

**EXHIBIT Q**

**KNOWN PRE-EXISTING HAZARDOUS SUBSTANCES REPORT**

[see attached]

*EXECUTION VERSION – DECEMBER 5, 2011*

Section 1 of this Exhibit identifies Pre-Existing Hazardous Substances that are known to rise to the level of Hazardous Environmental Conditions.

Section 2 of this Exhibit identifies Pre-Existing Hazardous Substances, or areas that may contain Hazardous Substances, known by the Concessionaire, but are not known by the Concessionaire to rise to the level of a Hazardous Environmental Condition.

Based on the information available to the Concessionaire as of the Agreement Date, the Pre-Existing Hazardous Substances identified in Section 1 are not known to be in quantities, concentrations or locations other than as identified.

Based on the information available to the Concessionaire as of the Agreement Date, the Pre-Existing Hazardous Substances identified in Section 2 are not known to be present in any locations other than as identified below, nor are the Pre-Existing Hazardous Substances identified in Section 2 below known to be present at concentrations or in quantities that: (a) may present an imminent or substantial safety or health hazard for the Department, the Concessionaire or their respective employees, agents, representatives or independent contractors, the general public or the surrounding environment; or (b) are required to be removed or remediated as a matter of Law or in accordance with the requirements of any Governmental Authority.

**Section 1: Known Pre-Existing Hazardous Environmental Conditions**

<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
1-1	Asbestos in Portsmouth Redevelopment Housing Authority	An asbestos survey conducted on the floor tile and mastic in the office building identified the floor tile mastic as asbestos-containing.	New MLK Extension: 1729 Columbus Avenue, Portsmouth, VA	N/A
1-2	Lead in Soil at CSX Container Yard	The Marshall Miller & Associates (MM&A), Phase II Environmental Site Assessment Addendum, CSXT Container Yard and Vacant Lot, report, commissioned by VDOT, reported one shallow soil sample (borehole SB-03) had a lead concentration of 5.19 milligrams per liter (mg/L) in the Toxicity Characteristic Leaching Procedure (TCLP) analyses, which is slightly above the limit of 5 mg/L lead concentration that defines a RCRA Characteristic Hazardous Waste under the Virginia Hazardous Waste Management Regulations (VHWMR) and 40 Code of Federal Regulations (CFR) Part 261.	New MLK Extension: CSX Container Yard	Exhibit Q Figure 1: New MLK Extension CSX Container Yard

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<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
1-3	Hazardous Waste Soil in the Portsmouth Boat Section	TCLP metals testing of the artificial soil layer between borings B-5P-AF and B-7P-AF within the Portsmouth Boat Section has shown that the layer contains hazardous levels of lead. The highest concentration of hazardous lead that was detected at any single location is 7.6 mg/L. The regulatory limit for hazardous lead is 5.0 mg/L. The artificial soil layer extends from the ground surface to Elevation -12.763 at boring B-5P-AF and from the ground surface to Elevation -15.602 at boring B-7P-AF.	New Midtown Tunnel (MTT): Portsmouth Boat Section	Exhibit Q Figure 2: New Midtown Tunnel Portsmouth Approach
1-4	Portsmouth Approach Soil	The Portsmouth Marine Terminal borders the Existing Midtown Tunnel and associated buildings on the Portsmouth side. In July 2000, eight test trenches were excavated as reported in the Phase I/II Preliminary Site Assessment and Site Remediation Report, prepared for VDOT by MM&A in July 2000 for the Pinner's Point Wastewater Treatment Plant (WWTP). and confirmed the existence of sludge residue from a depth of 2 feet below ground surface (bgs) to 10 feet bgs. Soil samples were collected from 21 soil borings advanced to depths of 16 feet bgs. There was one detection of Total Petroleum Hydrocarbon – Gasoline Range Organics (TPH-GRO) and 11 detections of Total Petroleum Hydrocarbon – Diesel Range Organics (TPH-DRO), six of which exceeded the Virginia DEQ clean-fill limit of 50 milligrams per kilogram (mg/kg). This report concluded that buried sewage sludge from the former Pinner's Point Wastewater Treatment Plant within the proposed Midtown tunnel alignment and contains concentrations of TPH.	New Midtown Tunnel: Portsmouth Approach	N/A

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Item:	Summary:	Description:	Location:	Reference:
1-5	Old Dominion Demolition Subsurface Investigation	The MM&A Site reports and records pertaining to New MLK Extension for the following: Strategic Alloys; Former Bill Lewis Chevrolet/Current Rogers Electrical (Site #5); Murro Chemical (Site #7); HERC Products, Inc (Site #8); and Portsmouth Redevelopment and Housing Authority (Site #9) were reviewed and contained subsurface investigation, which included two soil borings/monitoring wells in the northern part of the Old Dominion property, identified the presence of TPH-DRO in shallow soil at a concentration of 33.6 mg/kg below the Virginia DEQ reporting limit (50 mg/kg) and in groundwater at the site at concentrations of 1.4 and 2.3 mg/L above the Virginia DEQ reporting limit (1 mg/L). Additionally, several metals were detected in soil and groundwater at the site including arsenic, barium, cadmium, chromium, lead, and mercury. However, only arsenic was detected in soil at a concentration of 2.35 mg/kg above the industrial RBC of 1.6 mg/kg. None of the metals exceeded TCLP limits.	New MLK Extension: Old Dominion Demolition (2307/2317 Turnpike Road) and Scrap Yard (2125 Columbia Street)	N/A
1-6	New Midtown Tunnel Shorelines	The Phase II Environmental Site Assessment, Midtown Tunnel Shoreline Connections, Portsmouth & Norfolk, Virginia, prepared by MM&A, dated October 2008 evaluated the proposed shoreline connection footprint for planning soil and groundwater handling/disposal. A total of five soil borings were advanced on the Portsmouth side of the tunnel and three soil borings were advanced on the Norfolk side of the tunnel, all of which are located on the north side of Route 58. All five of the soil borings on the Portsmouth side of the tunnel were converted into monitoring wells and two of the three borings were converted to monitoring wells on the Norfolk side of the tunnel. The polychlorinated biphenyl (PCB) Aroclor 1260 was detected in boring MW-2/08BH-013 on the Norfolk side at a concentration of 5.0 mg/kg, which is above both the residential and industrial RBC values of 0.22 mg/kg and 0.74 mg/kg, respectively.	New Midtown Tunnel Norfolk Approach	N/A

**Section 2: Known Pre-Existing Hazardous Substances**

Item:	Summary:	Description:	Location:	Reference:
2-1	Existing Midtown Tunnel TSS	Environmental Resources Management, Inc. (ERM) was provided (through the Virginia Department of Transportation (VDOT) project data SharePoint site) with sampling results for monthly monitoring required by the Virginia Pollutant Discharge Elimination System (VPDES) permit for the Midtown Tunnel from January to November 2010. Based on ERM's review of 2010 sampling results, there was one exceedance of the permit maximum in February 2010 and two exceedances of the permit average in May 2010 and October 2010 for Total Suspended Solids (TSS). It was assumed that these exceedances were attributed to sand being applied to the roadway during winter months; however the exceedances continued throughout 2010.	Existing Midtown Tunnel	N/A
2-2	New Midtown Tunnel River Sediment	ERM reviewed the Sampling and Analysis Report, Midtown Tunnel River Sediments, Portsmouth & Norfolk, Virginia, prepared for VDOT by Marshal Miller and Associates (MM&A), dated August 2008. In preparation for construction of the second tunnel, as part of the above referenced report, sediment sampling was conducted in the river along the proposed alignment of the second tube. The results of this investigation detected polyaromatic hydrocarbons (PAHs), including benzo (b) fluoranthene, fluoranthene and pyrene, in the upper sediment sample (0 to 9 feet below ground surface (bgs) ) collected from soil boring B-1 and benzo(a)pyrene (BAP) in the lower sediment sample (9 feet bgs to anticipated tunnel bottom) collected from B-1. The detected PAHs were below risk based criteria (RBC) except for BAP which was detected above the residential RBC of 0.015 mg/kg but below the industrial RBC of 0.21 mg/kg. Total Petroleum Hydrocarbons – Diesel Range Organics (TPH-DRO) was detected in B-1 (upper sample) at a concentration of 43.2 mg/kg. Arsenic was detected in the upper and lower samples from all 10 boreholes advanced at concentrations ranging from 0.953 mg/kg to 8.11 mg/kg, which exceeded the residential and industrial RBCs of 0.39 mg/kg and 1.6 mg/kg, respectively. Concentrations of other metals detected were generally highest in the upper sediment sample collected from B-5, located in the central portion of the river.	New Midtown Tunnel	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-3	New Midtown Tunnel Shorelines	ERM reviewed the Phase II Environmental Site Assessment, Midtown Tunnel Shoreline Connections, Portsmouth & Norfolk, Virginia, prepared by MM&A for VDOT, dated October 2008. The above report was conducted to evaluate the proposed shoreline connection footprint for planning soil and groundwater handling/disposal. A total of five soil borings were advanced on the Portsmouth side of the tunnel and three soil borings were advanced on the Norfolk side of the tunnel, all of which are located on the north side of Route 58. All five of the soil borings on the Portsmouth side of the tunnel were converted into monitoring wells and two of the three borings were converted to monitoring wells on the Norfolk side of the tunnel. Concentrations of arsenic detected in all eight soil borings ranged from 1.65 mg/kg to 9.67 mg/kg, which exceeded the residential and industrial RBCs of 0.39 mg/kg and 1.6 mg/kg, respectively. The polychlorinated biphenyl (PCB) Aroclor 1260 was detected in boring MW-2/08BH-013 on the Norfolk side at a concentration of 5.0 mg/kg, which is above both the residential and industrial RBC values of 0.22 mg/kg and 0.74 mg/kg, respectively. Copper, lead, nickel and zinc were detected at concentrations exceeding the Virginia Water Quality saltwater standards in monitoring wells on the Norfolk side and copper, lead, nickel, zinc, arsenic and cadmium were detected at concentrations exceeding the Virginia Water Quality saltwater standards in monitoring wells on the Portsmouth side. Three metals (copper, arsenic and zinc) exceeded acute standards with copper being the most prevalent in groundwater samples.	New Midtown Tunnel	N/A
2-4	UPS Batteries in Existing MTT West Vent Building	During the site reconnaissance between November 16-20, 2010, ERM observed 20 uninterruptible power supply (UPS) batteries which contain lead and sulfuric acid that may exceed the 10,000 pound reporting limit for lead and/or the 500 pound reporting limit for sulfuric acid and therefore may require Tier II Inventory Reporting under Emergency Planning & Community Right to Know Act (EPCRA) Section 312.	Existing Midtown Tunnel: West Vent Building	N/A
2-5	AST in Existing MTT West Vent Building	During the site reconnaissance between November 16-20, 2010, ERM observed a 6,000-gallon diesel fuel aboveground storage tank (AST) associated with the on-site backup generator at the West Vent Building. The Virginia DEQ requires that owners of ASTs greater than 660 gallons submit an initial registration and fee upon installation and a renewal registration and fee every five years. Although requested from the formal VDOT process and site contact, ERM was not provided with the AST registration and renewal documents.	Existing Midtown Tunnel: West Vent Building	N/A

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<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
2-6	Drum in Existing MTT West Vent Building	During the site reconnaissance conducted between November 16-20, 2010, ERM observed one 55-gallon drum containing empty aerosol cans on the first floor of the building. ERM observed the drum containing used aerosol cans was not labeled as a hazardous waste. No Resource Conservation Recovery Act (RCRA) hazardous waste generator identification number is associated with this facility and no information regarding disposal of the aerosol cans was provided to ERM.	Existing Midtown Tunnel: West Vent Building	N/A
2-7	Drum in Pinner's Point Facility	During the site reconnaissance conducted between November 16-20, 2010, ERM observed one 55-gallon drum containing empty aerosol cans in the main building. ERM observed the drum containing used aerosol cans was not labeled as a hazardous waste. No RCRA hazardous waste generator identification number is associated with this facility and no information regarding disposal of the aerosol cans was provided to ERM.	Existing Midtown Tunnel: Pinner's Point Atlantic Headquarters Facility	N/A
2-8	UPS Batteries in Existing MTT East Vent Building	During the site reconnaissance conducted between November 16-20, 2010, ERM observed 20 UPS batteries which contain lead and sulfuric acid that may exceed the 10,000 pound reporting limit for lead and/or the 500 pound reporting limit for sulfuric acid and therefore may require Tier II reporting under EPCRA Section 312. An evaluation needs to be conducted to determine if lead and sulfuric acid contained in the UPS system batteries are subject to Tier II reporting.	Existing Midtown Tunnel: East Vent Building	N/A
2-9	AST in Existing MTT East Vent Building	During the site reconnaissance conducted between November 16-20, 2010, a 6,000-gallon diesel fuel AST associated with the on-site backup generator was observed at the East Vent Building. The Virginia DEQ requires that owners of ASTs greater than 660 gallons submit an initial registration and fee upon installation and a renewal registration and fee every five years. Although requested from the formal VDOT process and site contact, ERM was not provided with the AST registration and renewal documents.	Existing Midtown Tunnel: East Vent Building	N/A
2-10	UST at Pinner's Point	The facility maintains a 550-gallon double-walled UST associated with an oil/water separator. The oil/water separator was installed at the time of site construction (i.e. 2004/2005). Trench drains in the maintenance bays discharge to the oil/water separator. The integrity of the UST and oil/water separator is unknown.	Midtown Tunnel: Pinner's Point Atlantic Headquarters Facility	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-11	Existing Downtown Tunnel (DTT) TSS	ERM was provided (through the VDOT project data SharePoint site) sampling results for monthly monitoring required by the Virginia Pollutant Discharge Elimination System (VPDES) permit for the Existing Downtown Tunnel. Based on ERM's review of 2010 sampling results, there were several exceedances of the permit average (in January, February, March, April, July and October) and maximum for TSS at all Outfalls (February, July, April). It was assumed that these exceedances were attributed to sand being applied to the roadway during winter months; however, the exceedances continued throughout 2010. ERM has no more information concerning these exceedances.	Existing Downtown Tunnel	N/A
2-12	UPS Batteries at DTT West Vent Building	During the site reconnaissance conducted between November 16-20, 2010, ERM observed 20 UPS batteries which contain lead and sulfuric acid that may exceed the 10,000 pound reporting limit for lead and/or the 500 pound reporting limit for sulfuric acid and therefore may require Tier II reporting under EPCRA Section 312. An evaluation needs to be conducted to determine if lead and sulfuric acid contained in the UPS system batteries are subject to Tier II reporting.	Existing Downtown Tunnel: West Vent Building	N/A
2-13	Drum in DTT West Crash Building	During site reconnaissance conducted between November 16-20, 2010, ERM observed one 55-gallon drum containing empty aerosol cans in the main building. ERM observed the drum containing used aerosol cans was not labeled as a hazardous waste. No RCRA hazardous waste generator identification number is associated with this facility and no information regarding disposal of the aerosol cans was provided to ERM.	Existing Downtown Tunnel: West Crash Building	N/A
2-14	UPS Batteries in DTT East Vent Building	During the site reconnaissance conducted between November 16-20, 2010, ERM observed 24 UPS batteries which contain lead and sulfuric acid that may exceed the 10,000 pound reporting limit for lead and/or the 500 pound reporting limit for sulfuric acid and therefore may require Tier II reporting under EPCRA Section 312. An evaluation needs to be conducted to determine if lead and sulfuric acid contained in the UPS system batteries are subject to Tier II reporting.	Existing Downtown Tunnel: East Vent Building	N/A
2-15	Drum in DTT East Crash Building	During the site reconnaissance conducted between November 16-20, 2010, ERM observed one 55-gallon drum containing empty aerosol cans in the main building. ERM observed the drum containing used aerosol cans was not labeled as a hazardous waste. No RCRA hazardous waste generator identification number is associated with this facility and no information regarding disposal of the aerosol cans was provided to ERM.	Existing Downtown Tunnel: East Crash Building	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-16	Drum in DTT State Street Complex	During the site reconnaissance conducted between November 16-20, 2010, ERM observed two 55-gallon drums containing empty aerosol cans in the main building. ERM observed the drums containing used aerosol cans were not labeled as a hazardous waste. No RCRA hazardous waste generator identification number is associated with this facility and no information regarding disposal of the aerosol cans was provided to ERM.	Existing Downtown Tunnel: State Street Complex	N/A
2-17	Staining in DTT State Street Complex	During the site reconnaissance conducted between November 16-20, 2010, ERM observed oil staining around the 55-gallon drum of mineral spirits and on the floor of the tire machining area of the vehicle maintenance building.	Existing Downtown Tunnel: State Street Complex	N/A
2-18	DTT East Vent Building Properties	Bae Systems Norfolk Ship Repair and Metro Machine Corporation adjoin the DTT East Vent building and DTT East Crash building to the south, west, and north. Bae Systems is listed on the RCRA Treatment Storage Disposal Facility (TSDF), RCRA Corrective Action (CORRACTS), RCRA Large Quantity Generator (LQG) of hazardous waste, leaking tanks (LTANKS), Emergency Response Notification System (ERNS), and SPILLS databases. Bae Systems is listed as a LQG of flammable and corrosive wastes, cadmium, chromium, lead, mercury, and spent non-halogenated solvents and has been issued several violation notices. This site was assigned a low CORRACTS corrective action priority in October 1997. There are seven LTANKS cases reported for this site, one of which remains open. In addition, 13 LUST incidents were reported at this facility, one of which remains open. Metro Machine Corporation is listed on the RCRA-LQG, ERNS, and SPILLS databases. Metro Machine is listed as a LQG of flammable and corrosive wastes, arsenic, barium, cadmium, chromium, lead, silver, and methyl ethyl ketone and has been issued several violation notices. The north and west adjoining properties were also formerly occupied by Berkley Machine Works and Foundry Company since at least 1928. Based on the open LUST incidents and the current and historical use of these surrounding area properties, soil and groundwater impacts may be present beneath the East Vent Building.	Existing Downtown Tunnel: East Vent Building	N/A

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<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
2-19	H.E.R.C Property Subsurface Investigation	ERM reviewed several historical subsurface investigations conducted at the property (Subsurface Investigation Report, prepared by MM&A in September 1997; Boiler Cleaning and Specialty Corporation Martin Luther King Extension Project, prepared by MM&A in April 1998; and Phase II Site Assessment, prepared by MM&A in January 2009), which identified impacts of petroleum, metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) to soil and groundwater at the site, particularly around the northern property boundary, AST farm and former drum storage area, resulting from historical spills and poor housekeeping/waste disposal practices. The investigations also reported alleged improper disposal of petroleum into a ditch behind the site on the CSX property to the north.	New MLK Extension: H.E.R.C (1420 Columbus Avenue)	N/A
2-20	H.E.R.C Property AST Containment Area	During the site reconnaissance conducted between November 16-20, 2010, ERM observed approximately 6 inches of oily water sludge within the concrete AST containment area and staining was observed along the sides of the containment indicating previous overflows. The AST containment is constructed with concrete block walls and a crushed stone base, which could potentially serve as a conduit to subsurface soils and groundwater. No sampling within the containment structure was completed as part of previous subsurface investigations.	New MLK Extension: H.E.R.C (1420 Columbus Avenue)	N/A
2-21	Drums at H.E.R.C Property	During the site reconnaissance conducted between November 16-20, 2010, ERM observed approximately 100 plastic drums on the grassy area along the southwestern property boundary, half of which contained caustic soda. ERM observed chalky white stains in the area of these drums. As part of a previous investigation, one soil sample was collected from the area and analyzed for SVOCs. Although the soil sample was below detection levels for SVOCs, the report concluded that based on visual observations, potential impacted soils may be present in the area and recommended that the owner remove all chemical storage containers and remove visually or otherwise impacted soil and groundwater.	New MLK Extension: H.E.R.C (1420 Columbus Avenue)	N/A
2-22	Containers at H.E.R.C Property	During the site reconnaissance conducted between November 16-20, 2010, ERM observed approximately forty (40) 5-gallon containers of cleaning agents and thirty (30) 55-gallon drums of alcohol and acids were stored inside the building. ERM observed staining on the floor and under the overhead door located along the western wall of the building. ERM also observed etching of the concrete floor in the area of a former floor drain that was capped during the site visit.	New MLK Extension: H.E.R.C (1420 Columbus Avenue)	N/A

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<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
2-23	Drum at Little Tiny Pallet Company	During the site reconnaissance conducted between November 16-20, 2010, ERM observed one 55-gallon unlabeled plastic drum on the south side of the site building. The drum appeared to be cracked with some type of oil leaking from the side of the drum onto the pavement. Approximately 50 square feet of staining was observed on the asphalt pavement in the vicinity of the leaking drum.	New MLK Extension: Little Tiny Pallet Company (2225 Turnpike Road)	N/A
2-24	Debris at Little Tiny Pallet Company	During the site reconnaissance conducted between November 16-20, 2010, ERM observed a mounded debris pile located in the southwestern corner of the property. The surface of the debris pile appeared to consist of a soil/concrete mix. The origin and nature of the debris pile is unknown and it is located near a low-lying area/storm water ditch.	New MLK Extension: Little Tiny Pallet Company (2225 Turnpike Road)	N/A
2-25	ASTs at Rogers Electric & Stick It	During the site reconnaissance conducted between November 16-20, 2010, ERM observed approximately 400 square feet of staining in the vicinity of two 275-gallon steel ASTs that are used to store waste oil and used antifreeze. The ASTs were reportedly installed in 2006 and are not equipped with secondary containment.	New MLK Extension: Rogers Electric & Stick It (2220 Turnpike, includes 2115 County Street)	N/A
2-26	Rogers Electric & Stick IT Pollution Complaints	Two additional pollution complaint cases were listed for the property in the Environmental Data Resources, Inc. (EDR) radius map report, dated November 8, 2010 and the Phase II Environmental Study for the New MLK Extension, prepared by MM&A in 2009. A 1994 soil survey conducted at the facility identified greater than 100 ppm of petroleum in four of nine soils samples collected. Free product was also reportedly found in the vicinity of a suspect old UST. PC#94-4573 was assigned to the site but no further action was reportedly required. In 2001, a Phase II ESA conducted at the site found “samples from four of the ten borings exceeded Virginia DEQ reportable limits”. No further action was required and the pollution complaint case (PC#01-5089) was reportedly closed. Although no further action was required for the two pollution complaint cases, the results of the previous associated subsurface investigations revealed the presence of free product and residual soil impacts.	New MLK Extension: Rogers Electric & Stick It (2220 Turnpike, includes 2115 County Street)	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-27	Staining at Old Dominion Demolition	During the site reconnaissance conducted between November 16-20, 2010, ERM observed approximately 500 square feet of staining in the vicinity of bulk oil storage areas (i.e., 5-gallon buckets, 55-gallon drums, and ASTs) within the equipment storage area (scrap yard).	New MLK Extension: Old Dominion Demolition (2307/2317 Turnpike Road) and Scrap Yard (2125 Columbia Street)	N/A
2-28	CSX Railroad Subsurface Investigation	<p>ERM reviewed the SIR Report prepared by MM&amp;A in 1997 and Phase II Environmental Site Assessment Addendum, prepared by MM&amp;A in 2010, which revealed that prior subsurface investigations indicated that soils sampled in the container yard were impacted with TPH-DRO, Oil and Gas (O&amp;G), and lead.</p> <ul style="list-style-type: none"> <li>- TPH-DRO ranging from 26.8-349 mg/kg</li> <li>- O&amp;G in one sample at 1080 mg/kg</li> </ul> <p>Soils sampled from the CSX vacant lot were impacted with O&amp;G with levels ranging between 50-120 mg/kg. No further investigation was reportedly conducted to delineate the extent of environmental impacts.</p>	New MLK Extension: CSX Railroad	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-29	Murro Chemical Subsurface Investigation	Murro Chemical is located adjacent to the west of the CSX Railroad vacant lot and approximately 400 feet west of HERC (1420 Columbus Avenue). Three SPILLS incidents were reported for the property, all relating to offensive odors emanating from the site with no indication of spills to the subject property soil and/or groundwater. A September 1997 subsurface investigation report indicated the site was on the Comprehensive Environmental Response, Compensation, and Liability Information System – No Further Remedial Action Planned (CERCLIS-NFRAP) database, which indicated an initial investigation was performed, but either no contamination was found, contamination was removed quickly, or the contamination present did not warrant federal superfund action or consideration for the National Priority List (NPL). Two soil samples were collected from the site that revealed trace levels of VOCs and SVOCs. A May 1998 investigation report concluded that Virginia DEQ files concerning Murro Chemical indicated a history of animal and vegetable oil spills and odor complaints from the various locations onsite (focused on the northwest portion of site). Five soil borings taken onsite revealed elevated levels of oil and grease (O&G) and recommended screening any excavated soils from this area.	New MLK Extension: Murro Chemical	N/A
2-30	Pinner's Point Texaco	Pinner's Point Texaco is located at 2315 Woodrow Street, on the west side of US 58, at the northeast corner of Virginia Avenue and Woodrow Street. There is one open LUST listing which was reported in January 2008, three USTs (one 2,000-gallon gasoline, one 6,000-gallon gasoline, and one 10,000-gallon gasoline USTs) that are permanently out of use, and one 20,000-gallon diesel AST which was observed by ERM during the site reconnaissance (November 16-20, 2010) to be in poor condition. In addition, there was one spill to the ground of 50 gallons in June 2002.	New MLK Extension: West Side of Southbound US58	N/A
2-31	2003 Frederick Boulevard	The property is currently occupied by City of Portsmouth for use as a vehicle service center and fleet management. Six USTs were closed in ground at the site, nine USTs were removed from the ground, and four USTs are reportedly still in use at the property. The USTs all contained petroleum products and the condition of these USTs is not known. The facility also generates hazardous waste consisting of ignitable waste, corrosive waste, spent halogenated solvents, spent non-halogenated solvents, and metals.	New MLK Extension: North Side of Westbound I-264: The property at 2003 Frederick Boulevard	N/A

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Item:	Summary:	Description:	Location:	Reference:
2-32	1001 Elm Avenue	The facility is currently listed as a conditionally-exempt small quantity generator of ignitable waste, spent halogenated solvents, and tetrachloroethylene (PERC). Additionally, the Environmental Data Resources, Inc. (EDR) radius map report, dated November 8, 2010, indicated that a Phase II ESA of the property revealed contamination of soil and groundwater, and the property was referred to the state voluntary remediation program. It is not known if the soil and groundwater contamination is related to petroleum or chlorinated solvent impacts.	New MLK Extension: North Side of Westbound I-264: The property at 1001 Elm Avenue	N/A
2-33	Dredging Area 1 Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 1 was comprised primarily of sand in the top 10 feet (ft) (85 percent) and primarily of silt+clay in the bottom (69 percent).</p> <p>Generally, concentrations of detected analytes were elevated in the top 10 ft compared to concentrations in the bottom. The TPH-DRO concentration was 130 micrograms per kilogram (• g/kg) in the top Dredging Unit (DU) compared to 8.2 • g/kg in the bottom DU, and the total dichloro-diphenyl-trichloroethane (DDT) concentration in the top DU was 5.03 • g/kg compared to 0.245 • g/kg in the bottom DU.</p> <p>For total PCBs and total PAHs, concentrations in the top DU (17 and 5,308 • g/kg, respectively) were substantially greater than concentrations in the bottom DU (0.839 and 95.7 • g/kg). In the top DU, concentrations of the High Molecular Weight (HMW) PAHs comprised the majority (83 percent) of the total PAH concentration. HMW PAHs tend to be less water soluble and less volatile than Low Molecular Weight (LMW) PAHs, and therefore, the HMW PAHs are likely to bind to sediment particles, be deposited, and take longer to degrade.</p> <p>For metals, concentrations between the top and bottom DUs were more consistent, although the concentrations of copper, lead, and zinc were higher (by factors of 3, 4, and 1.7, respectively) in the top DU compared to concentrations in the bottom DU.</p> <p>Chlorinated pesticides, 2,3,7,8-tetrachloro-dibenzo-dioxin (TCDD), and SVOCs were low and detected analytes were estimated at concentrations generally below the laboratory reporting limit (except lindane and endrin ketone in the top DU). None of the PCB Aroclors or Tributyltin (TBT) was detected in either the top or the bottom DU.</p>	<p>New Midtown Tunnel: Dredging Area 1</p> <p>Area 1 represents the Support of Excavation (SOE) area along the Portsmouth side of the project footprint. This area requires removal of approximately 335,000 cubic yards (cy) of material. Area 1 was divided into two Dredging Units (DUs) for testing:</p> <p>1T: The exposed area above Mean Low Water (MLW) (52,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (65,000 cy) were combined into one</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
		<p>Despite the difference in the top and bottom DUs, none of the detected concentrations exceeded the Virginia exclusionary criteria.</p> <p>The conductivity of the soils was 5.7 (top) and 16.6 (bottom) millimhos per centimeter (mmhos/cm), the potential acidity was 6.02 (top) and 21.4 (bottom) tons Calcium Carbonate Equivalents (cce)/kT, and the neutralization potential was 27.8 (top) and 11.4 (bottom) tons cce/kT.</p> <p>Additional analytical testing, including the paint filter test, Extractable Organic Halides (EOX), Benzene, Toluene, Ethylene, and Xylene (BTEX), and TCLP, was conducted to evaluate the feasibility of other upland placement options. Results indicated that the samples did not pass through the paint filter, that the samples were not flammable, and that soil pH was slightly basic (9.6 and 8.3). EOX, cyanide, and most of the BTEX were not detected- benzene was detected at a low concentration below the laboratory reporting limit in the top DU.</p> <p>For TCLP, of the 38 chemical constituents tested, only seven-arsenic, barium, cadmium, chromium, lead, mercury, and selenium-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from Dredging Area 1. The concentrations of the detected chemical constituents were compared to the maximum concentrations of contaminants for toxicity characteristics (40 CFR 261.24). Concentrations of detected constituents were well below the toxicity characteristic criteria. The results also indicate that the materials were not corrosive or ignitable and, therefore, the sediments from the top and bottom DUs would not be considered a hazardous waste per USEPA criteria.</p>	<p>DU, comprising a total of 117,000 cy.</p> <p>1B: The bottom interval (from -10 ft below the sediment surface to the project depth) contains approximately 218,000 cy of dredged material.</p>	
2-34	Dredging Area 2 Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 2 was comprised primarily of silt+clay in both the top and the bottom DUs (76 and 82 percent, respectively).</p> <p>Generally, concentrations of detected analytes were substantially elevated in the top 10 ft compared to concentrations in the bottom. The TPH-DRO concentration was 270 • g/kg in the top DU compared to 40 • g/kg in the bottom DU, and the total DDT concentration in the top DU was 4.6 • g/kg compared to 1.27 • g/kg in the bottom DU.</p> <p>For total PCBs and total PAHs, concentrations detected in the top DU were the highest concentrations, by far, detected within the dredging</p>	<p>New Midtown Tunnel: Dredging Area 2</p> <p>Area 2 represents the in-water area extending from the Portsmouth side to the top slope of the Federal navigation channel. Area 2</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>footprint (4.6 times greater than any other sample for total PCBs and 8.5 greater than any other sample for total PAHs). Concentrations of total PCBs and total PAHs in the top DU (90 and 45,360 • g/kg, respectively) were substantially greater than concentrations in the bottom DU (18.5 and 1,232 • g/kg). Concentrations of total PAHs detected in the sample from the top of Dredging Area 2 were substantially higher than the other samples within the dredging footprint. One PAH-benzo(a)pyrene-was the only PAH with a concentration that exceeded the Virginia exclusionary criteria. The detected concentration of 1,400 • g/kg exceeded the Virginia exclusionary criteria value of 660 • g/kg by a factor of 2.1.</p> <p>For metals, concentrations between the top and bottom DUs were generally comparable, although the concentrations of copper, lead, and zinc were higher (by factors of 8, 7, and 5, respectively) in the top DU compared to concentrations in the bottom DU. For each of these three metals, the highest concentrations detected within the dredging footprint were detected in the sample from the top portion of Dredging Area 2.</p> <p>Chlorinated pesticides, 2,3,7,8-TCDD, and SVOCs were generally low and detected analytes were estimated at concentrations generally below the laboratory reporting limit (except for lindane in top DU). None of the PCB Aroclors or TBT was detected in either the top or the bottom DU.</p> <p>The conductivity of the soils was 40.3 (top) and 19.5 (bottom) mmhos/cm, the potential acidity was 17.8 (top) and 23.5 (bottom) tons cce/kT, and the neutralization potential was 24.9 (top) and 32.4 (bottom) tons cce/kT.</p> <p>Additional analytical testing, including the paint filter test, EOX, BTEX, and TCLP, was conducted to evaluate other upland placement options. Results indicated that the samples did not pass through the paint filter, that the samples were not flammable, and that soil pH was 8.2 and 7.9. EOX was detected in the top DU (535 mg/kg) and high concentrations of sulfide (826 and 102 mg/kg) were detected. Cyanide and the BTEX compounds were not detected in either the top or the bottom DU.</p> <p>For TCLPs of the 38 chemical constituents tested, only seven-arsenic, barium, cadmium, chromium, lead, mercury, and selenium-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from Dredging Area 2. The concentrations of the detected</p>	<p>was divided into two DUs for testing:</p> <p>2T: The top interval (0 to -10 ft below the sediment surface) has a total of 75,000 cy of dredged material.</p> <p>2B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 192,000 cy of dredged material.</p>	

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		<p>chemical constituents were compared to the maximum concentrations of contaminants for toxicity characteristics (40 CFR 261.24). Concentrations of detected constituents were well below the toxicity characteristic criteria. The results also indicate that the materials were not corrosive or ignitable and, therefore, the sediments from the top and bottom DUs would not be considered a hazardous waste per U.S. Environmental Protection Agency (USEPA) criteria.</p>		
2-35	Dredging Area 3 Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 3 was comprised primarily of silt+clay in the top DU (88 and 86.5 percent), while the bottom DU had a greater proportion of sand (48 and 55 percent).</p> <p>Generally, concentrations of detected analytes were elevated in the top 10 ft compared to concentrations in the bottom. TPH-DRO concentrations were 27 and 31 • g/kg in the top DU compared to 10 and 8.2 • g/kg in the bottom DU. For total PAHs, concentrations in the top DU (101 and 393 • g/kg) were substantially higher than concentrations in the bottom DU (12.0 and 19.5 • g/kg). In the top DU, concentrations of the HMW PAHs comprised the majority (87 and 90 percent) of the total PAH concentration. HMW PAHs tend to be less water soluble and less volatile than LMW PAHs, and therefore, if PAHs enter the aquatic environment, the HMW PAHs are likely to bind to sediment particles, be deposited, and take longer to degrade.</p> <p>For metals, concentrations between the top and bottom DUs were more consistent, although the concentrations of copper, lead, and zinc were higher (by factors ranging from 1.8 to 3) in the top DU compared to concentrations in the bottom DU. Other metals, such as aluminum, barium, chromium, iron, nickel, and vanadium also had higher concentrations in the top DU.</p> <p>Chlorinated pesticides (including total DDT), total PCBs, 2,3,7,8-TCDD, and SVOCs were low (and detected analytes were estimated at concentrations generally below the laboratory reporting limit. None of the PCB Aroclors or TBT was detected in either the top or the bottom DU.</p> <p>Despite the difference in the concentrations observed in the top and bottom DUs, none of the detected concentrations exceeded the Virginia exclusionary criteria.</p>	<p>New Midtown Tunnel: Dredging Area 3</p> <p>Area 3 represents the in-water area extending across the Federal navigation channel. Area 3 was divided into two DUs for testing:</p> <p>3T: The top interval (0 to -10 ft below the sediment surface) has a total of 148,000 cy of dredged material.</p> <p>3B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 290,000 cy of dredged material.</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>The conductivity of the soils ranged from 20.3 to 27.7 mmhos/cm, the potential acidity ranged from 12.9 to 38.6 tons cce/kT, and the neutralization potential ranged from 12.2 to 112 tons cce/kT.</p> <p>Additional analytical testing, including the paint filter test, EOX, BTEX, and the TCLP, was conducted to evaluate other upland placement options. Results indicated that the samples did not pass through the paint filter, that the samples were not flammable, and that soil pH was within the expected range (ranging from 7.6 to 8.1). Sulfide was detected in both the top and bottom DUs at concentrations ranging from 26 to 93 mg/kg. EOX, cyanide, and the BTEX compounds were not detected in either the top or the bottom DU.</p> <p>For TCLP, of the 38 chemical constituents tested, only seven-arsenic, barium, cadmium, chromium, lead, selenium, and silver-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from Dredging Area 3. The concentrations of the detected chemical constituents were compared to the maximum concentrations of contaminants for toxicity characteristics (40 CFR 261.24). Concentrations of detected constituents were well below the toxicity characteristic criteria. The results also indicate that the materials were not corrosive or ignitable and, therefore, the sediments from the top and bottom DUs would not be considered a hazardous waste per USEPA criteria.</p>		
2-36	Dredging Area 4 Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 4 was comprised primarily of silt+clay in both the top and the bottom DUs (55 percent or greater).</p> <p>Generally, concentrations of detected analytes were comparable between the top and bottom DUs in Area 4. For total PAHs, the concentration in one sample from the top DU (403 • g/kg) was higher than concentrations detected in the other three samples (one top and two bottom) from that DU (8.7 to 12.5 • g/kg). Similar to the other dredging areas, the HMW PAHs comprised the majority (94 percent) of the total PAH concentration.</p> <p>For metals, concentrations between the top and bottom DUs were also relatively consistent. Variability between the metal concentrations is likely natural variability.</p>	<p>New Midtown Tunnel: Dredging Area 4</p> <p>Area 4 represents the in-water area extending from the Norfolk side to the top slope of the Federal navigation channel. Area 4 was divided into two DUs for testing:</p>	<p>Exhibit Q Figure 3: New MTT Dredging Areas</p>

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		<p>Chlorinated pesticides (including total DDT), total PCBs, TPH-DRO, 2,3,7,8-TCDD, and SVOCs were low and detected analytes were found at concentrations generally below the laboratory reporting limit. None of the PCB Aroclors or TBT were detected in either the top or the bottom DU.</p> <p>For Dredging Area 4, none of the detected concentrations exceeded the Virginia exclusionary criteria.</p> <p>The conductivity of the soils ranged from 16 to 32.3 mmhos/cm, the potential acidity ranged from 13.3 to 17.2 tons cce/kT, and the neutralization potential ranged from 12.7 to 18.9 tons cce/kT.</p> <p>Additional analytical testing, including the paint filter test, EOX, BTEX, and TCLP, was conducted to evaluate other upland placement options. Results indicated that samples did not pass through the paint filter, that the samples were not flammable, and that the soil pH was within the expected range (ranging from 8 to 8.5). Sulfide was detected in both the top and bottom DUs at concentrations ranging from 23 to 64 mg/kg. EOX, cyanide, and most of the BTEX compounds were not detected in either the top or the bottom DU. Benzene was detected at low concentrations below the laboratory reporting limit in both the top and the bottom DUs.</p> <p>For TCLP, of the 38 chemical constituents tested, only seven-arsenic, barium, cadmium, chromium, lead, selenium, and silver-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from Dredging Area 4. The concentrations of the detected chemical constituents were compared to the maximum concentrations of contaminants for toxicity characteristics (40 CFR 261.24). Concentrations of detected constituents were well below the toxicity characteristic criteria. The results also indicate that the materials were not corrosive or ignitable and, therefore, the sediments from the top and bottom DUs would not be considered a hazardous waste per USEPA criteria.</p>	<p>4T: The top interval (0 to -10 ft below the sediment surface) has a total of 154,000 cy of dredged material.</p> <p>4B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 368,000 cy of dredged material.</p>	
2-37	Dredging Area 5 Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 5 was comprised primarily of sand in the top 10 ft (85 percent) and primarily of silt+clay in the bottom (65 percent).</p> <p>Generally, concentrations of detected organic analytes were elevated in the top 10 ft compared to concentrations in the bottom DU. The TPH-DRO concentration was 19 •g/kg in the top DU compared to 8.1 •g/kg in the</p>	<p>New Midtown Tunnel: Dredging Area 5</p> <p>Area 5 represents the SOE area along the Norfolk</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>bottom DU. For total PCBs and total PAHs, concentrations in the top DU (19 and 2,309 • g/kg, respectively) were substantially greater than concentrations in the bottom DU (1.84 and 192 • g/kg). Again, in the top DU, concentrations of the HMW PAHs comprised the majority (75 percent) of the total PAH concentration.</p> <p>For metals, concentrations were comparable for many, but were generally higher in the bottom DU for aluminum, arsenic, chromium, iron, magnesium, nickel, vanadium, and zinc. However, these concentrations are generally comparable to concentrations observed in the other sediment samples from the bottom dredging units within the project footprint.</p> <p>Chlorinated pesticides (including total DDT), 2,3,7,8-TCDD, and SVOCs were low and detected analytes were estimated at concentrations generally below the laboratory reporting limit (except deildrin and endosulfan I). None of the PCB Aroclors or TBT was detected in either the top or the bottom DU.</p> <p>For Dredging Area 5, none of the detected concentrations exceeded the Virginia exclusionary criteria.</p> <p>The conductivity of the soils was 0.9 (top) and 17.8 (bottom) mmhos/cm, the potential acidity was 7.4 (top) and 8.5 (bottom) tons cce/kT, and the neutralization potential was 13.1 (top) and 7.8 (bottom) tons cce/kT.</p> <p>Additional analytical testing, including the paint filter test, EOX, BTEX, and the TCLP, was conducted to evaluate other upland placement options. Results indicated that the samples did not pass through the paint filter, that the samples were not flammable, and that the soil pH was within the expected range (8.1 and 8.2). Sulfide was detected in the bottom DU at 30 mg/kg. EOX, cyanide, and the BTEX compounds were not detected in either the top or the bottom DU.</p> <p>For TCLPs of the 38 chemical constituents tested, only six-arsenic, barium, cadmium, chromium, lead, and selenium-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from Dredging Area 5. The concentrations of the detected chemical constituents were compared to the maximum concentrations of</p>	<p>side of the project footprint. Area 5 was divided into two DUs for testing:</p> <p>5T: The exposed area above MLW (4,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (7,000 cy) were combined into one DU, comprising a total of 11,000 cy.</p> <p>5B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 14,500 cy of dredged material.</p>	

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		<p>contaminants for toxicity characteristics (40 CFR 261.24). Concentrations of detected constituents were well below the toxicity characteristic criteria. The results also indicate that the materials were not corrosive or ignitable and, therefore, the sediments from the top and bottom of DUs would not be considered a hazardous waste per USEPA criteria.</p>		
2-38	Cut/Cover and Boat Sections Material - Shirley Plantation Testing	<p>Results of the grain size analysis indicated that the samples from the Cut/Cover and Boat sections on both the Portsmouth and Norfolk sides were comprised primarily of sand, ranging from approximately 60 to 75 percent.</p> <p>The conductivity of the soils ranged from 2.6 to 8.2 mmhos/cm, with soil pH ranging from 4.4 to 7.4. While three of the four samples measured had pHs within the expected neutral range for soils, the lowest pH was acidic (4.4) and was measured in the sample from the Cut/Cover Section on the Portsmouth side. The potential acidity of the samples on the Portsmouth side was 5.7 and 5.9 tons cce/kT, while on the Norfolk side the results were variable (11.1 and 1.3 tons cce/kT).</p> <p>For metals, concentrations were highest in the samples from the Boat Section on the Portsmouth side for the majority of the tested metals, including, aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, iron, mercury, nickel, silver, thallium, and vanadium. On both the Portsmouth and the Norfolk sides of the project area, concentrations were generally higher in the Boat Section for the heavier metals, notably copper, lead, and zinc.</p> <p>The TPH-DRO concentrations were elevated, with concentrations of 160 and 770 • g/kg in the samples from the Portsmouth side, and concentrations of 52 and 2,700 • g/kg in the samples from the Norfolk side. The highest concentration of TPH-DRO was detected in the Boat Section sample on the Norfolk side of the project area.</p> <p>Concentrations of PAHs were also elevated in the Cut/Cover and Boat sections on the Portsmouth side of the project area, and in the Boat Section on the Norfolk side of the project area. On the Portsmouth side of the project area, the total PAH concentration in the Cut/Cover Section was 631,308 • g/kg, and in the Boat Section the total PAH concentration was 65,070 • g/kg. On the Norfolk side of the project area, the total PAH in the Cut/Cover Section was 23.9 • g/kg, and in the Boat Section the total PAH</p>	<p>New Midtown Tunnel: Cut/Cover and Boat Sections</p> <p>Cut/Cover and Boat Sections represent the upland areas that will be excavated to build the tunnel approaches.</p>	<p>Exhibit Q Figure 3: New MTT Dredging Areas</p>

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		<p>concentration was 276,709 • g/kg. In addition to the elevated total PAH concentrations, five PAHs had concentrations that substantially exceeded the Virginia exclusionary criteria-benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.</p> <p>PCB Aroclors were not detected in the samples from the Portsmouth side. On the Norfolk side, Aroclor 1260 and 1242 were each detected. The total Aroclor concentrations for samples from the Norfolk side (60 and 126 • g/kg) were well below the Virginia exclusionary criteria value of 25,200 • g/kg. Total PCB congener concentrations were higher in the Boat Section samples on both the Portsmouth and Norfolk sides (by factors of 7 and 4, respectively).</p> <p>The dioxin congener 2,3,7,8-TCDD was only detected at one location-the Boat Section sample on the Portsmouth side. TBT was not detected in any of the locations in the Cut/Cover or Boat section on either side of the project area.</p> <p>On the Portsmouth side, 4'4'-dichloro-diphenyl-dichloroethane (DDD) was detected in the samples from both the Cut/Cover and Boat sections, and 4'4'-DDT was also detected in the sample from the Boat Section. Total DDT concentrations on the Portsmouth side were 7.4 • g/kg in the Cut/Cover Section and 24.4 • g/kg in the Boat Section. On the Norfolk side, 4'4'-DDT was detected in the samples from both the Cut/Cover and Boat sections, and 4'4'-dichloro-diphenyl-dichloroethylene (DDE) and 4'4'-DDD were also detected in the sample from the Boat Section. The total DDT concentration on the Norfolk side was 3.05 • g/kg in the Cut/Cover Section and 21.3 • g/kg in the Boat Section.</p> <p>Several other chlorinated pesticides were detected at elevated concentrations. On the Portsmouth side, elevated concentrations of gamma-beta-hexachlorocyclohexane (BHC) were detected in the sample from the Cut/Cover Section. In the sample from the Boat Section, gamma-BHC, endrin, and chlordane (alpha and gamma) were detected at elevated concentrations. On the Norfolk side, elevated concentrations of dieldrin were detected in the sample from the Cut/Cover Section. In the sample from the Boat Section, gamma-BHC and endrin were detected at elevated concentrations.</p>		

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		<p>The chlorinated pesticides detected in the Cut/Cover and Boat sections were each manufactured and used in commercial applications throughout the United States. DDT and DDD were both historically used as pesticides (Agency for Toxic Substances and Disease Registry [ATSDR] 2002/2008), and endrin is a persistent pesticide that does not breakdown readily in the environment (ATSDR 1996). Dieldrin was widely used as an insecticide (ATSDR 2002), and chlordane is a manufactured chemical that was used as a pesticide in the United States from 1948 to 1988 (ATSDR 1994). Gamma-BHC (lindane), which is comprised of greater than 99 percent gamma-BHC, was manufactured and used extensively as a commercial pesticide (ATSDR 2005). Because of the toxic effects of these pesticides, use of several (DDE, DDD, DDT, chlordane, dieldrin, and endrin) was banned by the USEPA.</p> <p>Concentrations of SVOCs were generally low, with detected concentrations below the laboratory reporting limit. However, carbazole and dibenzofuran were detected at three locations (both samples on the Portsmouth side, and the Boat Section on the Norfolk side). Concentrations of carbazole ranged from 390 to 6,900 • g/kg, and dibenzofuran concentrations ranged from 950 to 8,200 • g/kg. Neither of these two SVOCs have Virginia exclusionary criteria.</p> <p>Additional analytical testing, including the paint filter test, EOX, BTEX, and the TCLP, was conducted to evaluate other upland placement options. Results indicated that the samples did not pass through the paint filter, that the samples were not flammable, and that soil pH was circumneutral (ranging from 7.6 to 8.3) at three of the four locations and slightly acidic (5.4) in the sample from the Cut/Cover Section on the Portsmouth side. EOX and most of the BTEX were not detected. Each of the BTEX, including toluene and xylenes, were detected in one sample – the sample from the Boat Section on the Norfolk side. The Boat Section on the Portsmouth side was the only sample in which cyanide and sulfide were detected at concentrations above the reporting limit.</p> <p>For TCLP, of the 38 chemical constituents tested, only six-arsenic, barium, cadmium, chromium, lead, and selenium-were detected at low concentrations below the laboratory reporting limit in the Midtown Tunnel leachate from the Cut/Cover and Boat sections. The concentrations of the</p>		

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		<p>detected chemical constituents were compared to the maximum concentrations of contaminants for toxicity characteristics (40 CFR 261.24). In one sample (the Boat Section on the Portsmouth side), the lead concentration exceeded the TCLP screening criteria by a factor of 2.7. Concentrations of detected constituents were well below the toxicity characteristic criteria of 100 mg/L for barium; 5 mg/L for arsenic and chromium; and 1 mg/L for cadmium and selenium. The results also indicate that the materials were not corrosive or ignitable and, therefore, the soils from the Norfolk side and from the Cut/Cover Section on the Portsmouth side would not be considered a hazardous waste as per USEPA criteria. For the soils from the Boat Section on the Portsmouth side, coordination with Virginia Department of Environmental Quality (VDEQ) will be required to determine the suitability of the dredged material for upland placement.</p> <p>For the Cut/Cover and Boat sections, several of the tested constituents were detected at elevated concentrations, and concentrations of five PAHs exceeded the Virginia exclusionary criteria.</p>		
2-39	Dredging Area 1 Material - Ocean Dredged Material Disposal Site (ODMDS) Testing - Sediment Results	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 1 was comprised primarily of silt+clay (69 percent), similar to the grain size at the of the deep sediment sample from the Willoughby Bank reference site (82.4 percent). The ammonia concentration for the sediment from Dredging Area 1 was 74.2 milligrams per kilogram (mg/kg) and Total Organic Carbon (TOC) was 1.03 percent.</p> <p>Metals were detected in the sediment sample from the bottom of Dredging Unit 1 at low concentrations similar to the metal concentrations detected in the surficial sediment sample from the Willoughby Bank reference site. None of the metals detected in Dredging Area 1 exceeded the Threshold Effects Level (TEL) or Probable Effects Level (PEL) values. Additionally, the Simultaneously Extracted Metals (SEM)/ Acid Volatile Sulfides (AVS) ratio for Dredging Area 1 was less than 1, indicating that the six simultaneously extracted metals included in the analysis are not likely to be bioavailable to aquatic organisms.</p> <p>Total PAHs (Not Detected [ND]=½Method Detection Limit [MDL]) in the sediment from Dredging Area 1 were 95.7 micrograms per kilogram (µg/kg), slightly lower than the total PAH concentration in the surficial sediment sample from the Willoughby Bank reference site. HMW PAHs</p>	<p>New Midtown Tunnel: Dredging Area 1</p> <p>Area 1 represents the SOE area along the Portsmouth side of the project footprint. This area requires removal of approximately 335,000 cy of material. Area 1 was divided into two Dredging Units (DUs) for testing:</p> <p>1T: The exposed area above MLW</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>comprised the majority (81 percent) of the total PAH concentration. HMW PAHs tend to be less water soluble and less volatile than LMW PAHs, and therefore, the HMW PAHs are likely to bind to sediment particles, be deposited, and take longer to degrade. The total PAH (ND=½MDL) concentration was substantially lower than the TEL value (1,684 • g/kg).</p> <p>None of the PCB congeners, organophosphorus pesticides, or TBT was detected in the sediment from the bottom of Dredging Area 1. Chlorinated pesticides, dioxins and furans, and SVOCs were low and detected analytes were estimated at concentrations generally below the laboratory reporting limit. One chlorinated pesticide (gamma-BHC) was detected at a concentration that exceeded the TEL (0.32 • g/kg) by a factor of 1.25. However, the gamma-BHC concentration in Dredging Area 1 was lower than the gamma-BHC concentration in the surficial sediment sample from the Willoughby Bank reference site. The dioxin Toxicity Equivalency Quotient (TEQ) (ND=½ Reporting Limit [RL]) was 0.697 nanograms per kilogram (ng/kg).</p>	<p>(52,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (65,000 cy) were combined into one DU, comprising a total of 117,000 cy.</p> <p>1B: The bottom interval (from -10 ft below the sediment surface to the project depth) contains approximately 218,000 cy of dredged material.</p>	
2-40	Dredging Area 1 Material - ODMDS Testing - Standard Elutriate Results	<p>The concentration of ammonia-nitrogen in the Dredging Area 1 standard elutriate was 15.7 milligrams per liter (mg/L). This concentration exceeded the USEPA calculated chronic criterion (3.55 mg/L) by a factor of 4.4. The concentration of Total Kjeldahl Nitrogen (TKN) was 29.8 mg/L and the nitrate-nitrite concentration was 0.21 mg/L. Dissolved organic carbon in the elutriate from Dredging Area 1 was detected at a concentration of 7.6 mg/L, total phosphorus was detected at a concentration of 0.38 mg/L, and total sulfide was detected at a concentration of 0.96 mg/L. Cyanide was not detected in the elutriate from Dredging Area 1.</p> <p>Concentrations of metals in the standard elutriate from Dredging Area 1 were generally similar to the concentrations in the site water sample, but were higher than the concentrations in the site water sample in a few cases. Of the 24 tested metals, 20 metals were detected in the standard elutriate from Dredging Area 1 (beryllium, mercury, selenium, and silver were not detected). One of the detected metals (lead) exceeded the USEPA saltwater chronic water quality criterion (8.1 • g/L) by a factor of 1.9. None of the other metal concentrations exceeded the USEPA acute or chronic water quality criteria for the protection of aquatic life.</p>	<p>New Midtown Tunnel: Dredging Area 1</p> <p>Area 1 represents the SOE area along the Portsmouth side of the project footprint. This area requires removal of approximately 335,000 cy of material. Area 1 was divided into two Dredging Units (DUs) for testing:</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>Ten out of the 18 individual PAHs were detected in the standard elutriate, and the majority of the detected PAHs were detected at concentrations estimated below the reporting limit. The total PAH concentration (ND=½MDL) in the standard elutriate was 0.829 • g/L. The total LMW PAH (ND=½MDL) concentration in the standard elutriate was 0.620 • g/L and the total HMW PAH (ND=½MDL) concentration in the standard elutriate was 0.209 • g/L.</p> <p>None of the PCB congeners, chlorinated pesticides or organophosphorus pesticides were detected in the elutriate from Dredging Area 1. Dioxins and furans and SVOCs were low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit. The most toxic dioxin congener, 2,3,7,8-TCDD, was not detected in the standard elutriate from Dredging Area 1. The dioxin TEQ (ND=½RL) was 62.0 picograms per liter (pg/L). TBT was not detected in the standard elutriate sample from Dredging Area 1.</p>	<p>1T: The exposed area above MLW (52,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (65,000 cy) were combined into one DU, comprising a total of 117,000 cy.</p> <p>1B: The bottom interval (from -10 ft below the sediment surface to the project depth) contains approximately 218,000 cy of dredged material.</p>	
2-41	Dredging Area 1 Material - ODMDS Testing - Short-Term Fate and Effects (STFATE) Modeling and Limiting Permissible Concentration (LPC) Compliance	For the bottom of Dredging Unit 1, ammonia was the constituent that had the greatest potential to be released into the water column at elevated concentrations during open water placement. Ammonia concentrations indicated that a 4.4-fold dilution within 4 hours after placement of sediment at the ODMDS would be required to meet the LPC. Results of STFATE modeling indicated that within 4 hours following placement at the Norfolk ODMDS, the leading edge of the plume would stay within the boundary of the Norfolk ODMDS, and a 433-fold dilution would occur, which would be sufficient to achieve the dilution required to meet the acute and chronic water quality criteria for ammonia (and the acute and chronic water quality criteria for the other exceeding constituents). Therefore, the chemical constituents detected in the standard elutriate from the bottom of Dredging Unit 1 meet the LPC for water quality criteria.	<p>New Midtown Tunnel: Dredging Area 1</p> <p>Area 1 represents the SOE area along the Portsmouth side of the project footprint. This area requires removal of approximately 335,000 cy of material. Area 1 was divided into two Dredging Units (DUs) for</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
			<p>testing:</p> <p>1T: The exposed area above MLW (52,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (65,000 cy) were combined into one DU, comprising a total of 117,000 cy.</p> <p>1B: The bottom interval (from -10 ft below the sediment surface to the project depth) contains approximately 218,000 cy of dredged material.</p>	
2-42	Dredging Area 2 Material - ODMDS Testing - Sediment Results	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 2 was comprised primarily of silt+clay in both the top and the bottom DUs (76 and 82 percent, respectively), similar to the grain size in the deep sediment sample from the Willoughby Bank reference site (82.4 percent). TOC concentration was similar in both the top and bottom DUs (1.36 and 1.15 percent, respectively). However, in general, the concentrations of detected analytes were substantially elevated in the top DU compared to concentrations in the bottom DU.</p> <p>For metals, concentrations of copper, lead, mercury, silver, tin, and zinc in the top DU were substantially higher than concentrations in the bottom DU (by factors of 8, 7, 18, 9, 4, and 5, respectively) and in the surficial sediment sample from the Willoughby Bank reference site. For each of these six metals, the highest concentrations detected within the dredging footprint were detected in the sample from the top portion of Dredging</p>	<p>New Midtown Tunnel: Dredging Area 2</p> <p>Area 2 represents the in-water area extending from the Portsmouth side to the top slope of the Federal navigation channel. Area 2 was divided into two DUs for testing:</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
		<p>Area 2. In the top DU, six metals had concentrations that exceeded the TEL values (arsenic, cadmium, copper, lead, mercury, and zinc), but none of these concentrations exceeded the PEL values. In the bottom DU, none of the metal concentrations exceeded the TEL or PEL values. The Simultaneously Extracted Metals / Acid Volatile Sulfides (SEM/AVS) ratios for Dredging Area 2 were greater than 1 in the top and bottom DUs, indicating that the six simultaneously extracted metals detected in the analysis have the potential to be bioavailable to aquatic organisms.</p> <p>For total PCBs and total PAHs (ND=½MDL), concentrations detected in the top DU were the highest concentrations, by far, detected within the dredging footprint (4.6 times greater than any other sample for total PCBs and 8.5 greater than any other sample for total PAHs). Concentrations of total PCBs and total PAHs in the top DU (90 and 45,360 • g/kg, respectively) were substantially greater than concentrations in the bottom DU (18.5 and 1,232 • g/kg, respectively), and substantially higher than concentrations in the surficial sediment sample from the Willoughby Bank reference site (2.65 and 149 • g/kg, respectively).</p> <p>In the top DU, PAH concentrations were elevated, with 13 individual PAHs and the total PAH concentrations exceeding the PEL values. The total PAH concentration in the top DU exceeded the PEL (16,770 • g/kg) by a factor of 2.7. Total PCB concentrations in the top DU were also elevated, with a concentration (89.8 • g/kg) that exceeded the TEL value (21.6 • g/kg) by a factor of 4.2. PAH concentrations in the bottom DU were also elevated, with eight individual PAHs exceeding the TEL values; however, neither the total PAH concentration nor the total PCB concentration in the bottom DU exceeded TEL values.</p> <p>None of the organophosphorus pesticides or TBT was detected in either of the DUs in Dredging Area 2. Chlorinated pesticides, dioxins and furans, and SVOCs were generally low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit (except for gamma-BHC in the top DU). In the top DU, two chlorinated pesticides (4,4'-DDT and gamma-BHC) and one SVOC [bis(2-ethylhexyl)phthalate] were detected at concentrations that exceeded the TEL values (1.19 • g/kg, 0.32 • g/kg, and 182 • g/kg, respectively). Gamma-BHC in the top DU exceeded the PEL value (0.99 • g/kg) by a factor of 11 and was substantially higher than the concentration detected in the surficial</p>	<p>2T: The top interval (0 to -10 ft below the sediment surface) has a total of 75,000 cy of dredged material.</p> <p>2B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 192,000 cy of dredged material.</p>	

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		<p>sediment sample from the Willoughby Bank reference site. In the bottom DU, one chlorinated pesticide (gamma-BHC) exceeded the TEL value (0.32 • g/kg).</p>		
2-43	Dredging Area 2 Material - ODMDS Testing - Standard Elutriate Results	<p>The concentration of ammonia-nitrogen in the Dredging Area 2 standard elutriates was 24.2 mg/L (top) and 28.2 (bottom). These concentrations exceeded the USEPA calculated chronic criterion (3.55 mg/L) and acute criterion (23.6 mg/L). The concentration of TKN was 24.8 mg/L (top) and 24.2 mg/L (bottom), and the nitrate-nitrite concentration was 0.16 mg/L (top) and 0.19 mg/L (bottom). Dissolved organic carbon in the elutriate from Dredging Area 2 was detected at a concentration of 7 mg/L (top) and 10 mg/L (bottom), total phosphorus was detected at a concentration of 0.071 mg/L (top) and 0.18 mg/L (bottom), and total sulfide was detected at a concentration of 1.1 mg/L (top) and 0.64 mg/L (bottom). Cyanide was detected at a concentration of 1.6 • g/L in the elutriates from the top DU and the bottom DU from Dredging Area 2.</p> <p>Concentrations of metals in the standard elutriates from Dredging Area 2 were generally similar to the concentrations in the site water sample, but were higher than the concentrations in the site water sample in a few cases. Of the 24 tested metals, 17 metals were detected in the standard elutriates from Dredging Area 2 (aluminum, beryllium, cadmium, mercury, silver, thallium, and tin were not detected). None of the metals exceeded the USEPA saltwater acute or chronic water quality criteria.</p> <p>Ten out of the 18 individual PAHs were detected in the standard elutriates for Dredging Area 2, and the majority of the detected PAHs were detected at concentrations estimated below the reporting limit. The total PAH concentration (ND=½MDL) in the standard elutriates was 20.8 • g/L (top) and 3.44 • g/L (bottom). The total LMW PAH (ND=½MDL) concentration in the standard elutriates was 17.7 • g/L (top) and 3.02 • g/L (bottom) and the total HMW PAH (ND=½MDL) concentration in the standard elutriates was 3.17 • g/L (top) and 0.424 • g/L (bottom).</p> <p>Twenty (20) individual PCBs were detected in the standard elutriate sample from the top DU and nine individual PCBs were detected in the standard elutriate sample from the bottom DU in Dredging Area 2. The total PCB concentration (ND=½MDL) in the standard elutriates was 122 ng/L (top) and 22.8 ng/L (bottom). The total PCB concentration in the top DU exceeded the USEPA chronic water quality criterion (30 ng/L) by a</p>	<p>New Midtown Tunnel: Dredging Area 2</p> <p>Area 2 represents the in-water area extending from the Portsmouth side to the top slope of the Federal navigation channel. Area 2 was divided into two DUs for testing:</p> <p>2T: The top interval (0 to -10 ft below the sediment surface) has a total of 75,000 cy of dredged material.</p> <p>2B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 192,000 cy of dredged material.</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>factor of 4.1.</p> <p>None of the chlorinated pesticides or organophosphorus pesticides were detected in the elutriates from Dredging Area 2. Dioxins and furans and SVOCs were low and detected analytes were estimated at concentrations generally below the laboratory reporting limit. The most toxic dioxin congener, 2,3,7,8-TCDD, was not detected in the standard elutriates from Dredging Area 2. The dioxin TEQ (ND=½RL) was 65.4 pg/L (top) and 56.2 pg/L (bottom) (Table 22). TBT was not detected in the standard elutriates from Dredging Area 2.</p>		
2-44	Dredging Area 2 Material - ODMDS Testing - STFATE Modeling and LPC Compliance	<p>For Dredging Area 2, ammonia was the constituent that had the greatest potential to be released into the water column at elevated concentrations during open water placement. Ammonia concentrations indicated that a maximum 7.9-fold dilution within 4 hours after placement of sediment at the ODMDS would be required to meet the LPC. Results of STFATE modeling indicated that within 4 hours following placement at the Norfolk ODMDS, the leading edge of the plume would stay within the boundary of the Norfolk ODMDS, and a 433-fold dilution would occur, which would be sufficient to achieve the dilution required to meet the acute and chronic water quality criteria for ammonia (and the acute and chronic water quality criteria for the other exceeding constituents). Therefore, the chemical constituents detected in the standard elutriate from Dredging Unit 2 meet the LPC for water quality criteria.</p>	<p>New Midtown Tunnel: Dredging Area 2</p> <p>Area 2 represents the in-water area extending from the Portsmouth side to the top slope of the Federal navigation channel. Area 2 was divided into two DUs for testing:</p> <p>2T: The top interval (0 to -10 ft below the sediment surface) has a total of 75,000 cy of dredged material.</p> <p>2B: The bottom interval (from -10 ft below the sediment surface to the project</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
			depth) has a total of 192,000 cy of dredged material.	
2-45	Dredging Area 3 Material - ODMDS Testing - Sediment Results	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 3 was comprised primarily of silt+clay in the top DU (88 and 86.5 percent), while the bottom DU had a greater proportion of sand (44.1 and 51.8 percent). The grain size in the top DU in Area 3 was similar to the grain size in the deep sediment sample from the Willoughby Bank reference site (silt+clay of 82.4 percent), while the grain size in the bottom DU in Area 3 had a higher proportion of sand, more similar to the grain size in the surficial sediment sample from the Willoughby Bank reference site. The TOC concentrations were similar in the top and bottom DUs, with concentrations of 2.02 and 1.5 percent in the top DU and 1.64 and 0.509 percent in the bottom DU.</p> <p>For metals, concentrations between the top and bottom DUs were similar, although the concentrations of copper, lead, and zinc were higher (by factors ranging from 1.8 to 4.3) in the top DU compared to concentrations in the bottom DU. Other metals, such as aluminum, arsenic, beryllium, cadmium, chromium, cobalt, iron, manganese, nickel, selenium, silver, thallium, and tin also had higher concentrations in the top DU. Two metals (arsenic and nickel) had concentrations that exceeded TEL values in the top DU. The SEM/AVS ratios for the bottom DU of Dredging Area 3 was less than 1, indicating that the six simultaneously extracted metals included in the analysis are not likely to be bioavailable to aquatic organisms. One of the SEM/AVS ratios for the top DU of Dredging Area 3 was greater than one, indicating that the six simultaneously extracted metals included in the analysis have the potential to be bioavailable to aquatic organisms</p> <p>For total PAHs, concentrations in the top DU (101 and 393 • g/kg) were substantially higher than concentrations in the bottom DU (12.0 and 19.5 • g/kg). In the top DU, concentrations of the HMW PAHs comprised the majority (87 and 90 percent) of the total PAH concentration. HMW PAHs tend to be less water soluble and less volatile than LMW PAHs, and therefore, if PAHs enter the aquatic environment, the HMW PAHs are likely to bind to sediment particles, be deposited, and take longer to degrade. One individual PAH [dibenzo(a,h)anthracene] exceeded the TEL (6.22 • g/kg) by a factor of 10.2 in one of the samples from the top DU, but</p>	<p>New Midtown Tunnel: Dredging Area 3</p> <p>Area 3 represents the in-water area extending across the Federal navigation channel. Area 3 was divided into two DUs for testing:</p> <p>3T: The top interval (0 to -10 ft below the sediment surface) has a total of 148,000 cy of dredged material.</p> <p>3B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 290,000 cy of dredged material.</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>total PAH concentrations did not exceed TEL values in either the top or bottom DU.</p> <p>None of the organophosphorus pesticides or TBT was detected in either of the DUs in Dredging Area 3. PCBs congeners, total PCB concentrations, chlorinated pesticides (including total DDT), dioxins and furans (including the dioxin TEQs), and SVOCs were low, with analytes detected at concentrations estimated below the laboratory reporting limit. One chlorinated pesticide (gamma-BHC) was detected at concentrations that exceeded the TEL value (0.32 • g/kg) in three of the samples from Dredging Area 3 (two samples from the top DU and one from the bottom DU); however, gamma-BHC concentrations were similar to concentrations detected at the Willoughby Bank reference site.</p>		
2-46	Dredging Area 3 Material - ODMDS Testing - Standard Elutriate Results	<p>The concentrations of ammonia-nitrogen in the Dredging Area 3 standard elutriates were 18.4 and 17.7 mg/L (top) and 10.6 and 16.3 (bottom). These concentrations exceeded the USEPA calculated chronic criterion (3.55 mg/L) by factors ranging from 3 to 5.2. The concentrations of TKN were 18 and 16.3 mg/L (top) and 11.3 and 16.3 mg/L (bottom), and the nitrate-nitrite concentrations were 0.16 and 0.17 mg/L (top) and 0.23 and 0.17 mg/L (bottom). Dissolved organic carbon in the elutriates from Dredging Area 3 was detected at concentrations of 10 and 8.1 mg/L (top) and 4.3 and 2.8 mg/L (bottom), total phosphorus was detected at concentrations of 0.17 and 0.25 mg/L (top) and 0.042 mg/L (bottom), and total sulfide was detected at concentrations of 0.8 mg/L (top) and 1.6 mg/L (bottom). Cyanide was not detected in the elutriates from Dredging Area 3.</p> <p>Concentrations of metals in the standard elutriates from Dredging Area 3 were generally similar to the concentrations in the site water sample, but were higher than the concentrations in the site water sample in a few cases. Among the four elutriates, concentrations of metals were similar but generally slightly higher in the elutriates created from the top DU. Of the 24 tested metals, 18 metals were detected in the standard elutriates from Dredging Area 3 (aluminum, beryllium, cadmium, mercury, selenium, and silver, were not detected). None of the metals exceeded the USEPA saltwater acute or chronic water quality criteria.</p> <p>Seven out of the 18 individual PAHs were detected in the standard elutriates for Dredging Area 3, and the majority of the detected PAHs were detected at concentrations estimated below the reporting limit. The total</p>	<p>New Midtown Tunnel: Dredging Area 3</p> <p>Area 3 represents the in-water area extending across the Federal navigation channel. Area 3 was divided into two DUs for testing:</p> <p>3T: The top interval (0 to -10 ft below the sediment surface) has a total of 148,000 cy of dredged material.</p> <p>3B: The bottom interval (from -10 ft below the sediment surface</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>PAH concentrations (ND=½MDL) in the standard elutriates were 0.0.577 and 0.407 • g/L (top) and 0.512 and 1.44 • g/L (bottom). The total LMW PAH (ND=½MDL) concentrations in the standard elutriates were 0.421 and 0.252 • g/L (top) and 0.295 and 1.20 • g/L (bottom), and the total HMW PAH (ND=½MDL) concentrations in the standard elutriates were 0.156 • g/L (top) and 0.217 and 0.242 • g/L (bottom).</p> <p>Eight individual PCBs were detected in the standard elutriate samples from the top DU and four individual PCBs were detected in the standard elutriate samples from the bottom DU in Dredging Area 3. The total PCB concentrations (ND=½MDL) in the standard elutriates were 8.57 and 19.3 ng/L (top) and 7.5 and 9.84 ng/L (bottom). None of the total PCB concentrations exceeded the USEPA chronic water quality criterion (30 ng/L).</p> <p>None of the organophosphorus pesticides were detected in the elutriates from Dredging Area 3. Only one chlorinated pesticide (beta-BHC) was detected in one of the elutriates from the bottom DU. Dioxins and furans and SVOC concentration were low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit. The most toxic dioxin congener, 2,3,7,8-TCDD, was not detected in the standard elutriates from Dredging Area 3. The dioxin TEQs (ND=½RL) were 70.4 and 58.9 pg/L (top) and 54.5 pg/L (top and bottom). TBT was not detected in the standard elutriates from Dredging Area 3.</p>	<p>to the project depth) has a total of 290,000 cy of dredged material.</p>	
2-47	Dredging Area 3 Material - ODMDS Testing - STFATE Modeling and LPC Compliance	<p>For Dredging Unit 3, ammonia was the constituent that had the greatest potential to be released into the water column at elevated concentrations during open water placement. Ammonia concentrations indicated that a 5.2-fold dilution within 4 hours after placement of sediment at the ODMDS would be required to meet the LPC. Results of STFATE modeling indicated that within 4 hours following placement at the Norfolk ODMDS, the leading edge of the plume would stay within the boundary of the Norfolk ODMDS, and a 433-fold dilution would occur, which would be sufficient to achieve the dilution required to meet the acute and chronic water quality criteria for ammonia (and the acute and chronic water quality criteria for the other exceeding constituents). Therefore, the chemical constituents detected in the standard elutriate Dredging Unit 3 meet the LPC for water quality criteria.</p>	<p>New Midtown Tunnel: Dredging Area 3</p> <p>Area 3 represents the in-water area extending across the Federal navigation channel. Area 3 was divided into two DUs for testing:</p> <p>3T: The top</p>	<p>Exhibit Q Figure 3: New MTT Dredging Areas</p>

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			<p>interval (0 to -10 ft below the sediment surface) has a total of 148,000 cy of dredged material.</p> <p>3B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 290,000 cy of dredged material.</p>	
2-48	Dredging Area 4 Material - ODMDS Testing - Sediment Results	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 4 was comprised primarily of silt+clay in both the top and the bottom DUs (55 percent or greater), with location MTT-4BP was comprised of 90.8 percent silt+clay. The TOC concentrations were similar in both DUs, with 0.873 and 1.19 percent in the top DU, and 1.06 and 0.605 percent in the bottom DU. Generally, concentrations of detected analytes were comparable between the top and bottom DUs in Dredging Area 4.</p> <p>For metals, concentrations between the top and bottom DUs were generally comparable. Two metals (arsenic and nickel) had concentrations that exceeded the TEL values. Arsenic slightly exceeded the TEL value (7.24 mg/kg) for one of the top DU samples and one of the bottom DU samples (by factors of 1.2 and 1.4, respectively), and nickel slightly exceeded the TEL value (15.9 mg/kg) for one of the bottom DU samples (by a factor of 1.2). None of the metals exceeded the PEL values. The SEM/AVS ratio for Dredging Area 4 was less than 1, indicating that the six simultaneously extracted metals included in the analysis are not likely to be bioavailable to aquatic organisms.</p> <p>For total PAHs (ND=½MDL), the concentration in one sample from the top DU (403 •g/kg) was higher than concentrations detected in the other samples (one top and two bottom) from Dredging Area 4 (15.1 to 27.8 •g/kg) (Table 12). Similar to the other dredging areas, the HMW PAHs</p>	<p>New Midtown Tunnel: Dredging Area 4</p> <p>Area 4 represents the in-water area extending from the Norfolk side to the top slope of the Federal navigation channel. Area 4 was divided into two DUs for testing:</p> <p>4T: The top interval (0 to -10 ft below the sediment surface) has a total of 154,000 cy of dredged material.</p> <p>4B: The bottom</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>comprised the majority (94 percent) of the total PAH concentration, and one PAH [dibenzo(a,h)anthracene] exceeded the TEL (6.22 • g/kg) by a factor of 9.2 in one of the samples from the top DU. Total PAH concentrations were generally low, generally comparable to the reference site concentrations, and none of the total PAH concentrations exceeded the TEL values.</p> <p>None of the organophosphorus pesticides or TBT was detected in either of the DUs in Dredging Area 4. PCB congeners, total PCBs, chlorinated pesticides (including total DDT), dioxin and furan congeners, and SVOCs were low and detected analytes were found at concentrations generally below the laboratory reporting limit. One of the chlorinated pesticides (gamma-BHC) was detected at concentrations that exceeded the TEL value (0.32 • g/kg) at one of the top DU samples and both of the bottom DU samples; however, with the exception of one sample in the bottom DU, gamma-BHC concentrations were similar to concentrations detected at the Willoughby Bank reference site. At location MTT-4BN, gamma-BHC was detected at a concentration that slightly exceeded the PEL value (0.99 • g/kg) by a factor of 1.1.</p>	<p>interval (from -10 ft below the sediment surface to the project depth) has a total of 368,000 cy of dredged material.</p>	
2-49	Dredging Area 4 Material - ODMDS Testing - Standard Elutriate Results	<p>The concentrations of ammonia-nitrogen in the Dredging Area 4 standard elutriates were 11.2 and 8.4 mg/L (top) and 17.6 and 11.7 mg/L (bottom). These concentrations exceeded the USEPA calculated chronic criterion (3.55 mg/L) by factors ranging from 2.4 to 5. The concentrations of TKN were 11.3 and 10.7 mg/L (top) and 16.9 and 10.7 mg/L (bottom), and the nitrate-nitrite concentrations were 0.18 mg/L (top) and 0.2 and 0.19 mg/L (bottom). Dissolved organic carbon in the elutriates from Dredging Area 4 was detected at concentrations of 7.3 and 7.6 mg/L (top) and 9.2 and 6.2 mg/L (bottom), total phosphorus was detected at concentrations of 0.14 and 1.2 mg/L (top) and 0.72 and 0.65 mg/L (bottom), and total sulfide was detected at concentrations of 0.72 mg/L (top) and 0.88 and 0.72 mg/L (bottom). Cyanide was not detected in the elutriates from Dredging Area 4.</p> <p>Concentrations of metals in the standard elutriates from Dredging Area 4 were higher than the concentrations in the site water sample in a few cases. Among the four elutriates, concentrations of metals were similar but generally slightly higher in the elutriates created from the top DU. Of the 24 tested metals, 18 metals were detected in the standard elutriates from Dredging Area 4 (aluminum, beryllium, cadmium, mercury, silver, and thallium were not detected). One of the detected metals (arsenic)</p>	<p>New Midtown Tunnel: Dredging Area 4</p> <p>Area 4 represents the in-water area extending from the Norfolk side to the top slope of the Federal navigation channel. Area 4 was divided into two DUs for testing:</p> <p>4T: The top interval (0 to -10 ft below the sediment surface) has a total of</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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		<p>exceeded the USEPA saltwater chronic water quality criterion (36 • g/L) by a factor of 3.1 and also exceeded the USEPA saltwater acute water quality criterion (69 • g/L) by a factor of 1.6 (Table 18).</p> <p>Eight out of the 18 individual PAHs were detected in the standard elutriates for Dredging Area 4, and the majority of the detected PAHs were detected at concentrations estimated below the reporting limit. The total PAH concentrations (ND=½MDL) in the standard elutriates were 1.90 and 1.91 • g/L (top) and 1.35 and 0.484 • g/L (bottom). The total LMW PAH (ND=½ MDL) concentrations in the standard elutriates were 1.48 and 0.844 • g/L (top) and 1.03 and 0.335 • g/L (bottom) and the total HMW PAH (ND=½MDL) concentrations in the standard elutriates were 0.420 and 0.275 • g/L (top) and 0.319 and 0.149 • g/L (bottom).</p> <p>Six individual PCBs were detected in the standard elutriate samples from the top DU and two individual PCBs were detected in the standard elutriate samples from the bottom DU in Dredging Area 4. The total PCB concentrations (ND=½MDL) in the standard elutriates were 29.6 and 8.51 ng/L (top) and 7.5 and 11.7 ng/L (bottom). None of the total PCB concentrations (ND=½DL) exceeded the USEPA chronic water quality criterion (30 ng/L).</p> <p>None of the organophosphorus pesticides were detected in the elutriates from Dredging Area 4. Only one chlorinated pesticide (beta-BHC) was detected in two of the elutriates – one from the top DU and one from the bottom DU. Dioxins and furans and SVOCs were low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit. The most toxic dioxin congener, 2,3,7,8-TCDD, was not detected in the standard elutriates from Dredging Area 4. The dioxin TEQs (ND=½RL) were 52.4 and 56.9 pg/L (top) and 80.7 and 56.9 pg/L (bottom). TBT was not detected in the standard elutriates from Dredging Area 4.</p>	<p>154,000 cy of dredged material.</p> <p>4B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 368,000 cy of dredged material.</p>	
2-50	Dredging Area 4 Material - ODMDS Testing - STFATE Modeling and LPC	For Dredging Unit 4, ammonia was the constituent that had the greatest potential to be released into the water column at elevated concentrations during open water placement. Ammonia concentrations indicated that a 5.0-fold dilution within 4 hours after placement of sediment at the ODMDS would be required to meet the LPC. Results of STFATE modeling indicated that within 4 hours following placement at the Norfolk ODMDS, the leading edge of the plume would stay within the boundary of the Norfolk ODMDS, and a 433-fold dilution would occur, which would be	New Midtown Tunnel: Dredging Area 4  Area 4 represents the in-water area extending from the Norfolk side to the	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
	Compliance	sufficient to achieve the dilution required to meet the acute and chronic water quality criterion for ammonia (and the acute and chronic water quality criteria for the other exceeding constituents). Therefore, the chemical constituents detected in the standard elutriate Dredging Unit 4 meet the LPC for water quality criteria.	<p>top slope of the Federal navigation channel. Area 4 was divided into two DUs for testing:</p> <p>4T: The top interval (0 to -10 ft below the sediment surface) has a total of 154,000 cy of dredged material.</p> <p>4B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 368,000 cy of dredged material.</p>	
2-51	Dredging Area 5 Material - ODMDS Testing - Sediment Results	<p>Results of the grain size analysis indicated that the sediment from Dredging Area 5 was comprised primarily of silt+clay (65 percent), which was similar to the grain size of the deep sediment sample from the Willoughby Bank reference site (82.4 percent). The ammonia concentration for the sediment from Dredging Area 5 was 19.2 mg/kg and TOC concentration was 0.661 percent.</p> <p>Concentrations of detected metals were low, and the lowest metals concentrations in the dredging footprint were detected in the bottom of Dredging Area 5. None of the metals detected in Dredging Area 5 exceeded the TEL values, and the SEM/AVS ratio for Dredging Area 1 was less than 1, indicating that the six simultaneously extracted metals included in the analysis are not likely to be bioavailable to aquatic organisms.</p> <p>One individual PAH [dibenzo(a,h)anthracene] exceeded the TEL (6.22</p>	<p>New Midtown Tunnel: Dredging Area 5</p> <p>Area 5 represents the SOE area along the Norfolk side of the project footprint. Area 5 was divided into two DUs for testing:</p> <p>5T: The exposed area above MLW (4,000 cy) and the</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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Item:	Summary:	Description:	Location:	Reference:
		<p>• g/kg) by a factor of 7.4 in the bottom of Dredging Area 5, but the total PAH concentration was low (192 • g/kg), comparable to the reference site concentrations, and below the TEL value. Concentrations of HMW PAHs comprised the majority (91 percent) of the total PAH concentration.</p> <p>None of the organophosphorus pesticides or TBT was detected in Dredging Area 5. PCB congeners, total PCBs concentrations, chlorinated pesticides (including total DDT), dioxins and furans (including the dioxin TEQ), and SVOCs were low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit. One of the chlorinated pesticides (gamma-BHC) slightly exceeded the TEL value (0.32 • g/kg) by a factor of 1.2; however, the gamma-BHC concentrations detected in the bottom of Dredging Area 5 were similar to concentrations detected at the Willoughby Bank reference site.</p>	<p>depth interval from 0 to -10 ft below the sediment surface (7,000 cy) were combined into one DU, comprising a total of 11,000 cy.</p> <p>5B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 14,500 cy of dredged material.</p>	
2-52	Dredging Area 5 Material - ODMDS Testing - Standard Elutriate Results	<p>The concentration of ammonia-nitrogen in the Dredging Area 5 standard elutriate was 3.4 mg/L. This concentration did not exceed the USEPA calculated acute (23.6 mg/L) or chronic (3.55 mg/L) criterion. The concentration of TKN was 3.9 mg/L, and the nitrate-nitrite concentration was 0.21 mg/L. Dissolved organic carbon in the elutriate from Dredging Area 5 was detected at a concentration of 3.1 mg/L, total phosphorus was detected at a concentration of 0.064 mg/L, and total sulfide was detected at a concentration of 1.8 mg/L. Cyanide was not detected in the elutriate from Dredging Area 5.</p> <p>Concentrations of metals in the standard elutriate from Dredging Area 5 were generally similar to the concentrations in the site water sample. Of the 24 tested metals, 16 metals were detected in the standard elutriate from Dredging Area 5 (aluminum, beryllium, cadmium, mercury, silver, thallium, tin, and vanadium were not detected). None of the metals exceeded the USEPA saltwater acute or chronic water quality criteria.</p> <p>Seven out of the 18 individual PAHs were detected in the standard elutriate, and the majority of the detected PAHs were detected at concentrations estimated below the reporting limit. The total PAH concentration (ND=½MDL) in the standard elutriate was 1.15 • g/L. The total LMW PAH (ND=½MDL) concentration in the standard elutriate was</p>	<p>New Midtown Tunnel: Dredging Area 5</p> <p>Area 5 represents the SOE area along the Norfolk side of the project footprint. Area 5 was divided into two DUs for testing:</p> <p>5T: The exposed area above MLW (4,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (7,000 cy) were combined into one DU,</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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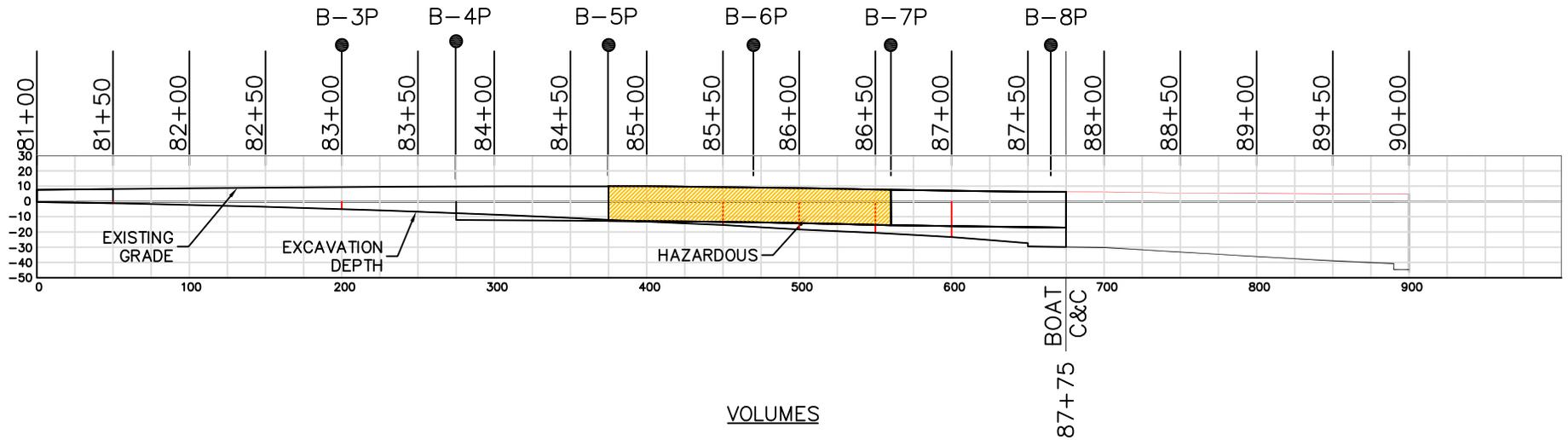
Item:	Summary:	Description:	Location:	Reference:
		<p>0.950 • g/L, and the total HMW PAH (ND=½MDL) concentration in the standard elutriate was 0.198 • g/L.</p> <p>Two of the individual PCBs were detected in the standard elutriate sample from Dredging Area 5. The total PCB concentration (ND=½MDL) in the standard elutriate was 10.9 ng/L, which was below the USEPA chronic water quality criterion (30 ng/L).</p> <p>None of the chlorinated pesticides or organophosphorus pesticides were detected in the elutriate from Dredging Area 5. Dioxins and furans and SVOCs were low, and detected analytes were estimated at concentrations generally below the laboratory reporting limit. The most toxic dioxin congener, 2,3,7,8-TCDD, was not detected in the standard elutriate from Dredging Area 5. The dioxin TEQ (ND=½RL) was 54.5 pg/L. TBT was not detected in the standard elutriate sample from Dredging Area 5.</p>	<p>comprising a total of 11,000 cy.</p> <p>5B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 14,500 cy of dredged material.</p>	
2-53	Dredging Area 5 Material - ODMDS Testing - STFATE Modeling and LPC Compliance	For the bottom of Dredging Unit 5, none of the constituents exceeded the USEPA acute or chronic criteria. Therefore, a dilution of the material is not required to meet the LPC for water quality criteria and the chemical constituents detected in the standard elutriate from the bottom of Dredging Unit 5 meet the LPC for water quality criteria.	<p>New Midtown Tunnel: Dredging Area 5</p> <p>Area 5 represents the SOE area along the Norfolk side of the project footprint. Area 5 was divided into two DUs for testing:</p> <p>5T: The exposed area above MLW (4,000 cy) and the depth interval from 0 to -10 ft below the sediment surface (7,000 cy) were combined into one DU, comprising a total of 11,000 cy.</p>	Exhibit Q Figure 3: New MTT Dredging Areas

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<b>Item:</b>	<b>Summary:</b>	<b>Description:</b>	<b>Location:</b>	<b>Reference:</b>
			5B: The bottom interval (from -10 ft below the sediment surface to the project depth) has a total of 14,500 cy of dredged material.	



PORTSMOUTH BOAT SECTION APPROACH EXCAVATION ONLY  
 4-13-2011 UPDATED SKANSKA EXCAVATION GRADES



VOLUMES

 HAZARDOUS LEAD  
 9,940 CY

- NOTE: 1)WIDTH OF CUT WITHIN BOAT SECTION LIMITS IS APPX. 65' (PER SKANSKA)  
 2)EXISTING GRADE DETERMINED FROM REV 2 PGL PROFILE SHEET  
 3)DATA SHOWN BASED ON FIELD SAMPLING AND REPORTS PROVIDED BY CONLEY ENVIRONMENTAL INC.

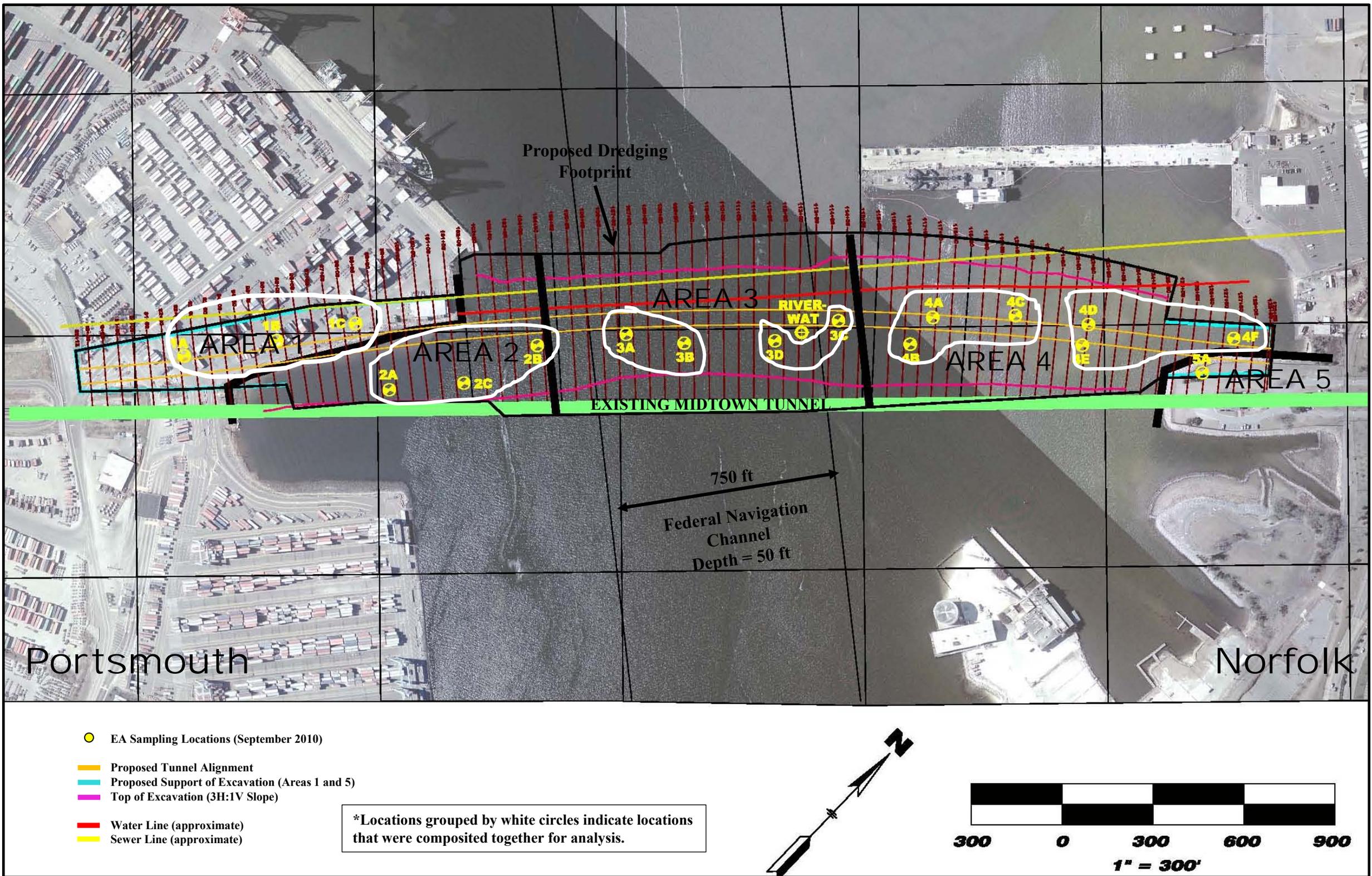


Figure 1. Sampling Locations: Elizabeth River Dredging Footprint, Midtown Tunnel, Virginia