SECOND FIVE-YEAR REVIEW REPORT FOR
ATLANTIC WOOD INDUSTRIES, INC. SUPERFUND SITE
PORTSMOUTH, VIRGINIA

MAY 2020

Prepared by

U.S. Environmental Protection Agency
Region 3
Philadelphia, Pennsylvania

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Paul Leonard, Acting Director **Date**
Superfund and Emergency Management Division
U.S. EPA, Region 3

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LIST OF ABBREVIATIONS AND ACRONYMS

ABM	Abrasive Blast Media
AOC	Administrative Order on Consent
ARRA	American Recovery and Reinvestment Act
AWI	Atlantic Wood Industries, Inc.
BaP	Benzo(a)pyrene
B-IBI	Benthic Index of Biotic Integrity
CA	Containment Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIC	Community Involvement Coordinator
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
FYR	Five-Year Review
IC	Institutional Control
ISS	In-situ Soil Stabilization
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
NCP	National Contingency Plan
NNSY	Norfolk Naval Shipyard
NPL	National Priorities List
O&M	Operation and Maintenance
OPW	Offshore Pile Wall
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCP	Pentachlorophenol
PPSD	Portsmouth Public School District
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SNJB	South Norfolk Jordan Bridge
TEQ	Toxicity Equivalents
tPAH	Total Polycyclic Aromatic Hydrocarbons
USACE	U.S. Army Corps of Engineers
UU/UE	Unlimited Use and Unrestricted Exposure
VDEQ	Virginia Department of Environmental Quality

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR Reports such as this one. In addition, FYR Reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, 42 U.S.C § 9621, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) 300.430(f)(4)(ii)) and considering EPA policy.

This is the second FYR for the Atlantic Wood Industries, Inc. Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. This FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three operable units (OUs). OU1 addresses on-site soils and dense non-aqueous phase liquid (DNAPL) creosote and pentachlorophenol (PCP); OU2 addresses groundwater; and OU3 addresses river sediments.

An EPA remedial project manager (RPM) led this FYR. Additional participants from EPA included the community involvement coordinator (CIC), human health and ecological risk assessors, and a hydrogeologist. Virginia Department of Environmental Quality (VDEQ) also participated in the review. Skeo provided EPA contractor support for this FYR. The review began on 7/1/2019.

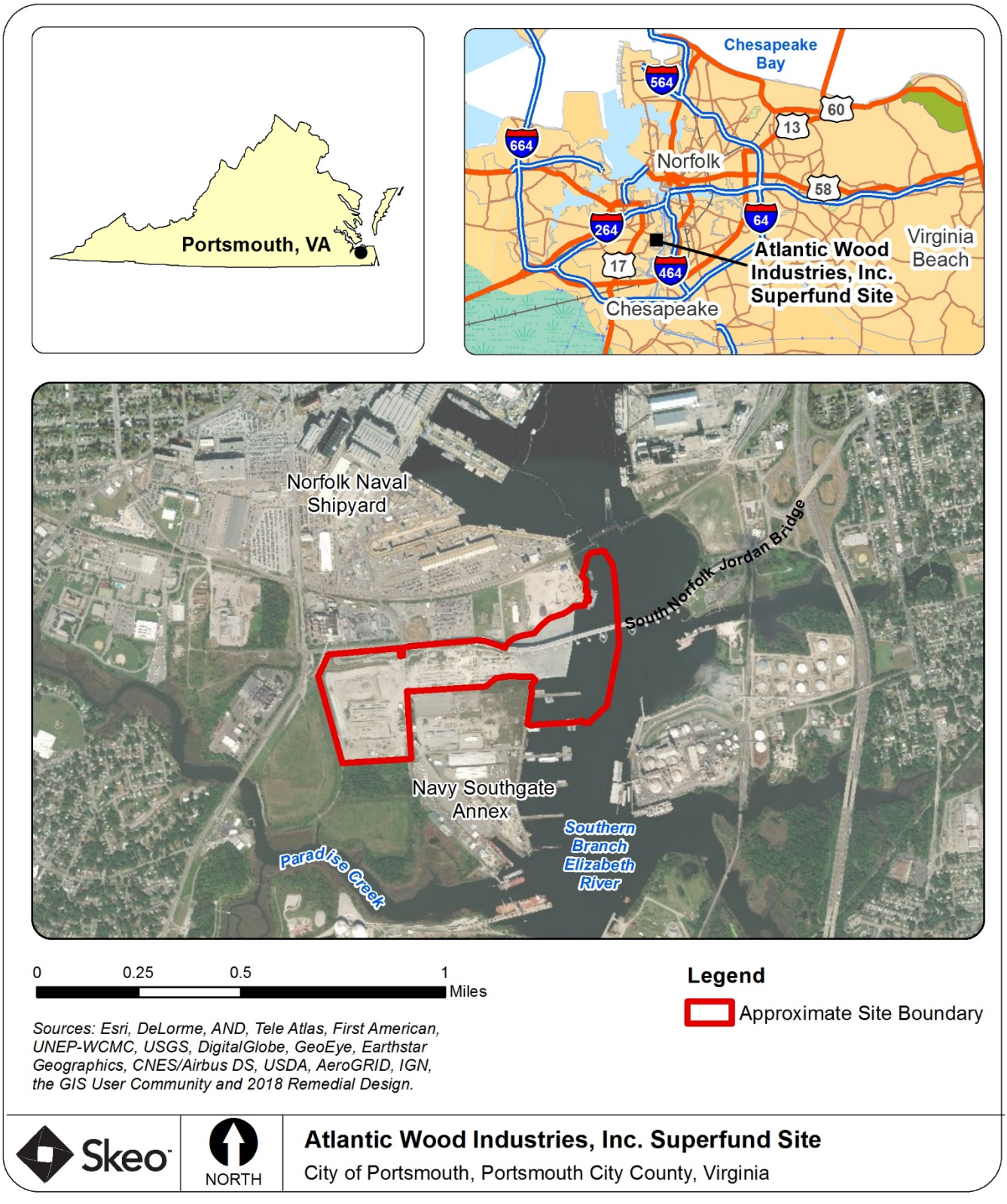
Site Background

The Site is generally located south of Elm Avenue and adjacent to the Southern Branch of the Elizabeth River in Portsmouth, Virginia (Figure 1). Prior to the recently completed dredging, the Site included approximately 50 acres of industrialized waterfront land with contaminated soil and groundwater and approximately 35 acres of contaminated sediments in the river. The Site is bounded on land by the Norfolk Naval Shipyard (NNSY) and several smaller, privately-owned parcels of land. Atlantic Wood Industries (AWI) is now known as Atlantic Metrocast, Inc. and currently operates a pre-cast concrete products manufacturing facility on the Site. Refer to Appendix A for additional resources used to develop this FYR and to Appendix B for the Site's chronology of events.

From 1926 to 1992, a wood treating facility operated at the Site using both creosote and PCP. The Site was contaminated from the wood treatment operation, treated wood storage, and waste disposal. At one time, the Navy leased a portion of the western half of the AWI property for use as storage; filling low-lying areas with contaminated material. The Navy also conducted sand blasting activities adjacent to the Site. Abrasive blast media (ABM) contaminated with heavy metals such as copper, zinc, lead, and arsenic have impacted the Site. Calcium hydroxide waste from the Navy's acetylene production was pumped across the Site and discharged into a wetland that straddled the property line between the NNSY and the AWI facility contaminating both the wetland and the river.

As a result of Site operations, sediments in the Southern Branch of the Elizabeth River were contaminated with visible creosote. The groundwater and soil at the Site are also heavily contaminated with creosote. Polycyclic aromatic hydrocarbons (PAHs), PCP, dioxins and metals contamination (mainly arsenic, chromium, copper, lead, and zinc) have been detected in soils, groundwater, and sediments.

Figure 1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Atlantic Wood Industries, Inc.		
EPA ID: VAD990710410		
Region: 3	**State:** VA	**City/County:** Portsmouth / Portsmouth City
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the Site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA		
Author name: Randy Sturgeon & Daniel Taylor, with additional support provided by Skeo		
Author affiliation: EPA Region 3		
Review period: 7/1/2019 - 5/22/2020		
Date of site inspection: 8/7/2019		
Type of review: Statutory		
Review number: 2		
Triggering action date: 5/22/2015		
Due date *(five years after triggering action date)*: 5/22/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

During the remedial investigation, soil throughout the AWI property was found to be contaminated, including property that AWI has since sold for the construction of the South Norfolk Jordan Bridge (SNJB). Sediments contaminated by AWI and Navy operations extended from the AWI facility shoreline east to the federal navigation channel, north to near a railroad bridge located just south of the main portion of the NNSY, and south to Pier B of the Southgate Annex of the NNSY. The Site also includes contaminated groundwater, mostly located under the former AWI facility. Figure 2 provides a detailed Site map and Figure C-1 shows the extent of contamination as was known when the Record of Decision (ROD) was issued in 2007.

The Site was formally added to the National Priorities List (NPL) in 1990. In the human health and the ecological risk assessments, EPA identified contaminants of concern (COCs) in soils, groundwater, and sediments that exhibited unacceptable risks (Table 1).

Table 1: COCs by Media

COC	Media
Benzo(a)anthracene, Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Fluoranthene, Naphthalene, Phenanthrene, Pyrene, PCP, Total Dioxin TEQ, Antimony, Arsenic, Beryllium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Thallium, Vanadium, Zinc	Soil
Benzene, Carbazole, Naphthalene, PCP, 2,4,6-Trichlorophenol, Total Dioxin TEQ, BaP, Benzo(a)anthracene, Benzo(b)fluoranthene, Indeno(l ,2,3-cd)pyrene, Phenanthrene, Arsenic, Cadmium, Chromium, Copper, Lead, Manganese, Zinc	Groundwater
Benzo(a)anthracene, BaP, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Calcium hydroxide sludge, Debenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic, Copper, Lead, Cadmium, Mercury, Thallium, Zinc, Total Dioxin TEQ	Sediments

Response Actions

AWI entered into an Administrative Order on Consent (AOC) with EPA to complete a removal action (short-term cleanup) in 1987, which was later amended in 1995. AWI installed a liner in a storm sewer to prevent creosote from entering the sewer and migrating to the Southern Branch of the Elizabeth River. AWI also excavated approximately 660 cubic yards of contaminated sediments from the river at the discharge of the storm sewer line. In 2003 as part of another removal action, the Navy restored a wetland on the east side of the Site by excavating calcium hydroxide sludge along with creosote and debris from the wetland.

In 1995, EPA issued a ROD that selected bioremediation, with low-temperature thermal desorption as a contingency remedy, to address creosote-contaminated soil and DNAPL creosote. Based on the pre-remedial design investigation, EPA concluded that, due to problems associated with the bioremediation treatability study and the discovery that the extent and complexity of the contamination was far greater than found in the remedial investigation, the remedy selected in the 1995 ROD would not adequately address the soil and DNAPL. This led EPA to conduct a new feasibility study (FS) for OU1 that was completed at the same time as the FSs for OUs 2 and 3. EPA then issued a comprehensive ROD in 2007 (2007 ROD) that required remediation of soils, groundwater, and sediments. Appendix C includes maps of the historical extent of contamination and the selected remedy in the 2007 ROD.

OU1 – Soil and DNAPL

EPA developed soil and DNAPL remedial action objectives (RAOs) as stated in the 2007 ROD:

- Reduce human health risks from exposure, including ingestion and dermal contact, to contaminants in the surface and subsurface soils to acceptable levels.
- Minimize the migration of contaminants from the unsaturated soils to the groundwater.
- Reduce risks to environmental receptors from exposures to contaminants in the surface and subsurface soils to acceptable levels.

EPA determined that a soil remedy based on cleanup criteria for three contaminants: arsenic (76 milligrams per kilogram (mg/kg)), benzo(a)pyrene (3 mg/kg), and dioxin (total dioxin toxicity equivalents (TEQ) of 0.001 mg/kg) would address unacceptable risks from all soil contaminants.

OU2 - Groundwater

EPA developed groundwater RAOs as stated in the 2007 ROD:

- Reduce human health risks from exposure, including ingestion, inhalation and dermal contact, to site-related contaminants in the groundwater to acceptable levels.

- Reduce the ability of the creosote DNAPL present in the groundwater to migrate deeper into the aquifer system.
- Prevent unacceptable risks to environmental receptors (such as benthic organisms) in the Southern Branch of the Elizabeth River from migration of dissolved contaminants in the groundwater.
- Prevent the recontamination of sediments in the Southern Branch of the Elizabeth River from the migration of dissolved groundwater contamination and/or DNAPL.
- Minimize the migration of site-related groundwater contaminants to Paradise Creek (portrayed in Figure 1) through the existing storm drain system, or its gravel bed, to limit any potential environmental impacts.

EPA selected groundwater cleanup criteria based on federal Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Virginia Groundwater Quality Standards. Not all groundwater contaminants have regulatory criteria, but by meeting criteria that do exist EPA expects the collocated non-regulated contaminants will also be reduced to acceptable risk levels. The portion of the groundwater plume where the selected remedy must meet groundwater cleanup criteria is the portion that extends beyond the edge of the soil cover or pavement that is required by the 2007 ROD.

Table 2: Groundwater Cleanup Criteria

COC	2007 ROD Cleanup Criteria [a] (milligrams per liter (mg/L))
Benzene	0.005
Benzo(a)pyrene	0.0002
PCP	0.001
Arsenic	0.010
Copper	1.0
Chromium	0.1
Cadmium	0.005
Total Dioxin TEQ	0.00000003
Mercury	0.00005
Manganese	0.05
Lead	0.05
Zinc	0.05
[a] Based on federal Maximum Contaminant Levels (MCLs), where applicable, Maximum Contaminant Level Goals (MCLGs), or Virginia Groundwater Quality Standards	

OU3 – Southern Branch of the Elizabeth River Sediments

EPA developed RAOs for the river sediments as stated in the 2007 ROD:

- Reduce human health risks from exposure, including ingestion and dermal contact, to contaminants in the sediments to acceptable levels.
- Reduce the risks to humans from the consumption of contaminated crabs and/or oysters taken from the Site.
- Reduce risks to ecological receptors, including benthic aquatic organisms, fish and birds, from contaminated sediments to levels that are acceptable.
- Do not inhibit navigation or the opportunity for future improvements to navigation.
- Prevent the migration of contaminated river sediments during any future river activity that involves disruption of the sediments.

As explained in the 2007 ROD, since polycyclic aromatic hydrocarbons (PAHs) related to creosote are more pervasive in the river sediments than metals and dioxin, EPA developed only a chemical-specific sediment cleanup criterion for total PAHs (tPAHs). As with the soils criteria, this simplified the remedial design by reducing the number of samples that had to be collected and analyzed and the amount of data to be managed during the cleanup. Remediating the PAHs in sediment addresses the metals and dioxin contamination as well. The cleanup criteria for tPAHs was established at 45 mg/kg.

Sitewide Remedy

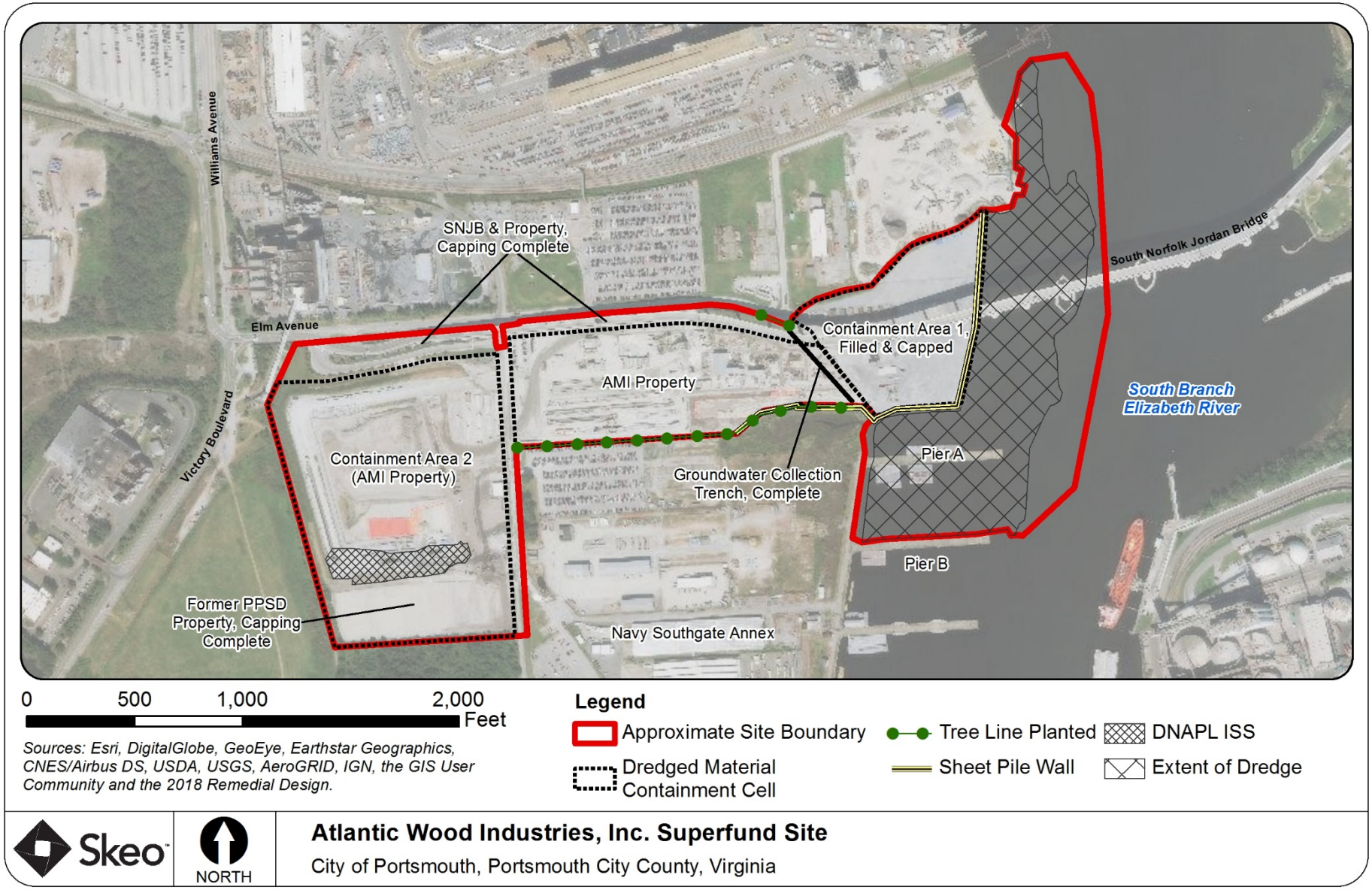
To achieve these RAOs, EPA selected a remedy for OU1, OU2, and OU3 in the 2007 ROD. The main components of the selected remedy include (see Figure 2):

- Construction of a sheet pile wall in the Southern Branch of the Elizabeth River to prevent DNAPL migration to the river and to create a consolidation area for sediments dredged from the river.
- Dredging of contaminated river sediments with tPAH levels above 100 ppm (once dredging starts, dredging continued to depth where the tPAH levels were equal to or less than 45 ppm).
- Consolidation of dredged sediments behind the sheet pile wall (creating new land) and on the western part of the AWI property.
- Treatment of contaminated sediments immediately behind the sheet pile wall once consolidation is complete.
- Monitored natural recovery of remaining sediments with tPAH concentrations between 45 and 100 mg/kg to attain the final sediment cleanup criterion of 45 mg/kg.
- Excavation or treatment in place of DNAPL on the west side of the AWI property (during the design, EPA determined it was most appropriate to use treatment in place).
- A soil cover or wear surface over the areas of contaminated soil, including land created by the consolidation of sediments.
- Monitored natural attenuation of groundwater.
- Prevention of contaminated groundwater migration around the sheet pile wall.
- Creation of wetlands to replace wetlands lost due to sediment consolidation.
- Operation and maintenance activities.
- Institutional controls (ICs).

In 2012, EPA issued an Explanation of Significant Differences (2012 ESD) documenting an increase in the estimated cleanup costs due to larger volumes of DNAPL requiring treatment and contaminated sediments requiring dredging. The 2012 ESD also documented the new location of the sheet pile wall in the river, showing it to be further from the shoreline. EPA issued a second ESD in 2018 to document an additional increase in the estimated cost and to outline the following changes to the selected remedy in the 2007 ROD:

- Adjusting the size of the landfill at the western portion of the Site (by including the location of the former Portsmouth Public School District (PPSD) operations center property) that will contain approximately 200,000 cubic yards of contaminated sediments that were dredged from the Southern Branch of the Elizabeth River.
- Increasing the thickness of the cap at the AWI property to protect the low-permeable layer of the cap from equipment AWI uses to move the large concrete products that it produces.
- Including the cost of a groundwater treatment plant, if necessary, to treat groundwater captured by the collection trench before it is discharged to the river.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site

Status of Implementation

Figure 2 includes the remedial features. EPA began the detailed design for the cleanup in early 2008 and began construction in 2010 using American Recovery and Reinvestment Act (ARRA) funds. The initial cleanup activities included excavation of contaminated soil along the south right of way of Elm Avenue and partial construction of the landfill berm. FIGG Bridge Developers, LLC purchased approximately seven acres of the northern portion of the AWI property and subsequently transferred that property to an affiliated company, SNJB Property, LLC in 2010. FIGG/SNJB constructed the soil cap on most of that property as part of its construction of the South Norfolk Jordan Bridge (see Figure 2) across the Southern Branch of the Elizabeth River, which was completed in 2012. Soil capping on the current AWI property is nearing completion.

Beginning in late 2012 on behalf of EPA, the U.S. Army Corps of Engineers (USACE) conducted in-situ soil stabilization (ISS) of the creosote- and PCP-saturated soils at the southwest portion of the AWI property. Contaminated soil/waste was solidified/stabilized in-situ to prevent movement of DNAPL and minimize the potential for the DNAPL to act as a continuing source of groundwater contamination (see Figure 2). USACE completed the work in the summer of 2013.

The USACE began construction of the offshore sheet pile wall in late 2011 and completed construction in the summer of 2013. The wall separated approximately 6.7 acres of highly contaminated sediments from the rest of the river and formed the south and east sides of a containment facility for the consolidation of contaminated sediment dredged from the Southern Branch of the Elizabeth River offshore of the AWI facility.

EPA approved the remedial design for dredging in March 2014, and the USACE began dredging the Southern Branch of the Elizabeth River in the spring of 2015. Dredging was completed in the summer of 2017. Confirmation samples were collected in a 100-foot grid. One-foot core samples were analyzed to determine if that grid met the criteria of 45 mg/kg tPAHs. Additional dredging was conducted to remove sediment from areas that failed confirmation sampling until the criteria were met. Overall, approximately 360,000 cubic yards of contaminated sediments were dredged and consolidated to the containment area (CA) on the land side of the offshore sheet pile wall (known as CA1) or moved to CA2 on the western portion of the Site for consolidation in the landfill (see Figure 2). Approximately 22,000 cubic yards of clean sand was put into the river 1) as a cover over contaminated sediment that could not be removed (for example, the Navy has a 50-foot no-dredge buffer zone along its bulkhead; and 2) to cover over areas of clay to provide a habitat for benthic organisms. After consolidation was completed, CA1 was capped with 12 inches of compacted low-permeable stone. Actions at CA2 addressed stockpiled sediments and included drying, grading and capping in place.

In 2012, EPA completed construction of a containment berm along the north shore of the former Wyckoff inlet of the river to help contain the sediment being dredged from the river. This berm included a swale on the upland side to collect and convey storm water runoff to the river since the water could no longer flow directly to the river.

EPA extended the Elm Avenue storm sewer across the AWI facility to the southwest terminus of the offshore wall in 2013 because the offshore pile wall blocked the stormwater reaching the river. At this time, EPA also constructed a groundwater collection trench to help control the water table because the wall prevented the groundwater from discharging directly to the river. EPA began passively discharging groundwater to the river from the trench in the fall of 2017. Initially, the water was stored in a tank and tested before release without treatment. Because testing indicated that treatment is not necessary at this time, the groundwater is discharged from the trench directly to the river. Long-term monitoring will determine if treatment becomes necessary. In 2017, EPA planted a number of poplar trees near the intersection of Elm Avenue and Veneer Road to remove groundwater. Additional trees were planted along the southern property boundary of AWI next to the Southgate Annex of the NNSY. This process is referred to as phyto-pumping and is intended to help contain groundwater contamination in the waste management area.

EPA expects to complete the capping, the secondary containment behind the offshore sheet pile wall, and the wetland mitigation in 2020. EPA will continue to evaluate the groundwater collection system.

Institutional Controls

Institutional controls (ICs) will be implemented to ensure the remedy is protective in both the short term and long-term scenarios. ICs will ensure, for example, that future construction does not adversely affect the remedy, provide notice to new landowners to prevent inappropriate future land use, educate and warn the public against consumption of fish and shellfish from the Southern Branch of the Elizabeth River, and prevent use of groundwater for drinking purposes. ICs pertaining to the AWI property are to be implemented through the recording of an environmental covenant as required by a Consent Decree that was finalized in 2019. Additional ICs will include environmental covenants, informational ICs, and/or local ordinances. Table 2 provides a summary of the planned or implemented ICs.

Table 2: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Sitewide	Prohibit use or pumping of contaminated groundwater.	September 2010 Order limited groundwater use on property currently owned by FIGG/SNJB ICs for the AWI property to be implemented by an environmental covenant as required in 2019 Consent Decree. Additional institutional controls will include environmental covenants for Site properties other than the AWI property (including the new land created), informational ICs and/or local ordinances

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Land Use	Yes	Yes	Sitewide	Prohibit residential or other non-industrial land uses. Ensure future uses do not interfere with any components of the remedy and are conducted in a manner to protect the health of future users from exposure to contaminated soil, groundwater, or vapors that could intrude into a building.	September 2010 Order limited use on property currently owned by FIGG/SNJB ICs for the AWI property to be implemented by an environmental covenant as required in 2019 Consent Decree. Additional institutional controls will include environmental covenants for Site properties other than the AWI property (including the new land created) and informational ICs and/or local ordinances

System Operations/Operation & Maintenance

After construction of the selected remedy is completed, operation and maintenance (O&M) activities will be undertaken to maintain the effectiveness of the cleanup. O&M activities that have taken place since, or will take place in the near future, on completed portions of the cleanup include: weed control in the stone cap; filling in low spots/areas of the cap caused by settlement, erosion, or vehicular rutting; inspection of the sheet pile wall (both above and below the water line); repairs of the concrete portion of the wall; and adding additional corrosion protection in the intertidal and splash zone of the batter piles.

Groundwater monitoring wells have been installed and monitoring is currently ongoing. The groundwater monitoring wells will be sampled periodically to evaluate the attenuation of the groundwater contamination over time and to determine if additional activities are necessary to control the water table elevation. The groundwater collection trench discharge will be sampled periodically to evaluate if treatment is necessary.

In October of 2019, the Virginia Surface Water Quality Standards (SWQS) were updated. Certain SWQS have decreased from the 2007 SWQS. The ARARs in the ROD are final at the time of the ROD issuance unless a change calls into question the protectiveness of the remedy. The change in SWQS are currently not anticipated to change the protectiveness of the remedy, however, EPA will continue to evaluate this during the next FYR period.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the previous FYR and the status of those recommendations.

Table 3: Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Not Protective	EPA is constructing the OU1 remedy in accordance with the 2007 ROD, which is expected to be protective after completion and once ICs are in-place. EPA has completed the first phase of waste solidification/stabilization in the west side CA2, but more waste material will be added to this area from dredging activities. Once this is complete, the Site requires a geotextile and soil or pavement cap to prevent soil exposures in accordance with the 2007 ROD. The OU1 remedy is not presently protective because capping is not yet complete, and dust generation in this area needs monitoring and possible controls to provide protection against fugitive dust bearing Site contaminants.
2	Short-term Protective	The remedy at OU2 will be protective after completion and once ICs are in-place. The remedy at OU2 is currently protective of human health for the short term because groundwater is not used as a drinking source and the City of Portsmouth requires residents to connect to the public water supply. Once ICs are in-place with restrictions on future land use, the remedy will be protective for the long term. The remedy is not yet protective for the long term for two reasons: (1) EPA has not yet installed a cap over the waste management area designed to reduce migration of contaminants away from the waste management area allowing Monitored Natural Attenuation (MNA) to work; and (2) EPA needs to establish ICs to prevent a future issue with vapor intrusion if buildings are constructed over the groundwater plume.
3	Not Protective	EPA is constructing the remedy at OU3 in accordance with the ROD, and it is expected to be protective after completion and once ICs are in-place. Exposure to contaminated sediments by both human and ecological receptors is possible, therefore short-term protectiveness is not yet achieved at OU3. The remedy at OU3 still requires: (1) completion of the sediment dredging in the Southern Branch of the Elizabeth River; (2) establishing ICs; and (3) capping sediments behind the OPW and at CA2. Currently, human exposures are possible from contact with sediments and consumption of fish and shellfish, and ecological exposures are possible for fish, shellfish, birds, and mammals from contact with sediments and from food consumption.

Table 4: Status of Recommendations from the 2015 FYR

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
OU1	Dusty conditions on-Site may expose current workers of Atlantic Metrocast to airborne contaminants until such time as soil capping is completed.	Air monitoring will be conducted to determine if dust control measures are necessary for current Atlantic MetroCast employees working at the Site.	Completed	Based on air monitoring results, risk to industrial workers from site related air emissions is minimal however certain COCs exceeded industrial screening RSLs. As a result, EPA implemented dust control measures to mitigate potential exposure.	1/5/2016
OU3	The unused fiber optic conduit buried under the river channel may serve as a preferential migration pathway for contaminants.	EPA will require Level3 Communications to grout the conduit.	Ongoing	Currently EPA working with landowner to obtain access to conduct work.	TBD

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

EPA notified the public of this FYR by a newspaper posting in The Virginia Pilot on Monday, January 27, 2020. (Appendix D). It stated that this FYR was underway and invited the public to submit any comments to EPA. The results of the review and the report will be made available at the Site's information repository, the Portsmouth Public Library-Craddock Branch, located at 28 Prospect Parkway, Portsmouth, VA 23702. Additionally, the report will be made available on EPA's Atlantic Wood Industries Site page (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302836), which can be reached from a computer at the library.

During this FYR process, interviews were conducted to document any perceived problems or successes with the portions of the remedy that has been implemented to date**.** The EPA CIC interviewed City of Portsmouth engineering and economic development staff, a local developer interested in reuse of the Site, staff from Elizabeth River Project (a local non-profit organization), and an adjacent landowner. Overall, respondents are pleased with the cleanup and are looking forward to future redevelopment at the Site. Most groups were satisfied with the frequent discussion about possible redevelopment and felt the work that has been done allows redevelopment. One interviewee did recommend more engagement with community groups. Interview responses are included in Appendix E.

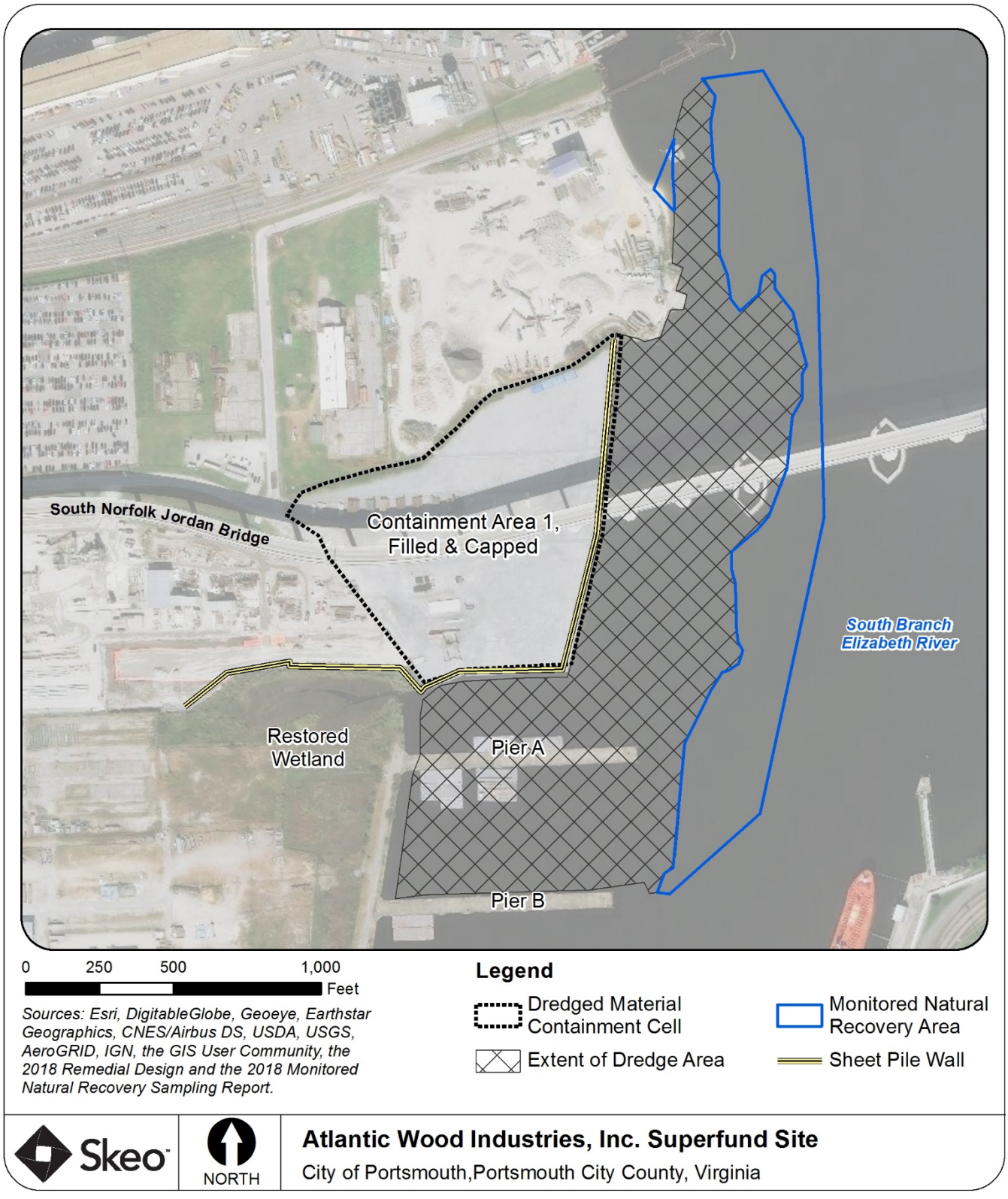
Data Review

In 2018, monitored natural recovery (MNR) sampling of the Southern Branch of the Elizabeth River sediments and biota monitoring was conducted to evaluate the effectiveness of the dredging. Detailed results are provided in the *2018 Monitored Natural Recovery Sampling Report Operable Unit 3, Elizabeth River Sediments, Atlantic Wood Industries Superfund site, Portsmouth, Virginia* and summarized below. Site-specific baseline and historical analytical and benthic community data from several previous sampling events that occurred 10-15 years ago were used for comparison. Reference locations include King's Creek given its distance from the Site, and Scuffletown Creek, which is across the river but beyond the influence of the Site. Monitoring of the sediments and biota will continue until the 2007 ROD performance standards are met. The study area is provided in Figure 3 below.

The included sediment monitoring was also conducted to document the extent of MNR of tPAH. The tPAH concentrations detected in the MNR area sediment samples ranged from 0.038 to 0.72 mg/kg in the top six inches of sediment; substantially less than the remedial goal of 45 mg/kg. According to the ROD, the sediment tPAH concentrations will be monitored until the top 1 foot of sediment has tPAH concentrations less than or equal to the 45 mg/kg remedial goal. Future sampling will target the top 12 inches of the sediment. Figure C-3 shows the MNR sediment monitoring sampling locations and results. EPA anticipates sampling one more time.

Biota monitoring of the Southern Branch of the Elizabeth River included a benthic study and a caged oyster and native oyster study to determine if aquatic organisms and aquatic habitats are recovering at the Site and if aquatic organisms are bioaccumulating compounds that could potentially affect higher levels of the food chain. Results from the benthic study indicated conditions at the Site have improved with overall decreasing contaminant concentrations when compared to the 2002 and 2009 benthic data. The reference locations, as well as the benthic community sample locations and benthic index of biotic integrity (B-IBI) results from the 2018 study are included in Figure C-4.

Figure 3: Study Area of Sediment and Biota Monitoring



When compared to the 2002 and 2009 baseline datasets, tPAH concentrations, as well as several other COCs in caged oysters and native oyster have mostly decreased in 2018, indicating reductions overtime, especially for

tPAHs. Arsenic and zinc had minor mean increases in caged oysters. Native oysters had mean increases in cadmium, copper, manganese and zinc from 2009 to 2018. Table 5 provides the mean caged oyster results compared to the 2002 and 2009 baseline data and Table 6 provides the mean native oyster results compared to the 2009 baseline data (2002 baseline data is not available) [1]. Figure C-5 provides the locations of the caged and native oyster monitoring locations from the 2018 monitoring event. Progress will continue to be tracked over time. The next event is planned to take place in the summer of 2020 or 2021.

Table 5: Mean Caged Oyster Results 2002, 2009, 2018 (mg/kg)

Analyte	2018	2009	2002
Arsenic	1.22	0.63	1.09
Cadmium	0.41	0.41	0.92
Chromium	0.14	0.16	0.16
Copper	45.24	50.91	64.77
Lead	0.11	0.23	0.23
Manganese	3.49	3.68	4.06
Zinc	653.33	634.11	890.00
Total PAH	0.01	0.37	5.38

Table 6: Mean Native Oyster Results 2009, 2018 (mg/kg)

Analyte	2018	2009	2002
Arsenic	0.63	0.95	--
Cadmium	0.79	0.71	--
Chromium	0.18	0.34	--
Copper	123.31	80.60	--
Lead	0.25	0.27	--
Manganese	5.80	3.33	--
Zinc	2,599.3	1,220.9	--
Total PAH	0.0012	0.15	--

Site Inspection

The Site inspection took place on August 7, 2019. Participants included the EPA RPM, EPA CIC, EPA human health and ecological risk assessors, and the EPA hydrogeologist, as well as VDEQ and Skeo (EPA FYR support contractor). The purpose of the inspection was to assess the protectiveness and progress of the remedy. The Site inspection checklist and site photographs are included in Appendices F and G.

During the inspection, the team viewed remedy components already constructed, including the containment area (CA1) behind the sheet pile wall capped with low-permeability stone, vegetated cap under the bridge, the DNAPL stabilization area, soil berms, and the cap at portions of the AWI property. During the inspection, active work at the Site consisted of de-watering activities and sediment consolidation in the landfill (CA2). The cap over completed portions of the DNAPL-impacted soil solidification/stabilization area in the southwestern portion of the Site was intact. The soil berms to the northeast and northwest were intact and vegetated. The CA1 capped area showed initial signs of settlement as well as weeds growing through the cap. These maintenance issues have since been addressed. The team did not encounter any major issues during the inspection.

During the inspection, remedial activities were ongoing. Contractors were observed at a distance working in CA2. Contractors were also observed at a distance capping the AWI property.

[1] Tissue sampling is conducted to compare the pre- and post-remediation concentrations of COCs in native oysters and to evaluate reductions over time. Due to off-site COC sources and biota movements (crabs), tissue-based cleanup levels were not established for this RAO. Risk reduction from consumption is demonstrated by reduction of tissue contaminant concentrations.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Remedy construction is still in progress. The remedy does not yet meet all requirements specified in the 2007 ROD, the 2012 ESD, and the 2018 ESD because EPA has not yet implemented all remedy components. Activities that that must still be completed include the capping at the AWI property, wetland mitigation, implementation of secondary containment behind the offshore sheet pile wall, and evaluation of the effectiveness of the groundwater collection trench. EPA expects the remedy to function as intended by the 2007 ROD and the ESDs once all remedy components are implemented. All construction activities that have been completed are consistent with design documents, design intent, and the decision documents.

EPA is constructing the OU1 remedy in accordance with the 2007 ROD, the 2012 ESD, and the 2018 ESD. EPA has completed capping of CA1 and most of the landfill (CA2). Dredged sediments were added to this area and a geotextile and low-permeability cap were installed to prevent soil exposure and limit rainwater infiltration in accordance with the 2007 ROD.

For OU2, monitoring of groundwater elevation and contaminant levels has begun. Groundwater in the area is not used as a drinking source, and the City of Portsmouth requires residents to connect to the public water supply. EPA will implement institutional controls following completion of construction.

For OU3, sediments meeting the decision documents requirements for dredging have been removed from the Southern Branch of the Elizabeth River, and consolidated in CA1 or CA2 in accordance with the ROD. This portion of the selected remedy is expected to be protective once EPA ensures that the MNR achieves performance standards. Additionally, a sand cover was placed over remaining contaminated sediment which could not be dredged in the Southern Branch of the Elizabeth River. Sediment biota and oyster tissue monitoring in 2018 generally indicate improvements from historical concentrations. The river will continue to be monitored for natural recovery.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

EPA has determined that there are no changes in the receptor exposure pathways that would affect the remedy protectiveness. The toxicity profile for BaP was updated January 2017, but the update does not have an impact on the current cleanup number for sediment or soil.

In October of 2019, the Virginia Surface Water Quality Standards (SWQS) were updated. Certain SWQS have decreased from the 2007 SWQS. The ARARs in the ROD are final at the time of the ROD issuance unless a change calls into question the protectiveness of the remedy. The change in SWQS are not anticipated to change the overall protectiveness of the remedy because the remedy would be the same with either values. However, EPA will evaluate this issue as it monitors the discharge from the groundwater collection trench.

EPA expects that full implementation of the remedy will protect against unacceptable human health and ecological risks.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No, no other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU1, OU2

OU(s): OU3	**Issue Category: Other**			
	Issue: The unused fiber optic conduit buried under the river channel may serve as a preferential migration pathway for contaminants.			
	Recommendation: Continue to work with landowner to obtain access to grout the conduit.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	12/29/2021

Other Findings

- None

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement		
Operable Unit:1	*Protectiveness Determination:* Will be Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The remedy at OU1 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.		

Protectiveness Statement		
Operable Unit:2	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The remedy at OU2 will be protective once MNA is complete and once ICs are in-place. The remedy at OU2 is currently protective of human health for the short term because groundwater is not used as a drinking water source, and the City of Portsmouth requires residents to connect to the public water supply. Once additional ICs are in-place with restrictions on future land use, and on-going monitoring shows that the groundwater beyond the waste management area meets the 2007 ROD requirements, the remedy is expected to be protective for the long term.		

Protectiveness Statement		
Operable Unit:3	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The remedy at OU3 will be protective once MNR achieves performance standards. The remedy at OU3 is currently protective for the short term because all sediments meeting the decision documents requirements for dredging have been removed from the Southern Branch of the Elizabeth River.		

VIII. NEXT REVIEW

The next FYR Report for the Atlantic Wood Industries, Inc. Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

EA Engineering, Science, and Technology, Inc. (EA). July 2014. Remedial Action Report, Elm Avenue Storm Drain Relocation and Groundwater Collection Trench, Atlantic Wood Industries Superfund Site, Portsmouth, Virginia.

EA. October 2019. Remedial Action Report, Dredging and Dredged Material Handling, Atlantic Wood Industries Superfund Site, Portsmouth, Virginia.

EA. October 2019. Remedial Action Report, East Side Containment Berm, Atlantic Wood Industries Superfund Site, Portsmouth, Virginia.

EA. October 2019. Remedial Action Report, Offshore Sheet Pile Wall, Atlantic Wood Industries Superfund Site, Portsmouth, Virginia.

EA. September 2019. 2018 Monitored Natural Recovery Sampling Report Operable Unit 3, Elizabeth River Sediments Atlantic Wood Industries Superfund Site, Portsmouth, Virginia.

U.S. Environmental Protection Agency (EPA) Region 3. September 1995. Record of Decision Operable Unit 1, Atlantic Wood Industries, Inc. Superfund Site, Portsmouth, Virginia.

EPA Region 3. December 2007. Record of Decision Operable Units 1, 2, and 3, Atlantic Wood Industries, Inc. Superfund Site, Portsmouth, Virginia.

EPA Region 3. August 2012. Explanation of Significant Differences, Atlantic Wood Industries, Inc. Superfund Site, Portsmouth, Virginia.

EPA Region 3. September 2018. Explanation of Significant Differences, Atlantic Wood Industries, Inc. Superfund Site, Portsmouth, Virginia

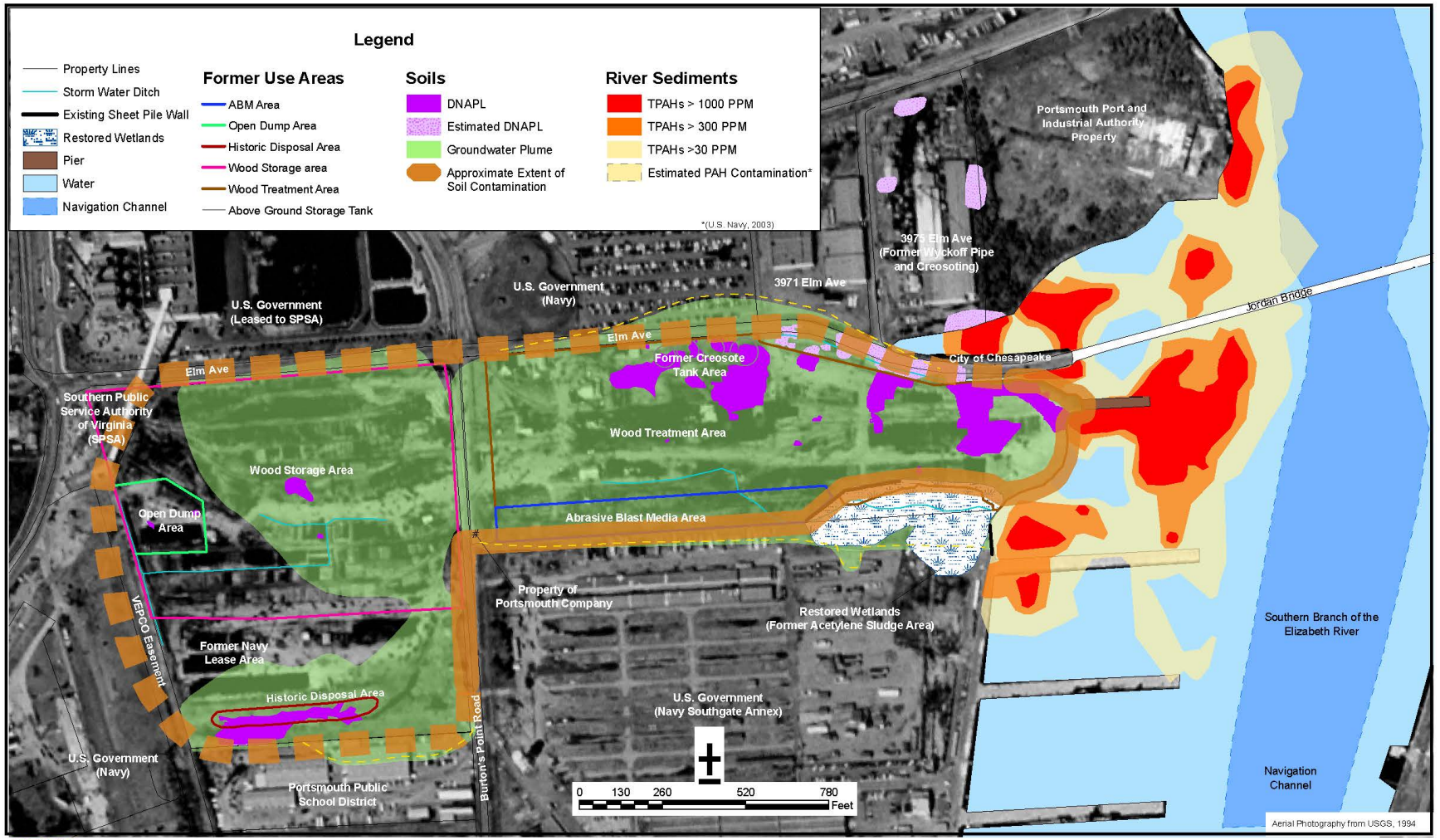
APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
The Site was operated as a wood-treating facility using both creosote and PCP. Site activities included treatment operations, storage of treated wood, and disposal of wastes	1926-1992
Parts of the west side of the property were leased to the U.S. Navy, which filled the area with contaminated material and stored war material there during World War II	Lease period during and shortly after WWII
The Navy discharged high-pH calcium hydroxide sludge into a wetland that straddled the AWI/Southgate Annex border and the river	1942-1966
EPA proposed the Site for listing on the NPL	June 10, 1986
EPA finalized the Site on the NPL	February 21, 1990
Pursuant to an amendment to the 1987 Administrative Order on Consent with EPA, AWI cleaned the Elm Avenue storm sewer and installed a liner within affected manholes, catch basins, and sewer lines to prevent creosote from continuing to leak from tanks into the sewer line	1995
EPA issued a ROD that selected bioremediation, with low-temperature thermal desorption as a contingency remedy, to address creosote-contaminated soil and DNAPL creosote	September 29, 1995
Findings in a pre-remedial design investigation report indicated the 1995 ROD would not adequately address contaminated soil and DNAPL due to problem in the treatability study and newly found high metals concentrations	June 2002
Acetylene sludge was removed and wetland restoration was completed, but the capping of the abrasive blast media area was deferred to coincide with future soil cleanup	2003
EPA issued ROD to address OU1, OU2 and OU3	December 21, 2007
Start date for remedy construction and trigger date for FYR	May 24, 2010
EPA issued an ESD to document a cleanup cost increase from $44.9 million to $98.2 million mainly due to an increase in the volume of sediments that require dredging and volume of DNAPL that required treatment	August 6, 2012
FIGG/SNJB completed construction of the South Norfolk Jordan Bridge	October 26, 2012
Construction completed for DNAPL stabilization/solidification	August 2013
EPA issued first FYR	May 22, 2015
EPA completed dredging of sediments from the Southern Branch of the Elizabeth River	Summer 2017
EPA issued an ESD, documenting the increase of the estimated cost from 98.2 million to 126.6 million, approving expanded areas available for landfill, added a wear surface over the cap, and added a contingency for a groundwater treatment.	September 17, 2018

APPENDIX C – ADDITIONAL SITE MAPS AND FIGURES

Figure C-1: Historical Extent of Contamination

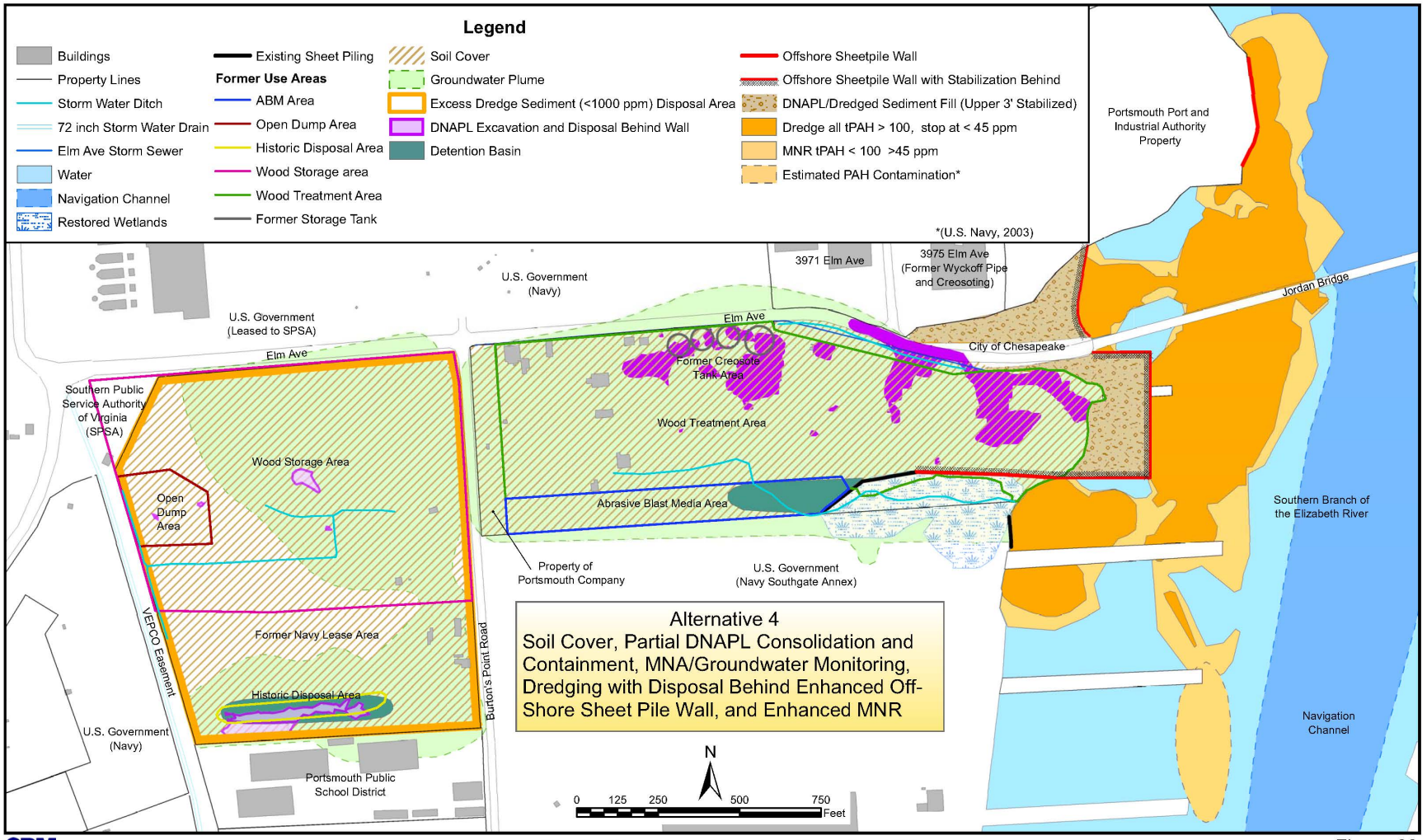


CDM
December 2007 Record of Decision

Atlantic Wood Industries, Inc. Superfund Site
Portsmouth, Virginia

Figure 2
Extent of Contamination
in Soil, Groundwater, and River Sediment

Figure C-2: Selected Remedy in 2007 ROD



CDM

December 2007 Record of Decision

Atlantic Wood Industries, Inc. Superfund Site
Portsmouth, Virginia

Figure 29
Alternative 4
AR315891
EPA's Selected Remedy

Figure C-3: MNR Sediment Monitoring Sample Locations and tPAH Results (2018)

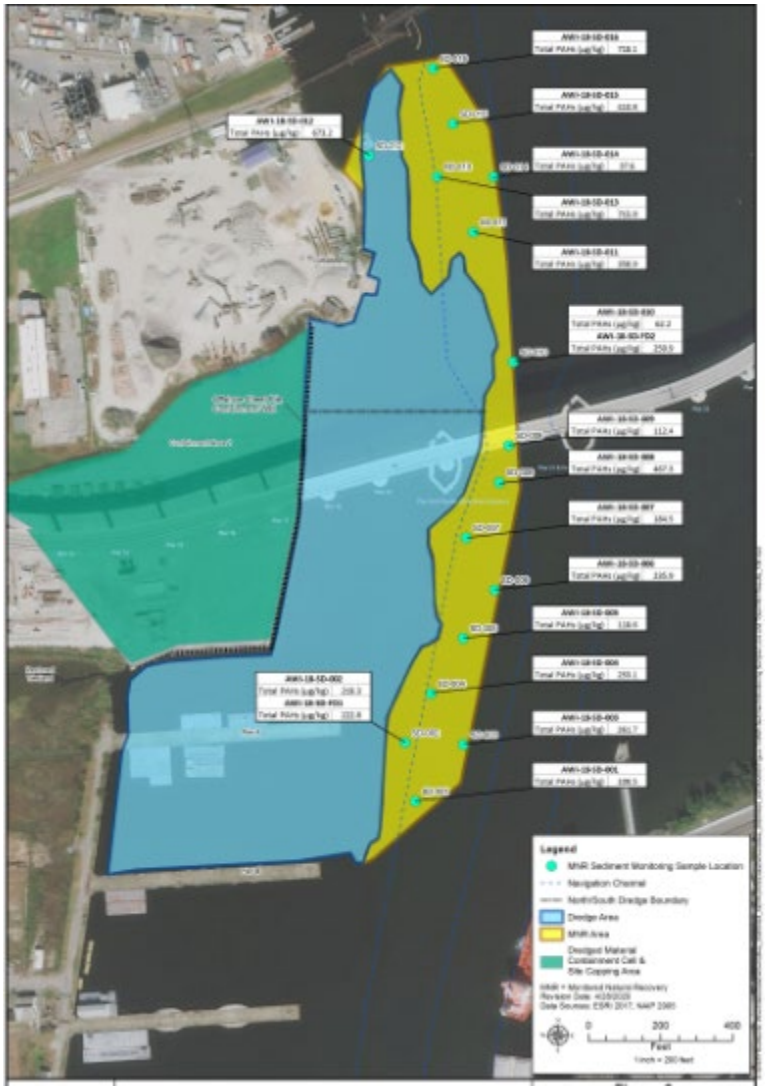


Figure C-4: Benthic Community/Habitat Monitoring Sample Locations and B-IBI

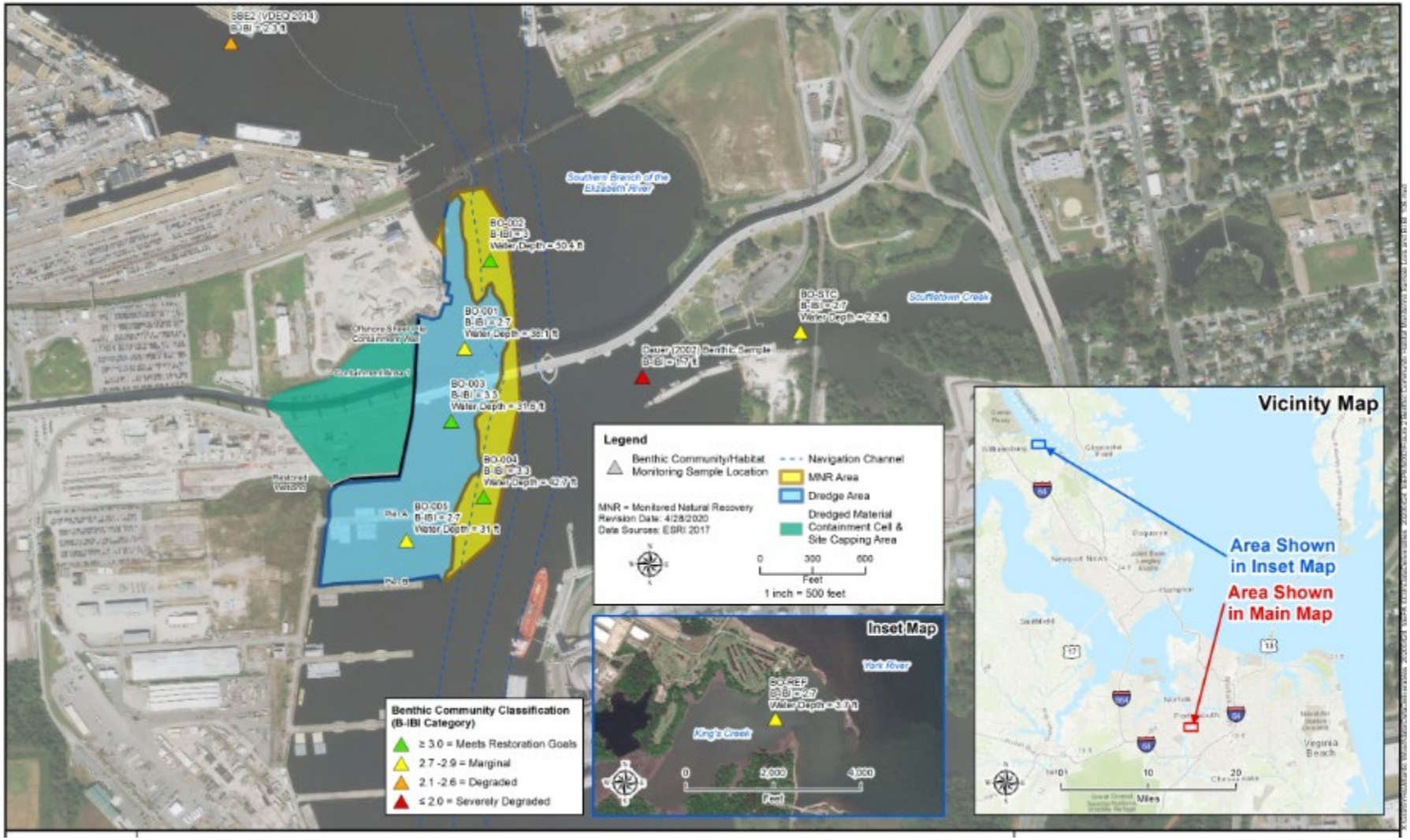
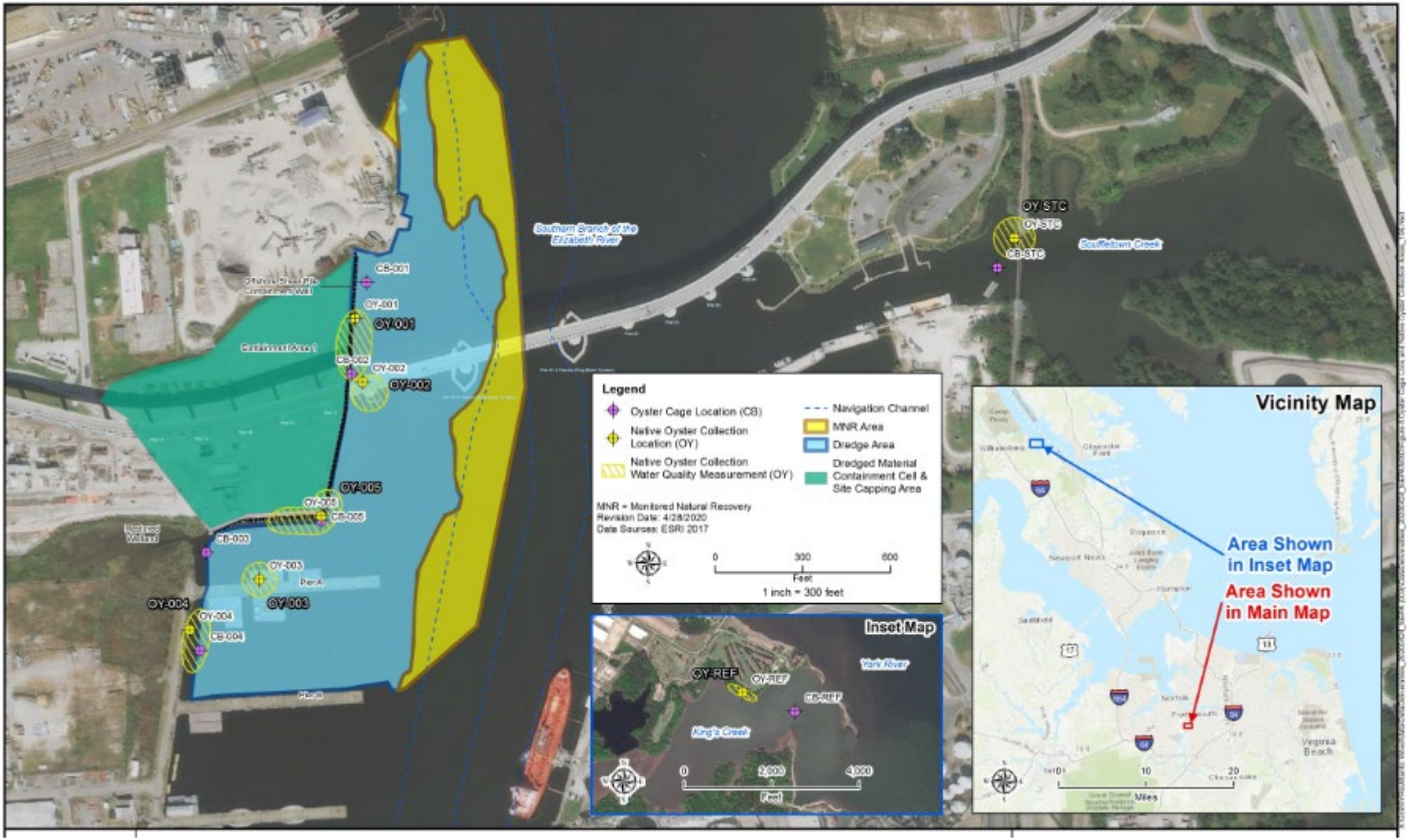


Figure C-5: Oyster Cage Locations and Native Oyster Collection Areas



APPENDIX D – PRESS NOTICE

EPA PUBLIC NOTICE

EPA REVIEWS CLEANUP
ATLANTIC WOOD INDUSTRIES SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) is reviewing the ongoing cleanup at the Atlantic Wood Industries Superfund Site located in Portsmouth, Virginia. EPA inspects sites every five years to ensure that cleanups conducted protect public health and the environment. EPA's 2015 review of the site concluded that the cleanup is working as designed and is protective in the short term. Findings from the current five-year review will be available in May 2020.

To access detailed site information, including the five-year review report once finalized, visit:
https://www.epa.gov/superfund/atlanticwood

For questions or to provide site-related information for the review, contact:
Lavar Thomas, EPA Community Involvement Coordinator
215-814-5535 or thomas.lavar@epa.gov

APPENDIX E – INTERVIEW FORMS

Atlantic Wood Industries, Inc. SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Atlantic Wood Industries, Inc.	
EPA ID	
Interviewer name: EPA CIC Lavar Thomas	**Interviewer affiliation: EPA**
Subject name: Brian Donahue	**Subject affiliation: Economic Development Department**
Subject contact information: Phone: 757-393-8804. donahueb@portsmouthva.gov	
Interview date: 08/08/19	**Interview**
Interview location: N/A	
Interview format: In Person **Phone** Mail Email Other:	
Interview category: City of Portsmouth	

1. What is your overall impression of the project? (general sentiment)
   It has been a positive process that is resulting in remediation and the redevelopment potential for underutilized contaminated properties. Overall positive project.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the Site? If so, please give purpose and results.
   Yes, frequent contact with Randy *(EPA RPM)* about the project status and how it has been progressing. The City of Portsmouth owns two properties (3920 & 3930 Burtons point road) adjacent to the Site. Frequently discuss plans for possible development.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   No.

4. Do you feel well informed about the Site's activities and progress?
   Yes, we have been informed and aware of the status of the project.

5. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   We feel that the Superfund program and the work that has been done has been a positive experience and goes along with mission to redevelop use of a waste site.

Atlantic Wood Industries, Inc. SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Atlantic Wood Industries, Inc.	
EPA ID: VAD990710410	
Interviewer name: EPA CIC Lavar Thomas	**Interviewer affiliation: EPA**
Subject name: Jeff Harper	**Subject affiliation: City of Portsmouth**
Subject contact information: Phone: 757-393-8592 x4191	
Interview date: 08/07/19	**Interview**
Interview location: City of Portsmouth Office	
Interview format: In Person Phone Mail Email Other:	
Interview category: City of Portsmouth	

1. What is your overall impression of the project? (general sentiment)
   Believe the project is going well. EPA is doing a good job in overseeing cleanup.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the Site? If so, please give purpose and results.
   Yes, recently coordinated for the water main break that took place close to the Atlantic Wood Site. Communications or reporting are required once activities involve capping at the Site, storm drains that involve the city, facilities interested in the Site and the right of way at Burtons Point Road.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   None.

4. Do you feel well informed about the Site's activities and progress?
   Yes.

5. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   Will there be a formal process of instituting ICs and permitting for future use?
   Overall, EPA has been good at keeping parties informed on site activities.

Atlantic Wood Industries, Inc. SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Atlantic Wood Industries, Inc.	
EPA ID: VAD990710410	
Interviewer name: EPA CIC Lavar Thomas	**Interviewer affiliation: EPA**
Subject name: Resident	**Subject affiliation:**
Subject contact information:	
Interview date:	**Interview**
Interview location: N/A	
Interview format: In Person **Phone** Mail Email Other:	
Interview category: Resident	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   The project went well as could be expected, however the work took much longer than expected – more than 9 years.

2. What have been the effects of this Site on the surrounding community, if any?
   Community is limited to the PER development activity. Overall, the Atlantic Wood project has set back the original proposal PER had originally worked out with the City of Portsmouth.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   There have been some issues, but these were worked out. Due to the magnitude of both the EPA work and the PER development, there have been significant interactions with other landowners and EPA representatives. However, as previously stated, most of these matters have been worked out.

4. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
   Yes.

5. Do you feel well informed about the Site's activities and progress?
   Yes.

6. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   It was and is a long, comprehensive and challenging process. PER does not have the use of land behind the sheet pile wall, and that process is slower than we would like. Additionally, the development of PER's waterfront, essential to long-term viability of our business in Portsmouth, has not occurred.

Atlantic Wood Industries, Inc. SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Atlantic Wood Industries, Inc.	
EPA ID: VAD990710410	
Interviewer name: EPA CIC Lavar Thomas	**Interviewer affiliation: EPA**
Subject name: Joe Rieger, Deputy Director - Restoration	**Subject affiliation: Elizabeth River Project**
Subject contact information:	
Interview date:	**Interview**
Interview location: N/A	
Interview format: In Person **Phone** Mail Email Other:	
Interview category: NGO	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   We are glad that the Site is getting cleaned up and remediated, however the remedy chosen could have been greener or more environmentally friendly. The overall project has been an extensive cleanup. The contamination is affecting the river life and biota. The remedy that was also chosen had an impact on the environment. Because of the constructed wall that was created, all the backfill caused the previous natural habitat to be lost.

2. What have been the effects of this Site on the surrounding community, if any?
   The Atlantic Wood and local businesses have been impacted because of the remedy and having to move things around. The project has had little effect on the community because the community is not aware of what is happening. There has not been a lot of outreach. There is a Sediment Technical Group and they provide technical updates.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   Not to my knowledge.

4. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?
   Yes, we host a meeting about sediment cleanup in the river. The technical folks working on the Site are informed, but not the larger community like Cradock. The community has not seen any community involvement about what's going on at the Superfund Site. Also, the community on the other side of the George Washington Highway.

   How can EPA best provide site-related information in the future?
   Through updates and interaction with the community.

5. Do you feel well informed about the Site's activities and progress?
   Moderately, Randy came down and spoke about where they were at Sediment Group Technical Meeting.

6. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   More effort should be made to keep the community informed about what EPA is doing at the Site. EPA has not done a good job in engaging the Cradock community and the community on the other side of the George Washington highway surrounding the Atlantic Wood Site. EPA can also use the Atlantic Wood process and change the way they use Peck Iron and Metal. It is important to incorporate the public and help communities understand what is going on and how they can be involved.

Atlantic Wood Industries, Inc. SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Atlantic Wood Industries, Inc.	
EPA ID: VAD990710410	
Interviewer name: EPA CIC Lavar Thomas	**Interviewer affiliation: EPA**
Subject name: Resident	**Subject affiliation:**
Subject contact information:	
Interview date: 08/1/2019	**Interview time: 3:25 PM.**
Interview location: N/A	
Interview format (circle one): In Person **Phone** Mail Email Other:	
Interview category: Resident/part site owner	

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
   Yes.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   Disappointed with reuse of my property.

3. What have been the effects of this Site on the surrounding community, if any?
   I do not know about the community. It has put pollution on my property and prevented use. Raised the groundwater levels. The pollution from the containment area went onto the property.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   No.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
   Mostly.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?
   On municipal water and does not use private well.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   He would like his problems corrected. The construction raised groundwater 3 feet from the ground and destabilized the ground.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Atlantic Wood Industries, Inc.	**Date of Inspection:** 08/07/2019
Location and Region: Portsmouth, VA 3	**EPA ID: VAD990710410**
Agency, Office or Company Leading the Five-Year Review: EPA Region 3	**Weather/Temperature:** 85 and sunny

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: Active sediment activities
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☒ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ _____ _____ _____

	Name	Title	Date	Phone No.	
	Problems/suggestions ☐ Report attached:_____				
4.	**Other Interviews** (optional) ☐ Report attached: _____				
	III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)				
1.	**O&M Documents**				
	☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A	
	☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☒ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☒ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: ICs not yet implemented.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: No change in land use

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☒ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: Minor areas of settlement in CA1

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3.	**Erosion**	☐ Location shown on site map	☒ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☒ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: Good condition		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☒ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill		

cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement
   Area extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type:_____ Area extent: _____
   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Area extent: _____ Depth: _____
   Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Area extent: _____ Depth: _____
   Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions
   ☐ Location shown on site map Area extent: _____
   Size: _____
   Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Area extent: _____
   Remarks: _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs maintenance
Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs maintenance
Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs maintenance ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A
☐ Siltation not evident
Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____
☐ Erosion not evident
Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A
Remarks: _____

H. Retaining Walls ☒ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement: _____ Vertical displacement: _____
Rotational displacement: _____

Remarks: Good condition

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☒ Applicable ☐ N/A

1. **Settlement** ☒ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps and Electrical**

   ☐ Good condition ☐ Needs maintenance

   Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

   ☐ Good condition ☐ Needs maintenance

   Remarks: _____

3. **Spare Parts and Equipment**

   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

   Remarks: _____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

   ☐ Air stripping ☐ Carbon adsorbers

   ☐ Filters: _____

   ☐ Additive (e.g., chelation agent, flocculent): _____

   ☐ Others: _____

   ☐ Good condition ☐ Needs maintenance

   ☐ Sampling ports properly marked and functional

   ☐ Sampling/maintenance log displayed and up to date

   ☐ Equipment properly identified

   ☐ Quantity of groundwater treated annually: _____

   ☐ Quantity of surface water treated annually: _____

   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

   ☐ N/A ☐ Good condition ☐ Needs maintenance

   Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

   Remarks: _____

4. **Discharge Structure and Appurtenances**

   ☐ N/A ☐ Good condition ☐ Needs maintenance

   Remarks: _____

5. **Treatment Building(s)**

   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

   ☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

Overall, the components of the remedy implemented to date are functioning as intended.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None noted.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted.

APPENDIX G – SITE INSPECTION PHOTOS

South Norfolk Jordan Bridge and CA1, facing east

Dredged area of Elizabeth River and offshore sheet pile containment wall, facing south

Weeds growing in CA1

CA1, facing west

Locked monitoring wells in CA1

Evidence of CA1 settlement within offshore sheet pile containment wall

Navy Pier A under which dredging occurred

Capped area of Elm Ave Right of Way

Capped area under South Norfolk Jordan Bridge (SNJB/FIGG property)

Cap construction on AWI property

Cap construction on AWI property

Current Atlantic Metrocast operations area

Dredged material stockpile at CA2

Capped area at northern, completed part of CA2 with Atlantic Metrocast concrete product storage

Dredged material stockpile at northern part of CA2 with warning sign


Grading of dredged material at CA2

Compacted Dredged Sediment at Former Portsmouth Public School District property

Contaminated soil stockpile at southern part of CA2

Application of amendment to dry out dredged sediment at southern part of CA2