appropriate response:

- ○ Project will be consistent with policy that Restricts Development-Related Runoff in the Gwynne Falls & Jones Falls Watersheds.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project is not within the Gwynne Falls or Jones Falls watersheds.

Coastal Zone Management Program - Critical Area Policies Checklist

Name of Project:

Sparrows Point Container Terminal

5.2 COASTAL RESOURCES

5.2.1 The Chesapeake and Atlantic Coastal Bays Critical Area

In addition to the policies in this section, the laws approved by NOAA implementing the Chesapeake and Atlantic Coastal Bays Critical Area Protection Program are enforceable policies.

Critical Area Policy 1 – Scope of the Buffer. In the Critical Area, a minimum 100-foot vegetated buffer shall be maintained landward from the mean high water line of tidal waters, the edge of each bank of tributary streams, and the landward edge of tidal wetlands. The buffer shall be expanded in sensitive areas in accordance with standards adopted by the Critical Area Commission. The buffer is not required for agricultural drainage ditches if the adjacent agricultural land has in place best management practices that protect water quality. Mitigation or other measures for achieving water quality and habitat protection objectives may be necessary in buffer areas for which the Critical Area Commission has modified the minimum applicable requirements due to the existing pattern of development. CAC (C9) COMAR 27.01.09.01, .01-6, .01-8.

Select appropriate response:

- (●) Project will be consistent with Scope of Buffer policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is located in an intensely developed area and existed before 1985, the buffer is a modified buffer area.

Critical Area Policy 2 – Buffer Disturbance. Disturbance to a buffer in the Critical Area is only authorized for a shore erosion control measure or for new development or redevelopment that is water-dependent; meets a recognized private right or public need; minimizes the adverse effects on water quality and fish, plant, and wildlife habitat; and, insofar as possible, locates nonwater-dependent structures or operations associated with water-dependent projects or activities outside the buffer. Disturbance to a buffer may only be authorized in conjunction with mitigation performed in accordance with an approved buffer management plan. CAC (C9) COMAR 27.01.03.03; COMAR 27.01.09.01, .01-2, .01-3.

- (●) Project will be consistent with Buffer Disturbance policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is located in an intensely developed area and existed before 1985, the buffer is a modified buffer area.

Critical Area Policy 3 - Protection of Bird Nesting Areas. Colonial water bird nesting sites in the Critical Area may not be disturbed during breeding season. CAC (C9) COMAR 27.01.09.04.

Select appropriate response:

- ○ Project will be consistent with policy Protecting Bird Nesting Areas.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Critical Area Policy 4 - Protection of Waterfowl. New facilities in the Critical Area shall not interfere with historic waterfowl concentration and staging areas. CAC (C9) COMAR 27.01.09.04.

Select appropriate response:

- ● Project will be consistent with the Protection of Waterfowl policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Waterfowl may experience disturbance during construction activities but these impacts will be temporary. The western, southern, and eastern boundaries of Sparrows Point are encompassed by MDNR-designated waterfowl areas. However, waterfowl activity directly adjacent to the project area at Coke Point was low at the time of a 2024 bird survey. The project area is identified as an Intensely Developed Area.

Critical Area Policy 5 -Restrictions on Stream Alterations. Physical alterations to streams in the Critical Area shall not affect the movement of fish. CAC (C9) COMAR 27.01.09.05.

Select appropriate response:

- ● Project will be consistent with the Restrictions on Stream Alterations policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Noise generated during construction may have temporary impacts on fish behavior/movement but these impacts will be minimized through Best Management Practices. A zone of passage during the spring migration period will be maintained during construction activities. No long-term impacts on fish behavior/movement will occur as a result of the project. A biological assessment and essential fish habitat analysis have been prepared and the applicant is in consultation with NMFS and MDNR on these matters. Mitigation required by NMFS will be added to the final BA, EFH and Final EIS and ROD.

Critical Area Policy 6 - Prohibition of Riprap and Artificial Surfaces. The installation or introduction of concrete riprap or other artificial surfaces onto the bottom of natural streams in the Critical Area is prohibited unless water quality and fisheries habitat will be improved. CAC (C9) COMAR 27.01.09.05.

Select appropriate response:

- (●) Project will be consistent with the Prohibition of Riprap and Artificial Surfaces policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The construction of the Coal Pier DMCF dike will include placement of artificial surfaces onto the bottom of the Patapsco River. These impacts will be mitigated as described in the mitigation plan, mitigation projects will improve water quality and fisheries habitat. The revetment slope would be armored with heavy stone (riprap) to provide slope stabilization and protect against wave action, propwash, and other erosive forces.

Critical Area Policy 7 - Prohibition of Dams and Structures. The construction or placement of dams or other structures in the Critical Area that would interfere with or prevent the movement of spawning fish or larval forms in streams is prohibited. CAC (C9) COMAR 27.01.09.05.

Select appropriate response:

- (●) Project will be consistent with the Prohibition of Dams and Structures policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

While a dam will be constructed in the Patapsco River, it will only limit fish movement into and out of the Coal Pier Channel. The Coal Pier Channel is an existing industrial navigation channel with legacy contaminants in the sediment, resulting in poor quality habitat for aquatic organisms. The project will include a dam at the mouth of the channel as part of the Coal Pier Channel Dredged Material Containment Facility. This will cap the contaminated sediments in the Coal Pier Channel, improving aquatic habitat in the immediate area.

Critical Area Policy 8 - Restrictions on Stream Crossings and Impacts. Development may not cross or affect a stream in the Critical Area, unless there is no feasible alternative and the design and construction of the development prevents increases in flood frequency and severity that are attributable to development; retains tree canopy and maintains stream water temperature within normal variation; provides a natural substrate for affected streambeds; and minimizes adverse water quality and quantity impacts of stormwater. CAC (C9) COMAR 27.01.02.04.

Select appropriate response:

- (●) Project will be consistent with the Restrictions on Stream Crossings and Impacts policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No stream crossings will occur.

Critical Area Policy 9 - Time of Year Restrictions for Construction in Streams. The construction, repair, or maintenance activities associated with bridges or other stream crossings or with utilities and roads, which involve disturbance within the buffer or which occur in stream are prohibited between March 1 and May 15. CAC (C9) COMAR 27.01.09.05.

Select appropriate response:

- ○ Project will be consistent with the Stream Construction Time-of-Year Restrictions policy.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Critical Area Policy 10 - Avoid & Minimize Construction Impacts in Habitat Areas. Roads, bridges, or utilities may not be constructed in any areas designated to protect habitat, including buffers, in the Critical Area, unless there is no feasible alternative and the road, bridge, or utility is located, designed, constructed, and maintained in a manner that maximizes erosion protection; minimizes negative impacts to wildlife, aquatic life, and their habitats; and maintains hydrologic processes and water quality. CAC (C9) COMAR 27.01.02.03C, .04C, .05C.

Select appropriate response:

- ● Project will be consistent with the Avoid or Minimize Habitat Area Impacts policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project will not impact areas designated to protect habitat, including buffers, in the Critical Area.

Critical Area Policy 11 – Intensely Developed Areas. The following policies apply in those areas of the Critical Area that are determined to be areas of intense development.

- To the extent possible, fish, wildlife, and plant habitats should be conserved.
- Development and redevelopment shall improve the quality of runoff from developed areas that enters the Chesapeake or Atlantic Coastal Bays or their tributary streams.
- At the time of development or redevelopment, appropriate actions must be taken to reduce stormwater pollution by 10%. Retrofitting measures are encouraged to address existing water quality and water quantity problems from stormwater.
- Development activities may cross or affect a stream only if there is no feasible alternative, and those activities must be constructed to prevent increases in flood frequency and severity attributable to development, retain tree canopy, maintain stream water temperatures within normal variation, and provide a natural substrate for affected streambeds.
- Areas of public access to the shoreline, such as foot paths, scenic drives, and other public recreational facilities, shall be maintained and, if possible, are encouraged to be established.
- Ports and industries which use water for transportation and derive economic benefits from shore access, shall be located near existing port facilities or in areas identified by local jurisdictions for planned future port facility development and use if this use will provide significant economic benefit to the State or local jurisdiction.
- Development shall be clustered to reduce lot coverage and maximize areas of natural vegetation.
- Development shall minimize the destruction of forest and woodland vegetation.

CAC (C9) COMAR 27.01.02.03.

Select appropriate response:

- (●) Project will be consistent with the Intensely Developed Areas policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is located within an intensely developed area and will be compliant with the policies.

Critical Area Policy 12 – Limited Development Areas & Resource Conservation Areas. The following policies apply in those portions of the Critical Area that are not areas of intense development.

- Development shall maintain, and if possible, improve the quality of runoff and ground water entering the Chesapeake and Coastal Bays.
- To the extent practicable, development shall maintain existing levels of natural habitat.
- All development sites shall incorporate a wildlife corridor system that connects undeveloped vegetated tracts onsite with undeveloped vegetated tracts offsite.
- All forests and developed woodlands that are cleared or developed shall be replaced on not less than an equal area basis.
- If there are no forests on a proposed development site, the site shall be planted to provide a forest or developed woodland cover of at least 15 percent.
- Development on slopes equal to or greater than 15 percent, as measured before development, shall be prohibited unless the project is the only effective way to maintain the slope and is consistent with other policies.
- To the extent practicable, development shall be clustered to reduce lot coverage and maximize areas of natural vegetation.
- Lot coverage is limited to 15 percent of the site.

CAC (C9) COMAR 27.01.02.04.

Select appropriate response:

○ Project will be consistent with policy regarding Limited Development Areas and Resource Conservation Areas.

◉ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Critical Area Policy 13 - Public Facilities Allowed With Restrictions in Buffer. Public beaches or other public water-oriented recreation or education areas including, but not limited to, publicly owned boat launching and docking facilities and fishing piers may be permitted in the buffer in portions of the Critical Area not designated as intensely developed areas only if adequate sanitary facilities exist; service facilities are, to the extent possible, located outside the Buffer; permeable surfaces are used to the extent practicable, if no degradation of ground water would result; and disturbance to natural vegetation is minimized. CAC (C9) COMAR 27.01.03.08.

Select appropriate response:

- ○ Project will be consistent with policy allowing Public Facilities within Buffer with Restrictions.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project does not include public facilities.

Critical Area Policy 14 - Water-Dependent Research Facilities. Water-dependent research facilities or activities may be permitted in the buffer, if nonwater-dependent structures or facilities associated with these projects are, to the extent possible, located outside the buffer. CAC (C9) COMAR 27.01.03.09.

Select appropriate response:

- ○ Project will be consistent with the Water-Dependent Research Facilities policy.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project does not include research facilities.

Critical Area Policy 15 – Siting Industrial & Port-Related Facilities. Water-dependent industrial and port-related facilities may only be located in the portions of areas of intense development designated as modified buffer areas. CAC (C9) COMAR 27.01.03.05.

Select appropriate response:

- ● Project will be consistent with policy regarding Siting Industrial and Port-Related Facilities.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is a port project and is sited entirely within an intensely developed area.

Critical Area Policy 16 -Restrictions on Waste Facilities. Solid or hazardous waste collection or disposal facilities and sanitary landfills are not permitted in the Critical Area unless no environmentally acceptable alternative exists outside the Critical Area, and these facilities are needed in order to correct an existing water quality or wastewater management problem. CAC (C9) COMAR 27.01.02.02.

Select appropriate response:

- ○ Project will be consistent with policy Restricting Waste Facilities.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No solid or hazardous waste facilities are included in this project.

Critical Area Policy 17 – Buffer Management Plan. If a development or redevelopment activity occurs on a lot or parcel that includes a buffer or if issuance of a permit, variance, or approval would disturb the buffer, the proponents of that activity must develop a buffer management plan that clearly indicates that all applicable planting standards developed by the Critical Area Commission will be met and that appropriate measures are in place for the protection and maintenance of the buffer. CAC (C9) COMAR 27.01.09.01-1, .01-3.

Select appropriate response:

- ● Project will be consistent with the Buffer Management Plan policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A buffer management plan will be developed if required by applicable permits.

Critical Area Policy 18 – Protection of Critical Area from Surface Mining Pollution. All available measures must be taken to protect the Critical Area from all sources of pollution from surface mining operations, including but not limited to sedimentation and siltation, chemical and petrochemical use and spillage, and storage or disposal of wastes, dusts, and spoils. CAC (D5) COMAR 27.01.07.02A.

Select appropriate response:

- ○ Project will be consistent with policy Protecting Critical Area from Surface Mining Pollution.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include surface mining.

Critical Area Policy 19 – Reclamation Requirements for Mining. In the Critical Area, mining must be conducted in a way that allows the reclamation of the site as soon as possible and to the extent possible. CAC (D5) COMAR 27.01.07.02B.

Select appropriate response:

- ○ Project will be consistent with policy that requires Reclamation for Mining.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include mining

Critical Area Policy 20 – Restrictions on Sand & Gravel Operations. Sand and gravel operations shall not occur within 100 feet of the mean high water line of tidal waters or the edge of streams or in areas with scientific value, important natural resources such as threatened and endangered species, rare assemblages of species, or highly erodible soils. Sand and gravel operations also may not occur where the use of renewable resource lands would result in the substantial loss of forest and agricultural productivity for 25 years or more or would result in a degrading of water quality or a loss of vital habitat. CAC (D5) COMAR 27.01.07.03D.

Select appropriate response:

- ○ Project will be consistent with policy regarding Restrictions on Sand & Gravel Operations
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include extraction of sand or gravel.

Critical Area Policy 21 - Prohibition of Wash Plants in Buffer. Wash plants including ponds, spoil piles, and equipment may not be located in the 100-foot buffer. CAC (D5) COMAR 27.01.07.03E.

Select appropriate response:

- ○ Project will be consistent with policy Prohibiting Wash Plants in Buffer.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No wash plants will be placed within the 100-fott buffer

Critical Area Policy 22 – Requirements for Agriculture in the Buffer. Agricultural activities are permitted in the buffer, if, as a minimum best management practice, a 25-foot vegetated filter strip measured landward from the mean high water line of tidal waters or tributary streams (excluding drainage ditches), or from the edge of tidal wetlands, whichever is further inland, is established in trees with a dense ground cover or a thick sod of grass. CAC (C4) COMAR 27.01.09.01-6.

Select appropriate response:

- ○ Project will be consistent with policy regarding Requirements for Agriculture in the Buffer.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include agriculture.

Critical Area Policy 23 – Geographical Limits for Feeding or Watering Livestock. The feeding or watering of livestock is not permitted within 50 feet of the mean high water line of tidal waters and tributaries. CAC (C4) COMAR 27.01.09.01-6.

Select appropriate response:

- ○ Project will be consistent with policy regarding Geographical Limits for Feeding or Watering Livestock.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Livestock operations are not a part of this project.

Coastal Zone Management Program - Critical Area Policies Checklist

Critical Area Policy 24 – Creating New Agricultural Lands. In the Critical Area, the creation of new agricultural lands shall not be accomplished by diking, draining, or filling of non-tidal wetlands, without appropriate mitigation; by clearing of forests or woodland on soils with a slope greater than 15 percent or on soils with a "K" value greater than 0.35 and slope greater than 5 percent; by clearing that will adversely affect water quality or will destroy plant and wildlife habitat; or by clearing existing natural vegetation within the 100-foot buffer. CAC (C4) COMAR 27.01.06.02C.

Select appropriate response:

- ○ Project will be consistent with policy regarding Creating New Agricultural Lands.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No new agricultural lands will be created as part of this project.

Critical Area Policy 25 - Best Management Practices for Agriculture. Agricultural activity permitted within the Critical Area shall use best management practices in accordance with a soil conservation and water quality plan approved or reviewed by the local soil conservation district. CAC (C4) COMAR 27.01.06.02G.

Select appropriate response:

- ○ Project will be consistent with policy requiring Best Management Practices for Agriculture.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include agriculture.

Critical Area Policy 26 - Cutting or Clearing Trees in the Buffer. Cutting or clearing of trees within the buffer is prohibited except that commercial harvesting of trees by selection or by the clearcutting of loblolly pine and tulip poplar may be permitted to within 50 feet of the landward edge of the mean high water line of tidal waters and perennial tributary streams, or the edge of tidal wetlands if the buffer is not subject to additional habitat protection. Commercial harvests must be in compliance with a buffer management plan that is prepared by a registered professional forester and is approved by the Department of Natural Resources. CAC (C5) Md. Code Ann., Nat. Res. § 8-1808.7; COMAR 27.01.09.01-7

Select appropriate response:

- (●) Project will be consistent with policy regarding Restrictions on Cutting or Clearing of Trees in the Buffer.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

TThe construction of High Head Industrial Basin DMCF would remove approximately 11.2 acres of uplands (forested and shrub) and 40 acres of aquatic habitat, and 1 mile of riparian habitat along the edge of teh basin. The project area scrub-shrub vegetation is composed of a mixed canopy of short-statured tree species and dense shrub cover. Dominant plants identified within this habitat unit included winged elm (Ulmus alata), staghorn sumac (Rhus typhina), poison ivy (Toxicodendron radicans), green foxtail, white sweet clover, common mugwort, Asian bittersweet (Celastrus orbiculatus), late boneset, and nodding spurge (Euphorbia nutans). A Critical Area Management plan will be developed in compliance with the Baltimore County Buffer Management Plan as part of the Baltimore County permitting process.

Critical Area Policy 27 - Requirements for Commercial Tree Harvesting in the Buffer. Commercial tree harvesting in the buffer may not involve the creation of logging roads and skid trails within the buffer and must avoid disturbing stream banks and shorelines as well as include replanting or allowing regeneration of the areas disturbed or cut in a manner that assures the availability of cover and breeding sites for wildlife and reestablishes the wildlife corridor function of the buffer. CAC (C5) Md. Code Ann., Nat. Res. § 8-1808.7; COMAR 27.01.09.01-7

Select appropriate response:

- ( ) Project will be consistent with policy regarding Requirements for Commercial Tree Harvesting in the Buffer.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include commercial tree harvesting.

Critical Area Policy 28 - General Restrictions to Intense Development. Intense development should be directed outside the Critical Area. Future intense development activities, when proposed in the Critical Area, shall be directed towards the intensely developed areas. CAC (D1) Md. Code Ann., Natural Res. § 8-1807(b); COMAR 27.01.02.02B.

Select appropriate response:

- (●) Project will be consistent with policy regarding General Restrictions on Intense Development.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The entire project is located within an intensely developed area and is consistence with policies for intensely developed areas.

Critical Area Policy 29 – Development Restrictions in Critical Area. The following development activities and facilities are not permitted in the Critical Area except in intensely developed areas and only after the activity or facility has demonstrated that there will be a net improvement in water quality to the adjacent body of water.

• Non-maritime heavy industry

• Transportation facilities and utility transmission facilities, except those necessary to serve permitted uses, or where regional or interstate facilities must cross tidal waters

• Permanent sludge handling, storage, and disposal facilities, other than those associated with wastewater treatment facilities. However, agricultural or horticultural use of sludge when applied by an approved method at approved application rates may be permitted in the Critical Area, but not in the 100-foot Buffer

CAC (C9) COMAR 27.01.02.02.

Select appropriate response:

- (●) Project will be consistent with policy Restricting Development in Critical Area.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project occurs in an intensely developed area.

MARYLAND

Coastal Zone Management Program - Tidal Wetlands Policy Checklist

Name of Project:

Sparrows Point Container Terminal

5.2 COASTAL RESOURCES

5.2.2 Tidal Wetlands

Tidal Wetlands Policy 1 – Projects That Alter Natural Character Shall Avoid Dredging & Filling, Be Water-Dependent and Provide Appropriate Mitigation. Any action which alters the natural character in, on, or over tidal wetlands; tidal marshes; and tidal waters of Chesapeake Bay and its tributaries, the coastal bays adjacent to Maryland's coastal barrier islands, and the Atlantic Ocean shall avoid dredging and filling, be water-dependent, and provide appropriate mitigation for any necessary and unavoidable adverse impacts on these areas or the resources associated with these areas. A proponent of an action described above shall explain the actions impact on: habitat for finfish, crustaceans, mollusks, and wildlife of significant economic or ecologic value; potential habitat areas such as historic spawning and nursery grounds for anadromous and semi-anadromous fisheries species and shallow water areas suitable to support populations of submerged aquatic vegetation; marine commerce, recreation, and aesthetic enjoyment; flooding; siltation; natural water flow, water temperature, water quality, and natural tidal circulation; littoral drift; local, regional, and State economic conditions; historic property; storm water runoff; disposal of sanitary waste; sea level rise and other determinable and periodically recurring natural hazards; navigational safety; shore erosion; access to beaches and waters of the State; scenic and wild qualities of a designated State scenic or wild river; and historic waterfowl staging areas and colonial bird-nesting sites. MDE (B2) COMAR 26.24.01.01, COMAR 26.24.02.01, .03; COMAR 26.24.05.01.

Select appropriate response:

- (●) Project will be consistent with Tidal Wetlands policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project involves dredging and expansion of an existing navigational channel and placement of a potion of the dredged material in waters of the United States (WOTUS) through the construction of a DMCF. The area to be dredged is an existing navigation channel, the project will widen and deepen the channel to allow for larger vessels to transit from the federal Brewerton Channel to the proposed Sparrows Point Container Terminal. Dredging will generate approximately 4.2 million cubic yards of dredged material. As part of a comprehensive plan for dredged material placement, a DMCF will be constructed in the existing Coal Pier Channel, an access channel on the Patapsco River. The Coal Pier Channel is bordered on three sides. This channel contains legacy contaminants from the Bethlehem Steel Company historic operations. The development of the DMCF in this channel significantly reduces the area impacted and will result in the capping of legacy contaminants in the sediment of the channel, reducing their availability to aquatic resources in the area. A mitigation plan has been developed to mitigate for the 19.6 acres of WOTUS impacted by the proposed Coal Pier Channel DMCF. In addition, approximately 55,000 CY of material will be dredged from the alignment of the exterior dike for the Coal Pier Channel DMCF prior to in-water placement of sand for dike construction. In addition to dredged material placement, 7,500 CY of fill will be placed for the bulkhead, 95,000 CY for the revetment and 75,000 CY for the construction of the Coal Pier Channel DMCF dike.

Coastal Zone Management Program - Living Aquatic Resources Policies Checklist

Name of Project:

Sparrows Point Container Terminal

5.2 COASTAL RESOURCES

5.2.6 Living Aquatic Resources

Living Aquatic Resources Policy 1 – Protection of Rare, Threatened or Endangered Fish or Wildlife. Unless authorized by an Incidental Take Permit, no one may take a State listed endangered or threatened species of fish or wildlife. DNR (A4) Md. Code Ann., Nat. Res. §§ 4-2A-01 to -09; Md. Code Ann., Nat. Res. §§ 10-2A-01 to -09.

Select appropriate response:

- (●) Project will be consistent with policy Protecting Rare, Threatened or Endangered Fish or Wildlife.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Consultation under the Endangered Species Act is ongoing with NMFS and USFWS, additionally consultation with MDNR regarding state listed species has been ongoing. The applicant will comply with the requirements of approvals under this process.

Living Aquatic Resources Policy 2 – Sustainable Harvesting of Fisheries. Fisheries shall be sustainably harvested. DNR (A4) Md. Code Ann., Nat. Res. § 4-215.

Select appropriate response:

- ( ) Project will be consistent with Sustainable Harvesting of Fisheries policy.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Fish harvesting is not part of this project.

Coastal Zone Management Program - Living Aquatic Resources Policies Checklist

Living Aquatic Resources Policy 3 – Protection of State Fishery Sanctuaries & Management Resources. Any land or water resource acquired by the State to protect, propagate, or manage fish shall not be damaged. DNR (A4) Md. Code Ann., Nat. Res. § 4-410.**Select appropriate response**:

- ○ Project will be consistent with policy Protecting State Fishery Sanctuaries & Fishery Management Resources.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project does not occur in a state fishery sanctuary or management area

Living Aquatic Resources Policy 4 – Fish Passage. No activity will be permitted that impedes or prevents the free passage of any finfish, migratory or resident, up or down stream. DNR (A4) Md. Code Ann., Nat. Res. § 4-501 to -502.

Select appropriate response:

- ● Project will be consistent with Fish Passage policy.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

While a dam will be constructed in the Patapsco River, it will only limit fish movement into and out of the Coal Pier Channel. The Coal Pier Channel is an existing industrial navigation channel with legacy contaminants in the sediment, resulting in poor quality habitat for aquatic organisms. The project will include a dam at the mouth of the channel as part of the Coal Pier Channel Dredged Material Containment Facility. This will encapsulate the contaminated sediments in the Coal Pier Channel, improving aquatic habitat in the immediate area.

Living Aquatic Resources Policy 5 – Time-of-Year Restrictions for Construction in Non-Tidal Waters. All in-stream construction in non-tidal waters is prohibited from October through April, inclusive, for natural trout waters and from March through May, inclusive, for recreational trout waters. In addition, the construction of proposed projects, which may adversely affect anadromous fish spawning areas, shall be prohibited in non-tidal waters from March 15 through June 15, inclusive. MDE (C2) COMAR 26.17.04.11B(5).

Select appropriate response:

- ○ Project will be consistent with policy regarding Time-of-Year Restrictions for Construction in Non-Tidal Waters.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No work will occur in non-tidal waters.

Living Aquatic Resources Policy 6 – Protection of Forest Buffers Along Trout Streams. Riparian forest buffers adjacent to waters that are suitable for the growth and propagation of self-sustaining trout populations shall be retained whenever possible. MDE (C5) COMAR 26.08.02.03-3F.

Select appropriate response:

- ○ Project will be consistent with policy Protecting Forest Buffers Along Trout Streams.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No trout streams are within the project area.

Living Aquatic Resources Policy 7 –Non-Tidal Habitat Protection & Mitigation. Projects in or adjacent to non-tidal waters shall not adversely affect aquatic or terrestrial habitat unless there is no reasonable alternative and mitigation is provided. MDE (C2) COMAR 26.17.04.11B(5).

Select appropriate response:

- ○ Project will be consistent with policy regarding Non-Tidal Habitat Protection & Mitigation.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No non-tidal habitat will be impacted by the project.

Coastal Zone Management Program - Living Aquatic Resources Policies Checklist

Living Aquatic Resources Policy 8 – Protection & Management of Submerged Aquatic Vegetation (SAV). The harvest, cutting, or other removal or eradication of submerged aquatic vegetation may only occur in a strip up to 60 feet wide surrounding a pier, dock, ramp, utility crossing, or boat slip to point of ingress in a marina, otherwise the activity must receive the approval of the Department of Natural Resources. No chemical may be used for this purpose, and the timing and method of the activity shall minimize the adverse impact on water quality and on the growth and proliferation of fish and aquatic grasses. MDE (A4) Md. Code Ann., Nat. Res. § 4-213.

Select appropriate response:

- (●) Project will be consistent with policy regarding Protection & Management of Submerged Aquatic Vegetation (SAV).
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A spring and summer survey for SAV was completed in 2024 and no SAV was found in the project area.

Living Aquatic Resources Policy 9 – Protection of Natural Oyster Bars. Natural oyster bars in the Chesapeake Bay shall not be destroyed, damaged, or injured. DNR (A4) Md. Code Ann., Nat. Res. § 4-1118.1.

Select appropriate response:

- ( ) Project will be consistent with policy Protecting Natural Oyster Bars.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project occurs in an area designated by MDNR as a "restricted shellfish harvesting area".

Living Aquatic Resources Policy 10 – Protection of Oyster Aquaculture Leases. A person, other than the leaseholder, may not willfully and without authority catch oysters on any aquaculture or submerged land lease area, or willfully destroy or transfer oysters on this land in any manner. DNR (A4) Md. Code Ann., Nat. Res. § 4-11A-16(a).

Select appropriate response:

- ○ Project will be consistent with policy Protecting Oyster Aquaculture Leases.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include or affect oyster aquaculture leases.

Living Aquatic Resources Policy 11 – Genetically Modified Organisms (GMOs) Are Prohibited in State Waters. An organism into which genetic material from another organism has been experimentally transferred so that the host acquires the genetic traits of the transferred genes may not be introduced into State waters. DNR (A4) COMAR 08.02.19.03.

Select appropriate response:

- ○ Project will be consistent with policy Controlling Nonnative Aquatic Organisms.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include or affect genetically modified organisms.

Living Aquatic Resources Policy 12 – Control of Nonnative Aquatic Organisms. Vectors for the introduction of nonnative aquatic organisms must be appropriately controlled to prevent adverse impacts on aquatic ecosystems. DNR (A4) Md. Code Ann., Nat. Res. § 4-205.1.

Select appropriate response:

- ● Project will be consistent with policy Controlling Nonnative Aquatic Organisms in State Waters.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

BMPs will be implemented to mitigate the introduction of nonnative aquatic organisms.

Living Aquatic Resources Policy 13 – Control of Snakehead Fish. Except as authorized by federal law, any live snakehead fish or viable eggs of snakehead fish of the Family Channidae may not be imported, transported, or introduced into the State. DNR (A4) COMAR 08.02.19.06.

Select appropriate response:

- ○ Project will be consistent with policy Controlling Snakehead Fish.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include any actions related to snakehead fish

Living Aquatic Resources Policy 14 – Nonnative Oysters Prohibited in State Waters. Nonnative oysters may not be introduced into State waters. DNR (A4) Md. Code Ann., Nat. Res. § 4-1008.**Living Aquatic**

Select appropriate response:

- ○ Project will be consistent with policy Prohibiting Nonnative Oysters in State Waters.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project does not include actions associated with nonnative oysters.

Coastal Zone Management Program - Tidal Shoreline Erosion Control Policies Checklist

Name of Project:

Sparrows Point Container Terminal

5.3 COASTAL USES

5.3.3. Tidal Shore Erosion Control

Tidal Shore Erosion Control Policy 1 – Use Materials to Match Function & Minimize Impacts. Structural erosion control measures that employ a jetty, groin, breakwater, or other offshore structure shall be designed to use materials that are of adequate size, weight, and strength to function as intended; free of protruding objects, debris, and contaminants; and selected to minimize impacts to water quality and plant, fish, and wildlife habitat. MDE (C1) COMAR 26.24.04.01-4.

Select appropriate response:

- ○ Project will be consistent with policy requiring Offshore Structures to Be Designed to Use Materials to Control Shoreline Erosion While Minimizing Adverse Impacts.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No structural erosion control measures will use a jetty, groin, breakwater, or other offshore structure for the SPCT project.

Tidal Shore Erosion Control Policy 2 –Prohibition of Unsuitable Materials for Backfilling. Tidal shore erosion control projects shall not use backfill containing litter, refuse, junk, metal, tree stumps, logs, or other unsuitable materials. MDE (C1) COMAR 26.24.04.01-4.

Select appropriate response:

- ● Project will be consistent with policy prohibiting the Use of Unsuitable Materials for Backfilling.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Tidal shore erosion control projects will not use backfill containing litter, refuse, junk, metal, tree stumps, logs, or other unsuitable materials.

Coastal Zone Management Program - Tidal Shoreline Erosion Control Policies Checklist

Tidal Shore Erosion Control Policy 3 – Requirements for Beach Nourishment Projects. Beach nourishment projects shall meet the following requirements: The fill material grain size shall be equal to or greater in grain size and character to the existing beach material, or determined otherwise to be compatible with existing site conditions and acceptable to the Department; The fill material shall be relatively free of organic material, floating debris, or other objects; Silt and clay fills that change the sandy nature of the existing beach materials are not acceptable; Gravel fill may be acceptable, if particle sizes are equal to or greater than the existing beach materials; and Fill material shall be placed above the mean high water line before final grading to achieve the desired beach profile, unless site conditions prohibit the placement of fill material above the mean high water line and specific measures are designed to prevent material from washing away from the site. MDE (C1) COMAR 26.24.03.06D.

Select appropriate response:

- ○ Project will be consistent with policy that defines Requirements for Beach Nourishment Projects.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Beach nourishment is not a part of the SPCT project.

Tidal Shore Erosion Control Policy 4 Nonstructural Shoreline Stabilization That Preserves The Natural Environment Is Required Unless Conditions Warrant Structural Stabilization. Improvements to protect property bounding on navigable water against erosion shall consist of nonstructural shoreline stabilization measures that preserve the natural environment, such as marsh creation, except in areas designated by Department of the Environment as appropriate for structural shoreline stabilization measures, including areas of excessive erosion, areas subject to heavy tides, and areas too narrow for effective use of nonstructural shoreline stabilization measures. MDE (C1) Md. Code Ann., Envir. § 16-201.

Select appropriate response:

- ● Project will be consistent with policy Preferring Nonstructural Shoreline Stabilization to Preserve the Natural Environment Unless Structural Stabilization is Warranted.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Construction of the marginal wharf would require structural stabilization of the shoreline beneath the wharf. This would include a bulkhead and pile-supported relieving platform to establish the revetment slope beneath the marginal wharf. The revetment slope would be armored. A mitigation plan has been proposed and is under review by USACE and MDE. A final mitigation plan will be implemented as required by USACE and MDE permits.

Tidal Shore Erosion Control 5 – Limited Encroachment into State Tidal Waters. Encroachment into State or private tidal wetlands for shore erosion control is limited to that which is structurally necessary and is verified by a design report. Bulkheads that encroach into tidal wetlands are prohibited unless the encroachment is three feet or less beyond the mean high water line and other nonstructural and structural shoreline stabilization measures have been considered and determined to be infeasible. MDE (C1) COMAR 26.24.04.01-4.

Select appropriate response:

- (●) Project will be consistent with policy Limiting Encroachment into State Tidal Waters.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

From the Basis of Design Report: Slope stability modeling indicated that the dredge depth in front of the wharf would destabilize the slope under the wharf, requiring pinning of the slope. A relieving platform with multiple deep pile rows was evaluated and selected. The piles both support the platform, preventing the terminal live loading from affecting the slope under the wharf, and pin the slope's failure plane under its own weight.

Tidal Shore Erosion Control Policy 6 – List of Shore Erosion Control Measures from Most to Least Consistent with State Policy. Tidal shore erosion control measures are listed below beginning with measures that are most consistent with State policy and ending with measures that are least consistent with State policy.

- No action and relocation of structures threatened by erosion
- Nonstructural shoreline stabilization that is dominated by tidal wetland vegetation, including a living shoreline
- Beach nourishment
- Breakwater
- Groin, jetty, or a similar structure
- Revetment
- Bulkhead

MDE (C1) COMAR 26.24.01.02; COMAR 26.24.04.01; COMAR 26.24.04.01-3.

Select appropriate response:

- (●) Project will be consistent with policy defining List of Shoreline Control Measures from Most to Least Consistent with State Policy.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

From the Basis of Design Report: Slope stability modeling indicated that the dredge depth in front of the wharf would destabilize the slope under the wharf, requiring pinning of the slope. A relieving platform with multiple deep pile rows was evaluated and selected. The piles both support the platform, preventing the terminal live loading from affecting the slope under the wharf, and pin the slope's failure plane under its own weight.

Tidal Shore Erosion Control Policy 7 – Conditions Prohibiting Shore Erosion Control Projects. Tidal shore erosion control projects shall not occur when:

- There is no evidence of erosion;
- Existing State or private tidal wetlands are effectively preventing erosion;
- Adjacent properties may be adversely affected by the proposed project;
- Navigation may be adversely affected by the project and the applicant has not adequately offset these impacts;
- Threatened or endangered species, species in need of conservation, or significant historic or archaeological resources may be adversely affected by the project; or
- Natural oyster bars or private oyster leases may be adversely affected by the project.

MDE (C1) COMAR 26.24.04.01.

Select appropriate response:

○ Project will be consistent with policy defining Conditions Where Shore Erosion Control Projects are Prohibited.

● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist

Name of Project:

Sparrows Point Container Terminal

5.3 COASTAL USES

5.3.5 Dredging and Disposal of Dredged Material

Dredging and Disposal of Dredged Material Policy 1 – Dredging for Non-Water Dependent Projects is Discouraged. A person may not dredge for projects that are non-water-dependent unless there is no practicable alternative. MDE (A3) Md. Code Ann., Envir. § 5-907(a); COMAR 26.24.03.02D.

Select appropriate response:

- ○ Project will be consistent with policy Discouraging Dredging for Non-Water Dependent Projects.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is water dependent.

Dredging and Disposal of Dredged Material Policy 2 – Dredging Requires An Environmental Analysis and Is Generally Discouraged. Dredging for sand, gravel, or fill material, including material for beach nourishment, is prohibited unless an environmental analysis determines that there will be no adverse impact on the environment and no alternative material is available. MDE (A3) COMAR 26.24.03.02C.

Select appropriate response:

- ● Project will be consistent with policy requiring An Environmental Analysis for Dredging.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Dredging is not being conducted to attain fill material. Dredging is required to allow the safe access of container vessels to the proposed terminal. Dredging has been minimized through a series of design and navigational evaluations. The project makes use of an existing channel, reducing the area for new work dredging. A complete impacts analysis was prepared as part of the Draft EIS (see chapter 4).

Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist

Dredging and Disposal of Dredged Material Policy 3 – Dredging Shall Allow Flushing & Make Maximum Use of Existing Channels. Dredging of channels, canals, and boat basins shall be designed to provide adequate flushing and elimination of stagnant water pockets, and channel alignment shall make maximum use of natural or existing channels and bottom contours. MDE (B2) COMAR 26.24.03.02.

Select appropriate response:

- ◉ Project will be consistent with policy requiring Dredging to Allow for Flushing & to Make Maximum Use of Existing Channels.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project makes use of the existing Sparrows Point Channel. Dredging is needed to widen and deepen the channel to allow safe access by container terminals, optimization studies were completed to reduce the dredging area and the dredged material volume (see chapters 2 and 3 of the DEIS).

Dredging and Disposal of Dredged Material Policy 4 – Dredging Shall First Avoid & Then Minimize Habitat Impacts. The alignment of a channel shall first avoid and then minimize impacts to shellfish beds, submerged aquatic vegetation, and vegetated tidal wetlands. When feasible, the alignment shall be located the maximum distance feasible from shellfish beds, submerged aquatic vegetation, and other vegetated tidal wetlands. MDE (C6) COMAR 26.24.03.02.

Select appropriate response:

- ◉ Project will be consistent with policy requiring Dredging to First Avoid, & Then Minimize, Habitat Impacts.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project avoids impacts to habitat by using the existing Sparrows Point Channel. Dredging is needed to widen and deepen the channel to allow safe access by container terminals, optimization studies were completed to reduce the dredging area and the dredged material volume (see chapter 3 of the Draft EIS). A complete impacts analysis was prepared as part of the Draft EIS (see chapter 4).

Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist

Dredging and Disposal of Dredged Material Policy 5 – Dredging Time-of-Year Restrictions. Dredging is prohibited from February 15 through June 15 in areas where yellow perch have been documented to spawn and from March 1 through June 15 in areas where other important finfish species have been documented to spawn. MDE (A3) COMAR 26.24.02.06G.

Select appropriate response:

- (●) Project will be consistent with policy requiring Time-of-Year Restrictions for Dredging.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

This project will require permits from USACE and MDE under the Clean Water Act and the Rivers and Harbors Act and other applicable permits. It will also require authorization under the Magnuson-Stevens Fishery Conservation and Management Act and the Endangered Species Act. These permits and authorizations will include time of year restrictions and the applicant will comply with these permit requirements.

Dredging and Disposal of Dredged Material Policy 6 – 500 –Yard Setback Restriction for Dredging Near Submerged Aquatic Vegetation (SAV). Dredging is prohibited within 500 yards of submerged aquatic vegetation from April 15 through October 15. MDE (A3) COMAR 26.24.02.06H.

Select appropriate response:

- (●) Project will be consistent with policy requiring a 500-Yard Setback Restriction for Dredging near SAV.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A spring and summer SAV survey was completed in 2024 and no SAV was found within the project area.

Dredging and Disposal of Dredged Material Policy 7 – Restrictions on Mechanical & Hydraulic Dredging Near Shellfish Areas. Within 500 yards of shellfish areas, mechanical and hydraulic dredging is prohibited from June 1 through September 30 and mechanical dredging is also prohibited from December 16 through March 14. MDE (A3) COMAR 26.24.02.06E.

Select appropriate response:

- ( ) Project will be consistent with policy Prohibiting Mechanical & Hydraulic Dredging within 500 Yards of Shellfish Areas.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project occurs in an area designated by MDNR as a "restricted shellfish harvesting area".

MARYLAND Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist

Dredging and Disposal of Dredged Material Policy 8 –Dredge Disposal Site Selection Criteria. New disposal sites for dredged material shall be selected based on the following hierarchy of criteria: (i) beneficial use and innovative reuse of dredged material; (ii) upland sites and other environmentally sound confined capacity; (iii) expansion of existing dredged material disposal capacity other than the Hart-Miller Island Dredged Material Containment Facility and areas collectively known as Pooles Island. MDE (A3) Md. Code Ann., Envir. § 5-1104.2(d).

Select appropriate response:

- (●) Project will be consistent with policy defining Dredge Disposal Site Selection Criteria.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A thorough analysis of dredged material disposal options was completed. See section 2.1.1 of the Draft EIS.

Dredging and Disposal of Dredged Material Policy 9 – Dredge Material Disposal Facilities Shall Minimize Impacts. Disposal facilities for dredged material shall be designed to have the least impact on public safety, adjacent properties, and the environment. MDE (A3) COMAR 26.24.03.04A.

Select appropriate response:

- (●) Project will be consistent with policy requiring Dredge Material Disposal Facilities to Minimize Impacts.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

A thorough analysis of dredged material disposal options was completed. See section 2.1.1 of the Draft EIS and chapter 3 for a discussion of efforts to minimize dredged material disposal impacts. See chapter 4 of the Draft EIS for a thorough analysis of the impacts of dredged material placement.

MARYLAND **Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist**

Dredging and Disposal of Dredged Material Policy 10 – Sediment & Erosion Control Plan Shall Be Developed & Approved Prior to Upland Dredge Disposal. Prior to disposing of dredged material on upland areas, a sediment and erosion control plan must be developed and approved by the local soil conservation district or the Department of the Environment and the methods for protecting water quality and quantity must be identified in detail. MDE (A3) COMAR 26.24.03.03B.

Select appropriate response:

- [x] Project will be consistent with policy requiring Sediment & Erosion Control Plans to Be Developed & Approved Prior to Upland Dredge Disposal.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project will include erosion and sediment controls as part of construction BMPs and under the Maryland NPDES Program and project permit.

Dredging and Disposal of Dredged Material Policy 11 – Restrictions on Open Water Disposal of Dredge Material in Chesapeake Bay & Its Tributaries. A person may not redeposit in an unconfined manner dredged material into or onto any portion of the water or bottomland of the Chesapeake Bay or of the tidewater portion of any of the Chesapeake Bay's tributaries except when the project is undertaken to restore islands or underwater grasses, stabilize eroding shorelines, or create or restore wetlands or fish and shellfish habitats. MDE (A3) Md. Code Ann., Envir. § 5-1101(a), 5-1102.

Select appropriate response:

- [x] Project will be consistent with policy Restricting Open Water Disposal of Dredge Material in Chesapeake Bay and Its Tributaries.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Dredged material will not be disposed in open water or in an unconfined manner in the Chesapeake Bay or tributaries.

Coastal Zone Management Program - Dredging & Disposal of Dredge Material Policy Checklist

Dredging and Disposal of Dredged Material Policy 12 – No Open Water Disposal of Dredge Material in Deep Trough of Chesapeake Bay. A person may not redeposit in an unconfined manner dredged material into or onto any portion of the bottomlands or waters of the Chesapeake Bay known as the deep trough. MDE (A3) Md. Code Ann., Envir. §§ 5-1101(a), -1102.

Select appropriate response:

- [x] Project will be consistent with policy Prohibiting Open Water Disposal of Dredge Material in Deep Trough of Chesapeake Bay.
- [ ] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Dredged material will not be disposed in the deep trough of the Chesapeake Bay.

Dredging and Disposal of Dredged Material Policy 13 – Restrictions on Open Water Disposal of Dredge Material from Baltimore Harbor. No material dredged from Baltimore Harbor shall be disposed of in an unconfined manner in the open water portion of Chesapeake Bay, or the tidal portions of its tributaries outside of Baltimore Harbor. MDE (A3) Md. Code Ann., Envir. § 5-1102(a).

Select appropriate response:

- [ ] Project will be consistent with policy Restricting Open Water Disposal of Dredge Material from Baltimore Harbor.
- [x] Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Dredged material will not be disposed in open water or in an unconfined manner in the Chespaeake Bay or tidal tributaries outside Baltimore Harbor.

Name of Project:

Sparrows Point Container Terminal

5.3 COASTAL USES

5.3.6 Navigation

Navigation Policy 1 – Piers Are Preferred to Dredging in Providing Access to Deep Waters. Navigational access projects shall when possible be designed to use piers to reach deep waters rather than dredging. MDE (B2) COMAR 26.24.03.02.

Select appropriate response:

- (●) Project will be consistent with policy Preferring Piers to Dredging in Providing Access to Deep Waters.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The proposed dredging is needed to provide an approach channel, turning basin, berth pocket, and channel transition areas. The recommended channel width was developed to minimize channel width while still optimizing the alignment, safe operations, and to minimize the dredging area and volume of dredged material. Deepwater access is needed based for the safe access of container ships. Detailed information on the existing and proposed channel dimensions are included in chapter 2 of the Draft EIS. A total of 4.25 MCY of material will be dredged for this project; 4.2 MCY for channel improvements and 55,000 CY for construction of the Coal Pier Channel DMCF.

Navigation Policy 2 – Central Access Channels with Short Spurs Are Preferred to Multiple Separate Channels. Navigational access channels to serve individual or small groups of riparian landowners shall be designed to prevent unnecessary channels**.** A central access channel with short spur channels shall be considered over separate access channels for each landowner. MDE (B2) COMAR 26.24.03.02.

Select appropriate response:

- (●) Project will be consistent with policy that Prefers Central Access Channels with Short Spurs to Multiple Separate Channels.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The expansion of an existing, single channel with channel wideners is proposed. Detailed information on the existing and proposed channel dimensions are included in chapter 2 of the Draft EIS.

Navigation Policy 3 – Channels Shall Minimize Impacts to Tidal Wetlands & Underwater Topography. Navigational access channels shall be designed to minimize alteration of tidal wetlands and underwater topography. MDE (B2) COMAR 26.24.03.02.

Select appropriate response:

- (●) Project will be consistent with policy requiring that Channels Minimize Impacts to Tidal Wetlands & Underwater Topography.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project will use the existing Sparrows Point Channel. Channel improvements were designed to minimize dredging requirements while still optimizing the alignment, safe operations, and to minimize the dredging area and volume of dredged materials, which will reduce the impacts to underwater topography. The project would not impact tidal wetlands.

Navigation Policy 4 - New & Expanded Marinas, with a Preference Given to Expansion of Existing Facilities, Shall Be Located in Strongly Flushed Waters More Than 4.5 Feet Deep at Mean Low Tide & Not Adversely Impact Habitat. New or expanded facilities for the mooring, docking, or storing of more than ten vessels on tidal navigable waters shall be located on waters with strong flushing characteristics and may not be located in areas where the natural depth is 4.5 feet or less at mean low water, and any of the following will be adversely affected: aquatic vegetation, productive macroinvertebrate communities, shellfish beds, fish spawning or nursery areas, rare, threatened, or endangered species, species in need of conservation, or historic waterfowl staging areas. Expansion of existing facilities is favored over new development. MDE (A1) COMAR 26.24.04.03.

Select appropriate response:

- ( ) Project will be consistent with policy requiring that New & Expanded Marinas, with a Preference Given to Expansion of Existing Facilities, Be Located in Strongly Flushed Waters More Than 4.5 Feet Deep at Mean Low Tide & Avoid Adverse Impacts to Habitat.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project does not include a marina.

Navigation Policy 5 – Restrictions on Placement of Mooring Buoys. The location of buoys for the mooring of boats shall not be located in designated private or public shellfish areas, cable-crossing areas, navigational channels, in other places in where general navigation would be impeded or obstructed, or public ship anchorage. The location of mooring buoys should not obstruct the riparian access of adjacent property owners or hinder the orderly access to or use of the waterways by the general public. DNR (A1) COMAR 08.04.13.02.

Select appropriate response:

- ○ Project will be consistent with policy Restricting Placement of Mooring Buoys.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project does not include any mooring buoys.

Navigation Policy 6 – Noise Limit for Vessels on State Waters. Vessels operated on state waters should not exceed a noise level of 90dB(a). DNR (A1) COMAR 08.18.03.03.

Select appropriate response:

- ● Project will be consistent with policy Setting Noise Limit for Vessels on State Waters.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Vessels present during construction and operation of SPCT will not exceed noise levels of 90dB and are consistent with current vessels utilizing this area. See section 4.16.2 of the DEIS for an analysis of noise from construction and operation activities including vessels.

Coastal Zone Management Program - Development Policies Checklist

Name of Project:

Sparrows Point Container Terminal

5.3 COASTAL USES

5.3.9 Development

Development Policy 1– Sediment & Erosion Control. Any development shall be designed to minimize erosion and keep sediment onsite. MDE (C4) COMAR 26.17.01.08.

Select appropriate response:

- (●) Project will be consistent with policy requiring Sediment & Erosion Control.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Project will include erosion and sediment controls as part of construction BMPs and as required by the Maryland NPDES Program and project permits.

Development Policy 2 – Erosion and Sediment Control Plan. An erosion and sediment control plan is required for any grading activity that disturbs 5,000 square feet of land area and 100 cubic yards of earth or more, except for agricultural land management practices and agricultural best management practices. MDE (C9) COMAR 26.17.01.05.

Select appropriate response:

- (●) Project will be consistent with policy requiring an Erosion & Sediment Control Plan.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Project will include erosion and sediment controls as part of construction BMPs and as required by the Maryland NPDES Program and project permits.

Development Policy 3 – Stormwater Management. Development or redevelopment of land for residential, commercial, industrial, or institutional use shall include stormwater management compliant with the Environmental Site Design sizing criteria, recharge volume, water quality volume, and channel protection storage volume criteria. MDE (C9) COMAR 26.17.02.01, -.06

Select appropriate response:

- ● Project will be consistent with policy requiring Stormwater Management.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The construction of the wharf and terminal facilities would result in impervious surfaces throughout the terminal facility. The planned stormwater conveyance system would consist of a series of pipes that would discharge stormwater effluent to surface waters through two permitted outfalls at the south end of Coke Point. It is anticipated that the stormwater discharge from the new terminal would be incorporated into the regional stormwater plan for the Sparrows Point facilities. It is anticipated that these discharges would use credits generated through the over-treatment of local Sparrows Point stormwater by the regional wet pond stormwater facility that is currently under construction at Sparrows Point.

Development Policy 4 – First Avoid then Minimize Wetland Impacts, Minimize Water Quality, Habitat & Forest Damage & Preserve Cultural Resources. Development must avoid and then minimize the alteration or impairment of tidal and non-tidal wetlands; minimize damage to water quality and natural habitats; minimize the cutting or clearing of trees and other woody plants; and preserve sites and structures of historical, archeological, and architectural significance and their appurtenances and environmental settings. MDE/DNR/CAC (D6) Md. Code Ann., Envir. §§ 4-402, 5-907(a), 16-102(b); Md. Code Ann., Nat. Res. §§ 5-1606(c), 8-1801(a); Md. Code Ann., Land Use § 8-102; COMAR 26.24.01.01(A).

Select appropriate response:

- ● Project will be consistent with policy that requires to First Avoid, then Minimize, Adverse Impacts to Tidal & Non-Tidal Wetlands, Water Quality, Natural Habitats, & Forests & Preserve Cultural Sites & Resources.
- ○ Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The SPCT project was designed to avoid and minimize the impacts of site development on wetlands, natural habitats, and water quality. No non-tidal wetlands would be impacted by the project. Measures to reduce impacts on the natural and human environment were incorporated during the design planning process (see Table 1 of the DEIS). As the design process advances to final design, additional decisions concerning equipment and materials to be used and the final project footprint would be made in an effort to further avoid and minimize impacts to the extent practicable while still achieving the project goals. From initial proposed action to the proposed action recommended in the DEIS, the area of impacts to WOTUS was reduced from approximately 100 acres to approximately 19 acres. The historical uses of this site include coking operations as part of the former Bethlehem Steel Mill. The site is entirely human-made land, created by filling in a portion of the Patapsco River with steel mill slag over several decades. Previously developed areas within the site are currently undergoing demolition and razing of structures. Sparrows Point, with its industrial history, is an example of a brownfield. In recent years, Sparrows Point has been undergoing a major redevelopment initiative aimed at transforming the site into a hub for modern industrial and commercial activities. The SPCT project would continue to redevelop the site. All proposed elements of the project are confined to the historical industrial site or to previously permitted dredged placement facilities.

Development Policy 5 – Proposed Development Projects Must Be Sited Where Adequate Water Supply, Sewerage and Solid Waste Services & Infrastructure Are Available. Any proposed development may only be located where the water supply system, sewerage system, or solid waste acceptance facility is adequate to serve the proposed construction, taking into account all existing and approved developments in the service area and any water supply system, sewerage system, or solid waste acceptance facility described in the application and will not overload any present facility for conveying, pumping, storing, or treating water, sewage, or solid waste. MDE (C9) Md. Code Ann., Envir. § 9-512.

Select appropriate response:

- (●) Project will be consistent with policy requiring that Proposed Development Projects Be Sited Where Adequate Water Supply, Sewerage and Solid Waste Services Are Available.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The entire project will be located within the TPA property at Sparrows Point. This is the former site of Bethlehem Steel on entirely human-made land. The area is being redeveloped into a hub for modern industrial and commercial activities. As such, water supply, sewerage, solid waster and infrastructure are available. Upgrades to utilities required for the SPCT project are included in project design. All proposed elements of the project are confined to the historical industrial site or to previously permitted dredged placement facilities.

Development Policy 6 - Proposed Construction Must Have Water and Wastewater Allocation or Provide Onsite Capacity. A proposed construction project must have an allocation of water and wastewater from the county whose facilities would be affected or, in the alternative, prove access to an acceptable well and on-site sewage disposal system. The water supply system, sewerage system, and solid waste acceptance facility on which the building or development would rely must be capable of handling the needs of the proposed project in addition to those of existing and approved developments. MDE (D6) Md. Code Ann., Envir. § 9-512.

Select appropriate response:

- (●) Project will be consistent with policy requiring Proposed Construction to Have Water & Wastewater Allocation or Provide Onsite Capacity.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Civil/site utility design features would include potable water and sanitary sewer to the two buildings, fire protection water throughout the site, and natural gas to the four emergency generators provided on-site. These services would be connected to county services.

Dredged material placed at High Head Industrial Basin DMCF would be slurried with surface water and hydraulically pumped to the DMCF. The water required to slurry the material would be withdrawn from Bear Creek at the offloading location. To the extent possible, slurry water from the DMCF would be recirculated and reused in this process. The use of surface waters and the volume of water withdrawn from Bear Creek would comply with conditions of a Water Appropriation and Use Permit issued by MDE. Therefore, no impacts on surface waters would be expected for water use to slurry and pump dredged material to the DMCF.

Dredged material to be placed at the Coal Pier Channel DMCF would be slurried with surface water and hydraulically pumped into the DMCF. The water required to slurry the material could be withdrawn from the Patapsco River (near the mouth of Bear Creek) at the offloading location. To the extent possible, slurry water would be recirculated from the Coal Pier Channel DMCF and reused in this process. The use of surface waters and the volume of water withdrawn from the Patapsco River would comply with the conditions of a Water Appropriation and Use Permit issued by the MDE.

Development Policy 7 – Structures Served by On-Site Water and Sewage Waste Disposal Systems Must Demonstrate Capacity Prior to Construction or Alteration. Any residence, commercial establishment, or other structure that is served or will be served by an on-site sewage disposal system or private water system must demonstrate that the system or systems are capable of treating and disposing the existing sewage flows and meeting the water demand and any reasonably foreseeable increase in sewage flows or water demand prior to construction or alteration of the residence, commercial establishment, or other structure. MDE (D6) COMAR 26.04.02.03F.

Select appropriate response:

- ○ Project will be consistent with policy that requires Structures Served by On-Site Water & Sewerage Disposal Systems to Demonstrate Capacity Prior to Construction or Alteration.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

No on-site sewage disposal system or private water system is included in the project design.

Development Policy 8 - Grading or Building in the Severn River Watershed Requires Approved Development Plan. Proponents of grading or building in the Severn River Watershed must create a development plan and have it approved by the soil conservation district. The plan shall include a strategy for controlling silt and erosion and must demonstrate that any septic or private sewer facility will not contribute to the pollution of the Severn River. MDE (D4) Md. Code Ann., Envir. § 4-308(a).

Select appropriate response:

- ○ Project will be consistent with policy requiring an Approved Development Plan prior to Grading or Building in the Severn River Watershed.
- ● Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Project is not within the Severn River Watershed.

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Development Policy 9 - Siting Requirements for Industrial Facilities. Industrial facilities must be sited and planned to ensure compatibility with other legitimate beneficial water uses, constraints imposed due to standards of air, noise and water quality, and provision or availability of adequate water supply and wastewater treatment facilities. MDE (D4) Md. Code Ann., Envir. §§ 2-102, 4-402, 9-224(b), 9-512(b); COMAR 26.02.03.02; COMAR 26.11.02.02B.

Select appropriate response:

- (●) Project will be consistent with policy that defines Siting Requirements for Industrial Facilities.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is located entirely within an intensely developed area and within a former industrial site that is currently zoned as industrial/commercial.

Development Policy 10 - Citizen Engagement in Planning & Development. Local citizens shall be active partners in planning and implementation of development. MDP (D6) Md. Code Ann., St. Fin. & Proc. §§ 5-7A-01 to -02.

Select appropriate response:

- (●) Project will be consistent with policy requiring Citizen Engagement in Planning & Development.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

As the lead federal agency, USACE has held public scoping meetings and will hold public hearings as part of the public review of the EIS and associated permits. Additionally, the project applicant has held more than 50 community meetings to inform the local communities and engage in discussions about the project. This engagement by the applicant will continue throughout the project construction and operation.

Development Policy 11 - Protect Existing Community Character & Concentrate Growth. Development shall protect existing community character and be concentrated in existing population and business centers, growth areas adjacent to these centers, or strategically selected new centers. MDP (D6) Md. Code Ann., St. Fin. & Proc. §§ 5-7A-01 to -02.

Select appropriate response:

- (●) Project will be consistent with policy that Protects Existing Community Character & Concentrates Growth.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project is located within a historical industrial area that the applicant is redeveloping for commercial and industrial uses. The area is currently zoned as commercial/industrial.

Development Policy 12 - Site Development Near Available or Planned Transit. Development shall be located near available or planned transit options. MDP (D6) Md. Code Ann., St. Fin. & Proc. §§ 5-7A-01 to -02.

Select appropriate response:

- (●) Project will be consistent with policy that requires Site Development to Be near Available or Planned Transit.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

The project area is served by CityLink Gold and Baltimore Link bus routes. The area is an intensely developed area.

Development Policy 13 - Design for Walkable, Mixed Use Communities. Whenever possible, communities shall be designed to be compact, contain a mixture of land uses, and be walkable. MDP (D6) Md. Code Ann., St. Fin. & Proc. §§ 5-7A-01 to -02.

Select appropriate response:

- ( ) Project will be consistent with policy that requires Communities to Be Compact, Include Mix Land Uses, & Be Walkable.
- (●) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Project is within a formerly industrial area and will be redeveloped as an industrial site.

Development Policy 14 – Communities Must Identify Adequate Water Supply, Stormwater & Wastewater Services & Infrastructure to Meet Existing & Future Development. To meet the needs of existing and future development, communities (geographically defined areas with shared interests, values, resources, and goals) must identify adequate drinking water and water resources and suitable receiving waters and land areas for stormwater management and wastewater treatment and disposal. MDE (D6) Md. Code Ann., Land Use § 3-106.

Select appropriate response:

- (●) Project will be consistent with policy that requires Communities to Identify Adequate Water Supply, Stormwater & Wastewater Services & Infrastructure to Meet Existing & Future Development.
- ( ) Not Applicable.

Describe situation and/or actions to make project or activity consistent with the above policy:

Civil/site utility design features would include potable water and sanitary sewer to the two buildings, fire protection water throughout the site, and natural gas to the four emergency generators provided on-site.