# Southeastern Public Service Authority of Virginia (SPSA) Landfill Expansion

## Final Environmental Impact Statement

NEPA ID number: EISX-202-00-E4R-1728404802

eNEPA number: EIS No. 20230075

PREPARED FOR

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FEBRUARY 2025

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Note: The Norfolk District determined that this environmental impact statement (EIS) review qualified for the extraordinary circumstances and therefore the increase above 150 pages was warranted. The proposed expansion has the potential to affect over 100 acres of wetlands regulated under Section 404 of the Clean Water Act, and a Department of the Army Individual Permit would be required for the applicant's preferred alternative. The project site is located within the ancestral Lands of the Nansemond Indian Nation and near the Great Dismal Swamp National Wildlife Refuge and Great Dismal Swamp National Natural Landmark. The Norfolk District conducted a thorough review of a reasonable range of alternatives and considered the effects of the project on a cultural resource that was identified during this EIS process. Moreover, the Norfolk District added a hybrid alternative (combining the No-Action Alternative and applicant's preferred alternative) to the Final EIS and held multiple public meetings throughout the EIS process. The location, scope, and complexity of this analysis support the determination to increase the page limit.

RESPONSIBLE AGENCY: The U.S. Army Corps of Engineers (Corps), Norfolk District (the Norfolk District) is the lead agency for the development of this environmental impact statement (EIS).

APPLICANT: Southeastern Public Service Authority (SPSA)

PROJECT TITLE: SPSA Regional Landfill Expansion Environmental Impact Statement. Department of Army (DA) Permit Number: NAO-1988-00021

DESIGNATION AND AUTHORITY: The decision to issue, issue with conditions, or deny the Applicant a DA permit, pursuant to Section 404 of the Clean Water Act (CWA) is a major federal action that has the potential to significantly affect the quality of the human environment. The Norfolk District prepared this EIS to comprehensively assess the impacts from the applicant's preferred alternative and evaluate reasonable alternatives to the preferred alternative. The Norfolk District will determine whether to issue, issue with conditions, or deny SPSA a DA permit, pursuant to Section 404 of the CWA. The DA permit application evaluation would be performed in accordance with guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404 (b)(1) and Section 401 of the CWA and in accordance with Title 62.1 of the Code of Virginia.

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THIRD-PARTY CONTRACTOR: VHB

COMMENT SOLICITATION: In response to the COVID-19 pandemic, on March 24, 2020, the Corps issued a memorandum, *Interim Army Procedures for National Environmental Policy Act (NEPA)*, in response to the coronavirus (COVID-19) pandemic, which was relied upon for scoping. A meeting invitation was emailed to federal and state agencies on April 15, 2020, and a virtual agency pre-scoping meeting was held via WebEx on May 7, 2020. The Norfolk District published a Notice of Intent and initiated the scoping process in the Federal Register to notify the public of the intent to prepare a Draft EIS (DEIS) on July 27, 2020. A public notice and notices to interested parties and local, state, and federal elected officials were sent via email on July 31, 2020, providing information about the proposed project and announcing that the Norfolk District was conducting public scoping for the SPSA Landfill Expansion Project EIS from

July 31, 2020, through September 14, 2020. The Norfolk District established a web-based Virtual Public Scoping Room that provided information about the project, including maps showing the project site and updates on the ongoing alternatives analysis. Based on comments received and further analysis, the Norfolk District refined the preliminary range of alternatives and identified two on-site alternatives as well as six possible off-site alternatives for potential evaluation in the EIS. Norfolk District held an additional scoping period from December 17, 2020, to January 18, 2021, to accept comments on the alternatives to be reviewed.

The Norfolk District published the DEIS on June 16, 2023. The DEIS was distributed to interested individuals, agencies, and organizations and was available for public and agency review for 60 days. The Norfolk District conducted two public information sessions in June 2023 and two public hearings in July 2023. The meetings were held in the City of Suffolk, Virginia (proposed expansion location) and in the Town of Ivor, which is in Southampton County, Virginia (near the proposed alternative site SH30). Comments on the DEIS were received after the publication of the public notice; during the public hearings as recorded and transcribed in the meeting transcript; and during the comment period. Comments on the DEIS were considered by the Norfolk District during the development of the Final EIS (FEIS) and are addressed in the Comment Response Summary (Appendix J). The Norfolk District will accept comments on the FEIS for 30 days following publication in the Federal Register.

# Executive Summary

## Purpose of and Need for Action

SPSA is responsible for managing and operating a safe, cost-effective, and environmentally responsible solid waste management system to satisfy the waste disposal needs of its member localities, which include the cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and counties of Isle of Wight and Southampton, all located in southeastern Virginia. The implementation of a regional waste management system began in 1985 with development of the Regional Landfill in Suffolk, Virginia. Since that date, SPSA has served as the regional solid waste management authority for the member localities. One of the purposes of SPSA, as stated in its articles of incorporation, is to acquire, finance, construct, operate, and maintain a garbage and refuse collection and disposal system. SPSA is a not-for-profit entity whose operations are bound by federal, state, and local laws and regulations, as well as its operating agreements with its members and other stakeholders.

In a submission to the U.S. Army Corps of Engineers (Corps) Norfolk District (Norfolk District), SPSA defined the purpose of the proposed project as expanding its operations into Cells VIII and IX, creating approximately 16 million cubic yards (CY) of disposal capacity at the existing Regional Landfill, in order to continue to meet the region's long-term solid waste disposal needs in a safe and environmentally sound manner. The Norfolk District has reviewed the applicant's purpose and need and has determined that the underlying purpose and need, from a public interest perspective, is to provide safe and environmentally sound solid waste management for the region through approximately 2060, consistent with the Regional Solid Waste Management Plan (RSWMP) for southeastern Virginia and the Use and Support Agreements with the member localities. Given the complexity of planning, permitting, and constructing large engineered projects such as a landfill expansion, as well as the lifespan of such projects, the Norfolk District has determined that it is appropriate to examine waste disposal capacity beyond the minimum planning horizon prescribed by regulation, and has therefore considered the purpose and need for the project to provide regional waste disposal capacity through roughly 2060, which translates to approximately 16 million CY of capacity. As used in this Purpose of and Need for Action, the term "disposal capacity" is not limited to landfilling but could include other alternatives for the disposition of that volume of waste.

SPSA currently has less than 13 years of permitted capacity, through 2037. In order to maintain 20 years of disposal capacity, SPSA began planning, preliminary design, and the permitting process for a landfill expansion in 2020. If permits are issued to authorize the construction of Cells VIII and IX, the life of the Regional Landfill would be extended through approximately 2060 depending on densities achieved during the operational window. Were the Norfolk District to identify a smaller planning horizon and capacity, e.g., a 20-year timeline starting now, projected waste management needs and applicable law would require SPSA to begin planning for additional capacity in just a few years (regardless of the alternative it pursues). SPSA is required to plan for solid waste management through at least 2040 under the current RSWMP, which expires in 2025. SPSA's required minimal planning horizon will extend to the year 2045 pursuant to the revised 2025 RSWMP. By 2030, upon the next RSWMP revision, SPSA must plan through 2050.

## Need for an Environmental Impact Statement

The proposed expansion has the potential to affect over 100 acres of wetlands regulated under Section 404 of the CWA (33 USC § 1344), and a Department of the Army Individual Permit would be required for the applicant's preferred alternative. In June 2023, SPSA submitted a Joint Permit Application (JPA) to the Norfolk District requesting authorization to permanently impact 109.64 acres of forested wetlands for their preferred alternative. The granting of the permit would be a major federal action by the Norfolk District. Accordingly, and as required by Section 102(2)(C) of the National Environmental Policy Act (NEPA) (42 USC § 4332(2)(C)), the proposed expansion requires an EIS to be prepared under the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500–1508) and Corps regulations (33 CFR Part 325). This EIS has been developed to assess the project, including the affected environment, environmental effects, and alternatives to inform the Norfolk District's decision making concerning SPSA's permit application.

## Applicable Legal Authorities

The analysis in this FEIS was conducted from June 2023 through 2024 and the Norfolk District relied on regulations, executive orders, and other authorities in effect during that time. These authorities included executive orders that have been rescinded on and since January 20, 2025, as well as regulations promulgated by CEQ whose authority to promulgate regulations binding on federal agencies has since been revoked. Norfolk District has removed references to the rescinded executive orders and has endeavored to revise this FEIS in a manner consistent with recently issued executive orders. The Norfolk District has balanced this effort against direction to take all available and lawful efforts to eliminate delays within permitting processes. The Norfolk District received DEIS comments on Environmental Justice. Those comments are addressed in the Comment Response Summary, which is attached as Appendix J, and in the "Local Community" section of the FEIS in Chapter 3 under "Topics Retained for Detailed Analysis." Norfolk District also received comments on Climate Change, and those comments are addressed in the Comment Response Summary and within the FEIS. Finally, although the Norfolk District has retained references to the CEQ NEPA Regulations, the District has also determined that the analyses in this document are consistent with the NEPA statute and the USACE regulations found at 33 C.F.R. Part 325, Appendix B.

## Scoping and DEIS Results

Based on scoping comments received and further analysis, the Norfolk District refined the preliminary range of alternatives and identified two on-site alternatives as well as six possible off-site alternatives for potential evaluation in the DEIS. Prior to publication of the DEIS, Norfolk District held an additional scoping period from December 17, 2020, to January 18, 2021, to accept comments on the alternatives to be reviewed. Based on those scoping comments and additional work, the Norfolk District determined that five of the off-site alternatives were not practicable and one was dismissed due to greater wetland impacts than the applicant's preferred alternative. The Norfolk District reviewed an additional 10 sites and carried one of those off-site alternatives (SH30) forward in the DEIS. Based on public comments on the DEIS and other factors outlined in this FEIS, the SH30 site was deemed not practicable. Comments received on the DEIS also suggested the review of a Hybrid Alternative that would combine a smaller landfill footprint with hauling to private landfills, which is the No-Action alternative. This FEIS provides the analysis of the Hybrid Alternative.

## Alternatives

This EIS analyzes four alternatives: the No-Action Alternative and three action alternatives (Alternatives A, B, C, and E, respectively). One site, Site SU02, was dismissed from further analysis in the DEIS because the conceptual development plan for a landfill at this site would have resulted in greater wetland impacts than that of the applicant's preferred alternative (Alternative C). As a result of public scoping and comments received on the DEIS released in June 2023, Alternative D (Site SH30) was evaluated in the DEIS, but has been determined not practicable and dismissed from further analysis in this FEIS.

Under the No-Action Alternative, SPSA would not expand its landfill operations into Cells VIII and IX and no construction requiring a Corps permit would occur. Landfill operations would continue to utilize the currently permitted capacity available through Cell VII, which is expected to last until approximately 2037. After Cell VII reaches capacity and is closed with a final cover system, waste would be hauled to other private landfills for processing and disposal.

Under Alternative B (Original Proposed Alternative), SPSA would expand its existing landfill operations into an expansion site, within which two new contiguous waste disposal cells (Cells VIII and IX) would be constructed over time, in phases. This new expansion site would permanently impact 117.36 acres of forested wetlands. Landfill cells within this site would provide 16 million CY of new waste capacity. Landfilling operations at the expansion site would be expected to occur between approximately 2036-2060.

Under Alternative C, the applicant's preferred alternative, Cells VIII and IX would be developed as they would under Alternative B; however, the airspace between Cells V and VII would also be utilized for landfilling operations. Infilling this airspace would secure an additional 1.52 million CY of disposal capacity, reducing the need for capacity provided by the expansion site to 14.48 million CY. Alternative C would permanently impact 109.64 acres of forested wetlands. This alternative would provide 16 million CY of new waste capacity. Landfilling operations at the expansion site would be expected to occur between approximately 2036-2060.

Alternative E comprises two scenarios that are within the spectrum of alternatives that were reviewed in the DEIS (i.e., they involve combinations of Alternatives A and C). The new hybrid alternative would provide both a 50% and a 25% diversion scenario in which 50% and 25% of MSW, respectively, would be diverted to private area landfills and the remaining MSW would be landfilled at the Regional Landfill. To landfill the remaining 50% and 75% of waste (under the 50% and 25% diversion scenarios, respectively) that would not be diverted and would continue to need landfilling, SPSA would develop the expansion site area with a smaller footprint than Cells VIII and IX, as described under Alternative C. Operation of this new area would begin in approximately 2036, shortly before Cell VII reaches capacity in 2037. Similar to Alternative C, the airspace between Cells V and VII would also be infilled and utilized for landfilling operations. Under the 50% diversion scenario, the required disposal capacity would be 7.24 million CY. The expected life of a cell this size would last approximately 11 years. A cell with this capacity would require a footprint of 53.76 acres. Combined with the approximate 18 acres required for supporting infrastructure, the total wetland impact under the 50% diversion scenario would be 71.76 acres. Under the 25% diversion scenario, the required cell disposal capacity would be 10.86 million CY, which would be expected to have a 16.5-year lifespan. The required footprint for a cell this size would be 72.85 acres. Combined with an approximate 24 acres required for supporting infrastructure, the total wetland impact under the 25% diversion scenario would be 96.85 acres. Under Alternative E, operations would continue until the reduced expansion area was filled to capacity. Following this, under the 50% diversion scenario, the landfill would close in approximately 2047. Under the 25% diversion scenario, the landfill would close in approximately 2052. Once the landfill closed, SPSA would begin hauling the remainder of waste to a private landfill.

The table below provides a comparison of the alternatives carried forward for analysis in this FEIS.

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### Table ES-1. Alternatives Summary Table

| | On-site Capacity (CY) | Off-site Hauled Capacity (CY) | Cell Footprint (AC) | Support Area Footprint (AC) | Total Wetland Impact (AC) | Years of Landfill Life (Approximate) | Years of Hauling (Approximate) | Greenhouse Gas Emissions (MT $CO_2E$) | Average Operational and Capital Cost ($ millions) |
|---|---|---|---|---|---|---|---|---|---|
| Alternative A | 0 | 16,000,000 | 0 | 0 | 0 | 0 | 24 | 1,618,254 | $1,046,596,933 |
| Alternative B | 16,000,000 | 0 | 91.60 | 25.76 | 117.36 | 24 | 0 | 1,295,696 | $686,644,600 |
| Alternative C | 16,000,000* | 0 | 84.28 | 25.36 | 109.64 | 24 | 0 | 1,293,436 | $686,026,600 |
| Alternative E: Hybrid 50% | 7,240,000* | 8,760,000 | 53.76 | 18.00 | 71.76 | 11 | 13.4 | 1,532,475 | $772,723,600 |
| Alternative E: Hybrid 25% | 10,860,000* | 5,140,000 | 72.85 | 24.00 | 96.85 | 16.5 | 7.9 | 1,450,446 | $805,928,000 |

*Includes 1.52 million CY of airspace between Cells V and VII.

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## Mitigation

SPSA's proposed mitigation plan focuses on their preferred alternative (Alternative C), and they have proposed to compensate for permanent impacts to 109.64 total acres of nontidal forested wetlands at a 2:1 ratio with 219.28 credits. The proposed compensation for the 109.64 acres of forested wetland impact would be accomplished through the purchase of 159 credits from established mitigation banks (2:1 ratio) and preservation of at least 602.80 acres of forested wetland (10:1 ratio) to obtain the remaining 60.28 credits. SPSA has indicated that the purchase of these mitigation bank credits would meet the no net loss requirement with a total of 114 acres of wetlands generated by creation or restoration. SPSA proposes the conservation of 742.56 acres of primarily forested wetland habitat within the sub watershed Nansemond River-Cedar, with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for canebrake rattlesnake habitat. SPSA has also mitigated for impacts to historic sites as set forth immediately below.

## Controversial Areas

During the scoping period, the Nansemond Indian Nation indicated that the project site was within historic Dismal Swamp and ancestral lands of the Nansemond Indian Nation. Subsequent to publication of the DEIS, the Nansemond Indian Nation expressed concerns that the project would adversely affect a Traditional Cultural Property (TCP) of significance to the Tribe. Evaluation of a TCP requires consideration under Section 106 of the National Historic Preservation Act. The Norfolk District has identified a TCP within the project area, in consultation with the Nansemond Indian Nation. The Norfolk District determined that the project would have an adverse effect on the TCP and has developed a draft Memorandum of Agreement (MOA), which is attached as Appendix H. The MOA would need to be signed prior to completion of a Record of Decision (ROD).

## Issues to be Resolved

Consistent with 40 CFR 1502.16 and 40 CFR 1508.27, the Corps evaluated the environmental consequences of the alternatives carried forward for detailed analysis. Topics carried forward for detailed impact analysis included: water resources; biological resources; transportation and traffic; air quality and emissions; noise; cultural resources; socioeconomics; and local community. The Corps also considered but ultimately dismissed the topic of on-site land use at the Regional Landfill, since any alternative selected would take place within the boundaries of the existing landfill. This EIS considers the affected environment and the Environmental Consequences of Alternatives A, B, C and E. Based on the analysis provided in this FEIS, the Norfolk Districts finds that the No-Action Alternative (Alternative A) is the environmentally preferred alternative as it would have the least impact on wetlands and Tribal concerns. The environmentally preferred alternative is not the Least Environmentally Damaging

Practicable Alternative (LEDPA). From a cost standpoint, for waste disposal at private landfills, market conditions are highly variable and would be dependent on future available capacity. Norfolk District's independent evaluations, which are detailed in Appendix D, were calculated using average tipping fees in Virginia. The No-Action Alternative A would cost approximately $361 million more than the applicant's preferred Alternative C, a 53% increase in cost. The Hybrid 50 Alternative E would on average cost $201 million more than the applicant's preferred, a 30% increase in cost and the Hybrid 25 Alternative E would on average cost $120 million more than the applicant's preferred alternative, a 17% increase in cost. The increased costs would be passed on to the individual members of the public that are served by SPSA. Norfolk District independently evaluated a reasonable range of alternatives and has determined that the only practicable alternatives are Alternative B: Original Proposed Alternative and Alternative C: Proposed Action (Applicant's Preferred). The Norfolk District will complete a public interest review and 404 (b)(1) analysis in the ROD before designating a LEDPA and making a permit decision on the applicant's preferred alternative, Alternative C.

# Chapter 1: Purpose and Need

## Introduction

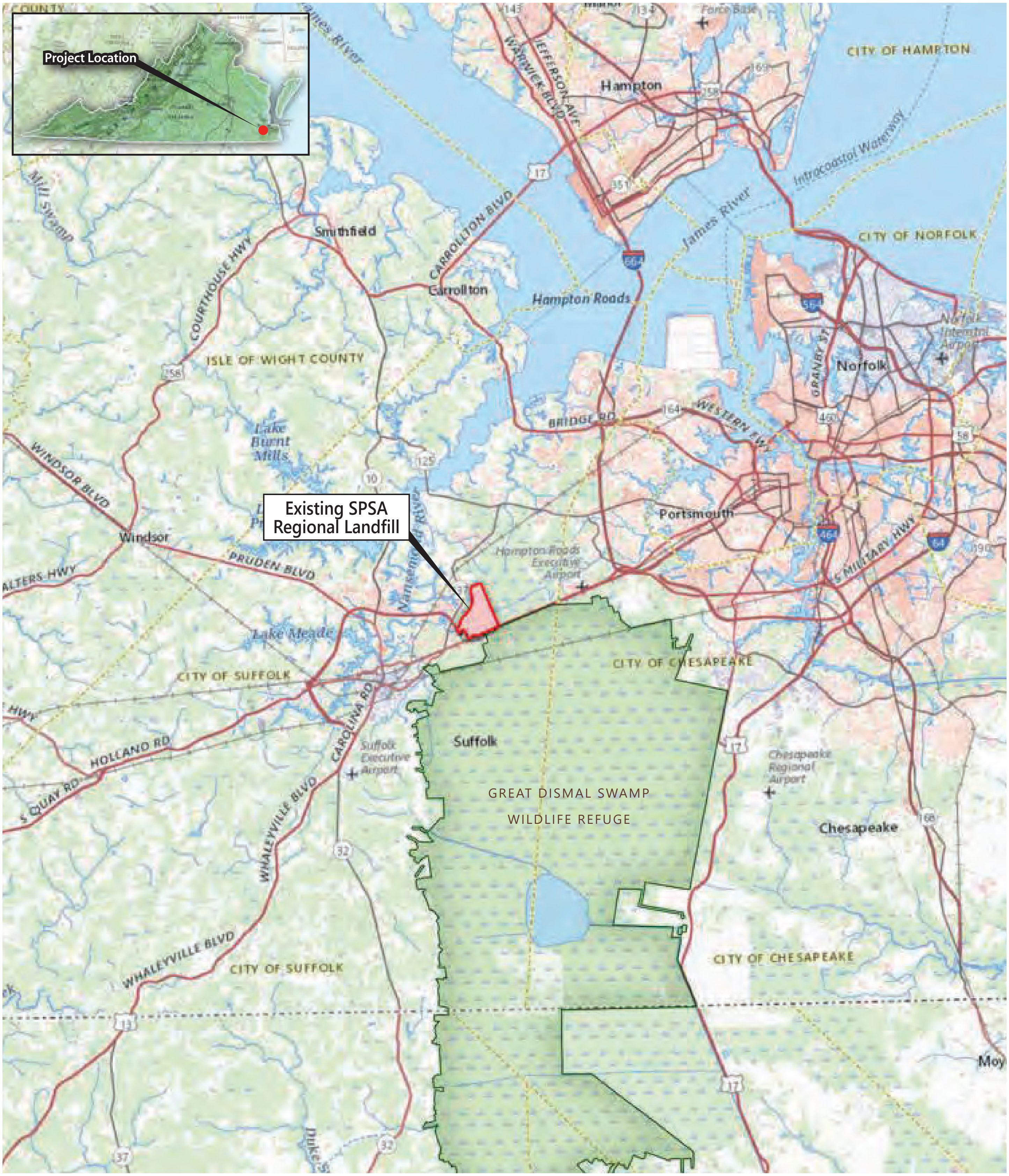
The U.S. Army Corps of Engineers (Corps) Norfolk District (Norfolk District), has prepared this Final Environmental Impact Statement (FEIS) to assess the potential environmental impacts of permitting and constructing the proposed expansion of the Southeastern Public Service Authority's (SPSA) Regional Landfill in the City of Suffolk, Virginia (applicant's preferred alternative). Because the proposed expansion has the potential to affect over 100 acres of wetlands regulated under Section 404 of the Clean Water Act (CWA) (33 USC § 1344), a Department of the Army Individual Permit would be required for the applicant's preferred alternative. The granting of the permit would be a major federal action by the Norfolk District. Accordingly, and as required by Section 102(2)(C) of the National Environmental Policy Act (NEPA) (42 USC § 4332(2)(C)), the proposed expansion requires an EIS to be prepared under the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500–1508) and Corps regulations (33 CFR Part 325).

SPSA was created in 1973 pursuant to the Virginia Water and Waste Authorities Act (formerly, the Water and Sewer Authorities Act), and is governed by a Board of Directors consisting of two representatives from each of the following member localities: cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and counties of Isle of Wight and Southampton, all located in southeastern Virginia.

One of the purposes of SPSA, as stated in its articles of incorporation, is to acquire, finance, construct, operate, and maintain a garbage and refuse collection and disposal system. SPSA's mission is to manage and operate a safe, cost-effective, and environmentally responsible solid waste management system to satisfy the waste disposal needs of its member localities, recognizing that different member localities have different waste-disposal needs. SPSA is a not-for-profit entity whose operations are bound by federal, state, and local laws and regulations, as well as its operating agreements with its members and other stakeholders.

The implementation of a regional waste management system began in 1985 with development of the Regional Landfill in Suffolk, Virginia (Figures 1-3). Since that date, SPSA has served as the regional solid waste management authority for the member localities. SPSA serves nearly 1.2 million residents, who generate more than one million tons of municipal solid waste per year. SPSA's waste management system includes the Regional Landfill and nine transfer stations, accompanied by a transportation operation, a fleet maintenance facility, a tire shredder facility, a white goods program (refrigerators, washing machines and other large household appliances), and a household hazardous waste program (Figure 4). Some member communities operate their own recycling program.

Service: ESRI Basemap USGS The National Map; USFWS GIS Data - National Wildlife Refuge Boundaries




**LEGEND**

- Potential Project Location
- Great Dismal Swamp

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

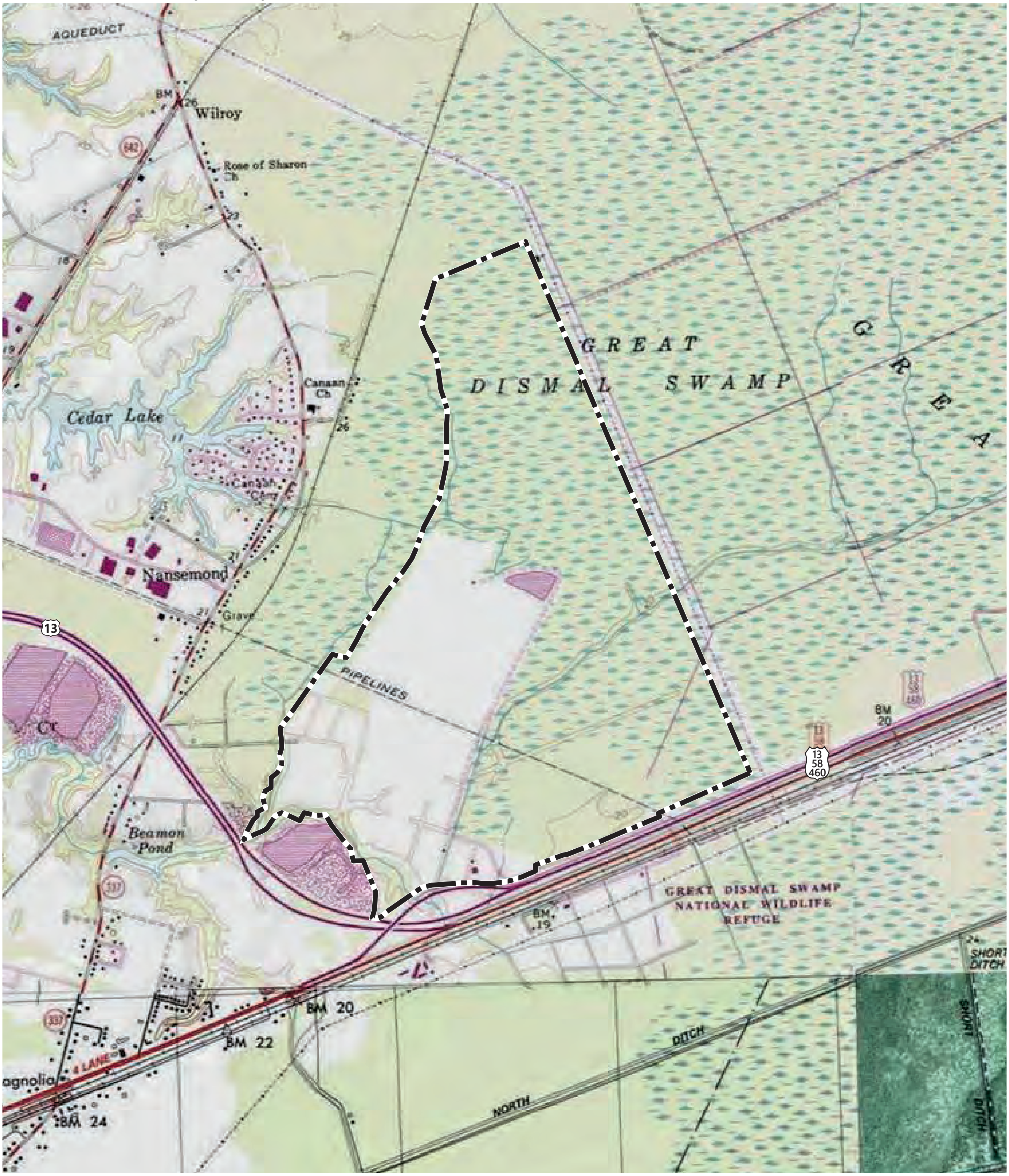
N

0 6 Miles

FIGURE 1

**SPSA Regional Landfill Project Location Map**

Service: USGS 7.5 minute Chuckatuck, Virginia Quadrangle




LEGEND

SPSA Property Boundary

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

N

0 2,000 Feet

FIGURE 2

**SPSA Regional Landfill**
**Project Location Map (Quadrangle)**

Source: Nearmap Imagery Dated February 10, 2022


LEGEND

SPSA Property Boundary

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

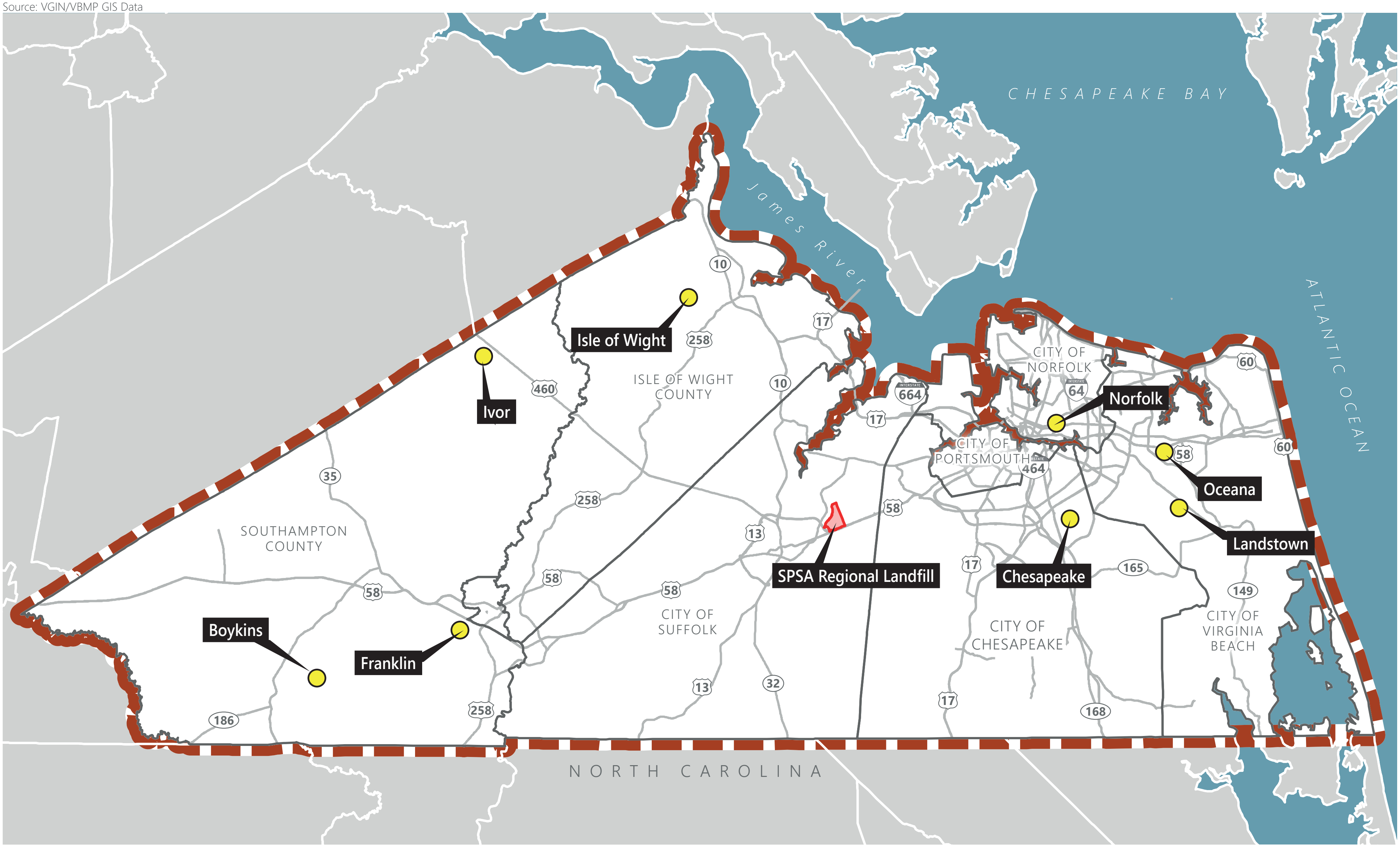
N

0 2,000 Feet

FIGURE 3

**SPSA Regional Landfill**
**Project Location Map (Aerial)**

Source: VGIN/VBMP GIS Data




**LEGEND**

Existing Regional Landfill
Service Area Boundary
Transfer Station

N

0 9 Miles

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 4

**SPSA Service Area Map**

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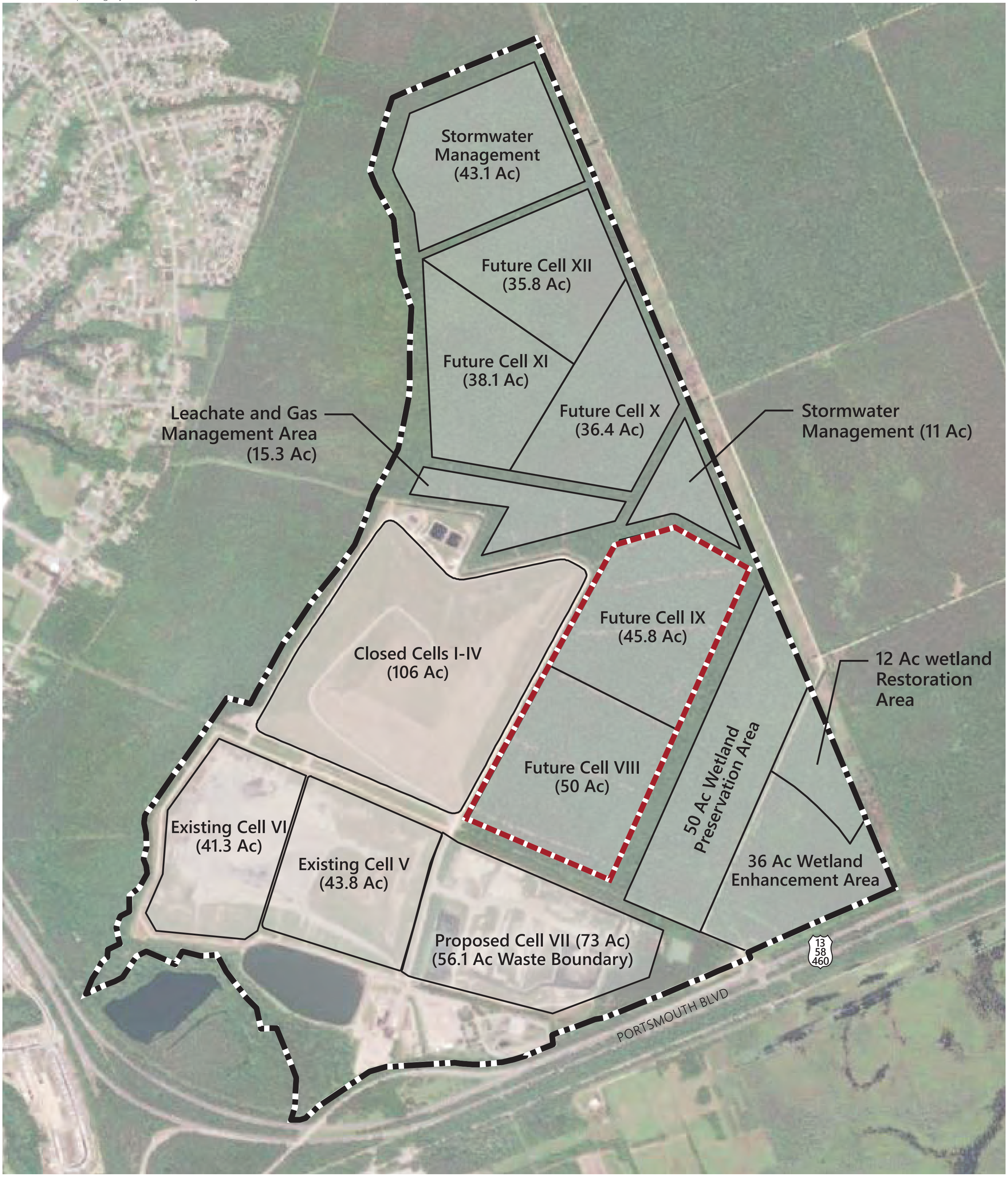
In order to be adequately prepared to meet the needs of its member communities, SPSA has determined that it needs to increase the solid waste disposal capacity at the Regional Landfill by incorporating an additional 16 million cubic yards (CY) of capacity within the active facility boundary (identified as Cells[1] VIII and IX and the airspace between Cells V and VII). The proposed expansion into Cells VIII and IX is part of SPSA's long-term plan for providing critical disposal capacity for the region and is consistent with the *Regional Solid Waste Management Plan (RSWMP) for Southeastern Virginia*, which identifies the need for future expansion of the active facility (HRPDC 2023). SPSA's long-term plan previously included expansion of waste disposal areas on the site to include Cells X, XI, and XII (Figure 5). In June of 2023, SPSA proposed to preserve the 217.21-acre future expansion area through a conservation easement. Preservation of the 217.21-acre area, including the standing timber, is part of SPSA's mitigation proposal.

[1] A landfill cell is an area of the landfill where solid waste is deposited.

Source: Nearmap Imagery Dated February 10, 2022




LEGEND

SPSA Property Boundary

Proposed Expansion Cells VIII & IX

Landfill Cell Boundary

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

N

0 1,250 Feet

FIGURE 5

**SPSA Regional Landfill Master Plan**

SPSA's proposed use of Cells VIII and IX would require approvals and permits from federal, state, and local agencies prior to any ground disturbance or construction. SPSA intends to apply for an amendment to its Virginia Department of Environmental Quality (VDEQ) Solid Waste Part A permit for expansion of the landfill operations to incorporate Cells VIII and IX. On June 2, 2023, SPSA submitted a Joint Permit Application (JPA) to the Norfolk District for work in Waters of the United States (WOTUS), including wetlands. The proposed construction of Cells VIII and IX, as well as the airspace between Cells V and VII, would require filling more than 100 acres of jurisdictional wetlands, regulated under Section 404 of the CWA. The JPA would also be used to apply for corresponding permits from the Virginia Marine Resources Commission, the VDEQ, and/or local wetlands boards.

The SPSA Regional Landfill Expansion project has involved coordination with the public, as well as with local, state, and federal officials. This coordination has taken place to ensure the public and all stakeholders remain informed and engaged throughout the project to satisfy requirements under NEPA and other agency requirements. Additional scoping details are provided in Chapter 4, "Consultation and Coordination," of this FEIS.

## SPSA's Solid Waste Management System

SPSA's solid waste management system transports and disposes of municipal solid waste (MSW), as well as construction and demolition debris (CDD). Municipal solid waste is the bulk of the waste entering SPSA's management system and includes typical household solid waste and commercial/industrial solid (nonhazardous) waste as defined by 9 VAC (Virginia Administrative Code) 20-81. Municipal solid waste delivered to SPSA's transfer stations is taken to the Regional Landfill for disposal. SPSA currently disposes the equivalent tonnage of commercial waste that is received at their transfer stations to private landfills.

Yard waste is managed through a variety of means to include recycling at the point of origin (residents recycle or compost their own yard waste), while some municipalities collect grass, clippings, and leaves at the curb. The majority of collected yard waste is then either sent for composting at a community or a private facility. Yard waste from Suffolk is taken to SPSA transfer stations for disposal at the Regional Landfill. See "Alternative Technologies" in Chapter 2, below, for additional detail about SPSA's waste diversion efforts.

SPSA provides CDD disposal services at the Regional Landfill, although typically, most CDD generated in the region is sent directly to private CDD landfills, both within and outside the area served by SPSA. Privately-owned collection firms provide CDD collection services, and construction contractors are responsible for procuring CDD collection containers (e.g., dumpsters or roll-offs) and services at their respective job sites.

General household recyclables include aluminum, steel, or tin cans, plastic bottles, cardboard, mixed paper, and glass. Franklin, Norfolk, Portsmouth, Suffolk, Virginia

Beach, and some areas of Southampton County operate a curbside recycling collection program. The municipalities deliver the collected materials to local material recovery facilities for processing and distribution to market. SPSA does not operate a household recyclable processing facility. In the other localities served by SPSA, recyclables are brought to drop-off locations by residents or private contractors.

## Project Location

The SPSA Regional Landfill is located at 1 Bob Foeller Drive in Suffolk, Virginia (see Figures 1-3). SPSA's service area includes approximately 2,000 square miles located in the Virginia cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the counties of Isle of Wight and Southampton, as illustrated on Figure 4. More than one million tons of municipal solid waste is generated within the service area per year. SPSA's Regional Landfill property is comprised of approximately 833 acres, of which 376 acres are within the active facility boundary currently permitted by the VDEQ under Solid Waste Permit No. 417.

## Project Background

SPSA's operations are determined in part by the RSWMP, which provides an overview and analysis of solid waste management by SPSA and its member localities in the geographic territory served by SPSA. The RSWMP is prepared by the Hampton Roads Planning District Commission (HRPDC) in coordination with SPSA and its member localities. The HRPDC serves as the regional solid waste planning agency and provides a framework for coordinating solid waste and recycling programs in the region. The planning horizon identified in the current 2020-2025 RSWMP, developed by the HRPDC, is through 2040. The RSWMP, last amended in December 2023, is attached as Appendix E.

In April 1984, SPSA initiated the acquisition and construction of a landfill located in Suffolk (the Regional Landfill), seven transfer stations and supporting equipment, truck and tractor fleets and heavy equipment, and ancillary facilities. SPSA subsequently financed a refuse derived fuel plant, fuel delivery system, and a waste-to-energy power plant located on federally owned land (U.S. Navy) in Portsmouth, Virginia (collectively, the RDF Plant), as well as a solid waste transfer station located in Suffolk, Virginia, and certain related equipment, truck and tractor fleets, and ancillary facilities. The RDF Plant accepted municipal and commercial solid waste, separated out materials unsuitable for burning as fuel, and then burned the refuse derived fuel to fire large boilers, providing steam and electricity to the Norfolk Naval Shipyard. Excess electricity produced was sold back to the electric grid. Collectively, these facilities and equipment formed the basis of SPSA's solid waste management system prior to July 1, 2024.

In April 2010, SPSA sold its RDF Plant and affiliated power plant to Wheelabrator Technologies, Inc. (Wheelabrator), a company then affiliated with Waste Management, Inc. Effective upon the sale of the RDF Plant, SPSA entered into an agreement with

Wheelabrator Portsmouth, Inc. for solid waste disposal services until January 24, 2018, followed by an extension to January 31, 2019. Following a competitive negotiation process in 2018, a new agreement was formed between SPSA and Wheelabrator for continuing solid waste disposal services from February 1, 2019, through June 30, 2027, with the option to renew for up to two five-year periods. Under the terms of the agreement, SPSA delivered some of the municipal solid waste it received to Wheelabrator for conversion to fuel. The RDF Plant processed approximately 83% of the waste that came through SPSA facilities. The waste was then burned at the RDF Plant, resulting in 211,236 megawatts of electricity being sold to the grid and 360,024 thousand pounds of steam being sold to the U.S. Navy (SPSA 2021d). The ash residue was transported to the Regional Landfill for use as an alternative daily cover or for disposal, depending on its quality. In 2021, WIN Waste Innovations, a waste management company, acquired Wheelabrator Portsmouth's assets, while also consolidating with nine other waste management firms to form WIN Waste Innovations. A fire at the Wheelabrator facility occurred in December 2022 and although repairs were performed, the plant was operating at a reduced capacity.

The U.S. Navy has developed plans, received approvals, and broke ground to construct a natural gas-powered steam and energy plant at the Naval Shipyard in Portsmouth. Once the plant is constructed, the U.S. Navy indicated that they would no longer purchase steam from Wheelabrator, a loss in revenue of nearly $10 million dollars per year. The loss in steam revenue combined with the cost to replace and repair the nearly 35-year-old aging infrastructure forced Wheelabrator to close its facility in June 2024. Upon its closure, all waste is being directed to the Regional Landfill.

## Regional Landfill Capacity

SPSA began disposing of solid waste in Cell I of the Regional Landfill in 1985. Cells I–IV were closed in the summer of 2009. SPSA is currently operating in Cells V and VI. Prior to 2008, the SPSA Regional Landfill was receiving over 1.2 million tons of waste and consuming 1.4 million CY of disposal airspace per year. Landfill disposal airspace is defined as the volume of space on a landfill site which is permitted for the disposal of waste, including both space excavated below ground and space above ground that was initially occupied by air and will eventually be displaced by disposed waste. Tonnage is a weight measurement (how much does the material weigh?) while cubic yards measures volume (how much space is filled?). Disposal airspace, measured in cubic yards is the available volume to be filled and varies depending on the efficiency of the landfill operation. Each year, SPSA publishes an *Airspace Management Report* (SPSA 2022a) which provides a detailed update on how much airspace remains at the Regional Landfill. In response to the disposal needs of the member communities, SPSA applied for a solid waste permit amendment to add Cell VII for disposal of approximately 10.8 million CY of waste. VDEQ issued an amended permit for the future expansion of the landfill into Cell VII in 2011.

SPSA's service area currently generates approximately 450,000 tons of MSW per year. Previously, 350,000 tons were taken to Wheelabrator's RDF plant for conversion to energy, and approximately 100,000 tons were taken directly to the Regional Landfill. Now, the bulk of that MSW is disposed of at the Regional Landfill.

Because of the closure of the Wheelabrator facility, SPSA's contract with Wheelabrator ended in June 2024—three years earlier than anticipated. In accordance with SPSA's Strategic Operating Plan, the SPSA Board of Directors and Executive Staff undertook a comprehensive review of the Designated Disposal Mechanism (DDM). The Regional Landfill was selected as the sole disposal location, or DDM, and the total incoming waste is expected to be 450,000 tons annually. This would result in the available airspace being consumed at a much higher rate, and the remaining capacity in Cells V and VI would be consumed by March 2027 or sooner. SPSA issued an RFI for system-wide disposal methods on November 6, 2023 with the goal of having a solution that would coincide with Wheelabrator's June 30, 2024 closure date. SPSA considered proposals for alternative technologies and/or disposal methods that are proven to be safe, viable, and cost-effective. SPSA remains interested in waste diversion and stays apprised of industry innovation and regularly takes meetings with companies like IBC Renewables and AMP Robotics to keep abreast of technological developments on the horizon.

Based on the above projections for Cells V and VI running out of airspace by 2027, SPSA had anticipated needing to start construction of Cell VII by the end of 2024 to ensure capacity remains available. Construction of Cell VII would require excavation and stockpiling of 1.5 million CY of soil material. Cell VII would be excavated to a level generally consistent with that of Cells V and VI, approximately 15 to 40 feet (ft) below grade. The soil borrow area currently being operated in the Cell VII area is providing the soil cover materials required for daily facility operations and is being conducted in a manner that establishes the subgrade elevations of the proposed Cell VII. Since the Regional Landfill was selected as the sole DDM in July 2024, the volume of waste disposed of at the Regional Landfill is expected to increase substantially, reducing its life to less than 20 years. Depending on the actual volume of waste delivered to the Regional Landfill, additional capacity beyond Cell VII could be needed between 2036 and 2038. In order to meet its contractual obligations to the member localities to maintain 20 years of operating capacity, SPSA needs to proceed assuming that these conditions may occur and begin seeking permits for additional disposal capacity at the Regional Landfill.

## Previous Regulatory Context

In 1982, the Hampton Roads region conducted a study to evaluate the environmental and economic aspects of developing a regional landfill. The location of the existing Regional Landfill in Suffolk was chosen following a siting study (USACE 1995). According to the Norfolk District's 1977 aerial photographs, the location of the administration buildings, entrance roads, and the majority of Cell VI and approximately one-quarter of Cell V were previously active agricultural fields when the landfill property was purchased by SPSA (USACE 1977). This equates to slightly more than 100 acres of agricultural fields that were used for the Regional Landfill. Prior to its development, the remaining 275 acres of the current active landfill space was within varying stages of a silvicultural operation owned by the Kirk Lumber Company. Logging on Cells I-IV began in 1977. By March 1982, Kirk Lumber Company had completely clearcut the area that now encompasses Cells I-IV, a small portion of Cell VI, and the majority of Cell V (USACE 1982). The proposed expansion area (Cells VIII and IX) was clearcut or selectively cut in 1991 or 1992. The remaining property within the future cells was also clearcut or selectively cut around that same time.

Of the 270 acres of forested area that was previously developed into the Regional Landfill, approximately 200 acres may have once been wetlands. Much of the land that was previously agricultural may have been wetlands that were historically part of the Great Dismal Swamp. In the early 1980s, the Norfolk District made the determination that if there were any wetlands on the Regional Landfill property, they were not subject to regulation under the Clean Water Act and did not require a permit from the Corps for any land disturbance or filling activity. Therefore, no permits were required for Cells I-VI or any of the other supporting infrastructure.

In 1988, SPSA began considering expansion options. The Norfolk District reviewed the future expansion areas using the 1987 Corps of Engineers *Wetland Delineation Manual* and determined that wetlands regulated under Section 404 of the Clean Water Act were present within Cells VII, VIII, and IX. Based on this determination, a permit from the Corps would be required for future landfill expansion work. SPSA applied for a Section 404 permit from the Norfolk District to impact 377 acres of forested wetlands within the 525-acre parcel. The Norfolk District prepared and published a DEIS for the expansion project on September 24, 1993, and the Final Environmental Impact Statement (FEIS) was published on May 26, 1995. During the extended comment period for the FEIS, SPSA submitted an alternative wetland mitigation plan. The Norfolk District announced its plan to develop a Supplement to the FEIS, which was published in July 1999 (USACE 1999). SPSA subsequently revised its long-range plan for the landfill expansion to incorporate new methods to increase landfill capacities at the existing site, as well as new landfill design options that could extend the life of the landfill beyond previous estimates.

SPSA subsequently submitted a modified permit application that reduced the proposed expansion footprint to a 69-acre portion of the acquired 525-acre parcel, resulting in approximately 12 acres of wetland impact. The Norfolk District determined that environmental impacts of the modified application could be evaluated under an Environmental Assessment and terminated efforts associated with the preparation of the Final Supplement to the FEIS. On September 27, 2002, the Norfolk District authorized impacts to 12 acres of forested wetlands under an Individual Permit for the development of Cell VII. As compensatory mitigation for the 12 acres of wetland impacts, SPSA was required to restore hydrology to a 12-acre area, enhance the hydrology in a 36-acre adjoining parcel, and preserve a 50-acre forested wetland area within the Regional

Landfill property boundaries. The City of Suffolk issued a conditional use permit for Cell VII in 2017. A condition of their permit is that SPSA must construct a new landfill entrance off of Route 58 to improve safety.

### Project Authorization and Regulatory Framework

For the proposed construction of Cells VIII and IX, SPSA submitted an application to the Norfolk District for a permit to authorize impacts to approximately 109.64 acres of forested wetlands regulated under Section 404 of the CWA. The granting of the permit would be a major federal action by the Norfolk District. Section 102(2)(C) of NEPA requires an EIS to be completed prior to issuing the permit.

Compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), (54 USC § 306108) and its implementing regulations (36 CFR Part 800), is ongoing and Section 7 of the Endangered Species Act of 1973 (ESA) (16 USC 1536) has been completed. While applicable cultural and species resource information, including potential impacts associated with the proposed alternatives, is documented in this FEIS, the FEIS is not intended for Section 106 or Section 7 compliance purposes. Compliance would occur through the Section 404 permit process, which is ongoing.

## Purpose of and Need for Action

### Regulatory Framework & SPSA's Strategic Operating Plan

As set forth in § 15.2-5102.1 of the Code of Virginia, SPSA's core purpose is "management of the safe and environmentally sound disposal of regional waste." Although the HRPDC is the agency responsible for preparing the solid waste management plan, SPSA is designated as the Regional Solid Waste Management Agency and charged with implementation of the regional solid waste management plan (RSWMP). HRPDC prepared the RSWMP to meet the requirements of the Virginia "Solid Waste Planning and Recycling Regulations," detailed in 9 VAC Section 20-130-120, and to establish a framework by which the region can meet the state-mandated planning requirements and recycling goals, as well as the long-term waste management needs of the region.

In terms of planning for future waste management, the regulations require that solid waste management plans within each planning unit contain an "assessment of all current and predicted needs for solid waste management for a period of 20 years and a description of the action to be taken to meet those needs." The planning period for the current RSWMP extends to 2040, and, accordingly, SPSA is required to plan for solid waste management through at least that year. The RSWMPs are updated every five years, however, and the current plan expires in 2025. Thus, this year, SPSA's required minimal planning horizon will extend to the year 2045 and, by 2030, to 2050.

As required by state regulations, the RSWMP provides background information on population and development patterns in southeastern Virginia, providing the context in which solid waste management occurs in the region. These principles combine projected economic growth and anticipated waste projections at the existing Regional Landfill when planning for available disposal capacity. The Norfolk District utilized these principles to independently analyze anticipated waste disposal needs for the region.

Additionally, SPSA's Strategic Operating Plan (SOP), which is adopted in its Use and Support Agreements with the member localities, provides that SPSA will maintain 20 years of operating capacity. The current version of SPSA's SOP became effective on July 1, 2024. As the RSWMP notes, the Regional Landfill, including the permitted Cell VII, is expected to exhaust its capacity by 2037, requiring that SPSA develop a plan for additional capacity to meet the regulatory planning requirements and its contractual obligations.

Norfolk District has developed and refined the project purpose and need in association with the RSWMP for southeastern Virginia, SPSA's SOP, the executed Use and Support Agreements, and an analysis of the region's waste disposal needs. As further described below, given the complexity of planning, permitting, and constructing large engineered projects such as a landfill expansion, as well as the lifespan of such projects, Norfolk District has determined that it is appropriate to examine waste disposal capacity beyond the minimum planning horizon prescribed by regulation, and has therefore considered the purpose and need for the project to provide regional waste disposal capacity through roughly 2060, which translates to approximately 16 million cubic yards of capacity. As used in this Purpose and Need for Action, the term "disposal capacity" is not limited to landfilling but could include other alternatives for the disposition of that volume of waste.

## Purpose of the Project

In a submission to the Norfolk District, SPSA defined the purpose of the proposed project as expanding its operations into Cells VIII and IX, creating approximately 16 MCY of disposal capacity at the existing Regional Landfill, in order to continue to meet the region's long-term solid waste disposal needs in a safe and environmentally sound manner. The Norfolk District has reviewed the applicant's purpose and need and has determined that the underlying purpose and need, from a public interest perspective, is to provide safe and environmentally sound solid waste management for the region through approximately 2060 consistent with the Regional Solid Waste Management Plan for Southeastern Virginia and the Use and Support Agreements with the member localities.

SPSA is required to plan at least twenty years into the future but plans beyond that as a result of the time it takes to plan, permit, and construct solid waste management facilities. FEIS Figure 6, the Illustrated Project Timeline, demonstrates the timing of construction and the relatively short estimated lifespan of each landfill cell. Were the

Norfolk District to identify a smaller planning horizon and capacity, e.g., a 20-year timeline starting now, projected waste management needs and applicable law would require SPSA to begin planning for additional capacity in just a few years (regardless of the alternative it pursues). By 2030, for instance, the RSWMP will be updated again and require SPSA to plan for capacity until 2050. Though there may be permitted MSW capacity through approximately 2040, SPSA is planning to meet capacity from 2040 through 2060 as part of its July 1, 2024, Strategic Operating Plan because development of a landfill requires extensive planning and permitting, including coordination with the public and completing environmental consultations, as well as lengthy dewatering and construction timeframes.

## Need for the Project

The project is needed to effectively meet the region's solid waste disposal needs. Based on current estimates and projected increases in municipal waste due to population growth, the current permitted landfill capacity is anticipated to be met by 2037. To satisfy the regulatory requirements and contractual obligations discussed above and to fulfill its core mission of managing the disposal of regional waste, SPSA is required to develop a plan for solid waste disposal (which could include alternatives beyond placement at the existing site) after 2037.

SPSA is responsible for the management of the safe and environmentally sound disposal of regional waste for its member localities: the cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the counties of Isle of Wight and Southampton. Member localities require a dependable, economically secure, and environmentally responsible solution for their residual post-recycling municipal solid waste. Member communities contribute MSW to SPSA facilities primarily from single-family residents. As described in the RSWMP, private companies collect MSW from multi-family, commercial, and industrial facilities. Waste collected by private companies is then either taken to SPSA's transfer stations or to private market facilities outside of the region.

Although there are multiple programs and management plans in place to divert the amount of waste going into the SPSA landfill, the amount of waste generated within the SPSA service area will change over time with population growth. The RSWMP performed an assessment of the region's future waste generation by applying a U.S. Environmental Protection Agency (EPA) per capita waste generation rate, measured in pounds per person per day. Per capita generation rates were applied to regional population projections for the years 2020, 2030, and 2040. Anticipated tons/year of municipal solid waste were 1,100,942 in 2020, 1,189,420 in 2030, and 1,292,460 in 2040 (HRPDC 2023). These waste generation projections include both municipal solid waste and recycled materials.

Based on current and anticipated municipal waste generated from its member localities and the resulting tonnages to be processed by SPSA, the currently constructed landfill area at SPSA's Regional Landfill, Cells V and VI, will run out of capacity in 2027. An additional landfill area, Cell VII, has been permitted but is not yet constructed. Once in operation, Cell VII will provide approximately 10–13 additional years of disposal capacity, depending on the amount of MSW collected, source reduction and reuse, and recycling. Thus, the landfill will run out of capacity by approximately 2037.

As explained below, based on the anticipated incoming volume of waste, SPSA would need 16 million CY of disposal capacity to provide approximately 20 years of waste disposal and fulfill the project purpose of providing capacity through roughly 2060. SPSA generally handles approximately 450,000 tons of MSW per year and manages 50,000–100,000 tons of other waste materials from local generators (construction demolition debris, sludge, and special wastes) that are disposed at the Regional Landfill. Based on a total of 500,000 to 550,000 tons per year and a density of 1,400 lbs/CY, about 20–22 years of landfill life (depending on the density achieved through daily operations) would equate to a need for approximately 16 million CY of disposal capacity. Waste in-place density measures the weight of waste per CY and is a measure of how efficiently a landfill uses its airspace. Higher densities mean more waste by weight can be disposed in the same airspace compared to waste with lower densities.

## Proposed Action Timeline

Activities associated with the development of the proposed expansion area (Cells VIII and IX, as well as the airspace between Cells V and VII), the applicant's preferred alternative, would begin in 2025 with clearing and grubbing Cell VIII Phase 1 and 2 areas of the proposed on-site expansion. Construction of Cell VII, which is already permitted, would proceed as planned. Expansion of the Regional Landfill into Cells VII–IX would provide capacity on-site through 2060. A timeline of activities related to the proposed on-site expansion is provided in Figure 6 and described below. This timeline includes the approximate five years required to complete the VDEQ solid waste permitting process and the Sections 401 and 404 permitting processes.

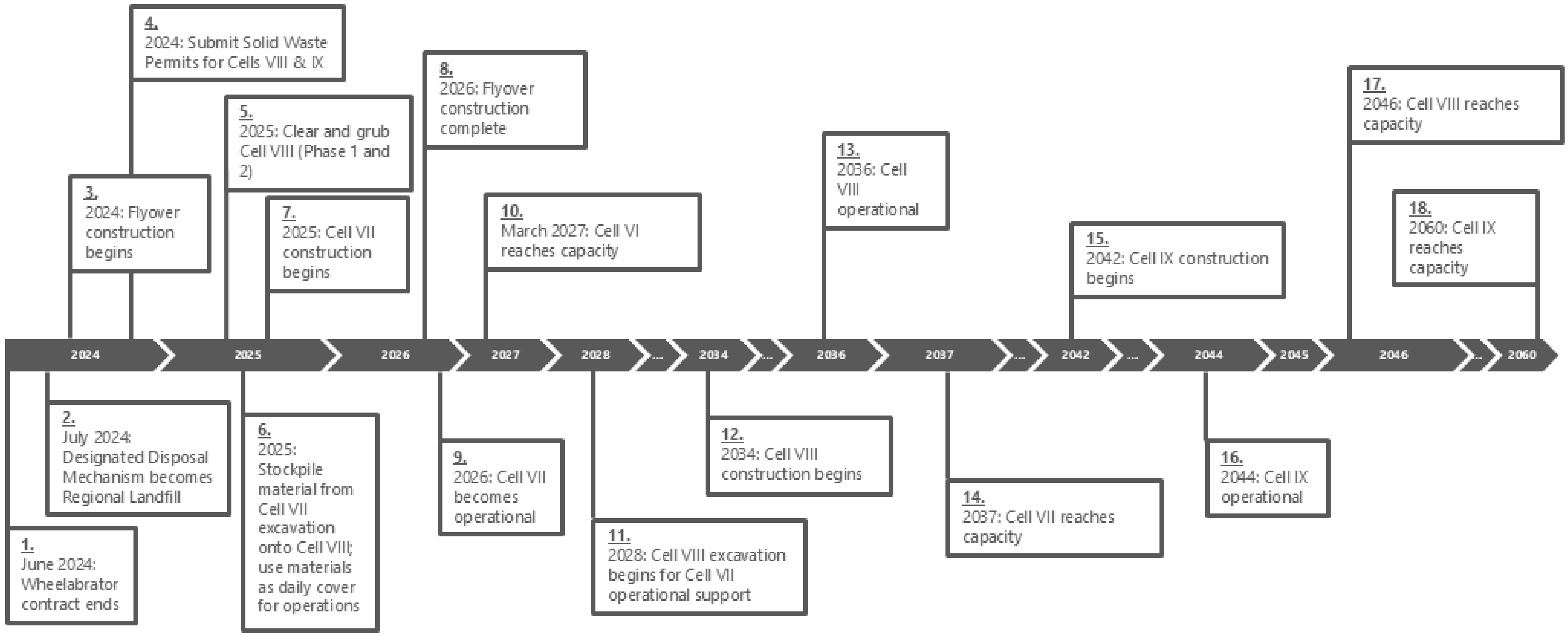
Development of Cells VIII and IX would occur in four stages. The initial stages of development of the expansion area require dewatering, followed by clearing and grubbing. If permitted, these activities would begin in 2025 and Cell VIII could possibly serve as a soil stockpile area during construction of Cell VII in 2025. Separate from this project, prior to Cell VII operation, SPSA is funding construction of a grade-separated interchange, or "flyover," to eliminate left turns from U.S. Routes 13/58/460 into the Regional Landfill. SPSA's Conditional Use Permit (CUP) with the City of Suffolk requires that this flyover be completed before waste is deposited in Cell VII (SPSA 2020). The flyover is being constructed by the Virginia Department of Transportation (VDOT) and costs approximately $40 million to construct. Construction of the flyover began in late 2024. The first phase of Cell VII is anticipated to become operational concurrent with the completion of the flyover construction in Fall 2026.

Excavation of the expansion area in Cell VIII Phases 1 and 2 would begin in 2028. Cell VIII construction and Cell IX construction would begin in 2034 and 2042, respectively. SPSA has indicated that Cells VIII and IX would be developed as an inward gradient landfill, similar to development of Cell VI and the VDEQ-approved plans for Cell VII. An inward gradient landfill occurs when the base liner is below the groundwater table, in order to establish a stable foundation for the landfill to optimize disposal quantity while providing an environmentally sound containment system. Cell VII is projected to reach capacity by 2037. Its construction will generate over 1.5 million CY of soil materials, which would be used to support its operation if they can be stockpiled on-site. Landfill operations require a substantial quantity of soil materials for use in landfill expansion and closure construction, daily soil cover, and intermediate soil cover needs. Soil materials can comprise between 10 to 20% of the total permitted airspace, depending on the availability and use of alternate daily cover materials.

In order to construct Cell VII and retain the soil materials from the excavation for use at the site, SPSA would need to develop a soil borrow and stockpile area. As part of the applicant's preferred alternative, SPSA is proposing to use the Cell VIII footprint for the storage and supply of soil materials generated from Cell VII construction, and then subsequently use the Cell IX footprint for storage and supply of soil materials for Cell VIII construction and operation. Alternatively, SPSA could use an off-site stockpile area and transport the soil materials by truck from Cell VII to the off-site location and then transport back to Cell VII for use as cover. SPSA has indicated that, while feasible, this transfer of soil would substantially increase their operating costs and reduce operating efficiency. Even without the expansion of the landfill into Cells VIII and IX, SPSA has indicated that they plan to construct and utilize Cell VII, which is already permitted. The timeline associated with construction and operation of Cell VII would not change even if permits are not issued to authorize the construction of Cells VIII and IX.

SPSA currently has less than 13 years of permitted capacity, through 2037. In order to maintain 20 years of disposal capacity, SPSA began planning, preliminary design, and the permitting process for a landfill expansion in 2020. If permits are issued to authorize the construction of Cells VIII and IX, the life of the Regional Landfill would be extended through approximately 2060 depending on densities achieved during the operational window.

## Figure 6. Illustrated Project Timeline



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# Chapter 2: Alternatives

This chapter describes the various actions that could be implemented to address SPSA's need for an additional 16 million CY of disposal capacity. CEQ and Corps regulations (40 CFR Parts 1500–1508 and 33 CFR Part 325 Appendix B) require the Corps to evaluate alternatives to the project that are considered reasonable. Reasonable alternatives must be those that are feasible, and such feasibility must focus on the accomplishment of the underlying purpose and need (of the applicant or the public) that would be satisfied by the proposed federal action (permit issuance). The alternatives analysis should be thorough enough to use for both the public interest review and the 404(b)(1) guidelines where applicable.

In addition to alternatives for taking action, this chapter describes a "no-action" alternative, as prescribed by 40 CFR § 1502.14. The No-Action Alternative would not require a permit action by the Corps. Under the No-Action Alternative, SPSA would continue current landfilling activities and utilize all previously permitted capacity within the SPSA Regional Landfill until this capacity is consumed. Subsequently, waste would be hauled to existing for-profit landfills for processing and disposal.

In accordance with the Section 404(b)(1) Guidelines (Guidelines) at 40 CFR § 230.10(a), a permit cannot be issued if a practicable alternative exists that would have less adverse impact on the aquatic ecosystem (known as the Least Environmentally Damaging Practicable Alternative [LEDPA]), provided that the LEDPA does not have significant adverse environmental consequences to other natural ecosystem components. An analysis was conducted to determine whether reasonable alternatives would also be practicable under the guidelines. "Practicable" means that the alternative is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose (40 CFR § 230.10(a)).

The action alternatives were developed by the Norfolk District's interdisciplinary team and incorporate feedback received during the agency pre-scoping meeting and public and agency scoping process, as appropriate. These alternatives meet the overall purpose of and need for taking action, which for this EIS, is available waste disposal capacity to meet the needs of the SPSA service area for approximately 20 years, starting in 2037 (when existing permitted capacity is exhausted).

The Norfolk District has considered Virginia law in developing alternatives. In particular, Virginia state law prohibits new sanitary landfills or expansions of existing landfills if there would be an impact of two or more acres to nontidal wetlands (see 9 VAC 20-81-120(E); VA Code § 10.1-1408.5(D)). As specified in VA Code § 10.1-1408.5(A), this prohibition does not apply to the expansion of an existing municipal solid waste landfill located in the cities of Danville, VA or Suffolk, VA "when the owner or operator of the landfill is an authority created pursuant to § 15.2-5102 that has applied for a permit under § 404 of the federal Clean Water Act prior to January 1, 1989, and the owner or operator has received a permit under § 404 of the federal Clean Water Act and the

Virginia Water Resources and Wetlands Protection Program, Article 2.2 (§ 62.1-44.15:20 et seq.)." Thus, this language exempts expansion of the SPSA Regional Landfill within the City of Suffolk from the two-acre limitation on wetland impacts.

Subsection F of section § 10.1-1408.5 also provides a broader exemption:

> There shall be no additional exemptions granted from this section unless (i) the proponent has submitted to the Department an assessment of the potential impact to wetlands, the need for the exemption, and the alternatives considered and (ii) the Department has made the information available for public review for at least 60 days prior to the first day of the next Regular Session of the General Assembly.

Thus, off-site alternatives with greater than two acres of wetland impacts could potentially be approved through the foregoing process. Furthermore, NEPA's implementing regulations contemplate that federal agencies may consider proposed actions that are inconsistent with state or local plans or laws, provided agencies describe the extent to which such inconsistencies would be reconciled (40 CFR § 1506.2). For these reasons, Virginia's general prohibition on development of new or expanded landfills with wetland impacts over two acres was not included as a criterion for the screening of alternatives.

The Corps recognizes that the exemption F of section § 10.1-1408.5 may be procedurally unclear or difficult and that additional information concerning this exemption process may more narrowly define the off-site alternative's practicability.

This chapter also includes alternative management concepts that were considered but dismissed from further analysis, as well as the rationale for their dismissal.

## Alternatives Screening Process

### On-site Alternatives Screening Process

Ten alternatives located at the existing SPSA Regional Landfill were analyzed in support of the project purpose and need to establish 16 million CY of waste disposal volume. All on-site alternatives require expansion into proposed Cells VIII and IX in varying amounts to meet the project need. Several factors were considered when developing on-site alternatives; these include the following:

- traditional landfill construction and operations
  - effective soil management allows SPSA to utilize soil on-site rather than obtain or dredge material from elsewhere
- location of an existing natural gas main that bisects the SPSA Regional Landfill
  - the timeframe required to relocate the pipeline is approximately 30 years; complete utilization of approved capacity at the Regional Landfill is anticipated to occur in March of 2027, and additional capacity is needed

    - by early 2026 to accommodate the “soft opening” required for new landfills. The soft opening protects the liner system by only allowing softer materials to be placed in the new landfill system
    - pipeline relocation would cost more than $34 million
- existing leachate and landfill gas infrastructure
    - relocating or extending this system would be difficult to complete; the addition of over 200 feet of riser pipe would be subject to stresses from the waste materials placed over and around them; the additional riser pipe would also increase the difficulty of removing and reinstalling submersible leachate pumps for maintenance
    - in some cases, sump risers would need to be decommissioned which can only happen when leachate generation has ceased; leachate generation is likely to continue for over 30 years after cell closure which pushes the timeframe of this effort beyond the scope of when additional capacity is needed
- floodplain considerations
    - in some cases, the capacity gained from connecting two cells would be limited due to their geometries and having to avoid the 100-year floodplain
- Federal Aviation Administration (FAA) height limitations due to the nearby Hampton Roads Executive Airport
- structural retaining walls
    - these were considered in multiple areas to support increased waste disposal volumes by building higher instead of wider, therefore reducing the required landfill footprint and wetland impacts. A mechanically stabilized earth (MSE) retaining wall alternates layers of geosynthetic materials and soil to create a near vertical exterior wall, which is usually precast concrete panels or wire mesh. The inboard slope of the MSE wall would include an expansion of the base liner system at stable slopes. A photo of an example MSE wall is shown in Figure 7 below.
- permitting/design and operation
    - approval for some alternatives and modifications to the existing leachate management system to support some alternatives is not certain
    - MSE wall design and permitting would be complicated and regulatory approval is not certain
    - operation would be challenging and would increase safety risks
- perimeter access and waste filling

- access around the site perimeter would be constrained with the narrow roadway at the top of an MSE; this would complicate the process for filling landfill cells with waste
    - widening the perimeter road to aid in filling landfill cells would add to wetland impacts along the perimeter
- stormwater infrastructure
    - for alternatives that include an MSE component, stormwater runoff from existing side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area
    - for alternatives that include an MSE component, runoff from completed side slopes would require a new perimeter channel and large vertical drain manholes through the berm to discharge collected stormwater

**Figure 7. MSE wall**

Source: McMahon & Mann Consulting Engineering and Geology, P.C. 2023

Table 1 describes the design considerations that were analyzed as on-site alternatives. A summary of factors considered for each alternative is provided in the "Comments" column. A detailed *On-site Alternatives Technical Memo* is provided in Appendix B and provides additional clarity and detail specific to each design.

### Table 1. On-site Alternatives

| On-Site Alt # | Alternatives | Net Wetland Savings (AC) | Total Lined Area (AC) | Reduction Volume of Cells VIII & IX | Total Cell Expansion Disposal Volume (CY) | Comments |
|---|---|---|---|---|---|---|
| 1 | Cells VIII & IX Expansion | - | 92.9 | - | 16,000,000 | Conventional design/construction/operation, leachate pump depth manageable, coordinates w/ Cell VII operations, generates soil for operation/construction, straightforward permitting/above confining layer |
| 2 | Relocate Natural Gas Main and Overlap onto closed Cells I-IV | 16.8 | 104.3 | 2,870,000 | 13,130,000 | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate collection and maintenance and to landfill gas system operation |
| 3 | MSE Wall Around South and West Boundary of Cells V & VI | -2.0 | 89.1 | 2,200,000 | 13,800,000 | An increase in wetland impacts, impacts to leachate and stormwater infrastructure, perimeter access and waste filling difficult, loss of operating soil for MSE wall build |
| 4 | MSE Wall and Gas Main Relocation and fill to 200 ft. | 15.5 | 99.7 | 5,200,000 | 10,800,000 | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; perimeter access and waste filling difficult; loss of operating soil for MSE wall build |
| 5 | MSE Wall and Gas Main Relocation and Fill to 240 ft. | 21.3 | 93.9 | 6,200,000 | 9,800,000 | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; perimeter access and waste filling difficult; loss of operating soil for MSE wall build |
| 6 | Capture Airspace Between Cell V and VII | 8.9 | 87.3 | 1,520,000 | 14,480,000 | Permitted for construction by VDEQ, wetland impact reduction of 7.72 acres, impacts to Cell V leachate and landfill gas infrastructure |

| On-Site Alt # | Alternatives | Net Wetland Savings (AC) | Total Lined Area (AC) | Reduction Volume of Cells VIII & IX | Total Cell Expansion Disposal Volume (CY) | Comments |
|---|---|---|---|---|---|---|
| 7 | MSE Wall Around Cells V, VI, and VII | 17.3 | 79.1 | 5,500,000 | 10,500,000 | Impacts to leachate and stormwater infrastructure, complicated permitting/design and operation, impacts to Cell V leachate and landfill gas infrastructure, loss of operating soil for MSE wall build |
| 8 | Construct Cell VIII and Overlap onto Cell VII with Gas Main Relocation | 62.4 | 84.9 | 9,760,000 | 6,240,000 | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; little overlap available due to floodplain; loss of operating soil for MSE wall build |
| 9 | MSE Wall Around Cells V-VII and Gas Main Relocation and Fill to 200 ft. | 64.1 | 85.5 | 10,360,000 | 5,640,000 | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; MSE wall on Cell VII provides little value; requires impacts to leachate and stormwater infrastructure; loss of operating soil for MSE wall build |
| 10 | 10 – 20 ft. High Soil Berm Around Cells VIII - IX | 3.2 | 90.0 | - | 16,000,000 | Conventional design/construction, leachate pump depth at limit of manageable, operational difficulty with safety concerns, loss of operating soil for berm build |

## Off-site Alternatives Screening Process

An off-site alternatives analysis was performed to support the development of a reasonable range of alternatives by identifying sites other than the existing Regional Landfill that could potentially meet SPSA's need for expanded waste disposal capacity.

Potential off-site alternatives were evaluated in four phases, including the following:

- Phase I – identifying parcels greater than 300 acres (an estimate of parcel size needed to support landfill disposal boundary geometries and supporting infrastructure such as roadways, stormwater management facilities, a scale facility, and operations and vehicle maintenance buildings), along accessible roadways, outside the 100-year floodplain.
- Phase II – evaluating fatal flaws (detailed below) in the sites identified in Phase I.
- Phase III – ranking the remaining sites based on general development criteria.

- Phase IV – further screening the remaining sites based on site-specific development criteria and scoping comments.

Phase I through Phase IV screening analyses were all carried out based on desktop reviews, using the best existing information available at the time of the analysis. The Phase I–III analyses identified six sites to be carried forward for further analysis. The Phase IV analysis evaluated and ranked these six sites based on site-specific characteristics. Details of the analysis and selection process are documented in the sections below.

### Phase I Analysis – Potential Site Identification

Phase I consisted of the identification of parcels that could potentially suit SPSA's needed use and therefore should be carried forward for Phase II analysis. The following criteria were used to locate potentially suitable sites:

- At least 300 acres of contiguous undeveloped land (can consist of multiple parcels with multiple owners and should be reasonably compact)
- Within the SPSA service area
- Within two miles of a major highway corridor (defined as Primary Roads and interstates)
- Outside of the 100-year Floodplain

This selection process identified 58 sites (not including the existing Regional Landfill site) to carry forward into Phase II analysis. The detailed analysis process is provided in the *Off-Site Alternatives Analysis Technical Memo* in Appendix A.

The SPSA service area and 58 sites are shown in Figure 8.

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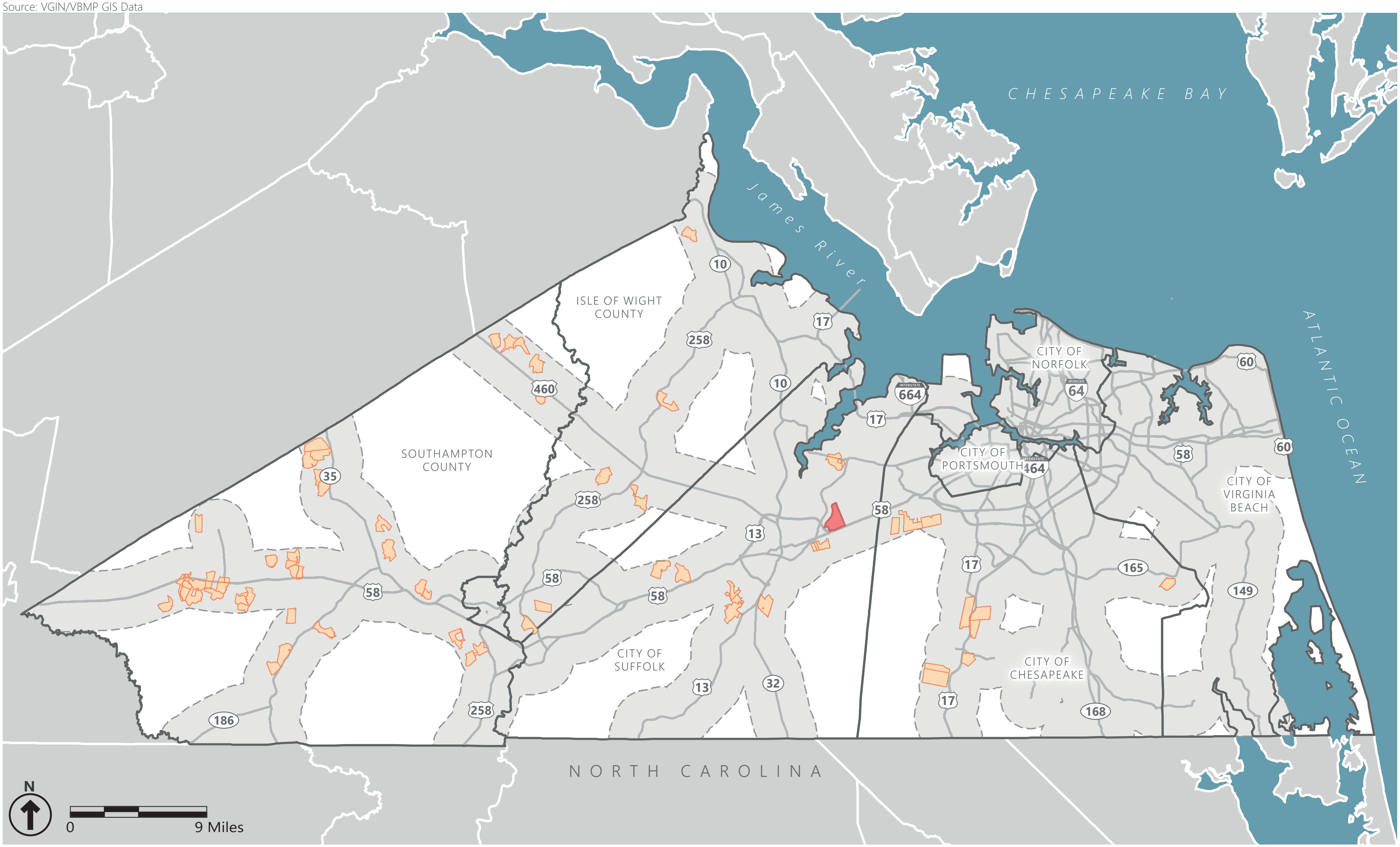
Source: VGIN/VBMP GIS Data




**LEGEND**

- County Boundaries within Service Area
- Existing Landfill
- Undeveloped Parcels Larger than 300 Acres (58 Sites)
- Search Area
- Roads
- Primary Waterbodies

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Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 8

**Phase I Criteria Results**

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## Phase II Analysis – Fatal Flaws

During the Phase II analysis, each of the 58 sites identified in Phase I was then examined for the following fatal flaws:

- Whether it was the current location of an airport or airfield
- Had greater than 124 acres of wetlands based on National Wetland Inventory mapping (the amount of wetlands potentially impacted by SPSA's original proposed alternative)
- Was bisected by a road or other linear infrastructure

Sites that had at least one fatal flaw were removed from further analysis. These eliminated sites are shown in Figure 9, color coded by elimination criteria. Phase II analysis resulted in 29 parcels being carried forward into Phase III of the analysis. Evaluation of these 29 parcels is detailed in Table 2 and the parcels are shown in purple with an identified site number in Figure 9.

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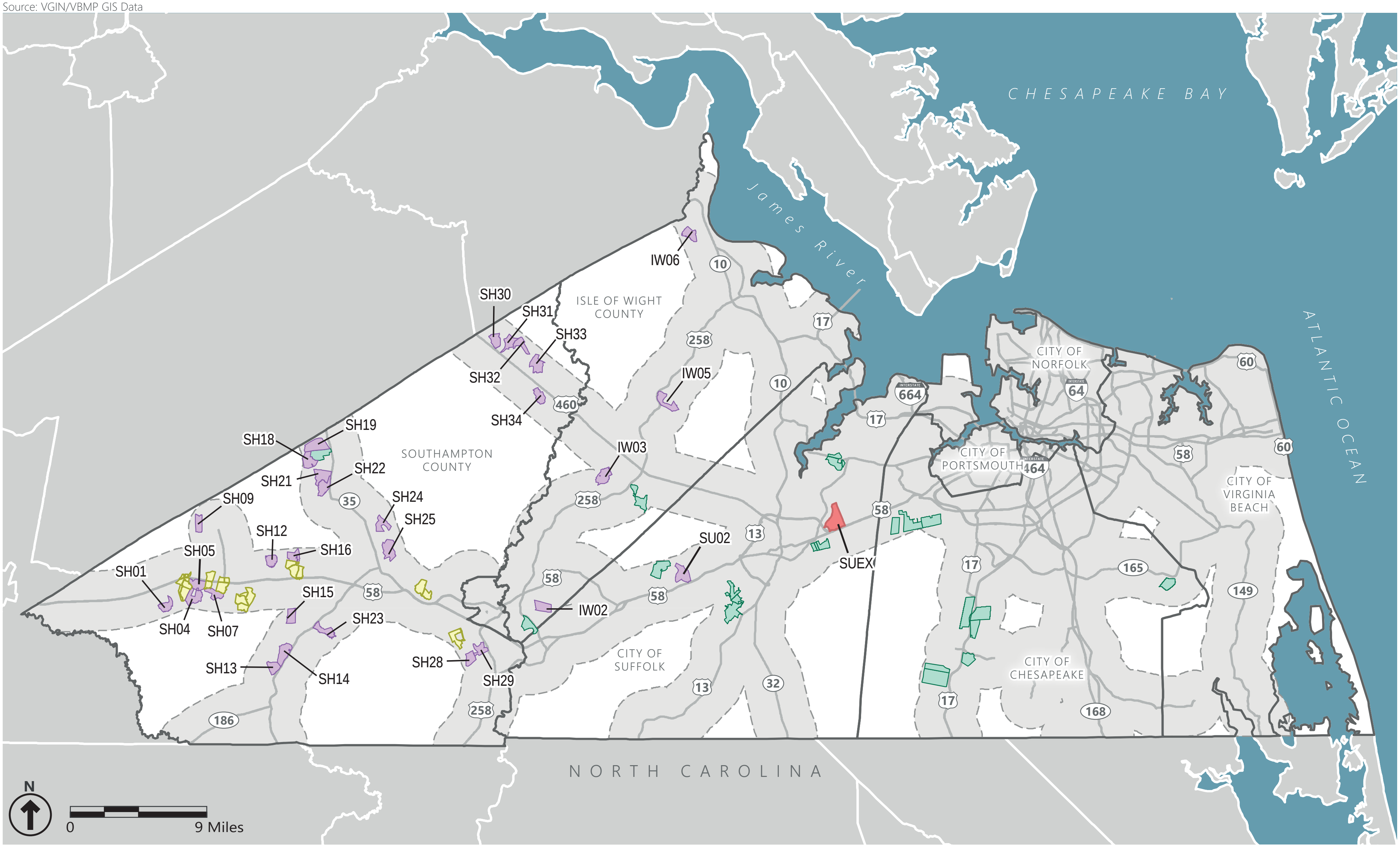
Source: VGIN/VBMP GIS Data




**LEGEND**

- County Boundaries within Service Area
- Existing Landfill
- Undeveloped Parcels Larger than 300 acres (58 Sites)
- Fatal Flaw - Bisected by Road or Other Linear Infrastructure
- Fatal Flaw - Wetlands > 124 acres
- Search Area
- Roads
- Primary Waterbodies

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 9

**Phase II Criteria Results**

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### Phase III Analysis – General development criteria analysis

Based on the results of the Phase I and II analyses, 29 sites were carried forward for analysis in Phase III. A system of 14 weighted criteria was used in Phase III to rank these 29 sites. The criteria were based on those identified in the Alternative Landfill Siting Study conducted in 1989 and 1990 by Environmental Engineering & Technology, Inc, supplemented through recent coordination with regulatory agencies. The following 14 criteria were used for Phase III ranking:

- Land use compatibility
- Roadway capacity
- Natural visual screening
- Zoning consistency
- Site configuration
- Site ownership
- Sewer availability
- Wetland impacts (based on estimated total area of wetlands on-site)
- Transportation costs
- Ease of development
- Proximity to airport or airfield
- Cultural resources
- Natural resources
- Environmental justice

Each criterion was assigned a weight reflecting its importance when considering the suitability of a site. Weights ranged from one to five, with five being the greatest importance and one being the lowest importance. A numeric input was then assigned to the site, using a scale of highly acceptable (+1), acceptable (0), or unfavorable (-1). Finally, a score was assigned to the site by multiplying the weight by the numeric input. Weighted inputs for all 14 categories were then summed and sites were ranked by their total weighted scores (see matrix in Appendix A). The highest possible score that a site could attain is 47.

Additional information on the specifics of each of the criteria reviewed and the assigned weighted values can be found in the *Off-Site Alternatives Analysis Technical Memo* in Appendix A.

Upon completion of the analysis, six sites scored 20 or more points (detailed in Table 2, below). Based on the analysis of the off-site parcels during Phase III, these six highest scoring sites were advanced for further study. The sites are summarized below, ordered by total score in Table 2, and illustrated in Figure 10.

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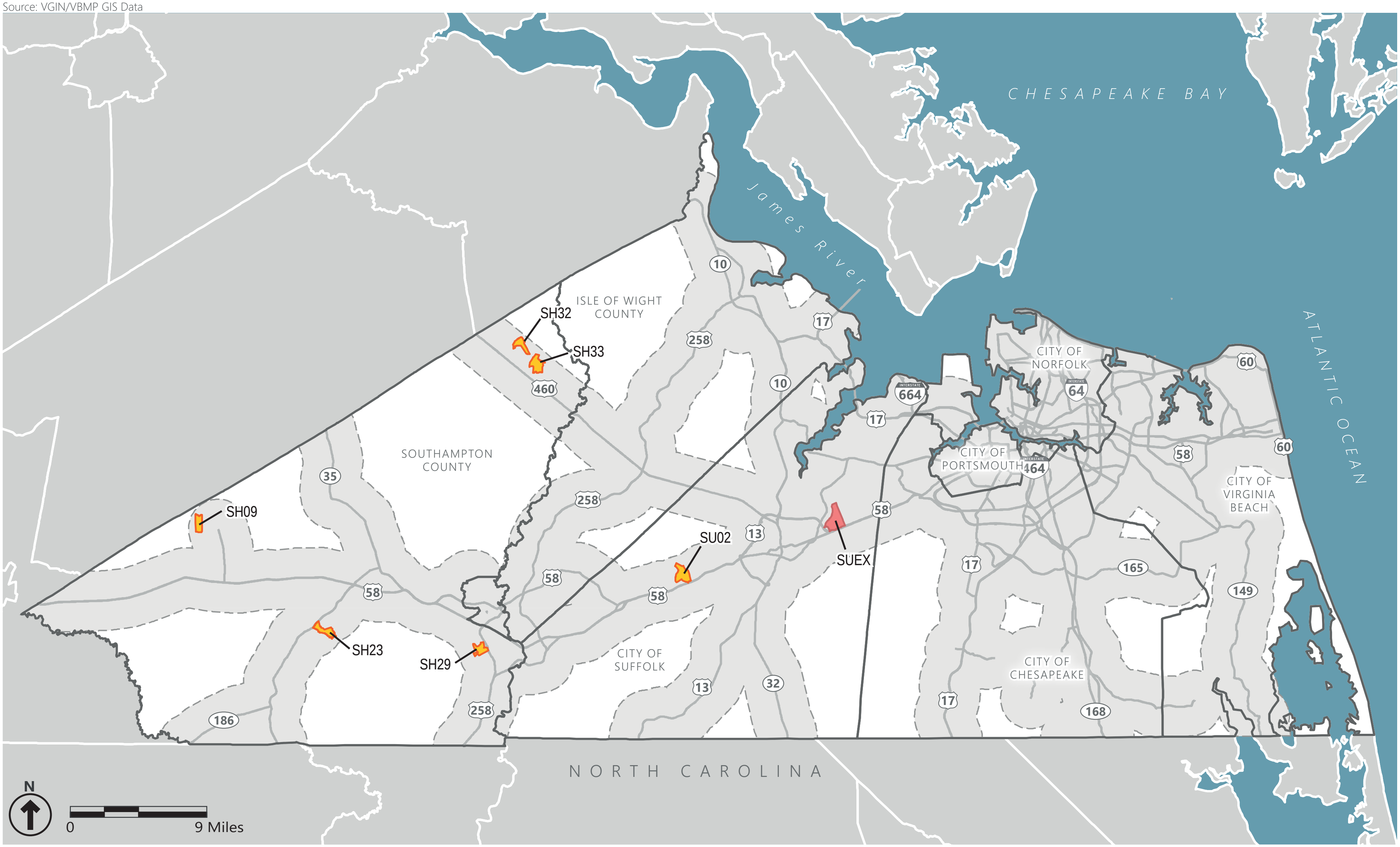
## Table 2. Top 29 Favorability Rankings

| Site | Land Use Compatibility | Roadway Capacity | Natural Screening | Zoning Consistency | Site Configuration | Site Ownership | Sewer Availability | Wetland Impact | Transportation Costs | Ease of Development | Proximity to Airport/ Airfield | Historic Site | Natural Resources | Environmental Justice | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SU02 | 5 | 3 | 3 | 3 | 3 | 1 | 2 | 5 | 2 | 2 | 3 | -5 | 5 | -5 | 27 |
| SH33 | 0 | 0 | 3 | 3 | 3 | 1 | -2 | 0 | 2 | 2 | 3 | 5 | 5 | 0 | 25 |
| SH23 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 5 | 0 | 2 | 3 | 5 | 5 | -5 | 22 |
| SH32 | 5 | 0 | 3 | 3 | 0 | 1 | -2 | -5 | 2 | 2 | 3 | 5 | 5 | 0 | 22 |
| SH09 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 5 | 0 | -2 | 3 | 5 | 5 | -5 | 21 |
| SH29 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 5 | 0 | 0 | 3 | 5 | 5 | -5 | 20 |
| SH01 | 5 | 0 | 3 | 3 | 3 | 1 | -2 | 5 | 0 | 2 | 3 | 5 | -5 | -5 | 18 |
| SH13 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 5 | 0 | 0 | 3 | 0 | 5 | -5 | 18 |
| SH19 | 5 | 0 | 3 | 3 | 3 | 1 | -2 | 0 | 0 | 2 | 3 | 5 | -5 | 0 | 18 |

| Site | Land Use Compatibility | Roadway Capacity | Natural Screening | Zoning Consistency | Site Configuration | Site Ownership | Sewer Availability | Wetland Impact | Transportation Costs | Ease of Development | Proximity to Airport/ Airfield | Historic Site | Natural Resources | Environmental Justice | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SH24 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 0 | 0 | 2 | 3 | 5 | 5 | -5 | 17 |
| SH30 | 5 | 0 | 3 | 3 | 3 | 1 | -2 | 0 | 2 | -2 | 3 | -5 | 5 | 0 | 16 |
| IW02 | 5 | 0 | 3 | -3 | 0 | 1 | 0 | 0 | 2 | 0 | 3 | 0 | 5 | 0 | 16 |
| SH25 | 5 | 0 | 3 | 3 | 0 | 1 | -2 | 0 | 0 | 2 | 3 | 0 | 5 | -5 | 15 |
| SH05 | 5 | 3 | 0 | 3 | 3 | 1 | -2 | 5 | 0 | -2 | 3 | 0 | 0 | -5 | 14 |
| SH31 | 5 | 0 | 0 | 3 | 3 | 0 | -2 | 0 | 0 | 2 | 3 | -5 | 5 | 0 | 14 |
| SH07 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 0 | 0 | -2 | 3 | 5 | 5 | -5 | 13 |
| SH12 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 5 | 0 | -2 | 3 | -5 | 5 | -5 | 11 |
| SH16 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 5 | 0 | -2 | 3 | -5 | 5 | -5 | 11 |
| SH04 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 5 | 0 | 0 | 3 | 0 | 0 | -5 | 10 |

| Site | Land Use Compatibility | Roadway Capacity | Natural Screening | Zoning Consistency | Site Configuration | Site Ownership | Sewer Availability | Wetland Impact | Transportation Costs | Ease of Development | Proximity to Airport/ Airfield | Historic Site | Natural Resources | Environmental Justice | Total Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SH14 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 0 | 0 | 0 | 3 | 0 | 5 | -5 | 10 |
| SH21 | 5 | 0 | 0 | 3 | 0 | 1 | -2 | 0 | 0 | 0 | 3 | -5 | 5 | 0 | 10 |
| SH18 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 0 | 0 | -2 | 3 | 0 | -5 | 0 | 6 |
| SH22 | 5 | 0 | -3 | 3 | 0 | 1 | -2 | 0 | 0 | -2 | 3 | -5 | 5 | 0 | 5 |
| SH28 | 5 | 0 | 3 | 3 | 0 | 1 | -2 | 0 | 0 | 2 | 3 | 0 | -5 | -5 | 5 |
| IW03 | 5 | 0 | 0 | -3 | 3 | 1 | 0 | -5 | 2 | -2 | 3 | -5 | 5 | 0 | 4 |
| IW05 | 5 | 0 | 3 | -3 | 0 | 1 | 0 | -5 | 2 | -2 | 3 | 5 | -5 | 0 | 4 |
| SH15 | 5 | 0 | 0 | 3 | 3 | 1 | -2 | 0 | 0 | -2 | 3 | -5 | 0 | -5 | 1 |
| SH34 | 0 | -3 | 0 | 3 | 3 | 1 | -2 | 5 | 2 | -2 | 3 | -5 | -5 | 0 | 0 |
| IW06 | 5 | 0 | 0 | -3 | 0 | 1 | -2 | -5 | 2 | -2 | 3 | -5 | 5 | -5 | -6 |

Source: VGIN/VBMP GIS Data




**LEGEND**

- County Boundaries within Service Area
- Existing Landfill
- Parcels Resulting from Phase III Analysis (6 Sites)
- Search Area
- Roads
- Primary Waterbodies

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 10

**Phase III Criteria Results**

## Phase IV Analysis – Site-specific criteria analysis

Following the completion of Phase III, further analysis and ranking of the six remaining sites were conducted based on site-specific operational opportunities or constraints afforded by each of them. The criteria were selected with consideration of technical landfill siting engineering and design principles. This was performed in two steps, Phases IVa and IVb, separated by a period of public scoping, as described below. The following nine criteria were used for Phase IV ranking:

- Wetland impacts (based on conceptual landfill footprint)
- Stream impacts
- Proximity to residential land uses
- Soil balance
- Leachate management
- Development flexibility
- Waste hauling
- Landowner, community, or local government concerns
- Site access

### *Phase IVa – Conceptual Footprint Analysis*

As a first step, the analysis evaluated whether each site could accommodate a landfill of sufficient size to meet the proposed expansion's purpose and need (16 million CY capacity), while minimizing impacts on wetlands. Towards that end, wetlands on each site were mapped using the best available mapping and data including National Wetlands Inventory (NWI), soils, aerial color infrared, true color aerial photography, and data pertaining to topography (LiDAR) survey (some limited, high-level ground-truthing was conducted for Site SU02 only; owners denied access to all other sites). Next, high-level conceptual landfill footprints were developed and overlain on each site in a manner that minimized wetland impacts. The conceptual footprints included waste disposal footprint, supporting facilities, borrow and stockpiling areas, stormwater management areas, and access roads.

The high-level concept drawings are available in the *Off-Site Alternatives Analysis Technical Memo* in Appendix A. Phase IVa screening showed that all six sites could accommodate a landfill of the requisite size with less impact to wetlands than the proposed expansion at the existing SPSA landfill. Therefore, none of the six sites were eliminated at this stage.

Comments were received from multiple parties during two 30-day scoping periods, from July 24, 2020, through September 8, 2020, followed by an alternatives-focused scoping period from December 17, 2020, through January 18, 2021. The alternatives scoping period included information described in Phase I through Phase IVa. After the alternatives scoping period concluded, the Phase IVb screening was performed.

### *Phase IVb – Site Ranking Analysis*

During Phase IVb, the six sites were evaluated and ranked according to the following criteria:

- Total wetland impacts – estimates of wetland impacts developed through Phase IVa analysis were ranked from the lowest (ranked first) to the highest (ranked last) acreage of impacted wetlands.
- Stream impacts – estimates of stream impacts were measured based on the conceptual footprint analysis in Phase IVa, ranked from shortest (ranked first) to longest (ranked last) length of stream affected.
- Proximity to residential land uses – the number of residential parcels within a one-mile radius of a central point located within the conceptual disposal footprint.
- Soil balance – an estimate of the amount of soil needed to operate the landfill (estimated at approximately 20% of total landfill capacity; soil is used as cover material to build up the cells as waste is added) compared to the amount of borrowed soil each site is anticipated to yield.
- Leachate management – the distance in miles from each site to the nearest potentially usable leachate discharge point.
- Development flexibility – sites with additional areas of upland that can be used to provide design flexibility.
- Waste hauling – measured in million truck miles traveled every year to transport waste from its origin to the alternative sites.
- Landowner, community, or local government concerns – scoping comments and feedback from site owners were organized into three broad categories: supportive, cautionary, or hostile, with sites receiving supportive comments ranking higher than those that elicited hostile comments.
- Site access – measured in miles to the nearest four-lane roadway, with sites ranked from closest to a four-lane roadway (ranked first) to farthest (ranked last).

### *Phase IV Analysis Results*

A point system was used to obtain a total ranking for each site. When ranked first, a site was awarded six points; when ranked second, it was awarded five points; when ranked third, it was awarded four points; and so on. When ranked sixth, a site was awarded one point.

The points assigned for each criterion were then added together to generate a total score for each site. The sites were then assigned a final rank based on the score, as shown in Table 3 below. With a score of 49, Site SU02 ranked first.

**Table 3. Phase IV Ranked Summary Results**

| Site | Total Score | Rank |
|---|---|---|
| SU02 | 49 | 1 |
| SH33 | 33 | 3 |
| SH23 | 37 | 2 |
| SH09 | 29 | 6 |
| SH32 | 30 | 5 |
| SH29 | 31 | 4 |

Upon the conclusion of the off-site Phase I–IV alternatives analyses, the Norfolk District decided that all six identified top sites should be considered reasonable alternatives. Subsequent to Phase IVb screening, more detailed analyses were performed, including more comprehensive field reviews where site access was allowed. Progressions in landfill design and accommodations for wetland avoidance supported a greater understanding of the total amount of wetland potentially impacted.

## Property Owner Outreach and Municipal Response

### *Initial Outreach*

The Norfolk District also undertook an effort to confirm the availability, and thus the practicability, of each site via property owner outreach. The Norfolk District sent two rounds of letters to property owners via certified mail to enable certified receipt. All letters were documented as received through the certified mail process. The first round of letters was sent to the owners of Sites SU02, SH33, SH23, SH09, SH32, and SH29 in September 2020, notifying them that their property met the Norfolk District's Phase IV criteria based on an initial desktop review. These letters also requested short-term access to the properties to conduct high-level walkover surveys of wetlands. The second round of letters was sent in November 2021 to landowners who did not have an opposing reaction to the first round of letters and whom the Norfolk District had not already confirmed an interest in selling (i.e., Site SU02). This second round of letters specifically requested information about the property owner's interest in and willingness to sell their property for potential landfill expansion. During the outreach period, the Norfolk District also tried to follow up with unresponsive property owners by phone.

During the scoping process, all municipalities in which one of the top six sites were located were contacted for comment. Municipal feedback was documented in scoping comments received. The City of Suffolk provided additional feedback via letter in March

2022, expressing its concern over the Norfolk District's consideration of Site SU02 as an alternative site. Table 4 below outlines site characteristics, county input received during public scoping as well as outside of the scoping periods, and property owner responses for each off-site alternative.

**Table 4. Off-site Alternatives Characteristics and Outreach Details**

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SU02 | Agricultural | ~546.0 | ~74.9<br><br>Based on desktop and limited field review | › Site is not located in the proper zoning district for a landfill. In order to develop landfill, site needs to be rezoned and a CUP approved for the landfill (see letter for specific requirements of the conditional use).<br>› Selection of site does not eliminate the necessity of condemnation proceedings, which could displace families from their homes.<br>› It is not reasonable to assume that Suffolk's city council would approve an amendment to the Comprehensive Plan, a rezoning, and a CUP.<br>› The existing road configuration is not sufficient for traffic associated with a landfill; thus, extensive road improvements would be necessary to mitigate traffic conflicts and ensure safety. | › Provided access to property<br>› Interested in the property being considered as an alternative landfill site and likely willing to sell |

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SH23 | Agricultural A-1 | ~391 | ~10.1<br><br>Based on desktop review only | › Landfills are permitted, with CUP<br>› A landfill at this site is generally inconsistent with the county's future plans and current ordinances<br>› County administrator noted that site has a very low probability of obtaining necessary approvals | › Norfolk District sent certified mail access request letter in September 2020 – no response received*, thus, property access not granted<br>› Norfolk District sent scoping letter in December 2020 – no response received*<br>› Norfolk District sent follow-up access request letter in May 2021 – no response received*<br>› Norfolk District unable to contact via phone or leave message (voice mailbox full)<br>› Norfolk District sent landowner interest and willingness letter in November 2021 – no response received* |

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SH09 | Agricultural A-1 | ~324 | ~18.7<br><br>Based on desktop review only | › Landfills are permitted, with CUP<br>› A landfill at this site is generally inconsistent with the county's future plans and current ordinances<br>› County administrator noted that site has a very low probability of obtaining necessary approvals | › Norfolk District sent access request letter in September 2020 – owner denied access to property in writing<br>› For further consideration, owner required Norfolk District to outline its legal support for the request to access the site, as owner considered request to access property an invasion of property rights<br>› Norfolk District unable to contact via phone (number not in service)<br>› Norfolk District sent landowner interest and willingness letter in November 2021 – no response received* |

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SH33 | Agricultural A-2 | ~474 | ~9.0<br><br>Based on desktop review only | › This zoning designation is intended to provide for gradual extension of single family residential and other appropriate development where urban services are planned<br>› Part of a Voluntary Agricultural and Forestal District<br>› Landfill at this site would require amendment to the Comprehensive Plan and zoning map, issuance of a CUP, and prior approval to develop property to a use more intensive than existing use<br>› A landfill at this site is wholly inconsistent with the county’s future plans and current ordinances<br>› County administrator noted that site has an extremely low probability of obtaining necessary approvals | › Norfolk District sent access request letter in September 2020 – owner denied access to property in writing and verbally<br>› Concern about threatened and endangered species implications<br>› Did not want Norfolk District to consider property as an alternative site for the landfill<br>› Only way for Norfolk District to obtain land is through eminent domain<br>› Threatened legal action if Norfolk District entered land<br>› Obtained legal counsel and committed to keeping the Norfolk District off of property |

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SH32 | Agricultural A-1 | ~311 | ~38.6<br><br>Based on desktop review only | › Borders an Agricultural A-2 district which is intended to provide for gradual extension of single family residential and other appropriate development where urban services are planned<br>› Landfills are permitted, with CUP<br>› A landfill at this site is generally inconsistent w/the county's future plans and current ordinances<br>› County administrator noted that site has a very low probability of obtaining necessary approvals | › Norfolk District sent access request letter in September 2020 – owner denied access to property in writing<br>› Norfolk District unable to contact via phone or leave message (no answering machine)<br>› Norfolk District sent landowner interest and willingness letter in November 2021 – no response received* |

| Alternative Name | Zoning District | Parcel Size (acres) | Total Wetland Impacts (acres) | County Comments | Property Owner Response |
|---|---|---|---|---|---|
| Site SH29 | Agricultural A-1 | ~176 | ~51.0<br><br>Based on desktop review only | › Landfills are permitted, with CUP<br>› A landfill at this site is generally inconsistent with the county's future plans and current ordinances<br>› County administrator noted that site has a very low probability of obtaining necessary approvals<br>› Generally encompassed by the Riverdale Voluntary Agricultural and Forestal District<br>› Approximately 1 mile southwest of the corporate limits of the City of Franklin and its accompanying centers of commerce and residential subdivisions<br>› Prevailing winds in Southampton County are generally from the west-southwest | › Norfolk District sent access request letter in September 2020 – owner denied access to property in writing<br>› Norfolk District left detailed voice message – no response*<br>› Norfolk District sent landowner interest and willingness letter in November 2021 – received written response indicating not willing to sell property in support of a landfill expansion project |

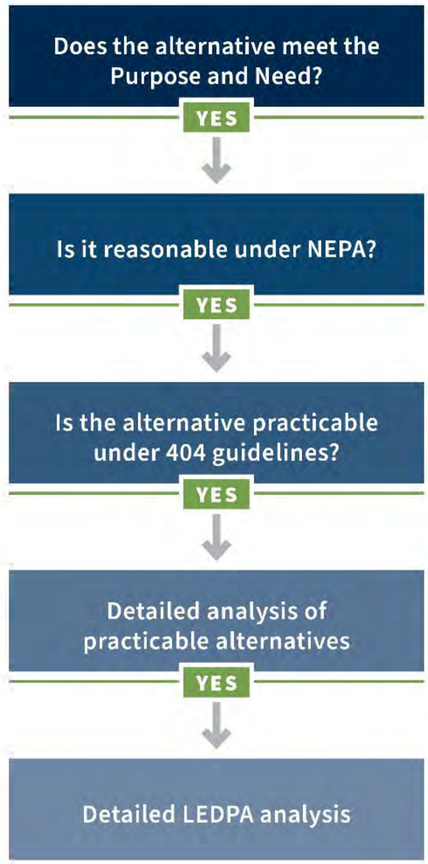
* If no response was received from the property owner, the Norfolk District interpreted this to mean that the property owner was not interested in providing access or selling.

## Alternatives Refined

As specified in 40 CFR § 1502.14(a) and Corps regulations (33 CFR Part 325 Appendix B), the Corps is required to evaluate alternatives to the project that are considered reasonable. Through the alternatives analysis, the Norfolk District determined that all 10 on-site alternatives were considered reasonable. Of the 58 sites originally identified in the off-site Phase I screening, only those that were carried forward into Phase IV screening were considered reasonable. Reasonable alternatives are defined as those that are technically and economically feasible, meet the purpose and need for the proposed action, and, where applicable, meet the goals of the applicant (40 CFR § 1508.1(hh); 33 CFR Part 325, App. B at (5)(a)). The Phase III analysis was used to determine which sites could be technically and economically feasible.

A sequential process was developed in conjunction with CEQ regulations, Corps *NEPA Implementation Procedures for the Regulatory Program*, and 404(B)(1) Guidelines to eliminate alternatives from further evaluation. The sequence of steps to refine alternatives to carry forward into detailed analysis is illustrated in Figure 11 below.

**Figure 11. Alternatives Refinement Flowchart**




Each step in the flowchart in Figure 11 was met before a site can continue through to the next stage of evaluation. The practicability analysis section below further defines practicability and describes why some alternatives were eliminated from further review.

## Subsequent Property Owner Outreach

Throughout the environmental review process, the Norfolk District consulted with EPA regarding its approach for analyzing alternatives. After further analysis of Site SU02, the Norfolk District determined that development of this site would result in greater wetland impacts than that of the applicant's preferred alternative (see "Site SU02 Analysis and Dismissal" section below). Because property owners of the five other sites that were analyzed in Phase IV did not grant access to their property or were non-responsive, EPA recommended that the Norfolk District identify additional sites for consideration, by revisiting sites that were considered in Phase III of the off-site alternatives screening process. The criteria that were evaluated for each of these sites is shown in Table 2.

In an effort to identify a site with fewer wetland impacts than the applicant's preferred alternative, the Norfolk District reconsidered the next 10 highest ranked sites that received lower scores than the initial top six ranked sites. Rather than evaluate the next 10 sites using the nine criteria associated with the Phase IV analysis, the Norfolk District investigated the potential for successful site acquisition or condemnation. In order to understand landowner interest and willingness to potentially sell their property in support of a regional landfill expansion project, certified letters were sent in May 2022 to sites identified as SH01, SH13, SH19, SH24, IW02, SH30, SH25, SH05, SH31 and SH07, illustrated on Figure 9. Site IW02, located in Isle of Wight County, is currently owned by International Paper and is being utilized for their operations. In total, 16 property owners were contacted via certified mail and two responded with an interest in selling during the initial and subsequent outreach periods.

The property owner of site SH30 responded and expressed an interest in selling. Access to the property was allowed and more comprehensive field reviews were conducted. Site SH30 was fully evaluated in the DEIS but was determined not practicable as discussed below in the Site SH30 Analysis and Dismissal.

## Practicability Analysis

The Corps 404 (b)(1) guidelines (guidelines) state that an alternative is practicable if it is "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

As described in the property owner outreach subsections above, only two landowners are willing to potentially sell their property to support regional landfilling needs. Unwillingness to sell alone, however, does not render an alternative impractical. The guidelines state that if it "is an otherwise practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered."

SPSA is a semi-governmental agency that has the authority to acquire property for public use through eminent domain. In order to construct a landfill on property acquired through eminent domain, the construction must also be consistent with local zoning ordinances and SPSA must obtain any necessary local approvals.

Construction of a landfill at any of the off-site alternatives in Southampton County would require at a minimum, the issuance of a CUP, and—for several sites—additional approvals or zoning changes would be required before a CUP could be granted. Outreach responses received from Southampton County state that construction of a landfill at the off-site locations in question would be inconsistent with future plans and current ordinances. The Southampton County administrator noted in writing that there is a very low probability of obtaining necessary approvals at the municipal level. Subsequently, on February 28, 2023, Southampton County passed a resolution of opposition against development of a new landfill within the boundaries of the County and authorizing the County Administrator and Attorney to do all things necessary and proper to express such opposition.

Similarly, in the City of Suffolk, even if SPSA used its eminent domain authority, rezoning approval and issuance of a CUP would be required. Like Southampton County, the City of Suffolk's outreach responses state that construction of a landfill at the off-site locations in question would be inconsistent with future plans and current ordinances. The Suffolk City Manager's office has stated in writing that the City would not support development of a second landfill within its municipal boundaries. The Norfolk District has evaluated the considerable time and costs associated with SPSA's use of eminent domain authority, the lack of project support for off-site locations within the City of Suffolk and Southampton County, and the need to obtain a CUP, zoning changes, or other approvals for construction, and determined that the off-site locations without a landowner that is willing to sell are impractical and may therefore be eliminated from further analysis. Though SPSA could conceivably obtain off-site locations through eminent domain, these locations could not reasonably be expected to fulfill the purpose of the proposed activity without support by local government.

## Alternatives Considered but Dismissed

Alternatives or alternative elements that were considered but are not technically or economically feasible, do not meet the purpose of and need for taking action, or create unnecessary or excessive adverse impacts on resources were dismissed from detailed analysis. These alternatives or alternative elements are discussed below.

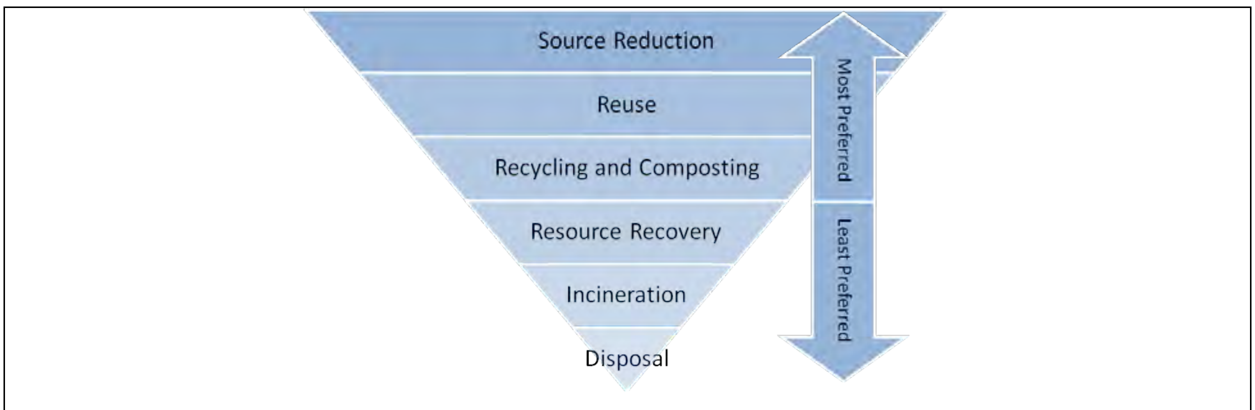
Additionally, state laws as they relate to solid waste management strategy were reviewed and are described herein. The laws of Virginia mandate the development and adoption of a solid waste management plan by all local governments in the Commonwealth. The HRPDC is the agency responsible for preparing the solid waste management plan in southeastern Virginia. A regional solid waste management plan has been prepared and subsequently amended by the HRPDC in cooperation with SPSA and the member local governments. The *Regional Solid Waste Management Plan for Southeastern Virginia* (HRPDC 2023) establishes a framework by which this region can meet the state-mandated planning requirements and recycling goals as well as the long-term waste management needs of this region. The solid waste management plan must address six policy areas specified in state law. These six policy areas include:

1. Source Reduction
2. Reuse
3. Recycling
4. Resource Recovery (Waste to Energy)
5. Incineration
6. Landfilling

The plan must give preference to lower numbered policy areas over higher numbered policy areas. These policy areas are based upon the widely accepted waste management hierarchy, originally conceived by the U.S. Environmental Protection Agency and embodied in the Virginia Solid Waste Management Regulations. The hierarchy encourages communities to develop policies that rank the most environmentally sound strategies for management of solid waste (see Figure 12):

- First, Reduce and Reuse – Efforts to prevent the creation of waste should precede other waste management options that deal with the waste after it is generated, as in recycling. The underlying thought is that solid waste that is not produced does not require management.
- Second, Recycle and Compost – This level includes recycling and composting. These techniques have the potential to divert large amounts of waste from disposal and turn them into valuable products. Through these techniques, waste materials can potentially go through several cycles of use, conserving raw materials and energy in the process.
- Third, Recover Energy – This level of the hierarchy also uses waste as a resource, but essentially the material can only be used once. The highest use becomes energy production.
- Finally, Dispose – After the first levels of the hierarchy are maximized, there may be residual solid waste left to manage. This material must be disposed of in an environmentally safe manner, through incineration or landfilling at a permitted facility.

**Figure 12. Waste Management Hierarchy**




Source: HRPDC 2023

In addition to addressing these policy areas, the plan must develop future estimates of waste generation and present how the region anticipates meeting future solid waste needs.

## Alternative Technologies

The alternative waste management technologies listed below will continue in operation and are supplemental to landfilling (see the “Elements Common to All Alternatives” section). They cannot, however, either alone or in combination with one another, meet the project Purpose and Need as standalone alternatives because they do not provide 16 million CY of waste disposal capacity. As illustrated in Figure 12, disposal capacity is a necessary component of waste management planning.

SPSA continues to seek alternative technologies to reduce the volume of waste that is ultimately landfilled. Contractual examples include its relationship with Wheelabrator and the multiple Requests for Proposals (RFPs) it has issued over the last 10 years in an effort to partner with private enterprises to reduce landfill waste volume. After selling its waste-to-energy plant to Wheelabrator in 2010, SPSA contracted with Wheelabrator for their services and continued to deliver the bulk of the waste it received to the plant (HRPDC 2020). In 2016, SPSA issued an RFP for waste disposal services post-2018 in order to provide its member communities with additional options, in anticipation of new Use and Support Agreements. The intent of the RFP was to establish a contract for the processing, recycling, and/or disposal of 100% of the waste received at SPSA beginning in 2018, with the possibility of entering into contracts with more than one vendor. SPSA’s Board elected to enter into a contract with Re-Power South but discovered during contract negotiations that Re-Power did not have a viable off-taker for the end product of their process. Thus, the contract was never executed due to Re-Power’s inability to meet its obligation. SPSA issued another RFP for waste disposal services in 2017, designed to reduce waste entering the landfill. Wheelabrator and Republic Landfill were the only respondents (Republic Landfill does not offer any alternative form of waste disposal other than landfilling). SPSA re-negotiated with Wheelabrator to continue to process more than 80% of the area’s MSW under a contract through 2027 with two renewal terms. However, due to the U.S. Navy ending its contract for steam, Wheelabrator closed its facility in 2024.

SPSA continues to seek relationships with providers of innovative technologies and is willing to explore any and all viable opportunities to use alternative solutions to landfilling. On February 5, 2024, SPSA issued an RFP seeking alternative options. The SPSA Alternative Waste Disposal RFP Review Committee reviewed several proposals and toured some prospective facilities that could provide alternate technologies to reduce the amount of waste to be disposed. SPSA staff is nearing completion of their review of the Alternative Waste Disposal RFP responses and anticipate making a recommendation to the full SPSA Board of Directors to issue an intent to award a contract to one of the final two vendors at the February 26, 2025, Board Meeting. After the Board decides, staff will finalize negotiations with the selected vendor to develop a final contract that would then go back to the full SPSA Board for approval.

Although the following waste management technologies were eliminated from detailed analysis as standalone options, SPSA will continue to implement and support (for recycling and composting programs it does not manage) these technologies as often as possible in order to reduce the volume of its incoming waste stream and preserve the life of existing cells for as long as possible.

### Source reduction, Materials Reuse, Recycling, and Composting

In 2023, SPSA completed a Waste Characterization Study (Appendix I) to better understand waste flow and potential for improved waste diversion. The study analyzed waste composition to quantify the types of waste found in the waste stream. This information can be utilized to educate member communities as well as citizens of the region on what is being discarded. The data also assist in developing strategies for source reduction as well as potential economic benefits for recycling which may attract vendors desiring to offer alternative waste disposal mechanisms. Source reduction and materials reuse reduces the amount of waste requiring disposal, which can help prolong the life of the existing landfill cell (Cell VI) and conserve airspace. According to the *Regional Solid Waste Management Plan for Southeastern Virginia* (HRPDC 2020), source reduction has typically been used for industrial and hazardous waste applications. Reuse assumes the reuse of a material in a manner identical to its original use. Source reduction and materials reuse, however, do not eliminate the need for other waste disposal options.

Another method for source reduction is diverting food waste from the waste stream. Composting is also a useful alternative for managing yard and food waste and turning them into useful products.  Both of the vendors being considered through the RFP process included an organics component in their proposals. The potential vendors would use different methods to process organics into reusable products. The proposed organics processing should help reduce the total amount of waste entering the Regional Landfill. Previously, it has been in the best financial interest of member communities to manage these programs at the municipal level because it generated revenue for the locality and reduced the waste tonnage amount provided to SPSA, thereby reducing the municipality's costs for disposal.

Recycling helps divert large volumes of waste from disposal. Recycling allows materials to go through several cycles of use. This approach also helps conserve raw materials and energy in the process and reduces the amount of solid waste requiring disposal. Residential recycling programs are managed and administered by member localities and are not under SPSA's jurisdiction. Specifically, the Use and Support Agreements that SPSA holds with each of its eight member localities—which dictate the type of services SPSA provides for its member communities—stipulate that SPSA is responsible for managing municipal solid waste, the definition of which excludes recyclable waste. SPSA previously provided recycling services for its member localities but discontinued this service in 2010, at which time this service was transitioned to the localities (HRPDC 2016). SPSA discontinued its recycling programs in order to cut its costs and streamline operations (Harper 2010). At the time, member localities were incentivized to maintain recycling programs in order to keep as much out of the waste stream as possible, given SPSA's high disposal fees (Harper 2010). The more trash generated by a municipality, the higher the fee it pays to SPSA because municipalities are charged by the ton for solid waste. Fees paid to SPSA cover the increased number of trucks and sanitation workers needed to haul the waste away. With higher waste disposal fees from SPSA, municipalities pass these costs onto taxpayers; therefore, localities were incentivized to reduce the waste stream as much as possible to keep their waste fees to a minimum. For instance, in 2014, the city of Portsmouth saved $1.2 million in disposal fees by encouraging recycling. Even if SPSA could resume this responsibility, it would still need to pursue landfill expansion to address the need for 16 million CY of capacity for post-recycling waste disposal. While increases in recycling tonnages would potentially reduce the need for landfill space, it would not eliminate it entirely. Furthermore, the market for certain recyclable goods has dwindled in recent years. Specifically, the market for plastics is nearly non-existent and not economical; it is often cheaper for manufacturing companies to buy new plastic than it is to buy recycled plastic (ABC News 2022). Of 51 million tons of plastic produced by U.S. households in 2021, only 2.4 million tons (or less than 5 percent) of that volume was actually recycled (ABC News 2022). This is partially attributable to changing market conditions in China, which, along with many Southeast Asian countries, was the primary off-taker of U.S. recyclable material (DelBel 2022). These countries would process the recyclables and the U.S. would then buy them back as raw goods; however, due to Chinese policy changes, this market is no longer viable (DelBel 2022). Thus, the City of Chesapeake discontinued its curbside recycling program in 2022, giving residents the option to instead dispose of their recyclables in household garbage, contract with a private recycling company for pickup, or take their recyclables to drop-off sites located throughout the city. Nevertheless, SPSA strongly supports recycling initiatives and innovations to reduce the amount of waste to be landfilled. In December 2023, SPSA started a pilot program that sorts 40,000 tons of municipal solid waste annually. Artificial Intelligence (AI) and robotics are used to increase efficiency and increase productivity. This pilot will be used to determine the future potential for this technology.

SPSA operates a Tire Processing Facility at the Regional Landfill that recycles used tires from community members and commercial sources. Tires are cut up in a shredder and can then be repurposed as daily cover at the Regional Landfill or to repair access roads. SPSA also offers scrap metal collection on-site, where metal parts and appliances can be dropped off for recycling. Scrap metal is stored at the Regional Landfill until it is eventually transported to recycling facilities.

### Resource recovery (including waste incineration)

Resource recovery approaches use waste as a resource, often for energy production. Combustible items are burned as a fuel to produce steam or electricity. As described in Chapter 1, under the terms of SPSA's agreement with Wheelabrator, SPSA delivered some of the municipal solid waste it controls to the RDF plant for conversion to fuel. Prior to July 2024, approximately 83% of all the waste that came through SPSA facilities was processed through the Wheelabrator plant where the waste was incinerated. The process resulted in 211,236 megawatts of electricity which was sold to the grid and 360,024 pounds of steam which was being sold to the U.S. Navy (SPSA 2022b). This process has dramatically extended the availability of airspace in Cells V and VI. Noncombustible items, such as the ash residue, is transported to the Regional Landfill for beneficial use as an alternative daily cover or for disposal, depending on its quality. Although the Wheelabrator plant reduced the volume of waste requiring disposal, it did not eliminate the need for landfilling entirely. Landfill gas is also extracted from waste that is placed in the landfill. The resultant energy provides fuel for local processing plants and creates electricity that can be sold back to the grid.

Recyclable materials, typically glass, ferrous metals, and aluminum, are recycled following separation. Recycling and source reduction programs may enhance the effectiveness of the combustion alternatives.

With the closure of Wheelabrator in 2024 (as described above under "Project Background"), SPSA has considered the option of buying the Wheelabrator plant back or potentially building a new waste-to-energy (WTE) facility that it could operate. Ultimately, SPSA concluded that this approach is not a practicable alternative for several reasons. The Wheelabrator plant itself has been in operation since 1988 and much of the equipment in the facility is nearing the end of its useful life. The reliability of the equipment has dramatically decreased in recent years, while capital costs and expenses to maintain the equipment have sharply increased. A fire at the Wheelabrator plant occurred in December 2022 and despite repairs, the plant subsequently operated at a reduced capacity. Furthermore, the technology employed by Wheelabrator to turn refuse into fuel is not used in new WTE plants; rather, new plants utilize mass burn technology which is more cost efficient to operate and more reliable. In addition, building and operating a new WTE plant is cost prohibitive as the financial strategies previously used to operate the Wheelabrator plant are no longer available. Specifically, the Power Purchase Agreement (PPA) with Dominion Power, which helped secure the lucrative sale of electricity, has since ended. Although electricity is still sold to the grid, it is sold at market price which is now much lower per kilowatt hour than it was under the PPA. Considering lower electricity sales, along with the large amount of capital needed to upgrade the existing facility, SPSA assuming and operating the plant would result in over $14 million dollars in increased tipping fees per year across the region (SPSA 2022c). Of this amount, $10 million represents the amount WIN Waste Solutions will lose in revenue on an annual basis without having a buyer for the steam (i.e., the U.S. Navy). The remaining $4 million is the amount WIN Waste Solutions anticipates would be needed to upgrade and maintain Wheelabrator equipment and operations. Thus, if SPSA were to purchase and operate the plant, it would need to increase tipping fees for its member communities by $14 million dollars each year in order to keep the plant operational and financially viable.

Furthermore, operating a WTE facility requires special expertise that SPSA is currently not equipped to provide. SPSA engaged in discussions with WIN Waste Innovations to discuss WIN Waste operating Wheelabrator through the current contract term of 2027. One of WIN Waste's conditions for municipal waste, however, required SPSA to increase the "gate rate" paid to WIN Waste, which would result in a higher tipping fee for member communities. The SPSA Board of Directors in an open session with member communities rejected this rate increase in March 2022 (SPSA 2022c). As part of its discussions with WIN Waste, SPSA attempted to pursue a public-private partnership to construct and operate a new mass burn facility. Upon further discussions, however, WIN Waste's corporate office decided not to pursue the project due to the uncertainty surrounding the future viability of WTE plants in the U.S and the varying levels of success in recent years. In the past 13 years, the number of WTE plants in the U.S. has dropped from 87 to 75, citing restraints such as low electricity costs, regulatory requirements, and community opposition to this type of technology (Karidis 2019). Alternatively, Palm Beach County, Florida launched a new mass burn facility in 2015 to expand its waste capacity in light of a population boom. The plant took 15 years to construct and cost $672 million. Key factors which contributed to the success of the project included the development team's 20-plus-year history with operating an existing WTE facility and the Solid Waste Authority's ability to maintain assessment rates and raise capital through bond issues (Karidis 2019).

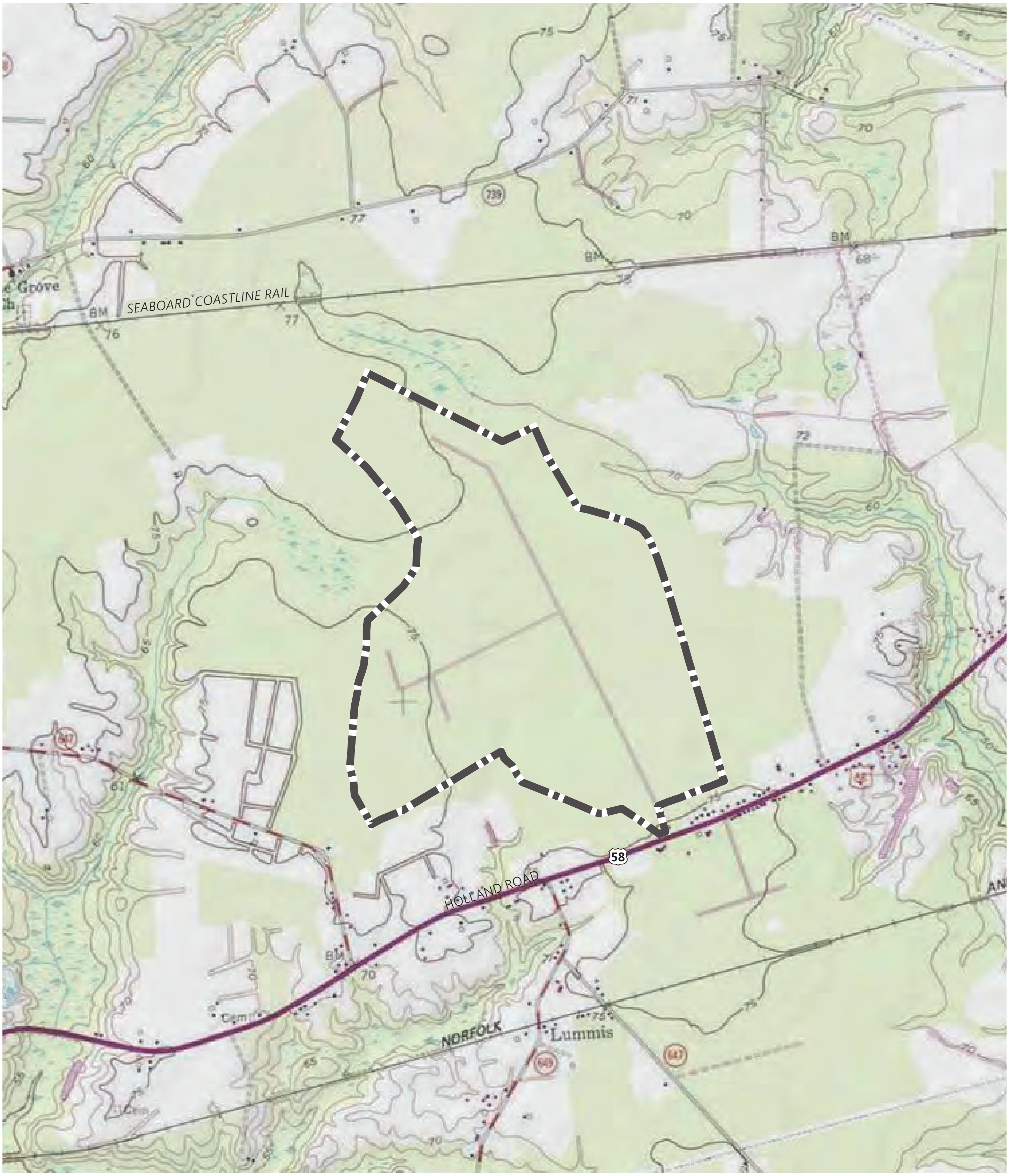
Anticipated cost to construct a new WTE facility in the region in 2024 is approximated between $550 million and $600 million, based on a facility sized to handle 460,000 tons of waste per year, and does not include land purchase and environmental permitting. This cost, combined with the uncertainty over environmental and health impacts, lack of a viable steam off-taker, and the low revenue resulting from the sale of electricity indicates that this alternative technology is not a reasonable disposal option for SPSA to pursue.

### Site SU02 Analysis and Dismissal

Site SU02 is a 546.9-acre site in Suffolk, Virginia (Figure 13), located approximately 10 miles west of the existing landfill. Because of the landowner's interest in selling, access was provided to the Norfolk District team to better understand the extent of wetlands on the site.

Prior to beginning fieldwork, VHB scientists conducted a preliminary off-site analysis of publicly available reports and data pertaining to topography (LiDAR), soils, hydrology, and current and historical aerial photography for Site SU02. Datasets and mapping were downloaded for each of these datasets and overlaid onto the proposed alternative study area. Layers were processed using ESRI's ArcMap 10.6.1 and included as base maps for mobile data collection using ESRI's Fieldmaps for ArcGIS. Once the above data was analyzed, VHB created a map depicting areas that were potential wetlands. The wetlands within Site SU02 were quantified using the techniques outlined in Chapter 5 of the *Atlantic and Gulf Coast Plain (AGCP) Supplement* describing the methodology for delineation and wetland determination of wetland/non-wetland mosaics.

Source: USGS 7.5 minute Buckhorn, Virginia Quaddrangle




LEGEND

Site SU02 Site Boundary (546.9 acres)

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

N

0 2,000 Feet

FIGURE 13

**Site SU02 Location Map (Quadrangle)**

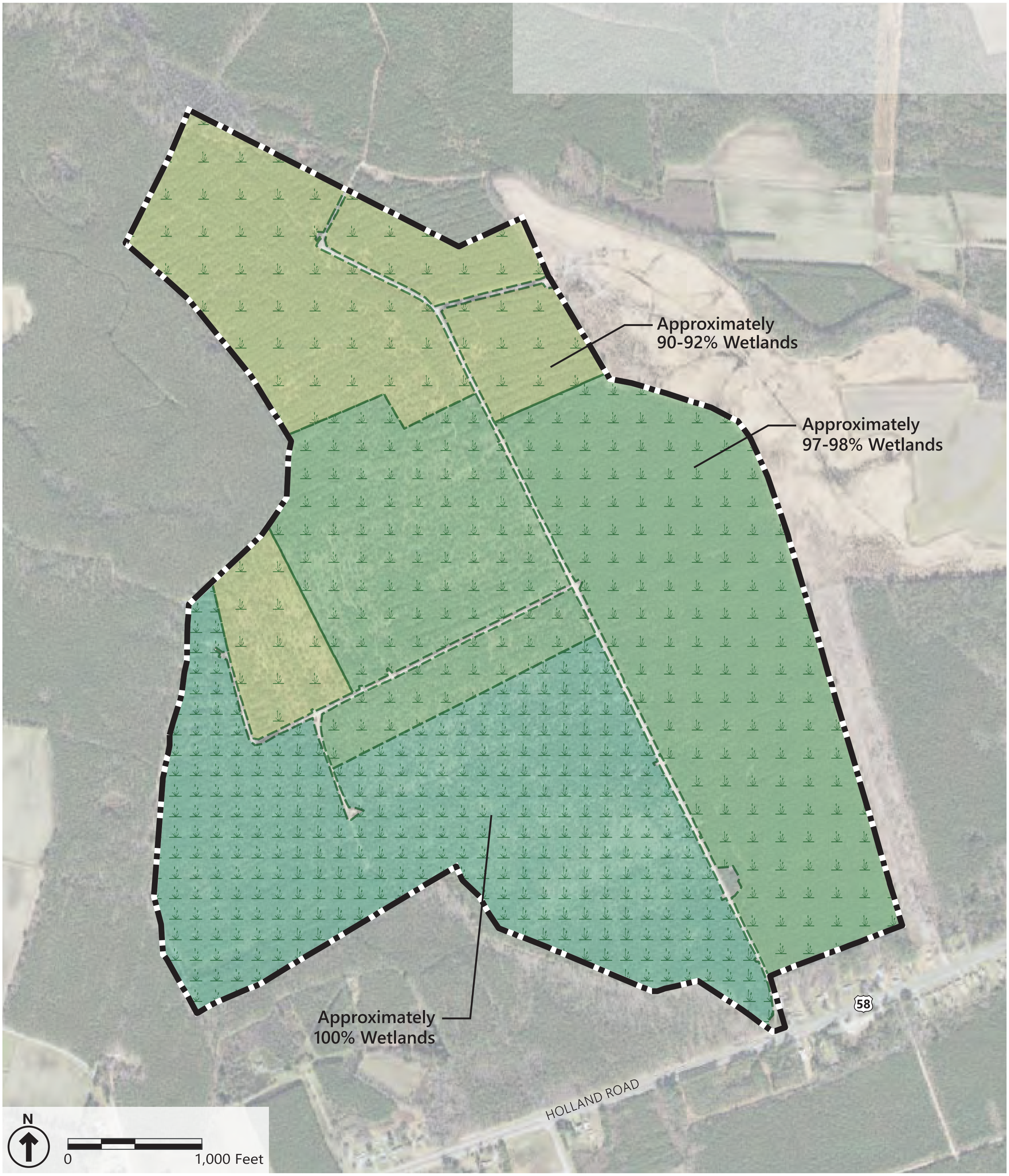
The boundaries of linear non-wetland features (silvicultural bedding and furrows) were delineated using a combination of mapping strategies and ground truthing with a transect-based sampling approach (e.g., GPS location of boundaries, true color and infrared aerial interpretation, LiDAR interpretation, etc. combined with transect results). Along each transect, regularly spaced wetland data points were collected to determine the presence of wetland characteristics. However, because these features were numerous, irregular, and discontinuous, the task of detailed mapping on silviculture bedding was potentially subject to inaccuracies related to the scale of the features and the resolution of off-site reference materials. The transect-length procedure for wetland/non-wetland mosaics provided the most defensible, accurate, and efficient approach to complete this study. Given that its use is sanctioned as an approved method in Chapter 5 (Difficult Wetland Situations) of the AGCP Regional Supplement, incorporating the wetland/non-wetland mosaics procedure is an appropriate methodology for completing the delineation on SU02.

Site SU02 consists primarily of non-riverine flatwoods and swamps (VDCR 2021a), with ditches excavated throughout the property and several upland dirt roads composed of fill material. The site is a pine plantation and has been regularly timbered since around the 1950s, with the last harvest occurring around 2010. Signs of past harvesting events are evident throughout the site, including gouges from skidding and tire tracks that are visible on aerial photography. Pine trees are planted in rows on bedding with furrows between each row. Large ditches line the roads and drain the site to the north and south, and smaller ditches are scattered between the rows in wetter areas. A large dirt road bisects the property into northeastern and southwestern halves, and two perpendicular roads provide access to other areas of Site SU02.

The U.S. Geological Survey (USGS) Quadrangle Map for Buckhorn, Virginia indicates that Site SU02 lies at an elevation between 70 and 75 ft. above mean sea level, and the parcel exhibits little change in elevation. The map indicates that a large portion of Site SU02 is wetland, and it indicates that Speights Run is located near and adjacent to the property. Ditches are shown oriented north-south and east-west through the center of the site, with the eastern ditch draining water from the on-site wetland(s) directly into Speights Run (USGS 2019b).

The wetland delineation conducted in February 2022 determined that there are four different wetland and upland areas at Site SU02, designated as Area 1, Area 2, Area 3, and Area 4 (Figure 14). Area 1 includes two areas on the north end of the site totaling 112.9 acres. The habitat in Area 1 consists of a wetland and upland mosaic that is approximately 90.83% wetland. Area 2 includes central portions of the property, as well as most of the area located northeast of the central access road. This area totals 237.1 acres in size, and it consists of a wetland and upland mosaic that is approximately 98.62% wetland. Area 3, located in the southwest quadrant of the site, consists of 174.4 acres of land that is entirely wetland. Lastly, Area 4 is 11.1 acres in size and consists of roadways and other contiguous uplands.

Source: VGIN/VBMP Most Recent Orthoimagery (2017-2019)




LEGEND

- Offsite Alternative Site Boundary (546.9 acres)
- Area 1: 124.3 acres (112.9 acres of Wetland)
- Area 2: 237.1 acres (233.8 acres of Wetland)
- Area 3: 174.4 acres (174.4 acres of Wetland)
- Area 4: 11.1 acres (Roadways and Contiguous Non-Wetlands)

Total Wetlands = 521.1 acres

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 14

**Site SU02 Wetland Delineation Map**

In general, these areas consist of pine plantation with 60 to 70% canopy closure. The primary canopy species is loblolly pine, with some water oak (*Quercus nigra*) and sweetbay (*Magnolia virginiana*). Shrub and sapling cover are moderate and consist of sweet pepperbush, inkberry (*Ilex glabra*), wax myrtle, and prickly blackberry (*Rubus pensylvanicus*). Groundcover is sparse due to canopy cover and thick pine duff, ranging from 10 to 30% cover. It is dominated by switch cane, hairy bluestem (*Andropogon glomeratus* var. *hirsutior*), and warty panic grass (*Panicum verrucosum*). Hydrology ranges from saturated soils to up to several inches of inundation.

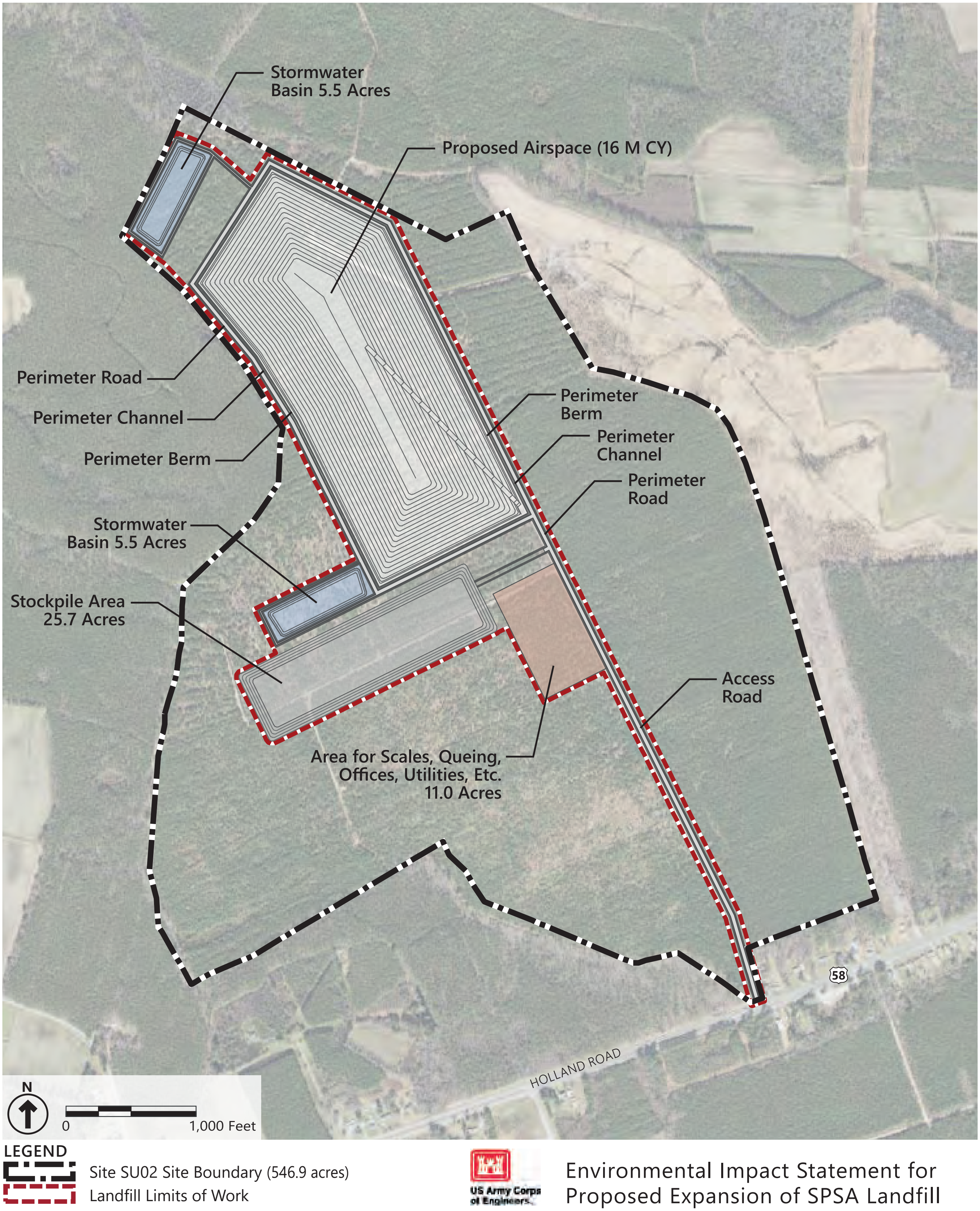
Soils map units present within Site SU02 include Lynchburg fine sandy loam, Rains fine sandy loam, and Eunola loamy fine sand, 0 to 2% slopes (USDA NRCS 2021). Rains fine sandy loam is the only hydric soil, and it makes up a large percentage of the area of the site. The soils consist of loamy sand to sandy loam and generally exhibit hydric soil indicators, including depleted matrix, thick dark surface, umbric surface, redox dark surface, and depleted dark surface.

A conceptual landfill development plan was developed for Site SU02. The concept plan detailed a total of 86.1 acres needed to develop the cell disposal footprint (which would stand 178 ft. high), with the total developed area (which includes support infrastructure) amounting to 167.2 acres (Figure 15). Support infrastructure would be constructed at the new site, including facilities similar to those at the existing Regional Landfill. These may include administration and maintenance buildings, utilities (water, sewer, and power), scales, a tire shredding facility, a household hazardous waste facility, access and haul roads, leachate sewer disposal surface drainage systems, and gas management recovery systems.

In addition, an access road would need to be constructed for vehicles entering the landfill from U.S. Route 58. This new road would provide the only vehicle access to the site and would transect the landfill from north to south. U.S. Route 58 would also need to be upgraded to add a left turn lane in the eastbound direction, for trucks turning into the landfill.

Development of the landfill on this site would result in approximately 164.2 acres of total wetland impacts (Figure 16). The conceptual design was developed with wetland avoidance as a top priority and minimization efforts were implemented to the greatest extent practicable by maximizing use of available uplands. The conceptual development plan for Site SU02 would result in greater wetland impacts than that of the applicant's preferred alternative, and is a factor in its consideration for dismissal. Additionally, the Suffolk City Manager's office has stated in writing that the city would not support development of a second landfill within its municipal boundaries. These were considerations factored into the dismissal of SU02 from further analysis.

Source: VGIN/VBMP Most Recent Orthoimagery (2017-2019)



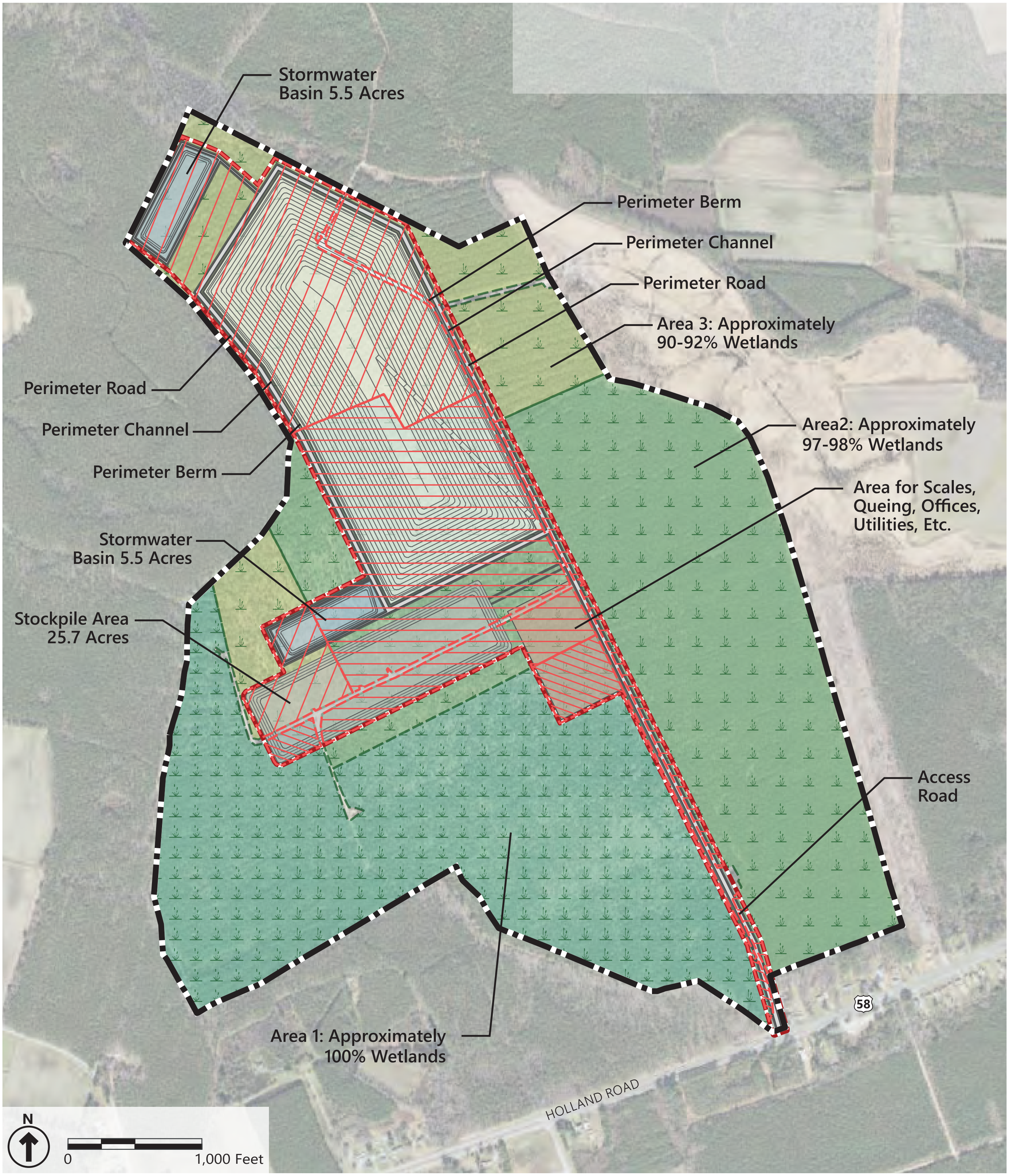

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 15

**Site SU02 Conceptual Development Plan**

Source: VGIN/VBMP Most Recent Orthoimagery (2017-2019)




LEGEND

Offsite Alternative Site Boundary (546.9 acres)

Landfill Limit of Work

Area 1 – 82.9 acres (75.4 acres of Wetlands)

Area 2 – 81.3 acres (79.7 acres of Wetlands)

Area 3 – 9.1 acres (9.1 acres of Wetlands)

Area 4: 11.1 acres (Roadways and Contiguous Non-Wetlands)

Total Wetlands Impacts = 164.2 acres

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 16

**Site SU02 Wetland Impacts**

## Site SH30 Analysis and Dismissal

SH30 is a 330-acre site in Southampton County, Virginia (Figure 17). This site was considered by the Norfolk District as Alternative D in the DEIS released in June 2023.

Under this alternative, the existing Regional Landfill would have closed for landfill operations once Cell VII reached capacity (anticipated around 2037) but would have continued to operate as a transfer station for the region. During the operation of Cell VII, soil stockpiling and borrowing would be done off-site, with material trucked in and out so that Cell VIII would not be used. Following the Regional Landfill's closure, a new landfill would have been developed and operated from approximately 2037–2060 on Site SH30 (Figures 17 and 18).

A conceptual landfill development plan was developed for Site SH30. Of the 330 acres available on Site SH30, 85 acres would have been utilized for the cell disposal footprint (which would stand 260 ft. high), with the total developed area (which includes support infrastructure) amounting to 138 acres (Figure 19). Support infrastructure would have been constructed at the new site, including facilities similar to those at the existing Regional Landfill. These may include administration and maintenance buildings, utilities (water, sewer, and power), scales, a tire shredding facility, a household hazardous waste facility, access and haul roads, leachate sewer disposal, stormwater management, and gas management recovery systems.

Permitting and construction of a new landfill at SH30 would take approximately 10 years and would consist of the stages described under Alternative B, below. Operations at this new landfill would also be similar to those practices described under Alternative B.

The proposed development of Site SH30 would have resulted in approximately eight acres of wetland impact. Since the placement of a landfill would have bisected the existing wetland drainage on SH30, additional wetland impacts may have been required to reroute and maintain continuity of the wetlands on the west of the property with wetlands on the east side of the property. The estimated wetland impacts also do not include potential wetland impacts or impacts to other WOTUS that could be required for an entrance road upgrade. The entrance to SH30 appears to be a state road; however, the property on either side of the entrance road is not under the same ownership as SH30, and that property was not reviewed for the presence of wetlands.

As discussed earlier in this chapter, the wetland impacts at SH30 would have been inconsistent with title 9, section 20-81-120 of the Virginia Administrative Code and section 10.1-1408.5 of the Code of Virginia, which prohibits new sanitary landfills or expansions of existing landfills with greater than two acres of wetland impact. The Office of the Attorney General for the Commonwealth of Virginia issued an advisory opinion concerning Section 10.1-1408.5 on September 20, 2021, concluding that its language "prohibits the siting of a landfill in wetlands that impacts two or more acres unless the landfill is covered by a special exemption in subsections (A)(i) or (A)(ii)." Due to the possibility of utilizing the exemption outlined in subsection F of Virginia statute § 10.1-

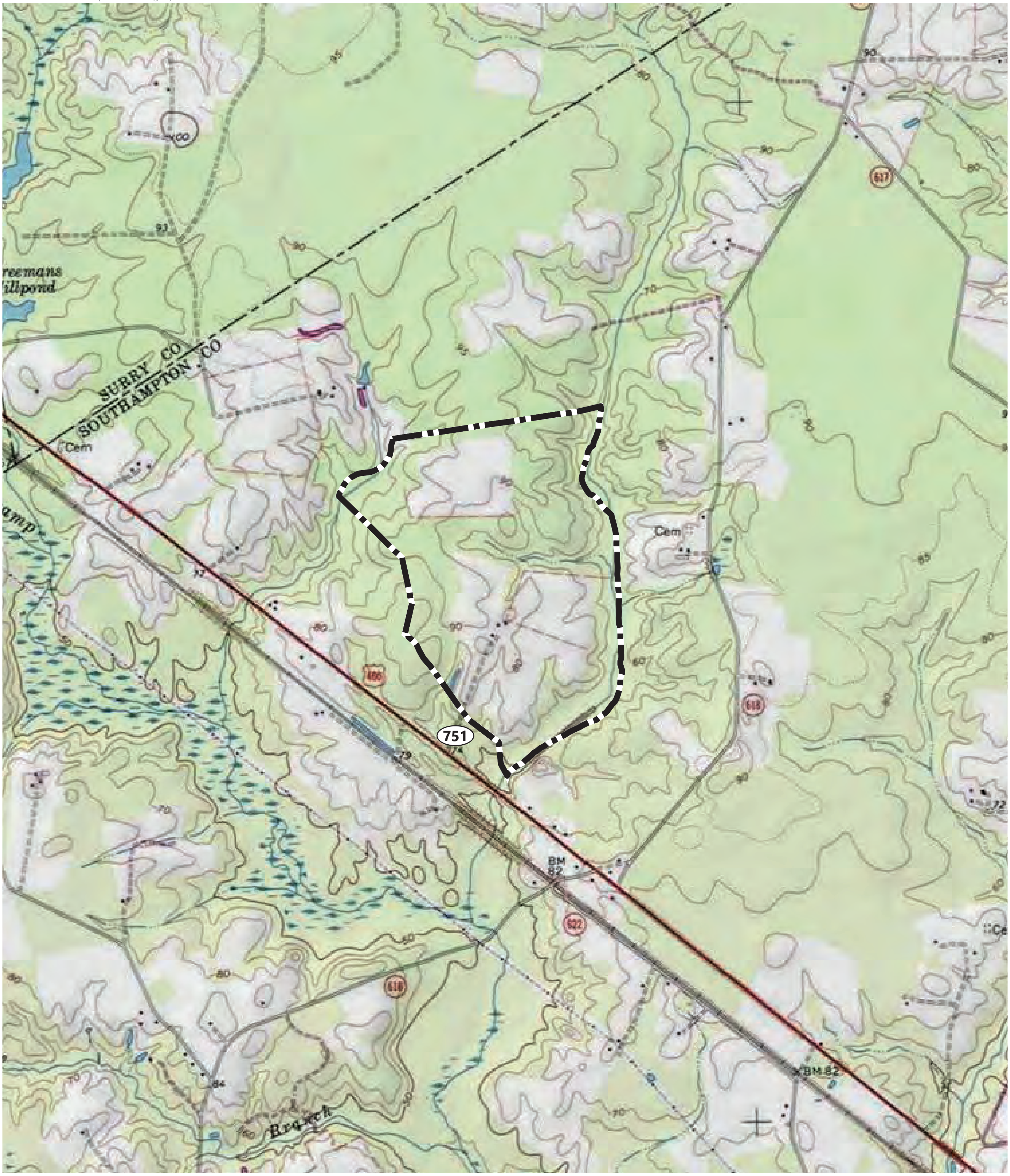
1408.5, and because NEPA permits consideration of proposed actions that may be inconsistent with state or local plans or laws, the Norfolk District decided to carry this alternative through the NEPA process for further review. The Norfolk District investigated the procedures for receiving an exemption under subsection F, including further engagement with VDEQ to evaluate how subsection F should be interpreted. Ultimately, the exception appears to require legislative action.

Local land use regulations and plans also preclude the development of SH30. According to correspondence received from the Southampton County Planning Director, development of a landfill at Site SH30 is "…generally inconsistent with the county's future plans and current ordinances." (from letter to the Norfolk District dated July 5, 2022). Specifically, the county's Comprehensive Plan designates Site SH30 as "Industrial" and "places a strong emphasis on job creation in areas noted as Industrial." Also, Site SH30 "has a zoning designation of A-1, Agricultural, district. Within the County's current zoning regulations, sanitary landfills in the A-1 zoning designation require approval of a Conditional Use Permit by the Board of Supervisors after review and recommendation from the Planning Commission." (from letter to the Norfolk District dated July 5, 2022). Subsequent to publication of the DEIS, during the public information meeting in June 2023, the Norfolk District was made aware that the Board of Supervisors of Southampton County had passed an ordinance in opposition of SPSA's landfill construction within the county. A copy of the ordinance was provided to the Norfolk District on June 23, 2023.

Following public review of the DEIS during summer 2023, the Norfolk District considered comments received regarding SH30 (see Appendix J for the *DEIS Comment Response Summary*), including comments related to the primary public interest factors. Per 33 CFR Part 325, Appendix B, the Norfolk District must consider an objective evaluation of the public interest in its decision. Top public interest concerns about SH30 related to traffic safety along Route 460 (including emergency medical service access and capacity), potential impacts to private wells, local water sources, local communities, and potential archaeological resources.

The Norfolk District applied a multi-layered approach to its review of alternatives, including the review of SH30. Based on the uncertainties around receiving an exemption from the state two-acre wetland impact limit, the Southampton County resolution of opposition, the unlikelihood of receiving a Conditional Use Permit from the county (even if an exemption to state law could be obtained), and the public interest factors discussed above, the Norfolk District has determined that SH30 is not a practicable alternative and therefore it has been dismissed from further consideration.

Source: ESRI Basemap Orthoimagery (2020)




LEGEND

Site SH30 Site Boundary (330 acres)

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Southampton County, Virginia

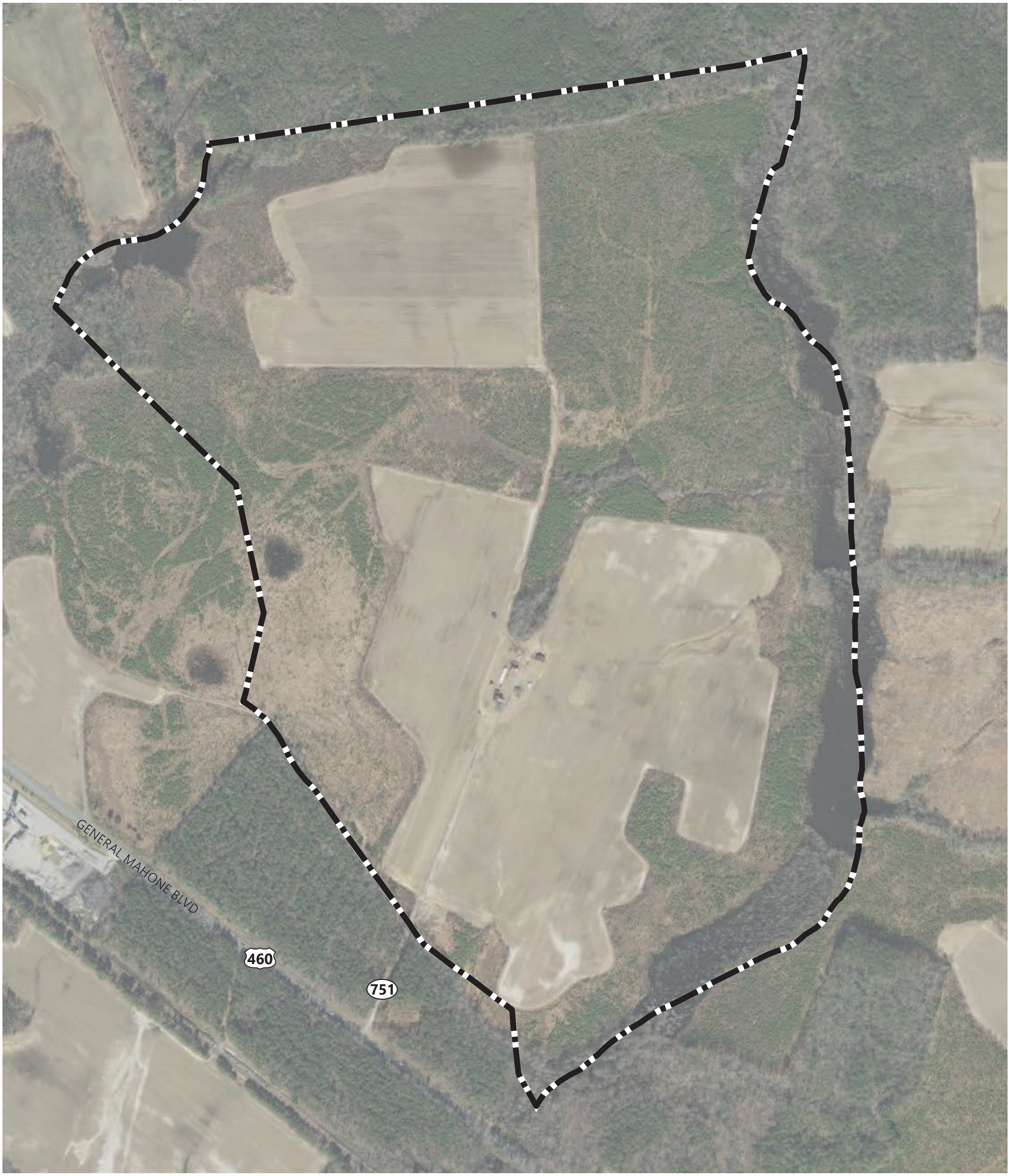
FIGURE 17

**Alternative D (Site SH30) Project Location Map (Quad)**

N

0 2,000 Feet

Source: VGIN/VBMP 2021 Orthoimagery




LEGEND

Site SH30 Site Boundary (330 acres)

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Southampton County, Virginia

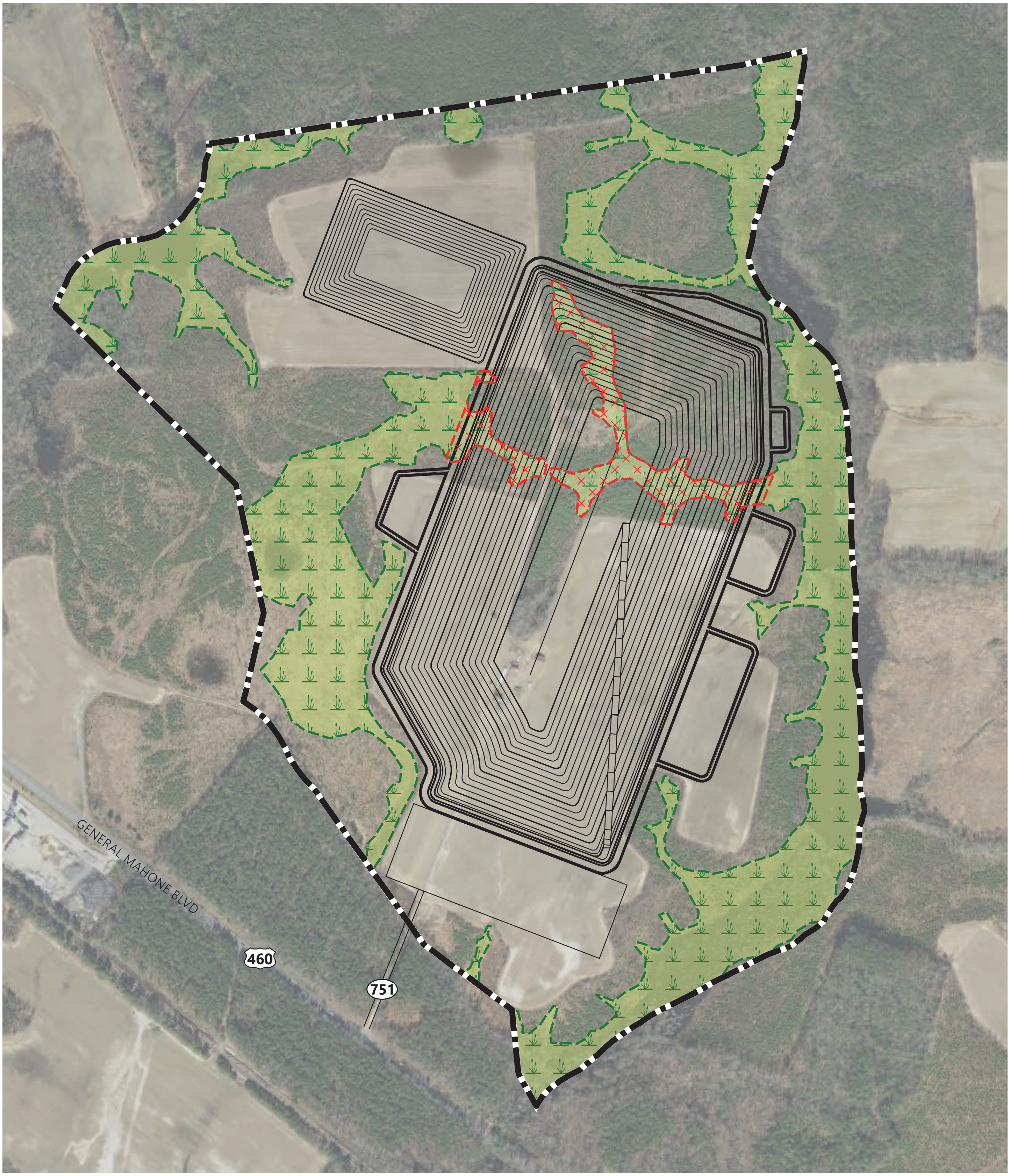
N

0 700 Feet

FIGURE 18

**Alternative D (Site SH30) Project Location Map (Aerial)**

Source: VGIN/VBMP 2021 Orthoimagery




LEGEND

Site SH30 Site Boundary (330 acres)

Approximate Extent of Onsite Wetlands (approx. 83 acres)

Potential Wetland Impacts (8 acres)

N

0 700 Feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Southampton County, Virginia

FIGURE 19

**Alternative D: Off-site Alternative (SH30)**

## Elements Common to All Alternatives

While three different approaches for landfill expansion are presented in the action alternatives described below, there are some alternative waste management technologies that will continue in operation and are supplemental to landfilling, regardless of the alternative selected by the Norfolk District (including the No-Action Alternative). Technologies include source reduction, materials reuse, recycling, composting, and resource recovery (waste to energy). SPSA actively seeks alternative technologies to reduce the volume of waste that is ultimately landfilled. SPSA works with its member localities and the HRPDC to continue to examine various alternative technologies for managing solid waste.

Elements of the different alternative waste management technologies are described in more detail in the “Alternative Technologies” section above.

## Alternative A: No-Action Alternative

Under Alternative A, SPSA would not expand its landfill operations into Cells VIII and IX and no construction requiring a Corps permit would occur (Figure 20). Landfill operations would continue to utilize the currently permitted capacity available through Cell VII, which is expected to last until approximately 2037. Cell VII would be constructed according to SPSA’s development plans. To retain the soil generated from the excavation of Cell VII, SPSA would transport soil by truck to an off-site stockpile area. When the soil is needed for cover on Cell VII, SPSA would transport it back from the stockpile area for its use at the site. To prolong capacity available at Cell VII, SPSA has issued RFPs to establish a new program for waste disposal at one or more waste facilities while maintaining available airspace at the Regional Landfill.

After Cell VII reaches capacity and is closed with a final cover system, waste would be hauled to other area landfills for processing and disposal. (Note: at the time of the DEIS publication in June 2023, Shoosmith Sanitary Landfill was included as a potential receiver facility because it was an active landfill pursuing an expansion permit. Since that time, Shoosmith has been removed as a potential receiver facility because it stopped pursuing an expansion permit and receiving waste due to public opposition.) Potential receiver facilities are listed below with the total remaining permitted capacity as of 2023 (HRPDC 2023):

- Atlantic Waste Disposal (private landfill owned by Waste Management in Waverly, Virginia)
    - Distance from Regional Landfill: 45 miles
    - Total remaining permitted capacity (tons): 43,943,186
    - Remaining reported permitted life: 54 years

- Bethel Landfill (private landfill owned by Waste Management in Hampton, Virginia)
    - Distance from Regional Landfill: 35 miles
    - Total remaining permitted capacity (tons): 21,816,740
    - Remaining reported permitted life: 65 years
- Brunswick Waste Management Facility (municipal landfill in Lawrenceville, Virginia)
    - Distance from Regional Landfill: 80 miles
    - Total remaining permitted capacity (tons): 9,569,031
    - Remaining reported permitted life: 40 years

The Suffolk transfer station and maintenance facility would remain operational following Cell VII closure. Operational practices surrounding groundwater and surface water monitoring, as well as leachate and landfill gas management, would also continue following Cell VII closure. SPSA would shift its infrastructure to support waste transport to private disposal facilities and would potentially need to increase the existing transfer system network.

As previously noted, prior to Cell VII operation, SPSA is funding construction of a grade-separated interchange ("flyover") to eliminate left turns from U.S. Routes 13/58/460 into the Regional Landfill. SPSA's CUP with the City of Suffolk requires that this flyover be completed before waste is deposited in Cell VII (SPSA 2020). The flyover is being constructed by VDOT and costs approximately $40 million to construct. In order to fund this construction, SPSA increased municipal tipping fees beginning in fiscal year (FY) 2022, which enabled SPSA to secure the funds needed to begin construction. The flyover is being constructed between eastbound and westbound U.S. Routes 13/58/460 and will provide solid waste and residential traffic in Suffolk an alternative to entering the landfill without using the median crossing on this road (HDR 2016).

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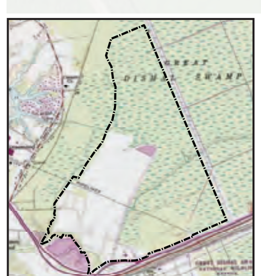
Source: ESRI Orthoimagery (2020)

**LEGEND**

- SPSA Property Boundary
- Landfill Cell Boundary
- Potential Future Buildout
- VDOT Constructed Flyover
- Expansion Area (137.18 acres)
- Wetlands (133.79 acres; Confirmed on 08.24.2022 (NAO-2016-00765))
- Ditch (0.93 acres; Confirmed on 08.24.2022 (NAO-2016-00765))
- Wetland Preservation Area (50 acres)
- Wetland Enhancement Area (36 acres)
- Wetland Restoration Area (12 acres)

N

0 1,000 Feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 20

**Alternative A: No-Action Alternative**

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## Alternative B: Original Proposed Alternative

Under Alternative B, SPSA would expand its existing landfill operations into an expansion site, within which two new contiguous waste disposal cells (Cells VIII and IX) would be constructed over time, in phases (Figure 21; see detailed description of construction stages below). Cell VIII would be constructed first, followed by Cell IX. This new expansion site would incorporate an additional 137.18 acres (identified as Cells VIII and IX, including the support areas for roadways and stormwater management) of landfill property within the active facility boundary. Alternative B would result in 117.36 acres of wetland impact. Landfill cells within this site would provide 16 million CY of new waste capacity. Existing facilities at the Regional Landfill—including administration and maintenance buildings, utilities (water, sewer, and power), scales, a tire shredding facility, a household hazardous waste facility, a methane gas recovery system, access and haul roads, leachate sewer disposal surface drainage systems, and gas management recovery systems—would continue to be used.

Landfilling operations at the expansion site would begin following the end of the operational phase of Cell VII, which is anticipated to reach capacity by 2037. Thus, landfilling operations at the expansion site would be expected to occur between approximately 2036-2060.

The construction and operation of Cell VII is described in the "Construction Stages" section below, along with the construction plans for Cells VIII and IX.

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Source: ESRI Orthoimagery (2020)


**LEGEND**

- SPSA Property Boundary
- Landfill Cell Boundary
- Borrow Area and Stormwater Management Area
- Limit of Disturbance
- Expansion Area (137.18 acres)
- Wetlands (133.79 acres; Confirmed on 08.24.2022 (NAO-2016-00765))
- Ditches (0.93 acres)
- Wetland Impacts (117.36 acres)
- Wetland Avoided (16.43 acres)

N

0 300 Feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 21

**Alternative B: Original Proposed Alternative**

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## Construction Stages

### Stage 1: Use Portion of Expansion Site for Stockpiling and Borrow Material for Cell VII (Optional)

Material from Cell VII is currently being excavated for use as daily cover on Cell VI. The ongoing excavation of Cell VII would help expedite the later development of Cell VII as an inward gradient landfill. However, the total material to be removed from Cell VII for its design use as a landfill exceeds the amount of material necessary to provide daily and intermediate and final cover for Cell VI. This excess material excavated from Cell VII would be used to provide daily and intermediate cover for Cell VII after construction of the cell is complete and disposal of waste begins. The excavated material needs to be stored until applied as cover. If the expansion site is permitted by the time SPSA needs space to store the excavated material, SPSA may choose to store the material in Cell VIII until applied as daily and intermediate cover during routine operation of Cell VII. Under this scenario, SPSA would erect an earthen berm or other approved method to contain the stockpiled material within Cell VIII to prevent erosion and runoff. Alternatively, soil borrow material may be stockpiled off-site and trucked to and from the landfill as needed.

In preparation for this stage, SPSA would initiate dewatering of the site, followed by clearing and grubbing within the expansion site waste limits and areas to be used for access roads and stormwater control features. Dewatering through drainage ditches, sumps, and pumps would be conducted to draw down the groundwater to a level sufficient for clearing and grubbing activities and stockpiling of excavated material from Cell VII. Dewatering would require a Special Exception Permit from the VDEQ Office of Groundwater Characterization and Supply.

Clearing and grubbing would include the excavation and removal of all vegetation including trees not indicated to remain, stumps, brush, vines, hedgerows, heavy growths of grass, downed timber, rotten wood, roots, rubbish, and other debris. All material resulting from clearing and grubbing would be disposed of appropriately and in a manner that would not consume landfill capacity. Topsoil within the area being cleared would be stripped and stockpiled on-site.

### Stage 2: Construct Cell VIII within Expansion Site and Operate Cell

Cell VIII would be constructed in the southern part of the expansion site, closest to Cell VII as illustrated in the phasing plans shown on Figures 22 and 23. Construction would be accomplished in four main phases. The initial phase would include excavating the cell to a depth of 20 to 40 ft to an inward gradient landfill. Excavation would consist of the removal and disposal of materials located on-site, including the cutting and shaping of slopes necessary for the preparation of roadbeds and landfill subgrades, removal of root mat, ditch cutting, sediment basin installation, and other related work. Suitable excavated materials would be stockpiled within the future phases of the site footprint, to be used later as daily and intermediate cover. Additional site dewatering would occur during the excavation of cover material.

Cell VIII would be developed as an inward gradient landfill, with the facility bottom below the water table. The cell would be developed with a double composite liner system, with leachate collection and a groundwater dewatering system. The floor would be graded to direct any generated leachate toward the leachate collection system(s). Collected leachate would be transferred to the on-site leachate holding lagoons or to a storage tank prior to treatment on-site through heat assisted evaporation or discharge to the Hampton Roads Sanitation District (HRSD) for treatment.

Groundwater removed during the dewatering process would be routinely monitored, and if uncontaminated, released into the on-site stormwater management system and discharged off-site. If the groundwater exceeds the maximum contaminant level requirements of the Virginia Solid Waste Management Regulations (VSWMR), it would be treated on-site as leachate and discharged to HRSD. Groundwater monitoring would occur at permit-defined frequencies. Current permit monitoring frequencies are quarterly or biannually by outfall, with conditions stating that VDEQ be notified as soon as SPSA knows or has reason to believe that an activity has occurred or will occur that would result in a discharge exceeding allowable concentration levels.

Waste disposal would begin once one or more phases of Cell VIII are completed. Wastes entering the Regional Landfill are primarily MSW, soils, and construction and demolition debris. This waste would be directed to the cell and placed in successive layers. Solid waste would first be heavily compacted so that it takes up as little room as possible in the cell (SPSA 2021a). At the end of each day, a six-inch (in.) layer of cover material would be spread over newly deposited waste to suppress odors; every 14 days, SPSA would place a 12-in. layer of soil over the landfill to serve as intermediate cover (SPSA 2021a). As waste levels reach a certain point, operations would move into adjacent phases of Cell VIII and be repeated, before moving into Cell IX.

### Stage 3: Construct Cell IX within Expansion Site and Operate Cell

Cell IX would be constructed in the northern part of the expansion site. Construction would be accomplished in four main phases. The initial phase would include excavating the cell to a depth of 20 to 40 ft. to an inward gradient landfill. Excavation would consist of the removal and disposal of materials located on-site, including the cutting and shaping of slopes necessary for the preparation of roadbeds and landfill subgrades, removal of root mat, ditch cutting, sediment basin installation, and other related work. Suitable excavated materials would be stockpiled within the future phases of the site footprint, to later be used as daily and intermediate cover. Additional site dewatering would occur during the excavation of cover material.

Similar to Cell VIII, Cell IX would be developed as an inward gradient landfill, with the facility bottom below the water table. The leachate management and groundwater monitoring processes would be the same for Cell IX as for Cell VIII, described under Stage 2, above.

Waste disposal would begin once one or more phases of Cell IX are completed. Operation of the cell would be the same as described under Stage 2, above.

### Stage 4: Establish Stormwater Management Area

Following the construction of a portion of Cell VIII at the expansion site, SPSA would establish the stormwater management pond to the northeast of this site. The area would be constructed to support landfill construction and operation.

### Stage 5: Closure and Long-term Monitoring/Maintenance

Once Cells VIII and IX reach their design capacity for solid waste, the cells would be provided a final cover and closed in accordance with VDEQ permit requirements and SPSA's Operating Plan. Closed landfill cells have a flat top and are covered with grass. Completed cells have stabilized roads which provide access for routine maintenance and monitoring. SPSA would be responsible for providing long-term monitoring and maintenance of the cells similar to other closed areas of the landfill.

The stages of construction and associated succession of development are illustrated in sequence on supporting Figures 22 and 23.

At the time of writing, SPSA is not planning additional expansion beyond what is proposed at the existing landfill in this EIS. However, as part of a 2016 Conditional Use Permit Application package, SPSA developed a Master Plan (as described in the "Cumulative Actions Considered" section below). The 2016 Master Plan illustrates future development of Cells X-XII in the future to further expand landfill capacity. SPSA is proposing to preserve these future cells under a conservation easement as part of their mitigation package, which is attached as Appendix G.

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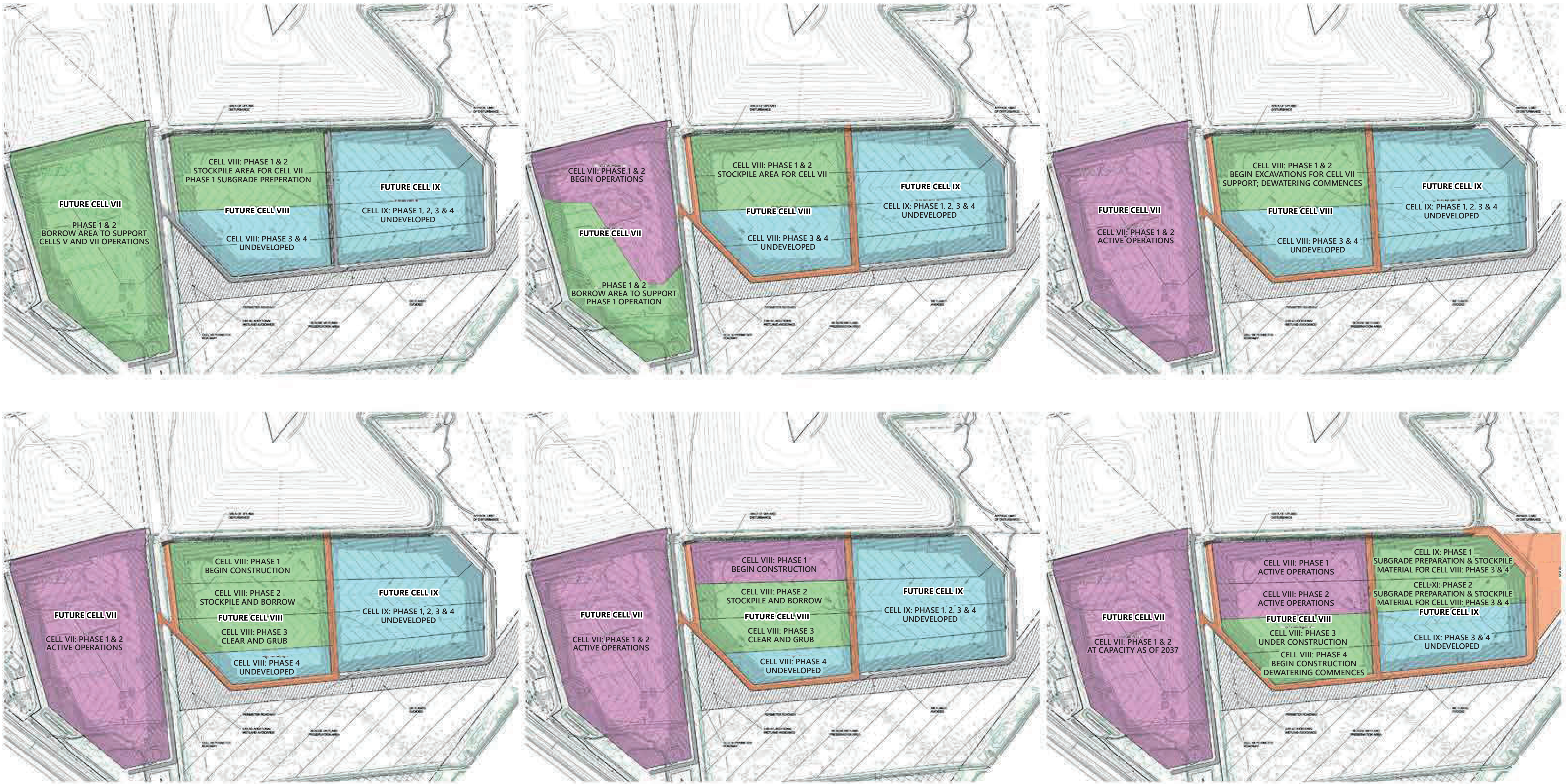



**LEGEND**

- Active or Full Phase
- Cleared, Stockpile, or Prepped
- Undeveloped
- Transportation

N

0 400 800 feet

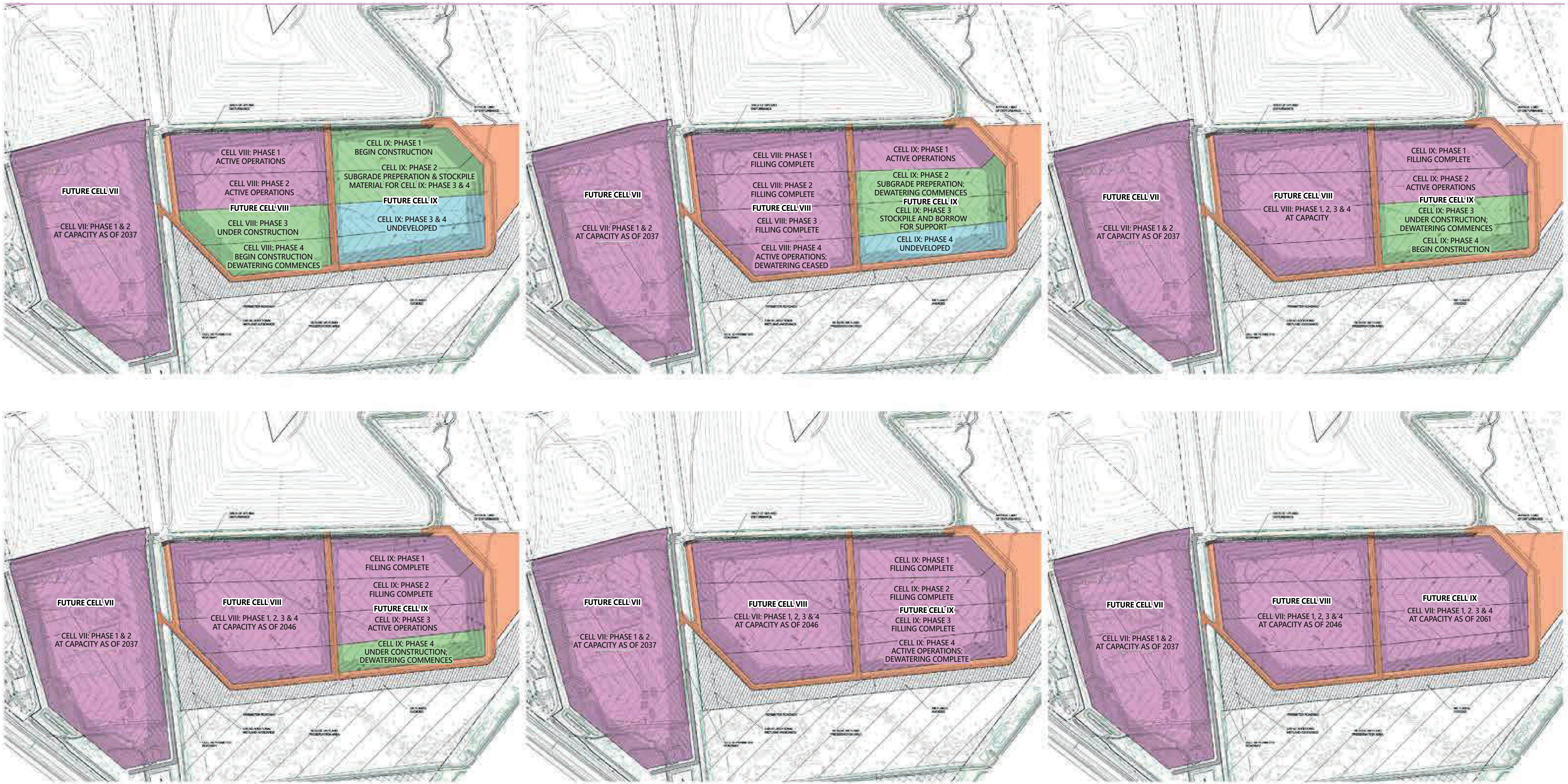
US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 22

**Phasing Plans**




**LEGEND**

- Active or Full Phase
- Cleared, Stockpile, or Prepped
- Undeveloped
- Transportation

N

0 400 800 feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 23

**Phasing Plans (continued)**

## Alternative C: Proposed Action (Applicant's Preferred)

Under Alternative C, Cells VIII and IX would be developed as described under Alternative B; however, the airspace between Cells V and VII would also be utilized for landfilling operations (Figure 24). Infilling this airspace would secure an additional 1.52 million CY of disposal capacity, reducing the need for capacity provided by the expansion site to 14.48 million CY. Developing and utilizing this airspace would require the relocation of the pump station and underground utilities, as well as infrastructure for Cell V leachate, landfill gas, and stormwater management.

Filling in this airspace, which is already permitted by VDEQ, would most likely occur following the construction and operation of Cells VIII and IX. Delaying its construction would allow the continued use of the landfill access roadway and leachate infrastructure until the disposal capacity is required to maintain landfill operations. It reduces the footprint of Cell IX by approximately 7.72 acres compared to Alternative B because the airspace provided between Cells V and VII would be utilized for landfill capacity. Wetland impacts resulting from Alternative C would total approximately 109.64 acres.

Similar to Alternative B, the expansion site could be used for stockpiling and borrowing during the construction and operation of Cell VII (expected to be operational from 2027–2037) if the expansion site is permitted by the time SPSA needs space to store the excavated material. Landfilling operations in the expansion site would begin by 2036, and the 11-acre borrow and stormwater management area would be used for stockpiling and borrowing during the development and operation of Cell IX. Alternatively, soil borrow material may be stockpiled off-site and trucked to and from the landfill as needed.

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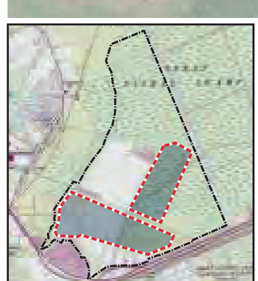
Source: ESRI Orthoimagery (2020)

**LEGEND**

- SPSA Property Boundary
- Landfill Cell Boundary
- Borrow Area and Stormwater Management Area
- Limits of Disturbance
- Expansion Area (137.18 acres)
- Wetlands (133.79 acres; Confirmed on 08.24.2022 (NAO-2016-00765))
- Ditches (0.93 acres)
- Wetland Impacts (109.64 acres)
- Wetland Avoided (24.15 acres)

N

0 400 Feet

US Army Corps of Engineers

Environmental Impact Statement for
Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 24

**Alternative C : Proposed Action (Applicant's Preferred)**

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## Alternative E: Hybrid Alternative

The hybrid alternative (Alternative E) was added due to comments received on the DEIS from the public and from cooperating agencies and consulting parties. Among other things, commenters suggested that the Norfolk District could consider alternatives that combined the No-Action alternative, resulting in diversion of waste from SPSA to private landfills, and the applicant's preferred alternative (Alternative C). The Norfolk District has therefore analyzed two waste diversion scenarios to determine their practicability. These scenarios are within the spectrum of alternatives that were reviewed in the DEIS. The new hybrid alternative would provide both a 50% and a 25% diversion scenario in which 50% and 25% of MSW, respectively, would be diverted to private area landfills and the remaining MSW would be landfilled at the Regional Landfill. There is a relationship between the percent diversion, cost, and the acreage of wetland impacts. Examination of a 25% and 50% diversion scenario provides appropriate perspective and information to further inform the Norfolk District's decision.

To landfill the remaining 50% and 75% of waste (under the 50% and 25% diversion scenarios, respectively) that would not be diverted and would continue to need landfilling, SPSA would develop the expansion site area with a smaller footprint than Cells VIII and IX, as described under Alternative C. Similar to Alternatives B and C, the expansion area could be used for stockpiling and borrowing during the construction and operation of Cell VII (expected to be operational from 2027–2037) if it is permitted by the time SPSA needs space to store the excavated material. Operation of this new area would begin in approximately 2036, shortly before Cell VII reaches capacity in 2037. Similar to Alternative C, the airspace between Cells V and VII would also be infilled and utilized for landfilling operations, as described under Alternative C, above. Infilling this airspace would secure an additional 1.52 million CY of disposal capacity, reducing the need for capacity provided by the expansion site to 14.48 million CY. Construction and operation for the hybrid expansion area would generally follow the stages described under Alternative B. Under the 50% diversion scenario, the required disposal capacity would be 7.24 million CY. The expected life of a cell this size would last approximately 11 years. A cell with this capacity would require a footprint of 53.76 acres. Combined with the approximate 18 acres required for supporting infrastructure, the total wetland impact under the 50% diversion scenario would be 71.76 acres. Under the 25% diversion scenario, the required cell disposal capacity would be 10.86 million CY, which would be expected to have a 16.5-year lifespan. The required footprint for a cell this size would be 72.85 acres. Combined with an approximate 24 acres required for supporting infrastructure, the total wetland impact under the 25% diversion scenario would be 96.85 acres.

Under Alternative E, operations would continue until the reduced expansion area was filled to capacity. Following this, under the 50% diversion scenario, the landfill would close in approximately 2047. Under the 25% diversion scenario, the landfill would close in approximately 2052. Once the landfill closed, SPSA would begin hauling the remainder of waste to a private landfill.

## Practicability of Remaining Alternatives

The Norfolk District is required to carry forward a no action alternative for review. Additionally, the Hybrid Alternative (Alternative E) was analyzed due to agency and public responses received on the DEIS. In light of this timing, the agency has concurrently considered the environmental impacts and the practicability of Alternative E.

Some of the alternatives considered, as discussed in previous sections, were not carried forward for further analysis of environmental impacts because they were determined not to be practicable. Factors that were considered in the practicability determination include, but were not limited to, the following:

- Cost;
- Landowner willingness;
- County or local agency opposition (including conflicts with local land use laws and plans);
- Virginia's statutory prohibition on new landfills that exceed two acres of wetland impacts;
- traffic safety, including emergency medical service access and capacity;
- potential impacts to private wells; and
- logistics, including future availability of landfill capacity.

An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. The No-Action (Alternative A) and the Hybrid (Alternative E) would require SPSA to haul waste to private, for-profit landfills. Pursuant to the No-Action alternatives, SPSA would transition to a hauling operation when existing capacity is exhausted. Under the Hybrid Alternative scenarios, SPSA would transition to a hauling operation when existing and the added capacity is exhausted.

Table 5 below provides a comparison of the alternatives carried forward for analysis in this FEIS.

### Table 5. Alternatives Summary Table

| | On-site Capacity (CY) | Off-site Hauled Capacity (CY) | Cell Footprint (AC) | Support Area Footprint (AC) | Total Wetland Impact (AC) | Years of Landfill Life (Approximate) | Years of Hauling (Approximate) | Greenhouse Gas Emissions (MT $CO_2E$) | Average Operational and Capital Cost ($millions) |
|---|---|---|---|---|---|---|---|---|---|
| Alternative A | 0 | 16,000,000 | 0 | 0 | 0 | 0 | 24 | 1,618,254 | 1,046,596,933 |
| Alternative B | 16,000,000 | 0 | 91.60 | 25.76 | 117.36 | 24 | 0 | 1,295,696 | 686,644,600 |
| Alternative C | 16,000,000* | 0 | 84.28 | 25.36 | 109.64 | 24 | 0 | 1,293,436 | 686,026,600 |
| Alternative E: Hybrid 50% | 7,240,000* | 8,760,000 | 53.76 | 18.00 | 71.76 | 11 | 13.4 | 1,532,475 | 772,723,600 |
| Alternative E: Hybrid 25% | 10,860,000* | 5,140,000 | 72.85 | 24.00 | 96.85 | 16.5 | 7.9 | 1,450,446 | 805,928,000 |

*Includes 1.52 million CY of airspace between Cells V and VII.

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From a cost standpoint, for waste disposal at private landfills, market conditions are highly variable and would be dependent on future available capacity. Norfolk District's independent evaluations, which are detailed in Appendix D, were calculated using average tipping fees in Virginia. The No-Action Alternative A would cost approximately $361 million more than the applicant's preferred Alternative C, a 53% increase in cost. The Hybrid 50 Alternative E would on average cost $201 million more than the applicant's preferred, a 30% increase in cost and the Hybrid 25 Alternative E would on average cost $120 million more than the applicant's preferred alternative, a 17% increase in cost. The increased costs would be passed on to the individual members of the public that are served by SPSA. Thus, based on costs alone, the Norfolk Districts concludes that only Alternatives B and C are practicable.

In evaluating whether the No-Action and Hybrid Alternatives are capable of being implemented considering logistics, existing and future constraints must be taken into account. Projections from the current RSWMP indicate that landfill capacity is currently available at private landfills in the area. Based on data from the Virginia Department of Environmental Quality, the amount of MSW received in Virginia from in-state and out-of-state sources has generally risen over the last 10 years; however, the tons of disposal capacity available within MSW landfills has decreased over time (VDEQ 2024a, 2023, 2022 and 2021 Annual Solid Waste Reports CY2023, CY 2022, CY2021, and CY2020). As the next section demonstrates, the availability of disposal capacity at the private landfills considered under the No-Action (Alternative A) and the Hybrid (Alternative E) would not be guaranteed in the future. And, unlike Alternatives B and C (which are within SPSA's authority), the existence of necessary capacity would be outside SPSA's control.

Since publication of the DEIS, one of the sites considered for disposal under the No-Action Alternative (Alternative A), Shoosmith Landfill, has stopped accepting waste and is no longer pursuing a landfill expansion. Another site considered, the Bethel Landfill, has restrictions on the type and amount of waste that can be directed to the facility. The original lease agreement from 1986 for the Bethel Landfill specifies that the landfill may not accept residential refuse from other municipalities without prior approval from the City of Hampton. The agreement or subsequent agreements allow for disposal of waste from within the Virginia Peninsula Solid Waste Public Service Authority, which includes the cities of Hampton, Poquoson, and Williamsburg, and the counties of Essex, James City, King and Queen, King William, Mathews, Middlesex, and York (VPPSA Solid Waste Management Plan 2021). SPSA is currently allowed to haul a limited amount of commercial waste to the Bethel Landfill, but the amount cannot exceed the tons of commercial waste that are received at SPSA's transfer stations. Disposal at the Bethel Landfill is not an option to reduce the need for residential waste disposal capacity, since SPSA is not authorized to dispose residential waste at that facility. However, use of the Bethel Landfill does help SPSA dispose of commercial waste that is received at the SPSA transfer stations. Atlantic Waste Landfill, another potential site, is currently one of the designated disposal sites for New York City through a 20-year contract, which has two five-year renewal options. According to the Certification for Disposal Capacity, Waste Management (owner of Atlantic Waste Landfill) has a requirement to maintain primary disposal capacity and reserve disposal capacity at the Atlantic Waste Landfill for the City of New York Department of Sanitation (City of New York Department of Sanitation, Appendix E-WMNY Certification of Disposal Capacity Southwest Brooklyn Marine Transfer Station dated June 2018). This agreement does not preclude SPSA from using Atlantic Waste, but it does add some uncertainty to the future available disposal capacity at the facility. Finally, the Brunswick Waste Facility does not appear to have any known restrictions for disposal; however, SPSA has not utilized this landfill in the past due to the distance and cost of hauling and Brunswick County relies on the facility for disposal of its MSW.

Another logistical issue to consider is safety for long-distance hauling of MSW outside the SPSA service region. Members of the public commented on potential safety concerns over long-distance hauling of municipal waste, especially on Route 460, which would be the route used to transfer MSW to the Atlantic Waste Landfill. The public may have similar safety concerns about long-distance hauling of MSW on Route 58 to the Brunswick Waste Facility or the Hampton Roads Bridge Tunnel, the Monitor Merrimac Bridge Tunnel, and the James River Bridge, which would be utilized for hauling to Bethel Landfill.

Relying solely on private landfills to meet the need for 16 million cubic yards of MSW disposal capacity or even the reduced amounts under the Hybrid Alternative is not practicable on the basis of costs alone, and the uncertainty of future capacity further supports this finding. The Norfolk District independently evaluated a reasonable range of alternatives and has determined that the only practicable alternatives are Alternative B: Original Proposed Alternative and Alternative C: Proposed Action (Applicant's Preferred). The Norfolk District will complete a public interest review and 404(b)(1) analysis in the Record of Decision (ROD) before making a permit decision on the applicant's preferred alternative, Alternative C.

Table 6 provides a summary of all alternatives considered in the alternatives analysis. Considerations were applied to determine which alternatives should be eliminated.

## Table 6. Alternatives Considered

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| No-Action Alternative (Alternative A) | Y | Y | N | Not selected due to practicability analysis |
| Original Proposed (Alternative B) (On-site Alt #1) | Y | Y | Y | Conventional design/construction/operation, leachate pump depth manageable, coordinates w/ Cell VII operations, generates soil for operation/construction, straightforward permitting/above confining layer. Retained for analysis in the EIS |
| On-site Alt #2 | N | Y | N | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate collection and maintenance and to landfill gas system operation |
| On-site Alt #3 | Y | Y | N | An increase in wetland impacts, impacts to leachate and stormwater infrastructure, perimeter access and waste filling difficult, loss of operating soil for MSE wall build |
| On-site Alt #4 | N | Y | N | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; perimeter access and waste filling difficult; loss of operating soil for MSE wall build |

[2] Reasonable alternatives means a reasonable range of alternatives that are technically and economically feasible, meet the purpose and need for the proposed action, and, where applicable, meet the goals of the applicant (40 CFR § 1508.1(hh)).

[3] Practicable is defined as meaning the alternative is available, and capable of being done after taking into consideration cost, existing technology, and/or logistics in light of the overall project purpose (40 CFR § 230.10(a)).

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| On-site Alt #5 | N | Y | N | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; perimeter access and waste filling difficult; loss of operating soil for MSE wall build |
| Airspace between Cells V and VI (Alternative C) (On-site Alt #6) | Y | Y | Y | Permitted for construction by VDEQ, wetland impact reduction of 7.72 acres, impacts to Cell V leachate and landfill gas infrastructure. Retained for analysis in the EIS |
| On-site Alt #7 | Y | Y | N | Impacts to leachate and stormwater infrastructure, complicated permitting/design and operation, impacts to Cell V leachate and landfill gas infrastructure, loss of operating soil for MSE wall build |
| On-site Alt #8 | N | Y | N | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; requires impacts to leachate and stormwater infrastructure; little overlap available due to floodplain; loss of operating soil for MSE wall build |
| On-site Alt #9 | N | Y | N | Timeframe associated with relocating the natural gas main, closure of active cells, and leachate cessation does not meet the Purpose and Need; MSE wall on Cell VII provides little value; requires impacts to leachate and stormwater infrastructure; loss of operating soil for MSE wall build |

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| On-site Alt #10 | Y | Y | N | Conventional design/construction; leachate pump depth at limit of manageable; operational difficulty with safety concerns; loss of operating soil for berm build |
| Alternative technologies | N | N | N | This as a standalone alternative would not provide adequate waste disposal capacity[4] |
| SU02 | Y | Y | N | Eliminated through practicability analysis, see Site SU02 Analysis and Dismissal section for additional detail |
| SH01 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH02 | Y | N | N | Did not pass Phase II analysis |
| SH03 | Y | N | N | Did not pass Phase II analysis |
| SH04 | Y | N | N | Did not pass Phase III analysis |
| SH05 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH09 | Y | Y | N | Eliminated through practicability analysis |
| SH06 | Y | N | N | Did not pass Phase II analysis |

[4] Additional discussion describing why this alternative was dismissed is provided in previous sections.

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| SH07 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH08 | Y | N | N | Did not pass Phase II analysis |
| SH10 | Y | N | N | Did not pass Phase II analysis |
| SH11 | Y | N | N | Did not pass Phase II analysis |
| SH12 | Y | N | N | Did not pass Phase III analysis |
| SH13 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH14 | Y | N | N | Did not pass Phase III analysis |
| SH15 | Y | N | N | Did not pass Phase III analysis |
| SH16 | Y | N | N | Did not pass Phase III analysis |
| SH17 | Y | N | N | Did not pass Phase II analysis |
| SH18 | Y | N | N | Did not pass Phase III analysis |
| SH19 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH20 | Y | N | N | Did not pass Phase II analysis |
| SH21 | Y | N | N | Did not pass Phase III analysis |
| SH22 | Y | N | N | Did not pass Phase III analysis |

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| SH23 | Y | Y | N | Eliminated through practicability analysis |
| SH24 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH25 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH26 | Y | N | N | Did not pass Phase II analysis |
| SH27 | Y | N | N | Did not pass Phase II analysis |
| SH28 | Y | N | N | Did not pass Phase III analysis |
| SH29 | Y | Y | N | Eliminated through practicability analysis |
| SH30 | Y | Y | N | Eliminated through practicability analysis, see Site SH30 Analysis and Dismissal section for additional detail |
| SH31 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| SH32 | Y | Y | N | Eliminated through practicability analysis |
| IW01 | Y | N | N | Did not pass Phase II analysis |
| SH33 | Y | Y | N | Eliminated through practicability analysis |
| SH34 | Y | N | N | Did not pass Phase III analysis |

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| IW02 | Y | N | N | Rather than evaluate under Phase IV criteria, site was further investigated for potential acquisition or condemnation. Site considered not available |
| IW03 | Y | N | N | Did not pass Phase III analysis |
| IW04 | Y | N | N | Did not pass Phase II analysis |
| SU01 | Y | N | N | Did not pass Phase II analysis |
| IW05 | Y | N | N | Did not pass Phase III analysis |
| IW06 | Y | N | N | Did not pass Phase III analysis |
| SU03 | Y | N | N | Did not pass Phase II analysis |
| SU04 | Y | N | N | Did not pass Phase II analysis |
| SU05 | Y | N | N | Did not pass Phase II analysis |
| SU06 | Y | N | N | Did not pass Phase II analysis |
| SU07 | Y | N | N | Did not pass Phase II analysis |
| CH01 | Y | N | N | Did not pass Phase II analysis |
| CH02 | Y | N | N | Did not pass Phase II analysis |
| CH03 | Y | N | N | Did not pass Phase II analysis |
| CH04 | Y | N | N | Did not pass Phase II analysis |
| CH05 | Y | N | N | Did not pass Phase II analysis |
| CH06 | Y | N | N | Did not pass Phase II analysis |
| CH07 | Y | N | N | Did not pass Phase II analysis |
| CH08 | Y | N | N | Did not pass Phase II analysis |

| Alternative | P&N? | Reasonable?[2] | Practicable?[3] | Reason |
|---|---|---|---|---|
| CH09 | Y | N | N | Did not pass Phase II analysis |
| CH10 | Y | N | N | Did not pass Phase II analysis |
| VB01 | Y | N | N | Did not pass Phase II analysis |
| Hybrid Alternative 25% (Alternative E) | Y | Y | N | Eliminated through practicability analysis |
| Hybrid Alternative 50% (Alternative E) | Y | Y | N | Eliminated through practicability analysis |

Practicable alternatives are analyzed in detail in Chapter 3.[5]

[5] Site SU02 and SH30 are not further analyzed in Chapter 3 because they were dismissed from detailed analysis. The rationale for this dismissal is described in the above section, “Alternatives Considered but Dismissed.”

# Mitigation

## Federal Mitigation Background

In 1972, Congress passed amendments to the Federal Water Pollution Control Act, commonly known as the Clean Water Act, establishing a new section of the Act and a new regulatory program. Section 404 of the CWA requires landowners to secure a permit from the Corps for activities that would lead to a discharge of dredged or fill material into waters of the U.S., including wetlands.

Two national goals guide the operation of the Section 404 program. The first is the CWA's goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The second is the goal to have no overall net loss of wetland acreage and functions. This "no net loss goal" has been reaffirmed multiple times and most significantly through what is commonly referred to as "The Compensatory Mitigation Rule," issued by the Department of Defense and EPA in 2008 (U.S. Code 2008). The agencies' commitment to the no net loss goal is key to understanding the mechanisms and methods which qualify as acceptable mitigation.

## The Mitigation Sequence

The Section 404 program allows permittees to fill wetlands and streams while continuing to achieve the standards of the CWA and the no net loss goal, primarily through compensatory mitigation. The Corps must follow a three-part sequence, referred to as the mitigation sequence, when evaluating permits. The mitigation sequence provides that, prior to issuing a Section 404 permit, the Corps needs to make a determination that potential impacts have been avoided "to the maximum extent practicable" and minimized "to the extent appropriate and practicable." The remaining impacts must be offset or compensated. This third step of the mitigation sequence is known as compensatory mitigation.

When an applicant submits a permit application to the Corps, that applicant must provide an explanation of how impacts to aquatic resources would be avoided and minimized by the project. The applicant must also provide a brief description of how it proposes to compensate for any remaining impacts to wetlands, streams, or other aquatic resources. The section below provides a general overview of mitigation options and credit availability.

## Compensatory Mitigation Mechanisms

There are generally three acceptable mechanisms in common practice to satisfy compensatory mitigation obligations: mitigation banking, in-lieu fee mitigation, and permittee-responsible mitigation.

These three mechanisms are detailed below.

### Mitigation Bank

A mitigation bank is a site, or a suite of sites, where resources (e.g., wetlands, streams, riparian areas) are restored, established, enhanced, or preserved for the purpose of providing compensatory mitigation for impacts authorized by Corps permits. In general, a mitigation bank sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor. The operation and use of a mitigation bank are governed by a mitigation banking instrument.

### In-Lieu Fee Mitigation

In-lieu fee mitigation is a program involving the restoration, establishment, enhancement, or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Corps permits. Similar to a mitigation bank, an in-lieu fee program sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the in-lieu program sponsor. The operation and use of an in-lieu fee program is governed by an in-lieu fee program instrument.

### Permittee-Responsible Mitigation

Permittee-responsible mitigation is an aquatic resource restoration, establishment, enhancement, or preservation activity undertaken by the permittee to provide compensatory mitigation in which the permittee retains full responsibility for the completion and success of the mitigation effort.

## Mitigation Methods

There are generally four methods in common practice to satisfy compensatory mitigation obligations: restoration, creation, enhancement, and preservation. The no net loss goal relates to the replacement of area and functions, and these different compensation methods differ in their ability to replace these targets. These methods have variable contributions to the no net loss goal. Restoration approaches, which are expected to provide a net increase in both area and function, are often preferred to offset impacts. However, preservation may be preferable for resources which are not likely to be replaced or impacts that may create significant temporal loss, such as impacts to high quality or mature forested wetlands.

In order to ensure an equal replacement of or increase in wetland functions or values, the Corps requires that a wetland functions and values assessment be conducted both before impacts and after mitigation activities. Although many different functional assessment methodologies that are regularly used in other Corps districts have been developed over the years, the Norfolk District recommends using the Wetland Attribute Form. The Wetland Attribute Form was developed by the Norfolk District in conjunction with the EPA (USACE 2020), and it is based on the New England Highway Methodology (USACE 1993). This methodology assesses wetland functions and values through a descriptive approach using both wetland science and judgment in the field.

The four mitigation methods are detailed as follows:

### Restoration

Restoration is the manipulation of the physical, chemical, or biological characteristics of a site, with the goal of returning natural and historical functions to a former or degraded aquatic resource. Restoration is generally preferred as the first mitigation option considered under permittee-responsible mitigation, mitigation banks, and in-lieu fee programs because the likelihood of success is greater compared to establishment, and the potential gains in terms of aquatic resource functions are greater compared to enhancement and preservation. Restoration is sub-divided into the categories of re-establishment and rehabilitation.

Re-establishment is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural and historical functions to a former aquatic resource. Re-establishment results in a gain in aquatic resource area and functions.

Rehabilitation is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural and historical functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not necessarily result in a gain in aquatic resource area.

### Establishment

Establishment, also known as creation, is the manipulation of the physical, chemical, or biological characteristics on an upland site to develop an aquatic resource that did not previously exist. When successfully completed, establishment results in a gain in aquatic resource area and functions.

### Enhancement

Enhancement is the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve the functions of a specific aquatic resource. Enhancement results in the gain of selected aquatic resource functions but may also lead to a decline in other aquatic resource functions. Enhancement does not result in a gain in aquatic resource area.

### Preservation

Preservation is the removal of a threat to, or prevention of the decline of, aquatic resources by an action in or near those aquatic resources. Preservation includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical protection mechanisms.

## Project-Specific Mitigation Options

Alternatives B, C, and E are located in the Hampton Roads Watershed (HUC 02020208), a contributing watershed to the James River. The 2008 Compensatory Mitigation Rule (Rule) establishes an understood preference hierarchy for mitigation mechanisms. The Rule outlines the three generally acceptable mitigation avenues (U.S. Code 2008), in order of preference, as:

- mitigation banks,
- in-lieu fee funds, and
- permittee-responsible mitigation

Alternatives B, C, and E would be located on the existing SPSA landfill site, and these alternatives would incur 117.36 ac,109.64 ac, and 71.76 for the Hybrid 50 scenario and 96.85 ac for the Hybrid 25 scenario of forested wetland, respectively. At a minimum, these impacts would require 234.72,219.28, 143.52, and 193.7 non-tidal wetland credits. SPSA has purchased all of the available wetland credits from mitigation banks within the service area. The Virginia Aquatic Resource Trust Fund (VARTF) holds approved but yet to be released acre-based non-tidal wetland credits within the SPSA project service area (Alternatives B, C and E). Since the in-lieu fee credits have not yet been released, they would not be available for this project. Although the Rule establishes permittee-responsible mitigation as the least preferable compensation mechanism, the uniqueness of the applicant’s preferred alternative’s geographical location and the scale of the mitigation needs present ample means and opportunity to complete effective permittee-responsible mitigation actions. Geographically, the applicant’s preferred alternative’s regional location in the southeastern Virginia coastal plain creates an opportunity to provide mitigation to valuable wetland resources that have been systematically impacted to support agriculture, forestry, and development since the inception of Virginia’s colonial era.

### SPSA’s Proposed Mitigation Plan

SPSA’s *Compensatory Mitigation Plan* dated November 11, 2024, and January 27, 2025, is attached as Appendix G. SPSA’s proposed mitigation plan focuses on their preferred alternative (Alternative C), and they have proposed to compensate for permanent impacts to 109.64 total acres of nontidal vegetated wetlands (PFO) at a 2:1 ratio with 219.28 credits. The proposed compensation for the 109.64 acres of forested wetland impact would be accomplished through the purchase of 159 credits from established mitigation banks (2:1 ratio) and preservation of at least 602.80 acres of forested wetland (10:1 ratio) to obtain the remaining 60.28 credits. SPSA has indicated that the purchase of these mitigation bank credits would meet the no net loss requirement with a total of 114 acres of wetlands generated by creation or restoration.

SPSA purchased 83 credits from the Chesapeake Mitigation Bank, which is located within the same watershed (HUC 02080208), approximately 6.5 miles east of the proposed expansion site. Of the 83 credits obtained, approximately 72.21 credits (87%) are from the creation/restoration of wetlands. The Chesapeake Mitigation Bank was constructed within the historic Great Dismal Swamp; however, the site drains north to the Elizabeth River. The mitigation is within the same overall watershed (Hampton Roads) as the expansion site but would also provide benefits to the Great Dismal Swamp since the bank involved restoration of wetlands previously associated with the Great Dismal Swamp. SPSA purchased a total of 76 credits from the Davis Mitigation Bank, which is located in the adjacent watershed (HUC 03010205), approximately 15 miles southeast of the expansion site. According to the Corps' Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS), the project is within Davis Mitigation Bank's primary service area. Of the 76 credits obtained, approximately 41.8 credits (55%) are from the creation/restoration of wetlands. The Davis Bank also restored wetlands within the historic Great Dismal Swamp area and the bank's service area includes most portions of the historic Great Dismal Swamp.

SPSA proposes the conservation of 742.56 acres of primarily forested wetland habitat within the sub-watershed (020802080105- Nansemond River-Cedar Lake), with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for canebrake rattlesnake habitat. These properties were selected due to their proximity to the impact area, similar history, and ecological characteristics to compensate for impacts associated with Cells VIII and IX. All preservation sites were historically part of the Great Dismal Swamp and are within one mile of the proposed impact area. Each site has been logged previously, except for the cypress swamp. If not preserved for this project, these proposed preservation areas would most likely be logged again in the future and could potentially be developed. The preservation areas provide buffers to the surrounding neighborhoods, help protect downstream water quality, and serve as a connection between Burnetts Mill Creek and the Great Dismal Swamp.

A legal agreement is being crafted to place the proposed preservation areas under a conservation easement to be maintained by a third-party entity, ensuring long-term protection of the sites. It is anticipated that all the preservation areas would be managed by the Virginia Outdoors Foundation (VOF) with SPSA serving as the long-term steward. The third-party entity will have the right to enforce site protections and SPSA would provide the resources necessary to monitor and enforce these site protections. The third-party holder would be required to notify the Norfolk District and other appropriate entities of any non-compliance in accordance with the terms of the real estate instrument.

EPA requested a functional assessment of the proposed impact site. A Hydrogeomorphic (HGM) Approach to assessing mineral flat wetland functions on the proposed impact area compared to a reference site in the Great Dismal Swamp was conducted by HDR in July 2023. The HGM study is attached to SPSA's *Compensatory Mitigation Plan* in Appendix G. Based on the results of this study the overall wetlands within the impact area have slightly lower functional conditions than surrounding reference wetlands. The differences were due to past logging and recent disturbances, which have allowed some patches of invasive species and emergent areas. After a joint site visit with Norfolk District, EPA, and VDEQ in June 2024 to the preservation sites, the Norfolk District and EPA discussed the need to complete the HGM model on the preservation sites. The Norfolk District concluded that conducting this assessment for the preservation areas would not yield additional insights beyond what is already established if SPSA could provide sufficient information to demonstrate how the preservation sites could compensate for the lost functions and values of the proposed impact site. HDR provided a “Comparison of Functions and Values for Proposed SPSA Landfill Expansion Cells 8 & 9 and Preservation Areas” which is attached to the *Compensatory Mitigation Plan* in Appendix G. SPSA’s Mitigation Plan also provided additional information about the benefits of the preservation areas. The discussion that follows provides a description of the functions and values provided by each preservation site and the mitigation banks to help compensate for the loss of functions and values associated with the proposed wetland impacts of the landfill expansion.

The 217.21 acres within the previously proposed Cells X, XI, and XII would no longer be developed as part of the landfill and would instead be preserved in perpetuity. This habitat is adjacent to and quite similar to the impact area for the expansion. An 8.40-acre buffer directly adjacent to Cells VIII and IX would be designated as canebrake rattlesnake habitat. The remaining 208.81 acres would count towards the wetland preservation. The open water channels on site allow for storage capacity for floodflow alteration and nutrient cycling and overall, this preservation area would serve to recharge the aquifer similar to the impact area. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The seasonal ponding that creates the open water features in Cells X, XI, and XII serves as the ideal habitat and breeding ground for amphibians. The vegetation in the proposed impact area is very similar to the vegetation present in the proposed preservation areas.

There are 23.81 acres of wetlands surrounding the limits of disturbance for the development of Cells VIII and IX. This area was included in the study limits but would not be disturbed as a result of this project. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII. SPSA proposes to include this acreage as a part of the on-site PRM preservation for canebrake rattlesnake mitigation. This portion would contribute 23.81 canebrake rattlesnake credits at a 1:1 mitigation ratio. Switch cane (*Arundinaria tecta*) and/or giant cane (*Arundinaria gigantea*) were documented on-site, and these cane thickets are prime habitat for the canebrake rattlesnake. The cane thickets provide cover allowing them to avoid predators and hunt grey squirrels, which is their main source of food (VDWR 2011). The area being preserved specifically for the canebrake rattlesnake is connected to the on-site wetland preservation areas, which enables wildlife to freely move throughout the habitats without having to cross through urbanized areas. The swamp provides ridges and glades and, during the fall months, a significant amount of leaf litter. These are all prime habitat conditions for the canebrake rattlesnake (VDWR 2011).

There are 12.87 acres of bald cypress swamp habitat located between the Nahra property and SPSA property in the southwest corner of the site that would be preserved. This mineral flat system acts as a groundwater recharge system and also discharges minimal groundwater in the area of Burnetts Mill Creek. The bald cypress-tupelo swamp on site allows for storage capacity for floodflow alteration, nutrient cycling, and carbon sequestration and acts as a sponge to hold onto water, sediment, and pathogens flowing downstream. Burnetts Mill Creek can support the presence of fish and potentially shellfish on the property. The preservation of the cypress swamp acts as a catch basin for the water that enters from the ditches on Route 58 to the west of the SPSA property. Water is filtered and settled out in the cypress swamp, increasing downstream water quality in Burnetts Mill Creek as it continues to flow further down the creek and enters the Nansemond River. Cypress-tupelo swamps are known habitats for many threatened and endangered endemic species, including the globally uncommon, state-rare eastern big-eared bat (*Corynorhinus rafinesquii macrotis*) and southeastern myotis (*Myotis austroriparius*), which both find roosting habitat in these mature forests. They are also an important habitat for many species of waterfowl, such as wood duck, mallards, heron species, warblers, and other songbirds—all of which use cypress swamps as habitat during their breeding season. Additionally, cypress swamps are also known to contain abundant crayfish, beavers, muskrats, and numerous other animal species (VDCR 2024). Bald Cypress-Tupelo Swamps are considered rare natural communities according to the VDCR Natural Heritage Program. The Bald Cypress-Tupelo Swamp on site has an overstory dominated primarily by Red Maple (*Acer rubrum*) and Bald Cypress *(Taxodium distichum*) trees. The herb layer was dominated by Switchcane (*Arundinaria tecta*) and Lizards-tail *(Saururus cernuus)*, which are also characteristic species of Cypress-Tupelo Swamps. Burnetts Mill Creek runs through the southwestern section of the on-site preservation areas, providing a unique habitat for amphibians and insects to reside.

SPSA has also acquired the Nahra Property on the northwestern perimeter of the Regional Landfill. The Nahra Property is in the primary HUC of the Regional Landfill and contains approximately 205.75 acres of preservable area outside of existing maintained easements. An 80.68-acre buffer directly adjacent to the active landfill would be designated as canebrake rattlesnake habitat. The remaining 125.07 acres would count towards the wetland preservation. The Nahra property acts as a groundwater recharge system in the mineral flat wetland areas on the property. The open water features on site allow for discharge of groundwater, storage capacity for floodflow alteration, nutrient cycling, and support the presence of fish and potentially shellfish on the property. These open water features are surrounded by mature hardwood trees that can provide a suitable habitat for bald eagles to nest. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The vegetation in the proposed impact area is very similar to the vegetation present in the proposed preservation areas. Switch cane (*Arundinaria tecta*) and/or giant cane (*Arundinaria gigantea*) were documented on-site; these areas include cane thickets that are prime habitat for the canebrake rattlesnake. The cane thickets provide cover allowing them to avoid predators and hunt grey squirrels, which is their main source of food (VDWR 2011). The area being preserved specifically for the canebrake rattlesnake is connected to the on-site wetland preservation areas, which enable wildlife to freely move throughout the habitats without having to cross through urbanized areas. The swamp provides ridges and glades and, during the fall months, a significant amount of leaf litter. These are all prime habitat conditions for the canebrake rattlesnake (VDWR 2011).

SPSA is in the process of purchasing a 282.92-acre property south of the SPSA property called Magnolia Farms. This property is in the same HUC as SPSA. The majority of the property contains palustrine forested wetlands that are considered to be mineral flat wetlands. This wetland type acts as a groundwater recharge system. There are small open water features on site that act as groundwater discharge. The dark mucky loam soils with a high organic content on-site are effective in nutrient cycling. The vegetation in the proposed impact area is very similar to the vegetation present in the proposed preservation areas. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The Magnolia Farms property is adjacent to the Great Dismal Swamp National Wildlife Refuge and the Great Dismal Swamp National Natural Landmark (NNL), allowing an extension and connectivity of wetland habitat and the wildlife that is protected in the refuge.

Mitigation banks provide a consistent method for compensating for impacts in one consolidated area. Both mitigation banks that were utilized were developed by regrading previously converted cropland and ditches to restore maximum groundwater recharge and minimize floodflow alteration. Restoration of wetlands and agricultural ditches in the mitigation banks allows for less erosion, retention and filtration of sediment, toxicants, and pathogens that would have otherwise run off-site through ditches and unnatural drainage. The mitigation bank areas previously consisted of monoculture crops with little diversity. Restoration of the forested wetlands provides increased biodiversity, functional communities, and resistance to diseases. The mitigation banks will become fully functioning forested wetlands and sequester carbon similar to the proposed impact area. In conjunction with the preservation areas, the forested wetlands within the mitigation banks would provide additional wildlife habitat contiguous to the Great Dismal Swamp and reduce population fragmentation.

# Chapter 3: Affected Environment and Environmental Consequences

## Introduction

This chapter describes the current environmental conditions in and surrounding the project as they relate to each impact topic retained for analysis. These conditions serve as a baseline for understanding the resources that could be impacted by implementing the project. This chapter also analyzes the beneficial and adverse impacts that would result from implementing any of the alternatives considered in this FEIS. This chapter includes direct, indirect, and cumulative impacts, as well as the methods used in these analyses.

## General Analysis Approach

In accordance with CEQ regulations for implementing NEPA, direct and indirect impacts are described under each impact topic (40 CFR §§ 1502.16, 1508.1(i)), and the impacts are assessed in terms of context and intensity (40 CFR § 1501.3(d)). Cumulative impacts for all topics, where applicable, are described at the end of the chapter. Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each impact topic.

The CEQ regulations provide the following definitions (40 CFR § 1508.1(i)):

- Direct effects are caused by the action and occur at the same time and place. Direct effects are analyzed in each resource section.
- Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. Indirect effects are analyzed in each resource section.
- Cumulative effects are effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time. This type of impact analysis and the cumulative actions identified are described in more detail below.

The analysis for each resource considers the duration and significance of the effects, and whether effects are beneficial or adverse, as defined below:

- *Duration*: Short-term effects are those that may occur only during a specific phase of the project, such as during construction activities. Long-term effects are those that would occur over a longer duration, such as the lifetime of the project.
- *Significance*: Minor effects are those that may be perceptible but are of very low intensity and may be too small to measure. Moderate effects are those that are more perceptible and typically are more amenable to quantification or measurement. Major effects are those that, in their context and due to their intensity, have the potential to meet the thresholds for significance set forth in the CEQ regulations (40 CFR § 1501.3(d)).
    - Significance requires consideration of both context and intensity. Depending on the nature of the topic, relevant contexts include society as a whole (human, national), the affected region, the affected interests, and the locality. Intensity refers to the severity of impact and includes consideration of beneficial and adverse impacts, and a wide range of criteria. Among these criteria are public health and safety, unique characteristics of the geographic locale, the level of public controversy, whether the action threatens to violate other laws, and other considerations.
- *Beneficial* or *Adverse*: A beneficial effect may cause positive outcomes to the natural or human environment. An adverse effect may cause unfavorable or undesirable outcomes to the natural or human environment.

## Cumulative Impacts Methodology

Cumulative impacts are defined as “effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time” (40 CFR 1508.1(i)(3)). Cumulative effects consider direct and indirect (secondary impacts). Indirect impacts result from actions that occur later in time or are farther removed in distance from the original action, but still reasonably foreseeable. As stated in the CEQ (1997) handbook, *Considering Cumulative Effects under the National Environmental Policy Act*, cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on impacts that are truly meaningful. In addition, CEQ guidance states that future actions can be excluded from the analysis of cumulative effects if the action will not affect resources that are the subject of the cumulative effects analysis. Cumulative impacts are considered for all alternatives, including the No-Action Alternative.

The evaluation of the cumulative impacts is based on a general description of the projects. These actions were identified through the internal and external project scoping processes, and through a desktop review of online sources, including municipal planning meeting minutes, local news articles, and other planning resources. The following descriptions include present and reasonably foreseeable projects or actions that may contribute to cumulative impacts. These actions are summarized below.

## Issues and Impact Topics Considered but Dismissed

### Land Use

#### On-site

None of the on-site alternatives have the potential to result in adverse impacts on land use, as each would take place within the boundaries of the existing landfill. Over the operational life of each on-site alternative, the area of active disposal would move from the current active area (Cells V and VI) to Cell VII (under Alternative A), and then to Cells VIII and IX (under Alternatives B and C). This would be consistent with the property's past and present use as a municipal waste management facility. There is no potential for any of the on-site alternatives to cause new land use incompatibilities either within or adjacent to the landfill. It is important to note, however, that all on-site alternatives would require approval from the City of Suffolk through its Conditional Use Permitting process regardless of their current zoning.

Although not immediately adjacent, the Hampton Roads Executive Airport is located less than five miles from the existing landfill. Because municipal waste landfills are bird attractants, the FAA Advisory Circular 150/5200-33C (2020) recommends that the following minimum distances be maintained between airports and landfills: 5,000 ft. for airports serving piston-powered aircraft; 10,000 ft. for airports serving turbine-powered aircraft; and five miles for all airports. By the time Cell IX is operational, the active landfill area would be approximately 4,000 ft. closer to the airport than it is today, but it would remain well outside the 5,000-ft. and 10,000-ft. radii. Additionally, the size of the working face of the landfill, which is what attracts birds, would remain approximately the same. Therefore, the landfill would not attract significantly more birds than is currently the case. Finally, the FAA would be provided with the opportunity to review and comment on the proposed expansion as part of the waste disposal permitting process. Based on the above, none of the on-site alternatives are anticipated to have an impact on Hampton Roads Executive Airport.

## Topics Retained for Detailed Analysis

Impact topics identify resources within the project area that could be affected, either beneficially or adversely, by the range of alternatives. Under Alternative A, SPSA would not expand its landfill operations into the expansion area and no construction requiring a Corps permit would occur. Landfill operations would continue to utilize the currently permitted capacity available and would haul to other area landfills for processing and disposal once the currently permitted space reached capacity. Under Alternative B, SPSA would expand existing landfill operations into an expansion site (contiguous Cells VIII and IX), which would be constructed over time. Under Alternative C, SPSA would expand into Cells VIII and IX, similar to Alternative B, but would also utilize the airspace between Cells V and VII for landfilling operations. This would secure an additional 1.52 million CY of disposal capacity, reducing the need for capacity provided by the expansion site to 14.48 million CY. Alternative E would provide both a 50% and 25% diversion scenario in which 50% and 25% of MSW, respectively, would be diverted to private area landfills and the remaining MSW would be landfilled at the Regional Landfill. To landfill the remaining 50% and 75% of waste (under the 50% and 25% diversion scenarios, respectively) that would not be diverted and would continue to need landfilling, SPSA would develop the expansion site area with a smaller footprint than Cells VIII and IX, as described under Alternative C.

Topics retained for detailed analysis in this section include water resources, biological resources, transportation and traffic, air quality and emissions, noise, cultural resources, socioeconomics, and local community. Potential cumulative impacts are also examined.

## Water Resources

### Surface Water/Hydrology

#### *Methodology*

Available topographic surveys of the subject property, Geographic Information System (GIS) elevation data, and hydrologic and hydraulic studies completed in the region were used to identify and characterize waterways within the project area with regards to hydrology and surface water flow. Further, national and regional data, studies, and projection tools were referenced to provide context on sea level rise and storm surge risk due to the region’s susceptibility to the effects of climate change and land subsidence.

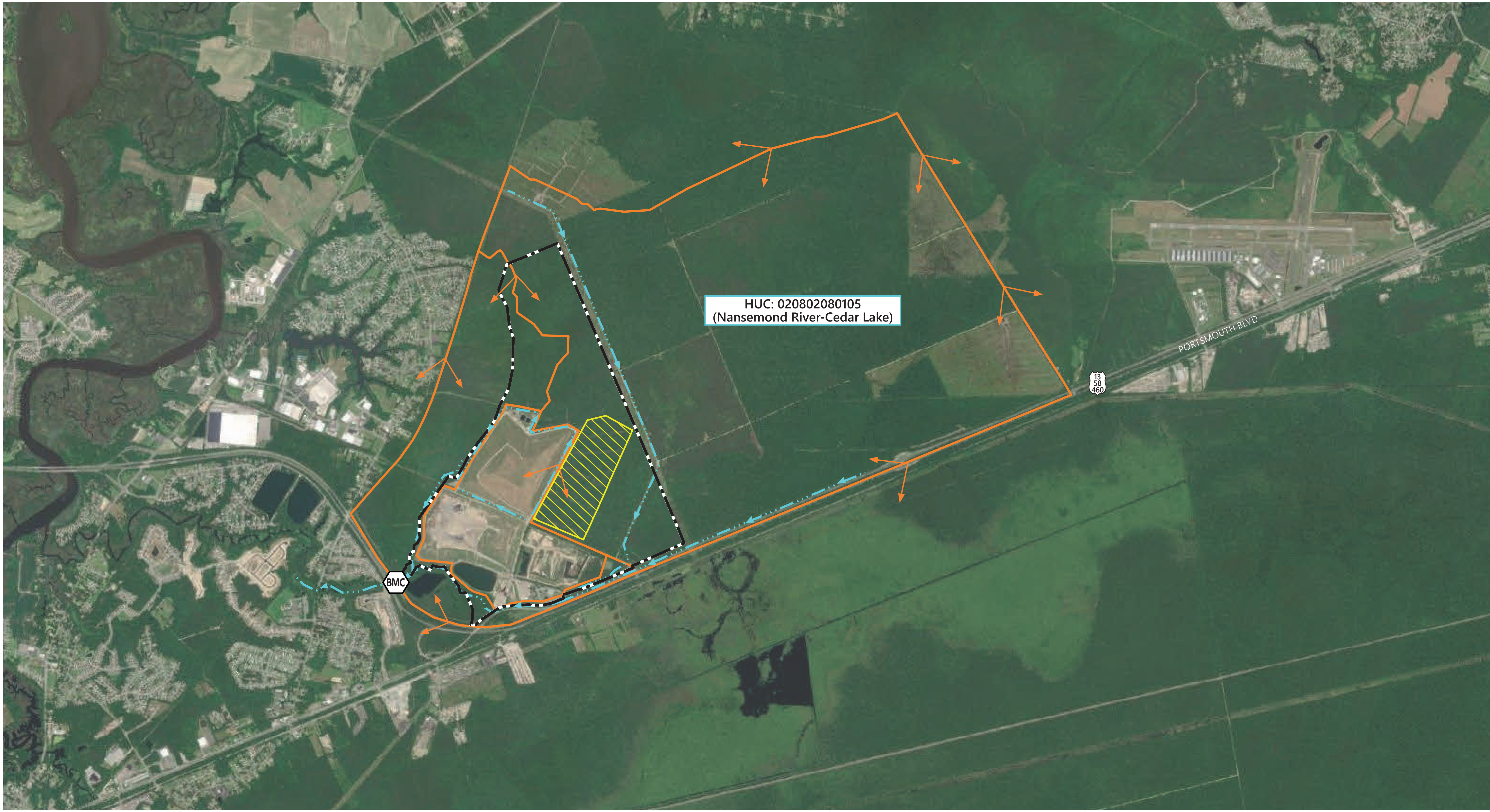
#### *Affected Environment*

##### *Surface Hydrology*

The project area for Alternatives B, C, and E is located north of U.S. Route 58, and the Great Dismal Swamp National Wildlife Refuge (NWR) and the Great Dismal Swamp NNL are situated immediately south of the site on the opposite side of the road. Although the NWR and NNL are located entirely south of the road, a portion of the Great Dismal Swamp lies north of U.S. Route 58, immediately adjacent to SPSA on the east side. The project area and surrounding areas are generally flat, with elevations ranging from approximately 20 to 22 ft. (NAVD88 datum). Surface water within most of this northern portion of the Great Dismal Swamp (approximately 2,500 acres, per a June 2019 floodplain study provided by SPSA’s consultant, HDR) flows slowly across nearly level land toward the southwest and in ditches that flow north to south and east to west. Eventually, surface waters are intercepted by a ditch that flows north to south along an existing powerline just east of the project area. This ditch then discharges into another drainage ditch that runs immediately north of U.S. Route 58 and south of the SPSA property until it discharges into Burnetts Mill Creek. Runoff from the area west of the powerline ditch flows in a southeasterly direction until it too is intercepted by the powerline ditch. Runoff from the area immediately west of the SPSA property flows to the southwest and into Burnetts Mill Creek to the southwest of the SPSA property (see Figure 25).

As stated, ground elevations range from 20 to 22 ft. (NAVD88 datum) with existing landfill Cells I through IV and an interceptor ditch immediately bordering the project area to the west. Based on ground elevations, the project area is the local high ground and surface and groundwater migrates away to the north, east, and south. The project area receives no runoff from adjacent lands. The land is characterized as a shallow groundwater wetland, distinguished as forested hardwood mineral flats. The underlying soils as mapped by NRCS are Tomotley loam, which is poorly drained, with very high runoff potential and a typical depth of 0-12 inches to the water table, and Torhunta loam, which is very poorly drained, with very high runoff potential, and a typical depth of 6-18 inches to the water table. Historically this land has been timbered and ditched, with large ditches east and south of the project area. A matrix of 23 groundwater monitoring wells installed within and adjacent to the project area, support the shallow water table with monthly data collected from October 2019 to October 2020 showing depths ranging from 0-10 feet below the ground surface with most wells reporting an average groundwater depth of two feet or less.

Source: ESRI Basemap The National Map; NOAA/NW/NHC Storm Surge Unit




LEGEND

- SPSA Property Boundary
- Expansion Area
- Existing Drainage Feature
- Drainage Area Boundary
- BMC Burnetts Mill Creek (pt. of analysis) (Drainage Area = approx. 5.3 sq mi.)

N

0 6,000 Ft

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 25

**Burnetts Mill Creek Drainage**

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Portions of the Great Dismal Swamp NWR south of U.S. Route 58 but north of the CSX Railroad also drain toward Burnetts Mill Creek in a similar fashion, via shallow flat surface flow and concentrated flow within ditches that run east to west and south to north. This eventually flows into an unnamed tributary that flows north, under Portsmouth Boulevard, just west of its intersection with U.S. Routes 13/58/460, and into Burnetts Mill Creek at Beamon Pond. Portions of the land in the northern portion of the larger contiguous area of the Great Dismal Swamp NWR and the NNL, just south of the CSX railroad, flow northeast toward Deep Creek and the Southern Branch of the Elizabeth River, and northwest toward Shingle Creek and the Nansemond River.

At the SPSA property, the surface hydrology consists of surface runoff that is directed into a combination of perimeter drainage ditches and on-site stormwater management facilities and sediment basins. For landfill Cells I through IV, which are capped and no longer in service, surface runoff is collected in an existing perimeter sedimentation and drainage control ditch. These are flat, grassed ditches with gravel dikes intermittently spaced to provide settling time for water and sediment as it flows from the base of the cells to a drainage point at Burnetts Mill Creek in the southwest corner of the property. This discharge point is listed as Outfall #1 in the current VDEQ Virginia Pollutant Discharge Elimination System (VPDES) permit # VA0090034 (VDEQ 2020). Surface hydrology in the remaining active portions of the SPSA landfill consists of runoff into perimeter ditches and on-site stormwater management facilities as per their VPDES permit and Stormwater Pollution Prevention Plan (SWPPP), before draining to the south and eventually into Burnetts Mill Creek via one of three other outfalls listed as Outfalls #2, 3, and 4 in the current VPDES permit.

*Sea Level Rise*

According to the Corps Sea Level Change Curve Calculator (Version 2021.12), sea level rise has increased at a rate of 4.44 millimeters (mm) per year (from 1927 to 2007) at the Sewells Point tidal gauge, located downstream of the project area on the James River in Norfolk, Virginia (USACE 2021). The National Oceanic and Atmospheric Administration's (NOAA) relative sea level trend has been updated since 2006 to a rate of 4.75 mm/year, with a 95% confidence interval of +/- 0.21 mm/year. This estimate is based on monthly mean sea level data from 1927 to 2020, which is equivalent to a change of 1.56 ft. in 100 years. By comparison, global average sea levels have been rising at a rate of approximately 1.7 mm/year. The difference between the average sea level rise computed from the 4 NOAA tidal stations in the region (3.9 mm/year) and the benchmark global rate (1.7 mm/year) is 2.2 mm/year, an estimate of the average rate of land subsidence at the four NOAA stations (see Table 7 below). These numbers indicate that land subsidence has been responsible for more than half the relative sea level rise measured in the southern Chesapeake Bay region (USGS 2013).

**Table 7. Relative Sea Level Rise at Selected NOAA Tidal Stations in the Southern Chesapeake Bay Region**

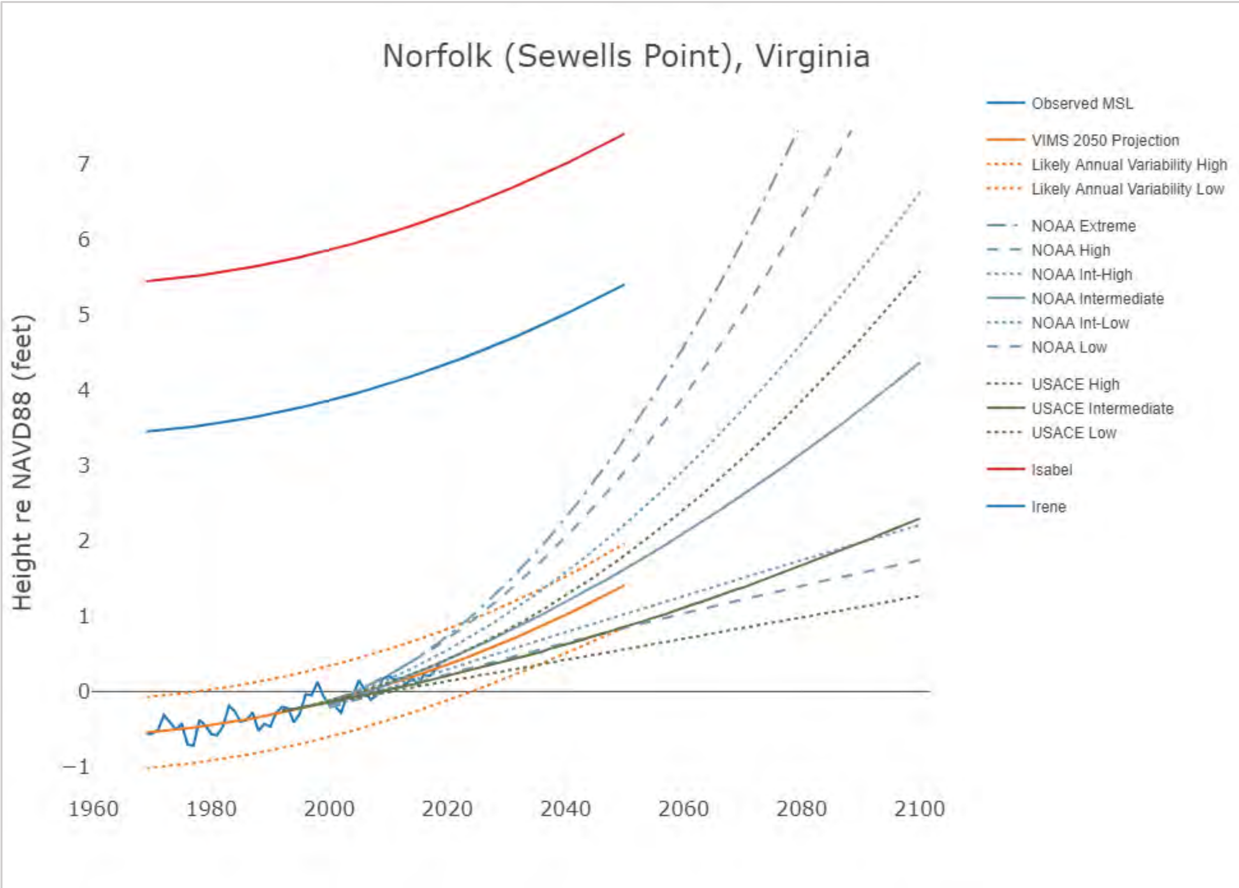
| | | | Rate of relative sea-level rise | |
|---|---|---|---|---|
| **ID** | **Site Name** | **Period** | **Measured, (mm/yr)** | **95% Confidence Interval (CI)** |
| 8632200 | Kiptopeke, Virginia | 1951-2006 | 3.5 | +0.42 |
| 8637624 | Gloucester Point, Virginia | 1950-2006 | 3.8 | +0.47 |
| 8638610 | Sewells Point, Virginia | 1927-2006 | 4.4 | +0.27 |
| 8638660 | Portsmouth, Virginia | 1935-2006 | 3.8 | +0.45 |
| | **Average** | | **3.9** | **+0.40** |

Source: Zervas 2009

Sea level rise is not a linear progression, but rather increases in rate each year. It is predicted to continue to increase at accelerating rates due to increasing ice melt, thermal expansion, and a slowing gulf stream, in addition to ongoing land subsidence. Regional sea level rise scenarios have been developed by the Corps, NOAA, the Virginia Institute of Marine Science (VIMS)[6], and other entities to help communities plan for the risk of rising sea levels. Figure 26 displays some of these scenarios and projections, in addition to observed Mean Sea Levels and flood heights of Hurricane Isabel (2003) and Irene (2011). Figure 26 shows these scenarios and projections at Sewells Point, Virginia, which is located approximately 17 miles northeast of the project area.

[6] VIMS 2022 Sea Level Report Card issued on March 7, 2023 shows that the sea level rise rate is now 5.38 mm/yr at Sewells Point, Virginia (VIMS 2023).

**Figure 26. Sea Level Rise Scenarios and Projections at Sewells Point, Virginia**




Source: Center for Coastal Resources Management, VIMS 2018

Corps-projected sea level rise ranges from 0.58 to 1.83 ft. by 2050 and from 1.31 to 5.64 ft. by the year 2100 (Table 8). Note that these projected sea level values represent mean sea level, thus it should be expected that elevations would be higher at high tide. NOAA's currently published data for the Sewells Point tidal gauge lists the mean high tide elevation at 0.94 ft., with a tidal range between low and high tide of 2.43 ft.; high tide is therefore approximately 1.21 ft. higher than mean sea level (NAVD 88 datum; USACE 2021). These currently published elevations are based upon data collected and processed from the 1983 to 2001 tidal epoch; data collected since that range show that sea levels are increasing more rapidly than predicted in 2006, and current rates match closely to the intermediate scenario listed above (USACE 2021). Thus, it is reasonable to assume that the currently published mean sea level of -0.26 ft. and the mean high water of 0.94 ft. (NAVD 88 datum) for the Sewells Point gauge are below the actual existing condition expected by the intermediate projected rise for 2021 of 0.24 ft. (USACE 2021).

**Table 8. Predicted Sea Level Rise at Sewells Point, Virginia (8638610; Epoch 1983–2001)**

| USACE Sea Level Rise Rate (ft./year relative to NAVD88)* | | | |
|---|---|---|---|
| **Year** | **Low** | **Intermediate** | **High** |
| 2021 | 0.16 | 0.24 | 0.47 |
| 2025 | 0.22 | 0.32 | 0.62 |
| 2030 | 0.29 | 0.42 | 0.83 |
| 2035 | 0.37 | 0.53 | 1.05 |
| 2040 | 0.44 | 0.64 | 1.29 |
| 2045 | 0.51 | 0.76 | 1.55 |
| 2050 | 0.59 | 0.88 | 1.83 |
| 2055 | 0.66 | 1.01 | 2.13 |
| 2060 | 0.73 | 1.14 | 2.44 |
| 2065 | 0.8 | 1.28 | 2.78 |
| 2070 | 0.88 | 1.42 | 3.13 |
| 2075 | 0.95 | 1.56 | 3.5 |
| 2080 | 1.02 | 1.71 | 3.89 |
| 2085 | 1.1 | 1.86 | 4.3 |
| 2090 | 1.17 | 2.02 | 4.73 |
| 2095 | 1.24 | 2.18 | 5.17 |
| 2100 | 1.31 | 2.35 | 5.64 |

*NOAA's 2006 Published Rate: 0.01457 ft./year

Source: USACE 2021

Note also that source material from tidal gauges, sea level rise projections, and topographic mapping elevations are all referenced to the NAVD88 vertical datum within this report. Typical default datums for tidal gauges and sea level rise projections are either Mean Lower-Low Water or Mean Higher-High Water and must be adjusted to match the same datum. Topographic datums are either National Geodetic Vertical Datum of 1929 (NGVD 29) or North American Vertical Datum of 1988 (NAVD 88), which for the project area have a vertical discrepancy of 1.35 ft. USGS topographic maps typically use NGVD 29, whereas current Digital Elevation Models or field or aerial photographic topography would use NAVD88. A USGS topographic map with a contour of 20 ft. in the NGVD 29 datum is equivalent to an elevation of 18.65 ft. on a NAVD 88 map.

Sea level rise would impact tidal waters downstream of the existing SPSA property and its proposed development under Alternatives B, C, and E. Those downstream tidal waters include the Nansemond River and Burnetts Mill Creek up to Nansemond Parkway (SR 337) where a vertical weir exists and form the downstream end of Beamon Pond. The specific elevation of the weir and whether it will be overtopped by the effects of sea level rise is unknown. However, further upstream at the crossing of Burnetts Mill Creek and U.S. Routes 13/58/460 (at the lowest point adjacent to the SPSA property), the culvert at this location has an invert elevation of seven feet (based on an HDR floodplain study referenced later in the floodplain portion of this chapter). A tidal elevation of seven feet or more is not expected based on sea level rise projections listed in Table 8, and thus no impacts from sea level rise are expected to surface waters or their drainage patterns on-site. Furthermore, the project area has ground surface elevations above 19 feet (NAVD88). Sea level rise may raise groundwater levels higher than present elevations regionally, but groundwater levels are already high and changes would not significantly alter groundwater flow directions, velocities, or discharge locations at the project area.

#### *Storm Surge*

The Corps completed the *North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk* (2015) in the wake of Hurricane Sandy to address coastal flood risks and provide communities with a planning-level framework to analyze flooding risks and identify possible solutions. Mapping efforts presented in Appendix D of that study identify areas of low to high risk of exposure from various flooding sources, including the 1% annual chance flood plus three ft. of freeboard, the 10% annual chance flood, and the Category 4 Sea, Lake, and Overland Surges from Hurricanes (SLOSH) modeling conducted by NOAA (USACE 2015). The extent of the Category 4 SLOSH event represents the maximum storm tide levels caused by extreme hurricane scenarios across the region. It therefore provides a reasonable approximation of the most extreme flooding event. Mapping for that analysis was completed at the scale of the project area by the Corps in February 2014 using the best available data at the time.

Examination of the current digitally available SLOSH mapping using the National Storm Surge Hazard Maps presented by NOAA, the National Weather Service, and the National Hurricane Center Storm Surge Unit indicates no risk at the project area for Alternatives B, C, and E under Category 3 (Figure 27). Under Category 4 (Figure 28), the risk boundary is similar to the risk area map presented in the Corps' *North Atlantic Coast Comprehensive Study*, with the addition of the potential for less than three ft. of flooding at the project area and greater than six ft. of flooding at Cell VII, due to its excavation. NOAA SLOSH mapping is based on an unspecified Digital Elevation Model source, and the maps also indicate that local features such as construction walls, levees, berms, pumping systems, or other mitigation systems found at the local level may not be included in the analysis. Interpretation of the mapping within the undeveloped forested area east of the project area indicates that the storm surge hazard boundary for flooding less than three ft. above ground is likely based on the

20 ft. elevation contour. The mapping does not take into consideration existing ditch lines, such as the major ditch that runs north to south along the powerline easement just east of the subject property, or the topography produced for the project area using aerial photography in 2016.

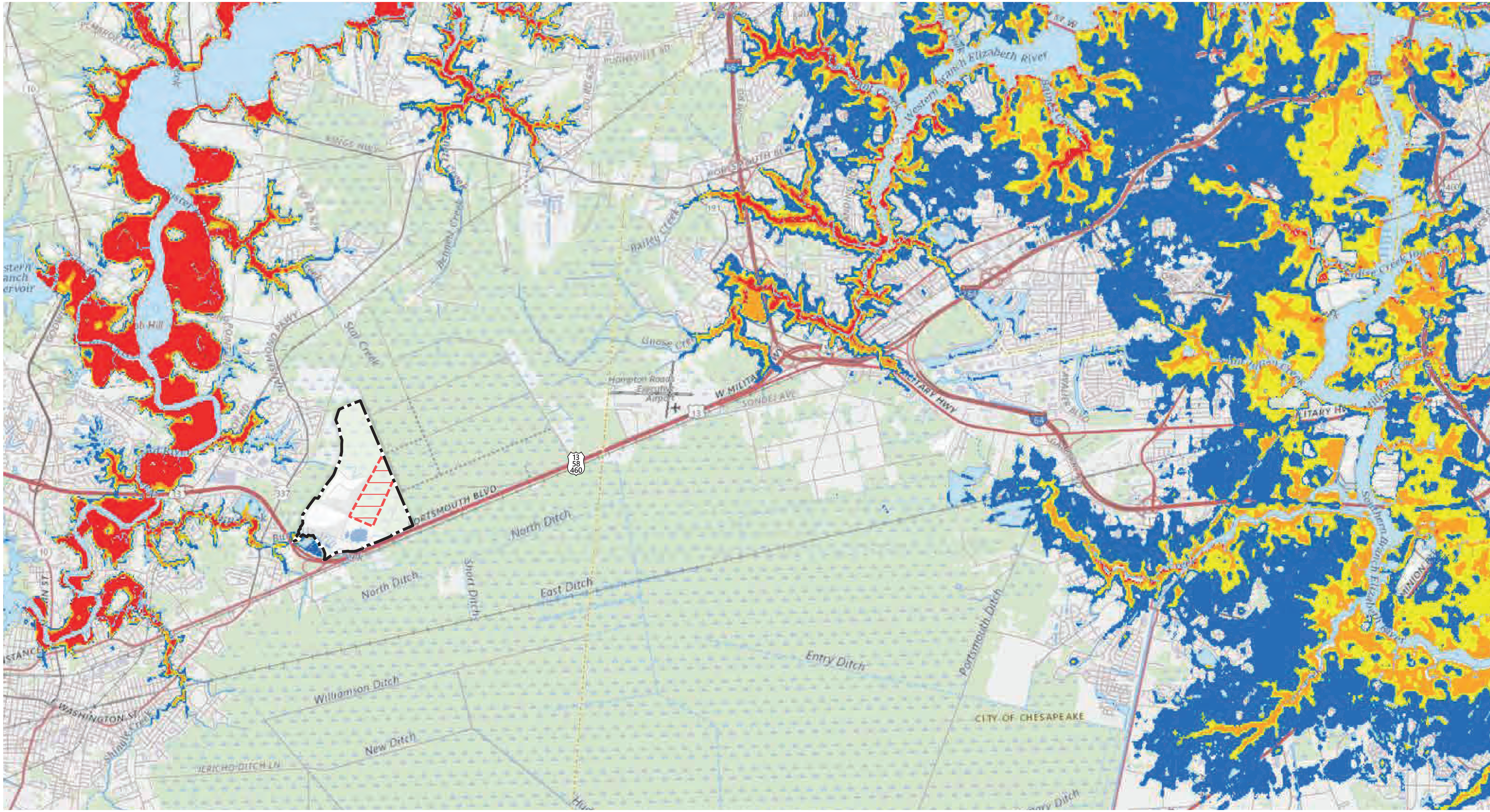
Regardless, this mapping is intended to indicate potential worst case scenario storm surge flooding vulnerability so that communities can evaluate their risk for the storm surge hazard. The project area has ground elevations ranging from 19 to 21 ft., and almost all land areas north, south, and east of this location, extending to the shorelines of the James River and Atlantic Ocean, are at lower elevations. Thus, the project area represents a fraction of the entire area projected to be impacted, and localized impacts are projected to be three ft. or less in depth.

Regionally, flooding would be expected to be widespread due to the coastal landscape position and severity of Category 3 or 4 hurricanes, whether resulting from storm surge, precipitation, or the combination of both. For Alternatives B, C, and E, hurricane wind and precipitation pose the greatest risk for power outages and flooding of facilities, the stormwater management facilities and downstream receiving waters. Virginia Solid Waste Management Regulations set the standards for siting, design, construction, operation, and closure of facilities, including requirements for the management of stormwater run-on (flow into the active portion of the landfill) and runoff, and to collect and control, at a minimum, the water volume resulting from a 24-hour, 25-year storm. Collection and treatment of water volumes for larger precipitation events consistent with hurricanes is typically prohibitive due to the amount of land necessary for such facilities.

SPSA does maintain a Disaster Response Plan, last revised May 19, 2022, which addresses the organizational structure and tasks and responsibilities in the event of disasters or major emergency conditions. Preparedness for impending severe weather events such as hurricanes includes the temporary suspension of waste receiving services, while ensuring that on-site measures are taken to continue operation of on-site facilities, including pre-pumping of leachate or stormwater management facilities in preparation of anticipated major precipitation event, and readiness of on-site power generators in preparation of wind- or precipitation-related support facilities damage.

The landfill stormwater system is currently designed to handle a 100-year storm event but knowing that future events may exceed that standard as the climate adapts, continuous management of the landfill facility and its support systems including the stormwater management facilities provides a moderate level of adaptability. Continuous management includes maintenance of vegetative cover, routine removal of sediment buildup in conveyance ditches, moderation of water levels in the leachate ponds, and installation of a wastewater concentrator which will reduce wastewater hauling and pumping, all of which are critical for a facility in this region where heavy rainfall, high wind, or hurricane level forces are somewhat common across the lifespan of a landfill facility.

Source: ESRI Basemap The National Map; NOAA/NW/NHC Storm Surge Unit




**LEGEND**

SPSA Property Boundary

Expansion Area

Depth of water less than 3 feet above ground

Depth of water greater than 3 feet above ground

Depth of water greater than 6 feet above ground

Depth of water greater than 9 feet above ground

N

0 6,000 Ft

US Army Corps of Engineers

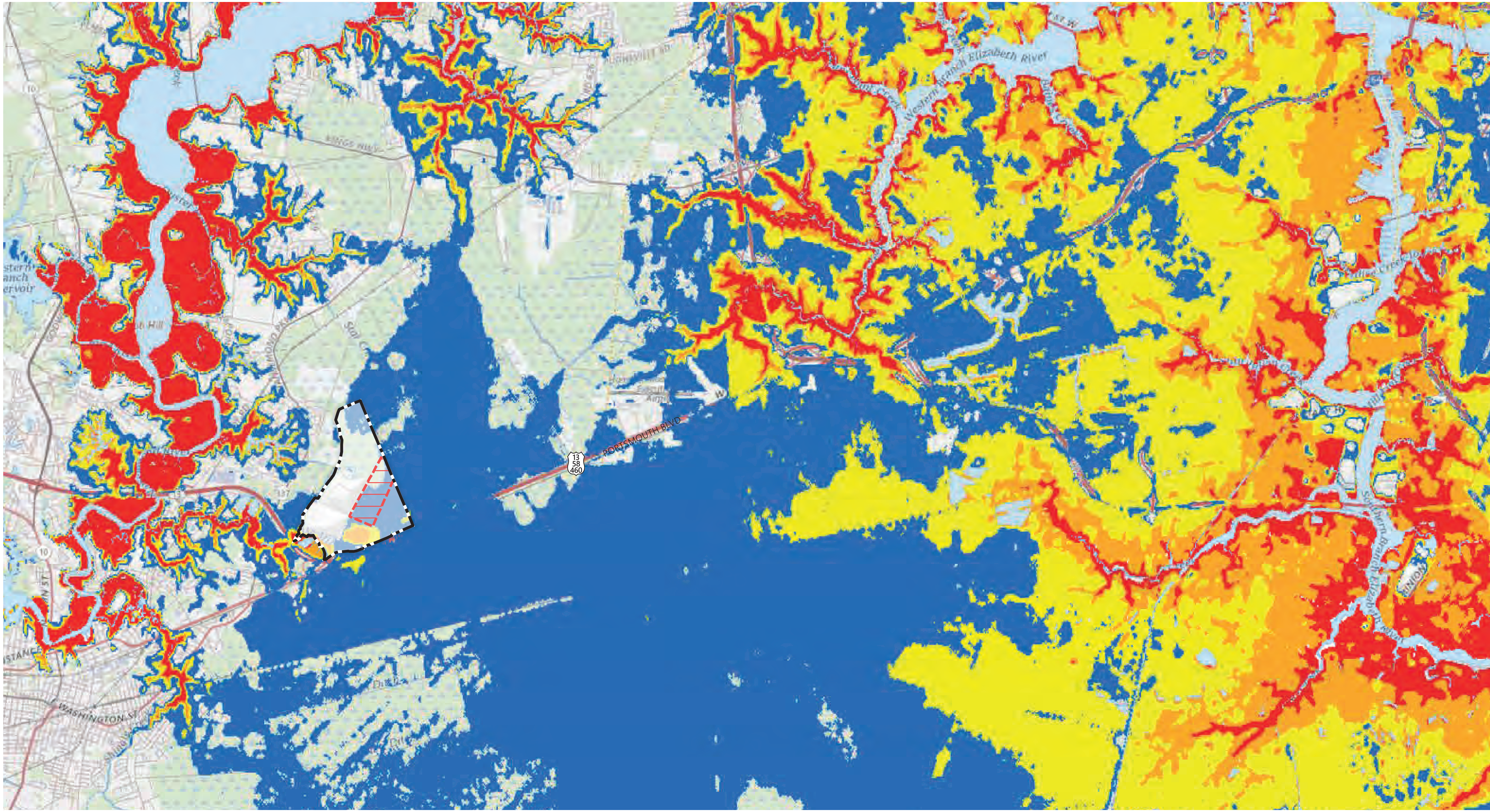
Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 27

**SPSA Regional Landfill National Storm Surge Hazard Maps – Category 3**

Source: ESRI Basemap The National Map; NOAA/NW/NHC Storm Surge Unit




**LEGEND**

SPSA Property Boundary
Expansion Area

Depth of water less than 3 feet above ground
Depth of water greater than 3 feet above ground
Depth of water greater than 6 feet above ground
Depth of water greater than 9 feet above ground

N

0 6,000 Ft

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 28

**SPSA Regional Landfill National Storm Surge Hazard Maps – Category 4**

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, neither short-term nor long-term adverse effects to surface hydrology are anticipated nor is an effect from sea level rise or risk of storm surge or impacts therefrom.

#### *Alternative B*

Under Alternative B, the change in land use from a high-water-table forested wetland with poor to very poor drainage to a landfill would affect the immediate surface hydrology. Without extensive data collection and development of a water budget for the watershed and its hydrologic inputs and outputs, the Norfolk District assumes that the land would be representative of a Curve Number of 77 (per Table 2-2c of the USDA Urban Hydrology for Small Watersheds, Technical Release 55, dated June 1986) under existing conditions and 90 for the developed condition, which would be a mix of impervious areas. Corresponding initial abstraction, which quantifies the losses due to water interception, evaporation and infiltration are 0.6 and 0.22 for existing and proposed conditions. Thus, this simplified approach (which does not include the effects of the groundwater table or existing ditch network) indicates that while the initial 0.6 inches of a rainfall event is lost in the wetland condition, that figure is reduced by more than 50% whereby only 0.22 inches is expected to be lost from infiltration or evaporation, resulting in an increase of 0.38 inches of runoff across the project area.

Short-term and long-term adverse effects are anticipated. Long-term adverse effects of this projected increase in runoff are expected to be offset by the design and implementation of stormwater management facilities, which would include a treatment train of perimeter ditches and traditional stormwater ponds that must comply with state regulations for water quality and quantity. Surface water hydrology in the project area is primarily driven by direct precipitation, with very little contributing watershed upslope beyond the footprint of Alternative B. Further, the volume of direct runoff is a fraction (approximately 3%) of the total surface hydrology that is generated by the contributing watershed that drains to Burnetts Mill Creek, to the southwest of the SPSA property. Direct precipitation onto the proposed expansion area would be intercepted by best management practices appropriate to the stage of the cell development, whether in the borrow pit phase, landfill development phase, operational phase, or upon the completion and capping phase per Virginia state regulations. That intercepted and treated surface water would be directed to eventually discharge into Burnetts Mill Creek, resulting in a hydroperiod comparable to pre-existing conditions as described under Alternative A. Both short- and long-term effects to hydrology would ultimately be offset through implementation of SPSA's proposed mitigation plan which includes on-site and off-site preservation and conservation. Additional mitigation details are included in SPSA's Mitigation Plan, located in Appendix G.

The SPSA project area does not have tidally influenced waters under current conditions; however, downstream off-site portions of Burnetts Mill Creek are tidally influenced. Both sea level rise and storm surge risk originate from the tidal water bodies to the north, east, and west of the project area. Given the site's landscape position at the headwaters of Burnetts Mill Creek and that it is higher in elevation than most land leading to the tidal shoreline to the north, east, and west, most adjacent lands would be affected by sea level rise and potential storm surges well before the project area; further, no amount of flood storage lost would improve flooding impacts at lower elevations in a storm surge event where flooding originates from the surrounding tidal water bodies. Thus, no adverse effects to sea level rise or storm surge are anticipated under Alternative B.

##### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations to secure an additional 1.52 million CY of disposal capacity and reduce the size of Cell IX by approximately 7.72 acres compared to Alternative B. Short-term and long-term adverse effects to surface waters are anticipated. Long-term adverse effects are expected to be offset with the development of on-site stormwater management facilities and required wetland mitigation, similar in nature to that described in Alternative B and in SPSA's Mitigation Plan located in Appendix G.

##### *Alternative E*

Under Alternative E, a hybrid approach diverting either 25% or 50% of waste to existing off-site landfill facilities, short-term and long-term adverse effects to surface waters are anticipated. Long-term adverse effects are expected to be offset with the development of on-site stormwater management facilities and required wetland mitigation, similar in nature to that described in Alternatives B and C, and in SPSA's Mitigation Plan located in Appendix G. The diversion of waste and resulting reduction in volume is not a linear relationship; the diversion of 25% of waste results in a reduction in project area of 11.7%, whereas the 50% diversion alternative results in a 34.5% reduction in footprint as compared to Alternative C. The landscape position and nature of the landfill operation and its support facilities would be similar to those described in Alternatives B and C.

### Floodplains

#### *Methodology*

Floodplains are regulated by local, state, and federal rules and regulations. Executive Order (EO) 11988, *Floodplain Management* (1977), requires federal agencies to "avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative."

The Federal Emergency Management Agency (FEMA) has primary federal jurisdiction over the administration of EO 11988. FEMA guidance for compliance with EO 11988 is found at 44 CFR Part 9. EO 13690, *Establishing a Federal Flood Risk Management Standard (FFRMS) and a Process for Further Soliciting and Considering Stakeholder Input* (2015), amended EO 11988 and established the FFRMS, to improve the nation's resilience to current and future flood risks, which are anticipated to increase over time due to the effects of climate change and other threats. EO 13690 and the FFRMS encourage the consideration of natural systems, ecosystem processes, and nature-based approaches when development alternatives are considered. This is consistent with recommendations and findings of the *North Atlantic Coast Comprehensive Study* (USACE 2015), which is aimed at reducing risk and increasing communities' abilities to withstand and rapidly recover from storm damages. EO 13690 and the FFRMS expand upon these tenets by calling for agencies to use higher design flood elevations than the base flood for federally funded projects, to address current and future flood risk so that projects last as long as intended.

The Virginia Flood Damage Reduction Act of 1989, VA Code § 10.1-600 et seq., was enacted to improve Virginia's flood protection programs and place related programs under one agency, the Virginia Department of Conservation and Recreation (VDCR). The VDCR is the manager of Virginia's floodplain program, serving as coordinator for all flood protection programs and activities in Virginia, as well as the designated coordinating agency of the National Flood Insurance Program. Under VA Code §10.1-602, VDCR works with localities to establish and enforce floodplain management zoning.

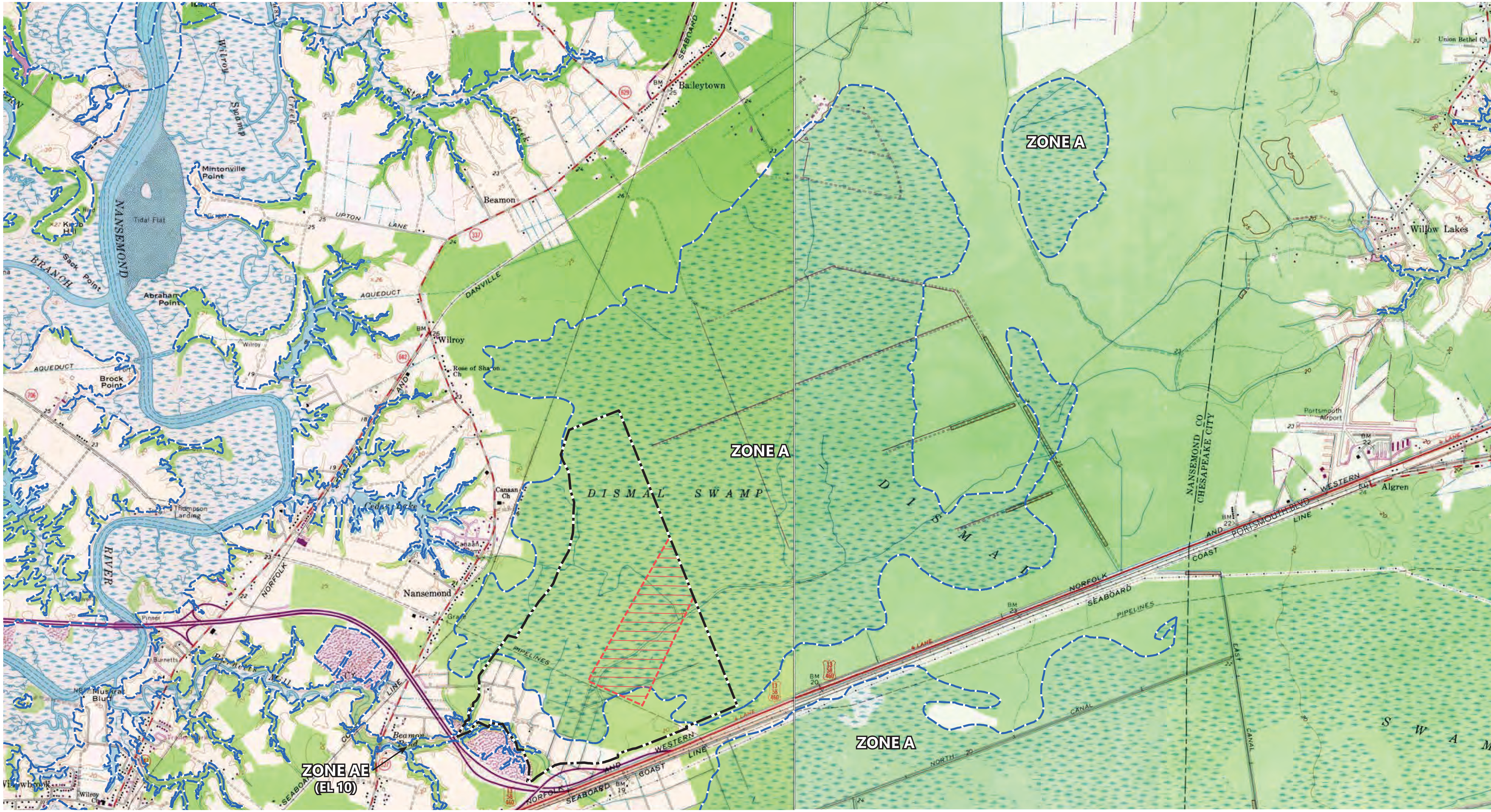
Virginia Solid Waste Management Regulations, 9 VAC 20-81-120 et seq., regulate the siting of new sanitary, CDD, and industrial waste landfills, as well as the expansion of those landfills with regard to floodplains, groundwater, receiving surface waters, and wetlands, among others. The City of Suffolk Zoning Ordinance, Section 31-416.2 Floodplain Overlay district, regulates uses, activities, and development within the floodplain. Its primary goals are to prevent the loss of property and life, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base (City of Suffolk 2015). Part c.1, Establishment of Zoning Districts, regulates the development of land within the various floodplain zones, as designated by FEMA.

#### *Affected Environment*

The area susceptible to flooding within the project area for Alternatives B, C, and E is identified on the current FEMA Flood Insurance Rate Map (FIRM) as Zone A (FIRM 5101560119E, dated August 3, 2015, for the City of Suffolk), which includes approximate study areas with no base flood elevation (1% annual chance or the 100-year flood). Most of the study area, including the Regional Landfill, and adjacent lands to the north and east, are within this flood zone, which is centered over the portion of the Great Dismal Swamp NWR north of U.S. Routes 13/58/460. This flood zone was established by FEMA in its first issuance of FIRMs for the City of Suffolk on March 24,

1978. It has continued to be shown as the same area and designation in all subsequent FIRM issuances. A November 16, 1990 Flood Insurance Study stated that approximate Zone A floodplain areas were mapped based on either a study completed by Benatec Associates of Columbus, Ohio (FEMA 1990) using the 1965 (photo revised 1979) Chuckatuck and Bowers Mill, Virginia USGS 7.5-minute topographic maps with a contour interval of five and ten ft., or the U.S. Department of Housing and Urban Development (HUD), Federal Insurance Administration Flood Hazard Boundary Map for the City of Suffolk, dated March 1978 (a copy of which has not been located). However, examination of the referenced topographic maps and more recent releases shows that the boundary of the FEMA Zone A floodplain in the project area matches the exact boundary of the wetland hatch shown on the topographic map. Thus, it is unlikely that any hydrologic or hydraulic analysis was prepared to determine this flood boundary. Figure 29 provides a composite view of the USGS topographic maps and the digital FEMA floodplain boundary, which displays the direct correlation between the floodplain and wetland hatch boundaries.

Source: USGS 7.5 minute Chuckatuck (1972) and Bowers Hill (1970), Virginia Quadrangles




**LEGEND**

SPSA Property Boundary

Expansion Area

FEMA Mapped Floodplain Boundary

N

0 2,000 4,000 Feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 29

**SPSA Regional Landfill FEMA Floodplain Mapping (1970 and 1972 USGS Quadrangles)**

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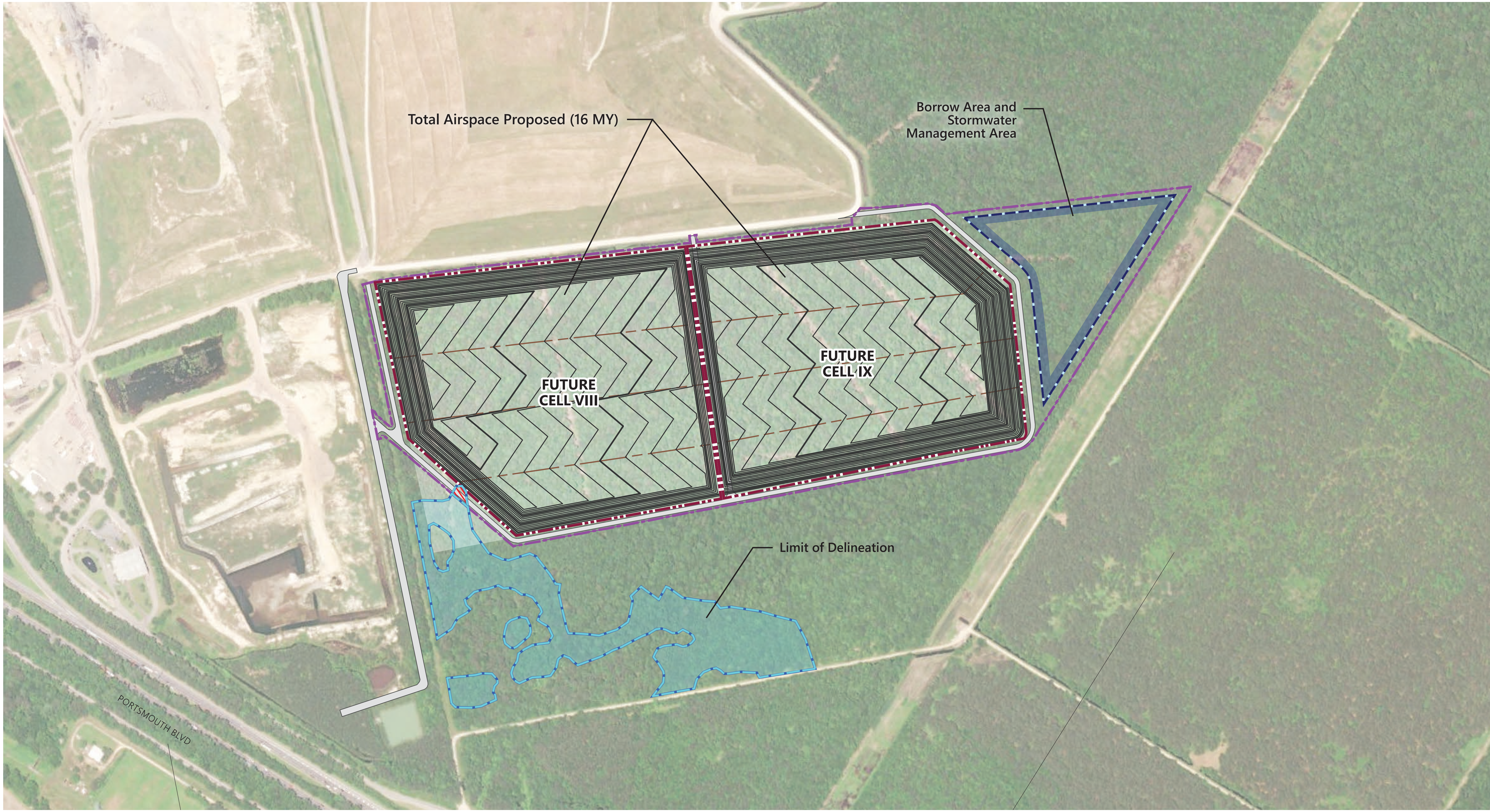
Per the 2015 City of Suffolk zoning ordinance for Zone A floodplain boundaries, the City Floodplain Administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data are utilized, the lowest floor shall be elevated to or above the base flood level. Thus, for the development of the proposed cells, SPSA's consultant, HDR, prepared an analysis using the FEMA-approved ICPR4 model, an unsteady state model that is ideal for flat basins interconnected by weir and ditch flow and where hydrologic residence times are more difficult to calculate than those with steady flow. The model simulations provide base flood elevations for each designated basin. For future Cells VIII and IX, the base flood elevation was determined to be 19.7 ft.

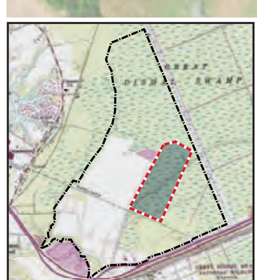
Delineation of the flood boundary at elevation 19.7 feet using topographic data generated from aerial photography dated March 22, 2016, significantly reduces the floodplain footprint at the study area (Figure 30) in comparison to the approximate FEMA Zone A boundary (Figure 29). Based on the FEMA mapped floodplain boundary, there is a proposed impact of 109.64 acres; however, use of the ICPR4 model and more recent topography reduces the proposed impact to 0.11 acre along the southeastern corner of the project area as a result of the proposed perimeter roadway, not the landfill cells (Figure 30). Most of the project area has ground surface elevations between 20 and 22 ft. in elevation (NAVD88 datum). Comparison of this delineated floodplain boundary with the boundary published by the First Street Foundation and their online resource, FloodFactor (2021), shows a similar boundary determination at the project area and in the larger wetland area to the east, which was determined in the HDR analysis to have a flood elevation of 21 ft. The FloodFactor floodplain boundary is based on county and nationally available digital elevation models, which provide a greater level of accuracy in depicting the boundary than a USGS topographic map with five to 10 ft. contour intervals (First Street Foundation 2021).

Climate change projections indicate a likelihood for greater frequency and intensity of precipitation events, with an increase in annual total precipitation as a result. The National Oceanic and Atmospheric Administration (NOAA) is chartered with providing Atlas 14 documents and data for precipitation frequency estimates. This data is typically used for sizing stormwater management facilities, bridge and culvert crossings, and estimating riverine flood limits. However, the currently published precipitation frequency estimates are based on historical data, that is no more recent than the year 2000, for the mid-Atlantic area. NOAA is in the process of updating these frequency estimates for an updated regional Atlas 15 to be issued in 2025. This update will include precipitation estimates based on both historical gages and observed trends and the incorporation of climate projection adjustment factors. As stated in a study conducted in New Jersey, which operates under the same Atlas 14 documents as Virginia, current precipitation amounts in New Jersey were found to be 2.5 to 10% higher than those reported through the year 2000, and precipitation amounts are likely to increase by more than 20% by the year 2100 (DeGaetano and Tran, 2021).

As a result, the precipitation and intensity associated with the 100-year storm is likely to increase, thereby increasing the 100-year flood depths and boundary. Given the landscape position of the project site in relation to the contributing watershed it is unlikely that the flood elevation of 21 feet is going to rise appreciably within the projected SPSA Regional Landfill life expectancy.

Source: ESRI Orthoimagery (2020)



**LEGEND**

- SPSA Property Boundary
- Landfill Cell Boundary
- Borrow Area and Stormwater Management Area
- Limits of Disturbance
- 100-Year Floodplain Elevation 19.7'
- Floodplain Impacts (0.11 acres)

N

0 300 Ft

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 30

**SPSA Regional Landfill**
**HDR 100-Year Floodplain Delineation**

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Note that HDR previously prepared a similar analysis of the watershed for the development of Cell VII that relied on the same unsteady state model (release version 3) using a rainfall distribution of 8.5 in. The current Atlas 14 published 100-year recurrence interval rainfall distribution has since increased, based on an updated 9.3 in. of rainfall over 24 hours. For comparison, Hurricane Floyd dropped 9.19 in. of rain in 24 hours on September 15, 1999. This updated rainfall distribution, which relies on 40 additional years of rainfall data, was established by NOAA in 2006 with the issuance of the NOAA Atlas 14, Volume 2, Version 3.0 for Delaware, District of Columbia, Illinois, Indiana, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. Comparison of the two models shows that the floodplain elevation increased by 0.3 ft. as a result of the 0.8 in. increase in rainfall distribution. As stated, precipitation frequency and intensity are anticipated to continue to increase. Floodplain elevations will increase accordingly, but this should be viewed from a regional perspective, since the downstream riverine flooding of Burnetts Mill Creek is predominantly on-site and affects only the SPSA property before passing under U.S. Routes 13/58/460 and entering the tidally influenced portion of the creek, where tidal floodplain and storm surge mapping will be the determining factor.

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, long-term adverse effects to the base flood elevation or to the floodplain are not anticipated. The FEMA-mapped floodplain is a Zone A, approximated floodplain boundary with no base flood elevation determined. Review of the source material for the floodplain determination shows that it was likely a map-based decision, which mirrored the wetland hatch area in the central portion of the Great Dismal Swamp NWR north of U.S. Routes 13/58/460. This floodplain and wetland system sits on land that is flat, with elevations generally in the range of 19 to 21 ft. (NAVD88 vertical datum). This system generally drains to the southwest, but at its outer edges also drains to the north, east, and west to other drainage systems. For the project area, the wetland and floodplain system drains southwest and into Burnetts Mill Creek and ultimately to the Nansemond and James Rivers. Modeling of the floodplain watershed in the project area determined a base flood elevation of 19.7 ft. The No-Action Alternative would not drain runoff into this base elevation floodplain and flood storage area. Thus, adverse effects are not anticipated.

#### *Alternative B*

Under Alternative B, long-term adverse effects to the base flood elevation are not anticipated. Approximately 0.11 acres of floodplain are anticipated to be affected by the construction of perimeter roadways, located beyond the extent of the disposal area. The base elevation floodplain and flood storage at the project area is driven solely by direct precipitation within the same footprint as the project area (there is no upstream or upslope contributing watershed) and downslope controls and contribution from the off-site watershed to the east. Thus, due to the nature of the applicant's preferred alternative, it is anticipated that future direct precipitation would be intercepted and drained into on-site stormwater management facilities, depending on the life cycle of Alternative B, to be discharged in accordance with Virginia stormwater management regulations with no adverse downstream effects.

Adverse effects to the base flood elevation are most commonly caused by land use changes, in which increases in impervious area and reductions in ground absorption result in increased runoff volume. An increase in impervious area under Alternative B is anticipated as a result of landfill cell development and construction of the gravel perimeter road. Although the landfill itself would consist of primarily dirt and grass cover materials which are considered pervious, the lined landfill cell would be considered impervious cover. Based on Chesapeake Bay regulations, the gravel road would not be completely impervious and would provide some absorption. On-site stormwater management, mostly in the form of sediment basins during the construction phase and perimeter channels during operational phases, would collect and slow the release of the runoff volume. The proposed project would effectively change the hydrologic regime for precipitation draining toward the receiving floodplain. In the existing condition, precipitation uptake occurs through evapotranspiration, including limited groundwater infiltration due to the high groundwater elevation. Under Alternative B, precipitation would effectively be collected on site, thereby eliminating the hydrologic connection to the adjacent 100-year floodplain in the southeast corner of the site, which is overwhelmingly supported by the much larger portion of the watershed in the Great Dismal Swamp NWR north of U.S. Routes 13/58/460. This disconnection of hydrology is not anticipated to adversely affect the floodplain volume or boundary. The intercepted precipitation on site would at first be collected within the landfill itself, then be withdrawn as it collects as leachate with the basin of the landfill. Withdrawn water, through on-site pumping, is treated and collected within on-site stilling basins. The water is then available for reuse (irrigation and equipment washing) and discharge into the downstream receiving waters in the southwest end of the site adjacent to U.S. Routes 13/58/460. As a result, it is not anticipated that Alternative B would have an adverse effect on the floodplain adjacent to and downstream of the project.

#### *Alternative C*

Under Alternative C,  the airspace between Cells V and VII would be filled in and utilized for landfilling operations to secure an additional 1.52 million CY of disposal capacity, reducing the size of Cell IX by approximately 7.72 acres compared to Alternative B. Long-term adverse effects to the floodplain are not anticipated under Alternative C. Similar to Alternative B, approximately 0.11 acres of floodplain are anticipated to be affected by Alternative C, due to the construction of perimeter roadways beyond the extent of the disposal area. The base elevation floodplain and flood storage at the project area is driven solely by direct precipitation within the same footprint as the project area (there is no upstream or upslope contributing watershed) and downslope controls and contribution from the off-site watershed to the east. Thus, due to the nature of Alternative C, it is anticipated that future direct precipitation would be intercepted and drained into on-site leachate and stormwater management facilities, depending on the life cycle of the applicant's preferred alternative, to be discharged in accordance with Virginia stormwater management regulations with no adverse effect downstream.

The base elevation floodplain and flood storage provided by the greater portion of the Great Dismal Swamp NWR north of U.S. Routes 13/58/460, in general, flows toward the southwest before being intercepted by a ditch running north to south along an existing powerline, and then discharging into a ditch along the north side of U.S. Routes 13/58/460 and eventually into Burnetts Mill Creek.

#### *Alternative E*

Under Alternative E, a hybrid approach diverting either 25% or 50% of waste to existing off-site landfill facilities, would result in effects similar to those described in Alternatives B and C.

## Groundwater

### *Methodology*

Groundwater resources were characterized based on a review of available reports and data, such as hydrologic and hydrogeologic studies of the project area that were produced as part of the engineering analyses and groundwater monitoring. Geologic and hydrogeologic USGS mapping, reports produced by the USGS, and publicly available GIS data were also reviewed.

### *Affected Environment*

Groundwater Management Areas are defined and managed in the state under 9 VAC 25-600-20, and groundwater in the vicinity of landfills is protected under 9 VAC 20-81-250. According to regional geologic mapping performed by the USGS (2006) and soil boring logs generated at the Regional Landfill (HDR 2019a), groundwater is present within several principal aquifers in the subsurface of the project area. The surface of the site is capped with approximately seven ft. of organic clays that ubiquitously cover the area; below the clay is a 25–50 ft. thick layer of unconsolidated sediments consisting of sand, silt, and to a lesser extent peat and clay that were deposited during the Pleistocene epoch and that make up the surficial water-bearing groundwater aquifer. Other principal aquifers underlying the surface aquifer (as observed by the USGS in the nearby well 58 C10) are shown in Table 9. Over 30 ft. of sandy clay separate the surface aquifer from the underlying Yorktown-Eastover aquifer and prevent groundwater flow between the two units. Fine-grained, low-permeability confining units also separate the lower three aquifers and prevent water exchange between them.

**Table 9. Principal Aquifer Systems Observed in the Vicinity of the Regional Landfill**

| Principal Aquifer Systems | Depth to Top of Aquifer (ft. below Mean Sea Level) |
|---|---|
| Yorktown- Eastover Aquifer | 90 |
| Piney Point Aquifer | 255 |
| Aquia Aquifer | 330 |
| Potomac Aquifer | 430 |

Groundwater in the surficial aquifer generally flows from northeast to southwest across the Regional Landfill site before discharging to Burnetts Mill Creek. Based on a water level monitoring event performed in January 2021, groundwater under the vicinity of the expansion area flows toward the south-southeast before discharging to a drainage ditch along the powerline easement that extends from the northeast boundary of the site to a swampy area adjacent to the U.S. Routes 13/58/460 bypass (HDR 2021b). As shown in Figure 31, the drainage ditches flow through a culvert beneath the bypass and into Beamon Pond, which is located at the headwaters of Burnetts Mill Creek, a tributary to the Nansemond River. According to regional groundwater level modeling performed by the USGS, groundwater in the deeper Yorktown-Eastover and Piney Point aquifers flows to the northeast toward the mouth of the James River; groundwater in the Aquia aquifer flows to the northwest; and water in the Potomac aquifer flows to the west toward Franklin, Virginia (USGS 2009).

Source: DEQ, 2021. Office of Water Supply, VA Department of Environmental Quality; HDR, 2021. January 2021 Groundwater Surface Map. SPSA Regional Landfill; Base map imagery from ESRI/Maxar (2020).


**LEGEND**

- Surface Drainage Feature
- Groundwater Contour (1 ft; HDR)
- Liner/Boundary Interiors (HDR)
- Expansion Site Including Cells VIII and IX
- Manufacturing/Industrial Well (DEQ)
- Maximum Potential Dewatering Radius of Influence
- SPSA Property Boundary
- Surface Water Flow Direction
- Groundwater Flow Direction

N

0 1,000 2,000 feet

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

Suffolk, Virginia

FIGURE 31

**SPSA Regional Landfill Groundwater Flow and Drainage Features**

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As part of the existing operating permit at the Regional Landfill, and in accordance with the Detection and Assessment Monitoring Programs (9 VAC 20-81-250) and Corrective Action Program (9 VAC 20-81-260), SPSA collects groundwater samples for quarterly analysis from 25 monitoring wells and 14 surface water sites. No substantial increases above background levels have been observed to indicate landfilling practices have negatively impacted groundwater (HDR 2021a).

Groundwater and surface water downgradient of these compliance wells are monitored as outlined in Table 10 below. Measurements indicated that the leachate had remained fully contained within the base liner system and anchor trench elevations and monitoring results to date do not indicate cadmium or cobalt are migrating within the groundwater or surface water at concentrations above groundwater protection standards. If affected groundwater or surface water migrated off-site in the future, SPSA would notify all persons who own the land or reside on the land that directly overlies any part of the release, as required by 9 VAC 20-81-260(C)(1)(b) If groundwater contamination were detected at the Regional Landfill, per the Good Neighbor Agreement SPSA holds with Suffolk, communities would be notified of an exceedance of any kind. SPSA would be required to coordinate with VDEQ to resolve any potential issues.

**Table 10. Groundwater and Surface Water Monitoring Program Summary**

| Monitoring Program | # of Monitoring Locations | Monitoring Frequency | Monitoring Parameters |
|---|---|---|---|
| Detection | 2 Monitoring Wells | Quarterly | Table 3.1 Column A of 9 VAC 20-81-250 |
| Assessment | 1 Monitoring Well | $1^{st}$ Quarter | Table 3.1 Column B of 9 VAC 20-81-250 |
| | | $2^{nd}$ – $4^{th}$ Quarters | Table 3.1 Column A of 9 VAC 20-81-250<br>Historical Column B Detects |
| Assessment and Corrective Action | 15 Monitoring Wells | $1^{st}$ Quarter | Table 3.1 Column B of 9 VAC 20-81-250<br>Site Specific Speciation/Attenuation Parameters |
| | | $2^{nd}$ and $4^{th}$ Quarter | Table 3.1 Column A of 9 VAC 20-81-250<br>Historical Column B Detects |
| | | $3^{rd}$ Quarter | Table 3.1 Column A of 9 VAC 20-81-250<br>Historical Column B Detects<br>Site Specific Speciation/Attenuation Parameters |
| Corrective Action | 2 Monitoring Wells | Quarterly | Constituents of Concern (Cadmium and Cobalt) |

| Monitoring Program | # of Monitoring Locations | Monitoring Frequency | Monitoring Parameters |
|---|---|---|---|
| | 4 Monitoring Wells | Semi-Annually | Constituents of Concern (Cadmium and Cobalt)<br>Site Specific Speciation/Attenuation Parameters |
| | 14 Surface Water Locations | Semi-Annually | Constituents of Concern (Cadmium and Cobalt) |

### Environmental Consequences

#### Alternative A

Under Alternative A, long-term adverse effects to groundwater are not anticipated. Based on groundwater monitoring reports for the current SPSA permit, the leachate management system in place for the Regional Landfill is effective, and no contamination of major groundwater aquifers is occurring under the site. Continued operation under the current configuration of the Regional Landfill is not anticipated to alter this record.

Under Alternative A, sea level rise may raise groundwater levels higher than present elevations but would not significantly alter groundwater flow directions, velocities, or discharge locations. Climate change has the potential to cause extreme heat conditions that result in drought. In a drought, local aquifer levels would be impacted by an increase in water being pumped out of local wells as well as decrease in recharge by precipitation.

#### Alternative B

Under Alternative B, long-term adverse effects to groundwater are not anticipated. Excavation to the design depth of 20-40 ft. below grade for cell construction would penetrate the full thickness of the surface aquifer along most of the extent of the expansion area and extend into the underlying dense, confining unit in deeper portions of the excavation. As indicated in Chapter 2, groundwater in the surface aquifer would temporarily be displaced from the zone of excavation due to phased dewatering activities during construction. The dewatering system would be installed separately from the leachate collection system to control pressure on the bottom and sides of the expansion site liners, to induce an inward gradient, as is currently used in Cells V, VI and VII, combined with a double composite liner system where if a failure were to occur, the cell would fill with groundwater verses leachate migrating out. Based on the radius of influence of sumps used for dewatering Cells V and VI during construction, which were constructed on similar geologic materials, the maximum anticipated radius of influence for dewatering Cells VIII and IX is approximately 1,400 ft. from sumps (HDR 2007, 2008). Once sufficient ballast (waste) is added to the cells, dewatering would cease, and the lined bases of Cells VIII and IX would lie within the surface aquifer and displace groundwater locally. To date, hydrology of wetlands in the area has not shown a discernible impact from dewatering other area cells. If needed, monitoring could be required as a condition of the Section 404 permit to determine potential permanent impacts.

At the regional scale, however, groundwater flow would be largely unaltered, with no impact on flow toward and discharge to Burnetts Mill Creek, as shown in Figure 31.

Development of the expansion area is not anticipated to adversely affect groundwater in the Great Dismal Swamp NWR or the NNL (located to the south) or penetrate the deeper principal aquifers. Groundwater flow simulations performed by the USGS indicate that groundwater in the northern portions of the NWR flow toward the north (i.e., toward the Regional Landfill) (USGS 2018), such that site groundwater is not anticipated to reach the NWR. Similarly, surficial groundwater at the site should not mix with groundwater in lower aquifers. Based on a nearby soil boring collected by the USGS and several other existing borings on the SPSA site, up to 70 ft. of low-permeability sandy clay currently separate the surficial groundwater aquifer from the underlying Yorktown-Eastover aquifer in the vicinity of the expansion site; approximately 50 ft. of that material would remain as a significant hydraulic buffer between the excavation base and the top of the Yorktown-Eastover aquifer. By extension, development of the expansion area is also not anticipated to have adverse impacts on the deeper Piney Point, Aquia, or Potomac aquifer systems, nor hydraulically connect them with the surface aquifer.

Alternative B would not cause adverse effects to public or private water supply wells. As indicated previously, dewatering activities associated with developing the expansion area are not anticipated to influence the surface aquifer beyond 1,400 ft. from sumps, the locations of which are yet to be determined. Figure 31 shows the locations of all permitted, non-permitted, and private active water wells near the project area on file with the VDEQ. All of these wells are registered as industrial or manufacturing wells, and none are located within the 1,400-ft. distance of the proposed expansion area. Water supply in this area is provided by public utility. According to water well inventory records, the wells shown in Figure 31 supply water from the Piney Point aquifer, over 300 ft. below ground surface; there are no known supply wells in the surface aquifer in the vicinity of the project area.

Under Alternative B, sea level rise may raise groundwater levels higher than present elevations but would not significantly alter groundwater flow directions, velocities, or discharge locations. Climate change has the potential to cause extreme heat conditions that result in drought. In a drought, local aquifer levels would be impacted by an increase in water being pumped out of local wells as well as a decrease in recharge by precipitation.

#### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations, to secure an additional 1.52 million CY of disposal capacity and reduce the size of Cell IX by approximately 7.72 acres compared to Alternative B.

Long-term adverse effects to groundwater are not anticipated under Alternative C. Similar to Alternative B, excavation for cell construction would penetrate the full thickness of the surface aquifer along most of the extent of the expansion area and extend into the underlying dense, confining unit in deeper portions of the excavation. Groundwater in the surface aquifer would be temporarily displaced from the zone of excavation due to phased dewatering activities during construction. Once sufficient ballast is added to the cells, dewatering would cease and the lined bases of Cells VIII and IX would lie within the surface aquifer and displace groundwater locally.

Similar to Alternative B, development of the expansion area under Alternative C is not anticipated to adversely affect groundwater in the Great Dismal Swamp NWR and the NNL, the deeper principal aquifers, or public or private water supply wells.

Under Alternative C, sea level rise may raise groundwater levels higher than present elevations but would not significantly alter groundwater flow directions, velocities, or discharge locations. Climate change has the potential to cause extreme heat conditions that result in drought. In a drought, local aquifer levels would be impacted by an increase in water being pumped out of local wells as well as a decrease in recharge by precipitation.

#### *Alternative E*

Under Alternative E, a hybrid approach diverting either 25% or 50% of waste to existing off-site landfill facilities, long-term adverse effects to surface waters are expected to be similar in nature to that described in Alternatives B and C. The diversion of waste and resulting reduction in volume is not a linear relationship; the diversion of 25% of waste results in a reduction in project area of only 11.7%, whereas the 50% diversion alternative results in a 34.5% reduction in footprint, as compared to Alternative C. The landscape position and nature of the landfill operation and its support facilities would be similar to those described in Alternatives B and C.

## Water Quality

### *Methodology*

Water quality is enforced at the state level, based on standards set by both the state and the EPA. States can choose to adopt national water quality standards or to revise these and adopt state-specific standards. National Pollutant Discharge Elimination System permits are issued by states with EPA approval. The existing facility and applicant’s preferred alternative must demonstrate compliance with the Virginia Chesapeake Bay Preservation Act, Virginia Stormwater Management Act, Erosion and Sediment Control Law, Water Quality Standards, Erosion and Sediment Control Regulations, Solid Waste Management Regulations, City of Suffolk Unified Development Ordinance, and HRSD Industrial Wastewater Discharge Regulations.

### *Affected Environment*

SPSA's consultant issued a Major and Minor Water Quality Impact Assessment, dated June 2016, revised in September 2016, for the application with the City of Suffolk for a CUP and Conditional Rezoning Application associated with the applicant's preferred alternative (specifically the use of Cells VIII and IX as borrow pits for the landfill development of Cell VII).

The project area is located within a Chesapeake Bay Preservation Resource Management Area as detailed in the aforementioned Water Quality Impact Assessment and as specified in the City of Suffolk Official Preservation Area District Maps per Section 31-415 of the City's Zoning Ordinance. For the applicant's preferred alternative of using Cells VIII and IX as borrow pits, stormwater management is not required under the City's Zoning Ordinance, however Virginia Erosion and Sediment Control Regulations would require perimeter controls, ditches and sediment basins, to manage water quality (sediment, phosphorus, and nitrogen) and water quantity (peak runoff control) within the footprint of the applicant's preferred alternative. Development of the borrow pits as a landfill would fall under state Solid Waste Management Regulations for water quantity and quality treatment. Surface runoff management during operations is required for the run-on (flow into the active portion of the landfill) and runoff. Due to the varying land use and cover from initial excavation through final cover installation, state regulations require, at a minimum, run-on flow prevention of the 24-hour, 25-year storm peak discharge and runoff collection and treatment of the 24-hour, 25-year storm water volume. It is anticipated that a stormwater management facility would be sized and located north of the future Cells VIII and IX. Perimeter ditches would provide conveyance of storm flows from the cells to the stormwater management facility and then to receiving waters to the south until connecting into Burnetts Mill Creek. Impervious areas in the post-development condition would consist of gravel roadways used for access to the new cells, and the cells themselves as they will be capped with materials necessary to limit the infiltration of waters and exfiltration of leachate. Stormwater management facilities currently serving the landfill are sized for the 100-year storm and also function to provide water on-site for roadway dust-control, and wheel washing to remove sediment from vehicles leaving the site. Future stormwater management will be sized to meet the minimum requirement or larger and will depend on the overall management plan for the site that includes a multi-pronged approach to stormwater management, maintenance, larger storm resiliency and water reuse with post-development conditions consisting of grass as final cover for the completed cells. Prior to the post-development condition, initial land disturbance associated with clearing and grubbing of existing vegetation and removal of soils as a borrow pit through the landfill operation of filling the cells, the facility would incorporate drainage channels and sediment basins for treatment under the Virginia Erosion and Sediment Control regulations to manage water quality (sediment, phosphorus, and nitrogen) and water quantity (peak runoff control) within the footprint of the applicant's preferred alternative.

Management, maintenance, and monitoring of the erosion and sediment controls, permitted outfall locations, best management practices, and wastes, fluids, and pollutants on-site would be conducted under the guidance of a SWPPP and VPDES Permit and state Solid Waste Management Regulations. The existing cells are currently managed by a VPDES permit (#VA0090034) issued on October 1, 2020, with an expiration of September 30, 2025. This permit requires the monitoring and reporting of effluent characteristics at the permitted outfall locations on a quarterly basis. The VPDES outlines specific limitations on discharges for pH, total suspended solids, biochemical oxygen demand (5-day), ammonia, alpha terpineol, p-Cresol, phenol, total recoverable zinc, total petroleum hydrocarbons, total organic carbon, and total kjeldahl nitrogen.

*Leachate*

In addition to the management of potential pollutants generated on-site and discharged at the authorized outfalls, the Regional Landfill must also manage the treatment and discharge of leachate from the capped and active landfill operation. In January 2017, SPSA notified VDEQ of the presence of elevated leachate levels over the liner system in Cells V and VI of the landfill. Measurements indicated that the leachate had remained fully contained within the base liner system and anchor trench elevations. It was determined that leachate had accumulated above normal levels due to the existing pump infrastructure not removing and disposing of leachate at a sufficient rate. Factors contributing to the insufficient pump rates included restrictions on daily volumes of leachate that could be discharged to the HRSD, manual operation of the leachate system, the physical condition of some of the pump systems, and operator inattentiveness.

As a result, VDEQ issued a Consent Order, and SPSA issued a Leachate Corrective Action Plan, dated July 2017, and revised on August 25 and September 21, 2017. As of 2018, the corrective actions had been completed. These actions most notably included the installation of a new Supervisory Control and Data Acquisition (SCADA) system that controls and monitors the leachate system in real time. Leachate is sampled once per month in accordance with SPSA's Industrial Discharge Permit with HRSD. The pH during this period has ranged from 7.2 to 7.9. All VOCs per EPA Method 624.1 have been below analytical detection limits. While these data describe current leachate characteristics, changes will occur over the coming years as the waste in the currently operating cells ages and the new cell opens up.

Promulgation of Per- and Polyfluoroalkyl Substances (PFAS) maximum contaminant levels (MCL) is now required by the Code of Virginia, and sampling and analysis of the PFAS constituents is forthcoming.

The Supervisory Control and Data Acquisition (SCADA) system measures the depth of leachate on the liner; flow from each leachate vault; flow from each lift station; total gallons pumped to HRSD for treatment; total gallons sent to the pump and haul station;

electrical information on each pump (volts, Amps) and start/stop status of pumps to record run times.

Leachate disposal strategies were also revised, whereby leachate from the low flow pump is still being discharged to HRSD's Nansemond Treatment Plant, which is in the Sustainable Water Initiative for Tomorrow (SWIFT) program (and therefore is restricted to 28,800 gallons per day) while any remaining gallons are hauled and discharged to HRSD's Atlantic Treatment Plant in Virginia Beach, which is not in the SWIFT program. SPSA has contracted with Heartland Water Technology to install a heat assisted leachate evaporation plant capable of treating up to 60,000 gallons of leachate per day. This technology will reduce the need for reliance on HRSD for treatment of the landfill leachate. The plant will be constructed at the Regional Landfill and should be operational by mid-2025.

Currently, the SPSA facility leachate production is approximately 50,000 gallons per day. Of that, approximately 20,000 gallons per day is pumped to the Nansemond Treatment Plant under the SWIFT program, however HRSD and SPSA are working together to eliminate this pumping quantity due to the high cost and complexity of treating leachate to meet drinking water standards. The remaining 30,000 gallons per day are hauled by tanker to the Atlantic Treatment Plant. Because SPSA utilizes intergradient landfill design, leachate production is the highest when the landfill first opens due to the waste elevation being below grade. As the waste level rises above grade, leachate is reduced through good operating procedures to shed rainwater and minimizing the size of the landfill working face. It is anticipated that an additional 30,000–50,000 gallons of leachate would be produced per day when the expansion site is first constructed. This would be offset by the closure and reduction of leachate in Cells I–VII.

The Heartland Water Technology, Heartland Concentrator™, leachate evaporation plant, is a direct-contact, low-temperature, high turbulence evaporation system that would be located within the service yard area of the Regional Landfill, where utilities are pre-existing for other operations at the yard. VDEQ determined that the unit would require New Source Review (NSR). The draft NSR was published, and the comment ended on January 31, 2025. The evaporator will be installed once a Construction Permit is issued. SPSA expects the system to be operational by mid-2025. The VDEQ public notice indicates that the "maximum annual emissions of air pollutants from the leachate concentrator system under the proposed permit are expected to be: 18.7 tons per year of particulate matter (PM/PM10/PM2.5); 15.8 tons per year of nitrogen oxides; 26.3 tons per year of carbon monoxide; and 9.5 tons per year of volatile organic compounds. The applicant proposes to use 257.6 million standard cubic feet of natural gas per year. The technology that will be used to control the air pollution from the facility is a mist eliminator for the control of PM, PM10, and PM2.5 emissions from the leachate concentrator; good combustion practices and proper operation, for the control of PM, PM10, PM2.5, and NOx emissions from the enclosed flare. There will be no adverse impact on the air quality near the facility. The air quality will remain in compliance with all applicable federal and state ambient air quality standards." (VDEQ 2024b)

The evaporation system re-uses waste heat generated at the Landfill from sources such as flare gas or engine or generator exhaust. The system also replaces the need for heat exchangers used by traditional evaporators by directly contacting hot gas with wastewater feed within a compact turbulent evaporation zone. The evaporation zone due to its low temperature process, avoids the volatilization of any particulate matter. The then cooled water vapor passes through a high-efficiency three-stage mist-elimination process, and cooled, clean water vapor is discharged through an exhaust stack. The vapor is not expected to have an odor.

The Leachate Evaporator removes the water from the leachate through an evaporation process and the residual would be mixed with a thickening agent and returned to the Landfill as a solid. No leachate material would leave the site.

#### *EPA Waterbody Quality Assessment*

Downstream receiving waters include Burnetts Mill Creek and the Nansemond River, which ultimately drains to the James River and the Chesapeake Bay. Burnetts Mill Creek from its confluence with the Nansemond River to a point approximately one mile downstream of the SPSA property, is listed by the EPA as an impaired waterbody and has been since 2002. As of reporting year 2014, Burnetts Mill Creek is listed as impaired for the following designated uses: aquatic life, fish consumption, open-water aquatic life, shallow water submerged aquatic vegetation, and shell fishing.

Causes of impairment include the presence of noxious aquatic plants, dissolved oxygen depletion, and the presence of fecal coliform and polychlorinated biphenyls (PCBs). Sources listed include agriculture, atmospheric deposition nitrogen, industrial point source discharge, internal nutrient recycling, loss of riparian habitat, and municipal point source discharges. The Nansemond River, both upstream and downstream of the confluence with Burnetts Mill Creek, is listed as having the same impairments for the same duration, but the presence of enterococcus bacteria is also listed as a cause of impairment for the Nansemond River only.

Findings of the Nansemond River Preservation Alliance (NRPA), as reported in their 2018 *State of the Nansemond River and its Tributaries Report Card*, were that the overall health of the waterway is declining, with the river impaired by excess bacteria (fecal coliform), sediment, and phosphorus (NRPA 2018). Recommendations are primarily focused on staffing and enforcement needed to establish achievable goals and corrective actions where development or land disturbers are not in compliance with land disturbance permits. Leachate management systems and permit requirements are designed to protect downstream waterbodies from impairments. Monitoring and reporting support these efforts further.

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, there is potential for short- and long-term adverse effects to water quality. The landfill is associated with ground disturbing activity, with lands under various stages of development, including completed cells that are capped and vegetated, open excavated cells with active disposal activities, and cells for borrow soils, which in turn will be used for disposal activities and finally capped and vegetated in the future. This activity has proceeded under the appropriate state water quality and quantity regulations, as specified and permitted under the Virginia Stormwater Management Act, Erosion and Sediment Control Law, Water Quality Standards, Erosion and Sediment Control Regulations, Solid Waste Management Regulations, City of Suffolk Unified Development Ordinance, and HRSD Industrial Wastewater Discharge Regulations. The landfill has operated for many decades in compliance with its permits and regularly meets its obligations for monitoring and maintenance of facilities and its discharges. However, due to the nature of the landfill activities, there is potential for adverse effects to water quality, which in most cases would be mitigated through on-site stormwater management facilities, best management practices, monitoring and proper maintenance.

#### *Alternative B*

Although stormwater management regulations aim to reduce impacts to water quality due to land use changes from pre-development conditions to post-development conditions, permanent short- and long-term adverse effects are anticipated. The adverse impact is anticipated as a result of the permanent conversion of an existing forested wetland system to a capped landfill system which would reduce infiltration and nutrient uptake. While it is noted that the existing wetlands have the potential to provide water quality benefits, those benefits are realized only for atmospheric pollutants that enter the wetlands from direct precipitation.

Stormwater regulations provide standards to manage, monitor, report and respond to the treatment of water quality and quantity during construction and post development. Off-site stormwater runoff, which typically has higher concentrations of pollutants from construction sites and developed lands, does not drain to the existing wetlands on site where treatment could occur, thus actual water quality benefits are anticipated to be low. Water quality treatment of direct runoff from the proposed borrow pits and landfill operation would be provided from existing and proposed stormwater management facilities, whereas collected leachate would also be treated on-site with a leachate evaporation facility. On-site stormwater management is designed to capture sediment laden runoff during construction and operation to meet water quality standards through reduction in phosphorous and nitrogen. Water quantity is managed to ensure discharges to downstream receiving waters are non-erosive. Stormwater capture and detainment allows sediment to settle prior to discharging to downstream receiving waters.

The Regional Landfill is an established facility with the necessary permits, infrastructure, and systems in place to continue to manage and monitor its water quality discharges as existing cells are capped and new cells are opened, developed, and eventually also capped. The stages of operation would continue with implementation of the applicant's preferred alternative. Cells VIII and IX would initially provide borrow soils for Cell VII as it is converted from borrow pit to disposal area and Cell VI is capped and vegetated. This activity would all be performed under the appropriate state water quality and quantity regulations, as specified and permitted under the Virginia Stormwater Management Act, Erosion and Sediment Control Law, Water Quality Standards, Erosion and Sediment Control Regulations, Solid Waste Management Regulations, City of Suffolk Unified Development Ordinance, and HRSD Industrial Wastewater Discharge Regulations. The landfill has operated for many decades in compliance with its permits and regularly meets it obligations for monitoring and maintenance of facilities and its discharges.

*Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations, to secure an additional 1.52 million CY of disposal capacity and reduce the size of Cell IX by approximately 7.72 acres compared to Alternative B. Permanent short- and long-term adverse effects to water quality are anticipated under Alternative C, and the anticipated stormwater management and  effects are similar in nature to that described in Alternative B.

*Alternative E*

Under Alternative E, which would entail a hybrid approach diverting either 25% or 50% of waste to existing off-site landfill facilities, short- and long-term adverse effects to water quality are expected to be similar in nature to that described in Alternatives B and C. The diversion of waste and resulting reduction in project footprint is not a linear relationship; the diversion of 25% of waste results in a reduction in project area of only 11.7% (or 12.8 acres of saved wetlands as compared to Alternative C), whereas the 50% diversion alternative results in a 34.5% reduction in footprint (or 37.88 acres of saved wetlands as compared to Alternative C). The landscape position and nature of the landfill operation and its support facilities would be consistent with Alternatives B and C, with the reduction in land disturbance of the existing forested wetland, thus under Alternative E, the effects on water quality would be reduced in comparison to those in Alternatives B and C, due to the avoided impact to the forested wetland system.

## Biological Resources

### Wetlands

#### *Methodology*

Wetlands within the study area are regulated and protected under state and federal regulatory programs. Within the Commonwealth of Virginia, activities conducted in wetlands are regulated by the Virginia Tidal Wetlands Act of 1972 and Virginia Code Sections 62.1-44.2 *et seq*. The Corps administers Section 404 of the CWA, which regulates discharges of dredge or fill into wetlands and other WOTUS. Wetlands as defined by the Corps in 33 CFR § 328.3 and by the EPA in 40 CFR § 120.2 are "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

EO 11990, *Protection of Wetlands*, discourages direct or indirect support of new construction impacting wetlands wherever there is a practicable alternative. Wetlands under EO 11990 include isolated and non-jurisdictional wetlands. The process for compliance would be accomplished through completion of the FEIS and practicability analysis for this project.

Under the EPA and Corps definition, a wetland requires the presence of the following 3 parameters:

- Hydric soil: a soil formed under conditions of saturation or flooding long enough to develop anaerobic, or low oxygen, conditions in the upper part;
- A dominance of hydrophytic vegetation: plants adapted for life in habitats with saturated or inundated soils for prolonged periods of time;
- Wetland hydrology: the presence of water at or above the ground surface for a significant duration during the growing season.

This determination is tied to Section 404 of the CWA, which provides for the protection of water quality in WOTUS, including wetlands, and instructs the Corps to issue permits for activities that result in the discharge of dredged or fill material into these areas. Alternatively, the U.S. Fish and Wildlife Service (USFWS) uses the Cowardin definition, which defines wetlands as:

"…lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have 1 or more of the following 3 attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year." (Cowardin et al. 1979)

The USFWS definition is more comprehensive than the EPA and Corps definition, acknowledging that physical or chemical conditions such as wave action, current, or high salinity may prevent development of hydric soils or hydrophytic vegetation in some wetland types. Therefore, some unvegetated or non-hydric soil sites, such as mudflats or high-energy shorelines, may not exhibit all three attributes but are still classified as wetlands.

*Wetland Delineation – Alternatives B, C, & E*

On January 19 and 26, 2022, environmental scientists from HDR performed a formal field delineation of an approximate 137.18-acre study area within the proposed expansion area, including Cells VIII and IX, for wetlands and waterways regulated under Sections 401 and 404 of the CWA (Figure 32). This field investigation was conducted according to the methodologies and guidance described in the Corps' *1987 Wetland Delineation Manual* and the *Atlantic Gulf and Coastal Plain (AGCP) Regional Supplement (Version 2.0)* (USACE 2010). Prior to beginning the on-site fieldwork, scientists conducted a preliminary off-site analysis of publicly available reports and data pertaining to topography, soils, and hydrology at the site. While on site, wetland scientists collected data describing hydrology, soil, and vegetation parameters throughout the study area. Data point locations represented transitions between non-wetland communities and jurisdictional wetlands and other WOTUS. The results of this delineation effort were submitted to the Norfolk District. The Norfolk District visited the site and preliminarily reviewed the delineation on December 7, 2021, and field confirmed the revised version on June 3, 2022. On August 24, 2022, the Norfolk District approved the wetland boundaries or Preliminary Jurisdictional Determination and confirmed that the 137.18-acre Cells VIII and IX expansion area included approximately 133.79 acres of wetlands and 0.93 acres of ditch. The uplands located within the expansion area total approximately 2.46 acres and exist in a linear area between the broad flat wetlands and the ditch along the adjacent utilized landfill cell to the northeast.

Source: Nearmap Imagery Dated February 10, 2022


LEGEND

SPSA Property Boundary

Proposed Expansion Cells VIII & IX

Wetlands (133.79 acres; Confirmed on 08.24.2022 (NAO-2016-00765))

Ditches (0.93 acres)

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 32

**SPSA Regional Landfill Wetland Delineation**

The evaluation of wetland functions and values is an integral part of project review, impacts analysis, and compensatory mitigation planning. The Corps and EPA have long held the policy that the assessment of impacts and the determination of mitigation to achieve a no net loss of wetlands should be based on the functions and values of the impacted wetlands (Dahl 2006).

The assessment of wetland functions and values is founded on the understanding that wetlands differ in their value (to wildlife, listed species, water quality, etc.), differ in the functions they provide, and vary in quality. The degree to which the functional integrity of wetlands differ can often be a matter of opinion. Biases due to personal preferences, perceptions, and individual experiences can also influence comparisons between different wetland types (e.g., emergent marsh versus hardwood swamp). In order to make unbiased comparisons of function and value, wetland scientists have developed assessment methodologies using a wide variety of techniques. The Norfolk District developed a technique called the Wetland Attribute Form (USACE 2020) that is based on the New England Highway Methodology (USACE 1993). This methodology assesses nine functions and values through a "descriptive approach" using both wetland science and judgment in the field. The nine functions and values include:

- Groundwater recharge/discharge;
- Floodflow alteration (storage and desynchronization);
- Fish and shellfish habitat;
- Sediment/pollutant retention;
- Nutrient removal, retention, and transformation;
- Production export (nutrients);
- Streambank erosion/shoreline stabilization;
- Wildlife habitat; and
- Rare/threatened/endangered species.

The Corps guide to the Wetland Attribute Form provides a listing of such characteristics that can be easily referenced on a data form based on "yes" or "no" responses to questions about the wetland being evaluated (USACE 2020). The data form then provides an "unbiased record of the wetland, including its location, function, appearance, and relationship to its adjacent land use" (USACE 2020). If, in the judgment of the evaluator, a particular function is present, justification for identifying that function is documented using descriptive characteristics. This method was applied to the wetlands within the proposed construction footprints for the landfill expansion (Alternatives B, C, and E).

### *Affected Environment*

The proposed SPSA expansion area consists primarily of coastal plain hardwood forested wetlands. Timber harvesting has historically and repeatedly occurred on the SPSA expansion area, most recently around 1992 just prior to SPSA's purchasing of the property, and signs such as old cut stumps are apparent. Additionally, individual cypress trees are scattered on the site and were identified during the field visit with the Norfolk District and EPA. Approximately 133.79 acres of contiguous wetland area and 0.93 acres of ditches were identified within the SPSA expansion area during the field wetland delineation that was approved by the Norfolk District on August 24, 2022 (see Figure 32). Approximately 117.36 acres of the wetland would be located within the proposed construction footprint under Alternative B, 109.64 acres of the wetland would be located within the footprint for Alternative C, and approximately 96.85 acres of the wetland would be located within the footprint for 25% diversion of waste while approximately 71.76 acres of the wetland would be impacted for 50% diversion, representing both scenarios for Hybrid Alternative E.

The USGS Quadrangle Map for Chuckatuck, Virginia indicates that the proposed SPSA expansion area lies at an elevation of approximately 20 ft. above mean sea level and that the site has little change in elevation. The map indicates that the entire site is wetland, and there are no named or USGS mapped streams on site. Ditches are shown along the northeastern boundary of the proposed expansion area and to the southeast of the site (USGS 2019a).

The wetland is composed primarily of hardwood mineral flats. These areas consist of mature hardwood canopy with at least 90% closure. The primary canopy species include swamp chestnut oak (*Quercus michauxii*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). Shrub and sapling cover are low to moderate and consist of sweet pepperbush (*Clethra alnifolia*), American holly (*Ilex opaca*), and highbush blueberry (*Vaccinium fuscatum*). Groundcover is moderate, ranging from 40 to 60% cover, and it is dominated by netted chain fern (*Woodwardia areolata*), switch cane (*Arundinaria tecta*), and cinnamon fern (*Osmundastrum cinnamomeum*), with some areas of Japanese stiltgrass (*Microstegium vimineum*).

Several small pine stands are scattered within the hardwood forest wetland. These areas are dominated by loblolly pine (*Pinus taeda*) with wax myrtle (*Morella cerifera*) and common greenbriar (*Smilax rotundifolia*). Groundcover is low due to a thick layer of pine needle detritus. Hydrology in these areas is similar to the hardwood wetland areas and consists of saturated to inundated soils.

In 2020, SPSA cleared five corridors (authorized under Nationwide Permit 6), each approximately 25 ft. in width, to provide access for the installation and sampling of piezometers to measure the depth of groundwater for wetlands. Impacts associated with this effort were temporary in nature. The hydrology remains unchanged in these corridors, and the vegetation is dominated by bushy bluestem (*Andropogon glomeratus*), dogfennel (*Eupatorium capillifolium*), Japanese stiltgrass, and other weedy pioneer species.

Soils map units present within the SPSA expansion area include Deloss Mucky Loam, Tomotley Loam, and Torhunta Loam (USDA NRCS 2021), all of which are considered hydric. The soils consist of loamy sand to sandy loam and generally exhibit hydric soil indicators, including loamy mucky mineral, depleted matrix, redox dark surface, or depleted dark surface.

Deloss mucky loam is typically found on marine terraces with 0 to 2% slope, and it is composed of loamy marine deposits. It covers approximately 2.5 acres, or 1.9%, of the study area under Alternatives B, C, and E. The hydrologic soil group for Deloss mucky loam is B/D, and the frequency of flooding is rated as none. The soil is very poorly drained with moderate permeability, and the depth to the water table is about 0 in.

Tomotley loam is generally found on nearly level terraces with 0 to 2% slope located in the coastal plain and is composed of loamy marine and fluvial sediments. Tomotley loam covers approximately 63.8 acres, or 48.4%, of the study area. Its hydrologic soil group is B/D, and the frequency of flooding is rated as none. The soil is poorly drained with moderate to moderately slow permeability, and the depth to the water table is typically 0 to 12 in.

Torhunta loam is typically found in swamps with 0 to 2% slope, and it is composed of loamy fluvimarine deposits. It covers approximately 65.4 acres, or 49.7%, of the proposed SPSA expansion site under Alternatives B, C, and E. The hydrologic soil group for Torhunta loam is A/D, and the frequency of flooding is rated as none or frequent. The soil is very poorly drained with moderately rapid permeability, and the depth to the water table is between 6 and 18 in.

Water levels range from saturated soils to up to 4 in. of inundation. In areas that did not exhibit surface water, a high-water table was observed, with water levels less than 6 in. below the soil surface. Water-stained leaves are present throughout the wetland. Soils also exhibit oxidized rhizospheres on living roots. Secondary hydrology indicators include geomorphic position and Facultative (FAC)-neutral test.

NWI identified one primary wetland type within the proposed expansion site under Alternatives B, C, and E. It is a PFO 1Ed which means palustrine (P) forested (FO) wetland dominated by broad-leaved deciduous (1) trees or shrubs with a water regime that is seasonally flooded or saturated (E), and the wetland is partially drained or ditched (d).

The wetland system is directly connected to similar wetlands to the north and ditches along the eastern, southeastern, and western boundaries. Adjacent wetlands are approximately the same elevation, so all areas receive water and fill at the same rate. Excess water from the wetlands drains to the ditches and eventually flows to the Nansemond River.

The wetland assessment, which was conducted using the Wetland Attribute Form, indicated that the wetland located on the SPSA expansion area provides multiple wetland functions and values and that there is no difference between the wetland area that would be impacted by Alternative B compared to Alternative C and Alternative E. Ditches bordering the wetland provide a means for groundwater discharge and recharge, and sandy soils contribute to this function (Function 1). Due to its large size and water storage capacity, the wetland provides substantial floodflow attenuation (Function 2). The ditches associated with the wetland can also provide some fish and shellfish habitat. However, the wetland itself is seasonally inundated and the pools that form when the wetland floods are shallow. Therefore, minimal habitat for fish and shellfish is present (Function 3). The herbaceous vegetation and sheet flow through the wetland remove sediment from the surface water (Function 4), and the vegetation, trees in particular, remove nutrients (Function 5). Production export occurs through wildlife foraging and migration to areas outside the wetland. The wetland has also been logged historically which provided production export, but future logging is not proposed (Function 6). The wetland does not provide protection against streambank and shoreline erosion (Function 7). The complete tree canopy, moderate shrub cover, ample groundcover, and large size provide high-quality nesting and foraging habitat for wildlife. The wetland is also part of a larger contiguous and undeveloped habitat complex that functions as a corridor for migration (Function 8). No protected species were observed during wetland field work, although database searches for state and federally listed species in the area indicated that canebrake rattlesnake (*Crotalus horridus*) has been documented on the site, and Mabee's salamander (*Ambystoma mabeei*) and tri-colored bat (*Perimyotis subflavus*) were documented within 2 miles of the SPSA site. Also, northern long-eared bat (*Myotis septentrionalis*) has the potential to occur on-site per the USFWS' Information for Planning and Consultation (IPaC) search. The SPSA expansion site has no designated critical habitat within its boundaries (Function 9) (USFWS 2021; VDWR 2021; VDCR 2021a). A summary of wetland functions and values for the footprint of the SPSA expansion site is provided in Table 11.

## Table 11. Wetland Functions and Values of the SPSA Expansion Site

| Function | SPSA Expansion Site | |
|---|---|---|
| | Present | Principal Function |
| Groundwater Recharge/Discharge | ● | |
| Floodflow Alteration/Attenuation | ● | |
| Fish and Shellfish Habitat | ● | |
| Sediment/Toxicant Removal | ● | X |
| Nutrient Removal/Retention/ Transformation | ● | X |
| Production Export | ● | |
| Sediment/Shoreline Stabilization | | |
| Wildlife Habitat | ● | X |
| Endangered Species Habitat | ● | |

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, no wetland filling would occur. Once capacity in Cell VII is achieved in 2037, the landfill would be closed and capped. Waste would then be diverted to other disposal sites. Therefore, no wetland impacts would occur at the Regional Landfill location and no permit action from the Norfolk District would be required.

#### *Alternative B*

Under Alternative B, Cells VIII and IX of the landfill and their associated infrastructure would be developed, permanently removing approximately 117.36 acres of forested wetland (see Figure 21). To offset this loss, a combination of mitigation strategies would be used. The design would minimize wetland impacts to the extent practicable, and compensatory mitigation would include purchase of credits from a mitigation bank and wetland preservation. Compensatory mitigation in the form of mitigation bank credits at a 2:1 ratio would replace wetland acreage and address some of the temporal loss of wetland functions. Preservation of on-site wetlands within the area that was slated as future expansion would prevent future cumulative impacts, provide a buffer, and serve as wildlife habitat. The on-site preservation would also prevent future silvicultural operations, allowing for continued growth of the forest and long-term habitat benefits. The preservation of the adjoining property, which contains wetlands and uplands, would provide similar benefits. The preservation of property south of the SPSA site, located next to the Great Dismal Swamp, but within the Nansemond River watershed, would also provide similar functions as the other proposed preservation sites and the proposed expansion site. During construction best management practices, including silt fence and installation of required landfill liners, would be used to protect nearby wetlands. The local area would have a loss of wetland function including loss of wildlife habitat, sediment or nutrient removal, and floodflow attenuation. These functions are also provided in the nearby wetlands proposed for preservation and continue into other parts of the historic Great Dismal Swamp range.

#### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations (see Figure 24), which would secure an additional 1.52 million CY of disposal capacity, plus 14.48 million CY provided by the expansion site. Using this airspace would result in approximately 7.72 fewer acres of wetland impact than Alternative B. Under this alternative, approximately 109.64 acres of wetlands would be removed. Alternative C would reduce wetland impacts compared to Alternative B. Potential mitigation would be similar to that described under Alternative B and would include a combination of mitigation strategies. Best management practices would be used during construction. The loss of wetland functions would be similar to Alternative B but reduced for this alternative.

### *Alternative E*

Under Hybrid Alternative E, two scenarios are explored that are variations of other above-listed alternatives. The new hybrid alternative would provide both a 50% and a 25% diversion scenario in which 50% and 25% of MSW, respectively, would be diverted to private area landfills and the remaining MSW would be landfilled at the Regional Landfill. To landfill the remaining 50% and 75% of waste (under the 50% and 25% diversion scenarios, respectively) that would not be diverted and would continue to need landfilling, SPSA would develop a new cell in the expansion site area with a smaller footprint than Cells VIII and IX as described under Alternatives B and C. Under this alternative, 96.85 acres of wetlands would be removed under a 25% diversion scenario and 71.76 acres of wetlands would be removed under a 50% diversion scenario. Potential mitigation would be similar to that described under Alternative B and would include a combination of mitigation strategies. Best management practices would be used during construction and the loss of wetland functions would be similar to Alternatives B and C but reduced for the two scenarios in the hybrid alternative.

### *Indirect and Secondary Impacts*

The Section 404(b)(1) guidelines state that “secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material.” (40 CFR § 230.11(h)(1)). Although not specifically addressing impacts to aquatic resources, the CEQ regulations define indirect effects as “effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” (40 CFR § 1508.1(i)(2)).

Therefore, indirect effects are the consequences of the direct effects of a proposed action. For example, while the direct effect of filling a wetland would be the loss of the filled wetland area and the functions and values provided by that habitat, the indirect effects to the remaining area would result from the associated changes in wetland size, hydrology, vegetation cover, or degree of habitat fragmentation. These types of effects could adversely affect the ability of the wetland to provide functions and values or could reduce the functions and values to a greater degree than the loss of the portion of wetland area.

Indirect effects would change the ability of an aquatic resource to provide functions and would not affect the adjacent wetlands uniformly, except for some small resources (Forman and Deblinger 2000, Eigenbrod et al. 2009). These functional effects would occur as gradients, with the highest intensity occurring closest to the disturbance and decreasing with distance. The affected wetland areas would also experience the effects differently. For example, canopy gaps would not affect the wetlands and species in the same way or at the same distance. As another example, adverse effects on the ability of the wetlands to support wildlife habitat would be different in type and location than effects on the ability of a wetland to provide sediment or toxicant retention or nutrient transformation.

Indirect effects have been documented to extend more than 300 ft. and up to 900 ft. from roads and other development. There are numerous published studies documenting that development could adversely affect the hydrology of adjacent wetlands and the movement of nutrients, sediment, or wildlife between and within wetlands (Fahrig and Rytwinski 2009, Forman and Deblinger 2000, Van der Ree et al. 2011).

Loss of part of a wetland due to development associated with the project could create a new ecotone at the wetland-fill boundary, causing an "edge effect." An ecotone is a zone which lies at the boundary between two biomes, or habitats, and typically contains plant species characteristic of both habitats (Senft 2009). Community composition of this ecotone would vary due to interspecific competition, which could open these areas to generalist species tolerant of fluctuating conditions, typically consisting of weedy and invasive exotic species. The introduction of a new edge could also reduce biodiversity, which is a function of the length of the edge of the habitat versus the area of the habitat within the wetland. A change in the light regime could also cause a shift in the understory community from species requiring shade to species more tolerant of direct sunlight. Although there would be an edge effect, approximately 23.81 acres of wetlands surrounding the limits of disturbance for the development of Cells VIII and IX would not be disturbed as a result of this project. Invasive species monitoring within this edge area is a component of SPSA's mitigation plan. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII.

Placing fill within a wetland could also result in alterations in hydrology. Because fill reduces the volume of available storage across the wetland, water levels within adjacent wetland areas that are not directly affected could increase. The water level increase would be a function of the volume of fill placed in the wetland and the size of the remaining wetland. Increased water levels could impact wetlands by shifting the composition of the vegetation community to species tolerant of deeper water, causing hydrologic stress to trees that are less tolerant of fluctuations in water level. Increased water levels could also provide opportunities for invasive exotic wetland vegetation to recruit into areas where the vegetation is reduced by hydrologic stress.

As described in the Construction Stages section in Chapter 2, groundwater in the surface aquifer would temporarily be displaced from the zone of excavation due to phased dewatering activities associated with construction. The dewatering system would be installed separately from the leachate collection system to control pressure on the bottom and sides of the expansion site liners, to induce an inward gradient. Based on the radius of influence of sumps used for dewatering Cells V and VI during construction, which were constructed on similar geologic materials, the maximum anticipated radius of influence for dewatering Cells VIII and IX is approximately 1,400 ft. from sumps (HDR 2007, 2008). To date, hydrology of wetlands in the area has not shown a discernible impact from dewatering other area cells. Once sufficient ballast (waste) is added to the cells, dewatering would cease, and the lined bases of Cells VIII and IX would lie within the surface aquifer and displace groundwater locally. Because the SPSA landfill expansion area is contiguous with very large wetland areas, it is anticipated that water level increases under Alternatives B, C, and E would be negligible.

The introduction of fill into a wetland could also cause an alteration in the flow regime and drainage patterns of adjoining wetlands. Due to the relatively flat topography of the site and surrounding lands, the fill would have limited impact on water regime as the additional water has a large, flat area to spread out. As discussed above, construction of the project is not anticipated to result in adverse effects to nearby wetlands. The on-site ditches would intercept surface water flow from the project area and the adjoining wetlands. Also, the perimeter ditch system that would be constructed to prevent runoff from the landfill entering the adjacent areas would capture water that runs off the project area. This perimeter ditch system would help stop the transport of nutrients and sediment from the landfill to adjacent wetlands. The proposed landfill expansion would impact nutrient and sediment transport locally, but not to a large degree within the remaining wetlands due to the nature of the wetlands on the property. The wetlands are broad flat areas where nutrient and sediment transport generally occur at a large-scale during times of abnormal flooding.

Under Alternatives B, C, and E, landfill development would require dewatering of the project footprint during preliminary phased construction activities. The removal of groundwater from the SPSA expansion site could also artificially lower water levels in adjoining wetland areas. This hydrologic change has been shown to reduce plant species richness and shift the community from wetland species to species that are more drought tolerant (Perkins et al. 1984, Patton et al. 2007), as well as reducing overall vegetation cover (Sorenson et al. 1991). In general, plant species that are more tolerant of fluctuations in hydrology would remain or colonize the existing wetland areas, but dewatering the project area would reduce the numbers of species that require consistent wetland hydrology (Patton et al. 2007). The extent and magnitude of drawdown effects is difficult to predict, and they would be dependent on the locations of sumps, cumulative effects of withdrawal, and the rate of groundwater recharge (Winter 1988). Rapid alterations in hydrology may also result in the colonization of the wetland by invasive exotic species, while slower, more progressive changes, or temporary changes, could allow the community to naturally adjust (Bartholomew et al. 2020).

As discussed above, alterations in hydrologic regime can impact the composition of the vegetative community. The unimpacted wetlands would remain forested which is typically a more stable ecosystem during hydrologic shifts than emergent systems. The first vegetation shift to occur in a forested wetland is for emergent vegetation to reflect the new hydrologic condition. The trees may become stressed from the change in the water available to them, which can cause tree mortality in areas with a large hydrologic shift or a longer lasting hydrologic change. Often trees are less vulnerable to mortality during temporary drier hydrologic periods than hydrologic periods that include abnormal flooding. In this case, the dewatering would be a temporary situation that would return to normal after the cells are constructed. The fill within the cell is not anticipated to cause any abnormal flooding conditions within the remaining wetlands due to the broad expanse of wetlands surrounding the site. To better understand the extent and duration of potential indirect and secondary impacts, monitoring and reporting conditions could be considered during the Section 404 permitting process. These conditions could be included as a mitigative measure of the permit requirements.

## Protected Species

### *Methodology*

Pursuant to the ESA, an endangered species is defined as “any species which is in danger of extinction throughout all or a significant portion of its range,” and a threatened species is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 USC § 1532). The ESA protects threatened and endangered species at the federal level, while the Virginia Endangered Species Act and Virginia Endangered Plant and Insect Species Act protect state threatened and endangered species. The federal Bald and Golden Eagle Protection Act protects eagles from take or disturbance (16 USC § 668a et seq.), and USFWS recommends a 660-foot buffer zone between any development or construction and an active eagle nest during nesting season (USFWS 2007). In compliance with these regulations, searches were conducted to determine the presence or potential occurrence of the following: federally and state listed species, active eagle nests and roosts, and suitable habitat for rare, threatened, and endangered species.

Resources used to identify rare, threatened, and endangered species and their preferred habitat within the project area included the USFWS Information for Planning and Consultation (IPaC) system; the VDWR Virginia Fish and Wildlife Information Service (VaFWIS); the VDCR Natural Heritage Data Explorer (NHDE), and The Center for Conservation Biology (CCB) Virginia Bald Eagle Nest Locator. The IpaC (USFWS 2021), VaFWIS (VDWR 2021), and NHDE (VDCR 2021b) databases were used to identify rare, threatened, and endangered species that have been reported or have the potential to occur on or near the SPSA expansion area (Alternatives B, C, and E). This information was also used to identify suitable habitat for any rare, threatened, and endangered species, as well as designated critical habitat. The CCB Virginia Bald Eagle Nest Locator was used to identify the locations of nearby bald eagle (*Haliaeetus leucocephalus*) nests and roosts and to ensure there is, at a minimum, a buffer of 660 ft. between active eagle nests and the SPSA expansion area.

### *Affected Environment*

Table 12 below provides a list of federal and state protected species based on the results of the searches described above. It is divided into species that have suitable habitat within the expansion area and those with limited or no habitat within the project area.

The VaFWIS database indicated that the canebrake rattlesnake (state Endangered) was reported within the SPSA expansion site. Mabee’s salamander (state Threatened) and tri-colored bat (state Endangered) have been documented within 2 miles of the SPSA expansion site. The VaFWIS search and the IpaC search identified two additional species, the northern long-eared bat (state and federally endangered) and the red-cockaded woodpecker (state and federally endangered), that have the potential to occur within the SPSA expansion site. Both species are of high priority to federal and state wildlife conservation. The red-cockaded woodpecker in particular is in imminent danger of extinction in the Commonwealth of Virginia, and the nearby Great Dismal Swamp NWR contains suitable and occupied habitat. The other 15 species identified by the search have neither been observed on or near the SPSA expansion area nor is there suitable habitat within or adjacent to the expansion area.

### Table 12. Federal and State Listed Wildlife Species Potentially Occurring Within the Alternative Study Area

| Listed Species | Scientific Name | Federal Status | State Status | Confirmed on SPSA Site |
|---|---|---|---|---|
| Species with Potential Habitat within the Alternative Study Areas | | | | |
| Canebrake rattlesnake | *Crotalus horridus* | | SE | Confirmed |
| Mabee's salamander | *Ambystoma mabeei* | | ST | |
| Northern long-eared bat | *Myotis septentrionalis* | FE | SE | |
| Red-cockaded woodpecker | *Picoides borealis* | FE | SE | |
| Tri-colored bat | *Perimyotis subflavus* | Proposed FE | SE | |
| Species with Limited or No Suitable Habitat within the Alternative Study Areas | | | | |
| Atlantic sturgeon | *Acipenser oxyrinchus* | FE | SE | |
| Bachman's sparrow | *Peucaea aestivalis* | | ST | |
| Dwarf Wedgemussel | *Alasmidonta heterodon* | FE | SE | |
| Eastern black rail | *Laterallus jamaicensis* | FT | SE | |
| Henslow's sparrow | *Centronyx henslowii* | | ST | |
| Kemp's Ridley sea turtle | *Lepidochelys kempii* | FE | SE | |
| Little brown bat | *Myotis lucifugus* | | SE | |
| Loggerhead sea turtle | *Caretta caretta* | FT | ST | |
| Loggerhead shrike | *Lanius ludovicianus* | | ST | |
| Peregrine falcon | *Falco peregrinus* | | ST | |
| Piping plover | *Charadrius melodus* | FT | ST | |
| Rafinesque's eastern big-eared Bat | *Corynorhinus rafinesquii macrotis* | | SE | |
| Red knot | *Calidris canutus rufa* | FT | ST | |
| Roanoke logperch | *Percina rex* | FE | SE | |
| Yellow lance | *Eliptio lanceolata* | FT | ST | |

FE = Federally Endangered; FT = Federally Threatened; SE = State Endangered; ST = State Threatened
Source: USFWS IpaC (2021), VDWR VaFWIS database (2021), VDCR NHDE (2021b)

### *Canebrake Rattlesnake*

According to the VaFWIS, there are several documented sightings of canebrake rattlesnake, or canebrake, in the SPSA expansion area, with the most recent occurring in 2009. The canebrake is a snake in the viper family that is native to southeastern Virginia, and it is listed as endangered by the Commonwealth of Virginia. The canebrake is not federally listed. Although technically the same species, the mountainous population of timber rattlesnakes is considered distinct from the southeastern canebrake population, and only the southeastern canebrake is designated as endangered. Therefore, only the southeastern canebrake population is discussed in this analysis.

The VaFWIS indicates that canebrakes occupy a wide range of habitats, including swamps, cane fields, low pine flatwoods, moist woodlands, floodplains, open areas, creek bottoms, rocky ridges, fallow agricultural fields, thickly wooded areas, and areas full of fallen logs (VDWR 2011, 2021). In a coastal plain population in Hampton County, South Carolina, canebrakes exhibited seasonal and sex-based variation in habitat selection (Waldron et al. 2006a). The snakes observed had three behaviorally based seasons: the foraging season (April-July), breeding season (August-October), and hibernation (November-March). During the foraging season, when snakes emerged from hibernation and began foraging, males favored bottomland hardwood forests, whereas females preferred pine-hardwood forests. However, both sexes tended to associate with fields during the breeding season and pine-hardwood forests during hibernation (Waldron et al. 2006a).

Across their range, canebrakes maintain large home ranges. Male snakes in Hampton County are estimated to inhabit home ranges of approximately 48 hectares, with females occupying closer to 30 hectares (Waldron et al. 2006b). It is anticipated that the South Carolina population, which is not state listed, behaves similarly to the endangered canebrakes in Virginia (Waldron et al. 2006a).

The snakes' foraging habitat includes live trees, fallen logs, and other cover types near small mammal runways. Canebrakes are ambush predators, and in southeastern Virginia, they primarily consume small mammals, including eastern gray squirrels (Sciurus carolinensis) and cotton rats (Sigmodon hispidus) (Goetz et al. 2016; VDWR 2011).

In its current condition, the SPSA expansion area provides suitable habitat for canebrakes. The area contains hardwoods, cane, and piles of fallen trees, as well as moist woodlands and swamps, all potential canebrake habitat. With more than 133 acres of contiguous forested wetlands, the site is also large enough to support the vast home ranges of numerous individuals. Given the presence of suitable habitat and previous on-site observations of canebrakes, this species is likely to be found within the SPSA expansion area.

### *Mabee's Salamander*

The Mabee's salamander has been previously observed adjacent to the SPSA expansion area, with one sighting documented by VaFWIS from 1900 (VDWR 2021). These small, stout ambystomatid salamanders, or mole salamanders, are listed as threatened in the Commonwealth of Virginia but are not federally listed (VDWR 2021). Recent occupancy data suggest that they are declining in southeastern Virginia (Fairman et al. 2013). Although the exact cause of this decline is unknown, potential contributing factors include habitat loss, habitat fragmentation, and range reductions due to climate change (Sevin and Kleopfer 2015; Sutton et al. 2015). A study indicated that human activity and land development from 1992 to 2001 caused a loss of suitable habitat in southeastern Virginia that presumably had adverse effects on Mabee's salamander populations (Niccoli and Kleopfer 2013), and those adverse effects are likely to have increased as development has continued to increase.

The VaFWIS states that Mabee's salamanders breed from late fall to early spring in fish-free vernal pools, in which young larval salamanders remain until they metamorphose, or develop, into juveniles. Juveniles and adults live a terrestrial life outside of the breeding season (VDWR 2021). They tend to inhabit savannas, bog and pond edges, low wet woods, and swamps, where they are often found in burrows or under logs (VDWR 2021). Although adults are terrestrial, Mabee's salamander reproduction is aquatic. During the breeding season, these salamanders favor large ponds with a higher proportion of grass and a relatively low number of trees and shrubs (Fairman et al. 2013).

The SPSA expansion area contains swamps with logs and other refugia required by this species, as well as hydrology that ranges from saturated to shallowly inundated, all of which could support terrestrial juvenile and adult salamanders. However, Mabee's salamanders prefer large ponds surrounded by more grass than trees and scrub (Fairman et al. 2013). Further, the salamanders require grassy, fish-free vernal pools for breeding (VDWR 2021). Vernal pools were not identified on-site during wetland delineations and pedestrian surveys. It is unlikely that Mabee's salamanders would migrate the required distance from their breeding habitat to use the SPSA expansion area. Because no breeding habitat is available on-site, Mabee's salamanders are not anticipated to be present within the SPSA expansion area.

### *Tri-colored Bat*

Although it is proposed to be federally listed as endangered, the tri-colored bat is listed as endangered by the Commonwealth of Virginia. It has been reported near the SPSA expansion area, with a documented observation from 1996 (VDWR 2021). According to VaFWIS, these bats can be found in caves, trees, vegetation, cliffs, barns, and sometimes in buildings and in wooded and cleared areas (VDWR 2021).

Tri-colored bats hibernate in caves throughout their range, and some roost in caves year-round (VDWR 2021). As a result, tri-colored bats have been impacted by White-nose Syndrome (WNS), a fungus first identified in 2006 that has caused widespread mortality of cave-hibernating bat species (Blehert et al. 2009). In 2012, a marked decline in tri-colored bat abundance was reported in West Virginia after WNS infected the population (Francl et al. 2012). A comparison of data from 2003-2004, pre-WNS, to data from 2016-2018, post-WNS, determined there was a significant reduction in both the distribution and abundance of tri-colored bats in the National Capitol Region (i.e., the area around Washington, D.C.) (Deeley et al. 2021). White-nose Syndrome infection of cave-hibernating bats poses the main threat to this species.

There is suitable roosting and foraging habitat for the tri-colored bat within the SPSA expansion area, as there are abundant trees and vegetation. According to the VDWR, during the winter, tri-colored bats hibernate in caves exclusively in the western region of Virginia (2020a). These bats then disperse after hibernation, sometimes migrating long distances, and can be found across the entire Commonwealth of Virginia in the summer (VDWR 2020a). Thus, tri-colored bats may be present within the SPSA expansion area during the warmer months while they are nesting and foraging.

#### *Northern Long-eared Bat*

The northern long-eared bat was identified by several searches as having the potential to occur on or near the SPSA expansion, although there are no confirmed observations on record for either site. These bats are listed as endangered at both the state and federal level. On November 29, 2022 the USFWS published a final rule to reclassify the northern long-eared bats as endangered under the Endangered Species Act. The effective date to reclassify the species from threatened to endangered was subsequently delayed from January 30, 2023, to March 31, 2023. According to VaFWIS, northern long-eared bats inhabit forested areas, foraging in hillsides and ridge forests and frequenting the space in the forest just above shrub level (VDWR 2021). During the spring and summer, males typically roost in caves, while females can be found under tree bark. There is evidence that northern long-eared bats often roost under the bark of pine snags (Rojas et al. 2017). Across their range, northern long-eared bats have been observed roosting in a number of different tree species, including black locust (*Robinia pseudo-acacia*; Menzel et al. 2002), shortleaf pine (*Pinus echinata*; Perry and Thill 2007), white pine (*Pinus strobus*; Rojas et al. 2017), and some hardwoods (Perry and Thill 2007). Like the tri-colored bat, both males and females hibernate in caves in western Virginia during the winter, dispersing across the state during the summer (VDWR 2020b).

As a cave-hibernating species, the northern long-eared bat is also impacted by WNS (Blehert et al. 2009), which has led to significant declines in their numbers. In western Virginia, the rate of capture of northern long-eared bats in 2011-2013, after WNS onset, was markedly lower than it was between 1990 and 2009, before the bats were impacted by WNS, suggesting population declines as a result of WNS (Reynolds et al. 2016). Further, the proportion of juveniles declined by nearly 77% over this period, evidence that WNS not only caused population declines but also impacted the future viability of northern long-eared bats in the area (Reynolds et al. 2016). According to USFWS (2020), WNS is by far the most pressing threat to this species. However, loss or degradation of winter hibernacula and summer roosting habitat has exacerbated these declines, as they further impact population viability. Since there are pines and hardwoods in the SPSA expansion area, there is suitable northern long-eared bat roosting habitat within the SPSA expansion site.

#### *Red-cockaded Woodpecker*

The final species of concern identified by this search was the red-cockaded woodpecker. According to VaFWIS, there are no recorded observations of this species on or adjacent to the SPSA expansion area. The red-cockaded woodpecker is listed as endangered at both the state and federal level, and it has been in imminent danger of extinction in Virginia since the 1980s (Watts and Harding 2007). This species is included in this analysis because of the expansion area's proximity to the Great Dismal Swamp NWR, which is a site of ongoing active red-cockaded woodpecker management.

According to VaFWIS, this highly specialized woodpecker is found strictly in open pinewoods, with a preference towards longleaf pines. The birds excavate nesting cavities in mature to overmature live pines, often selecting trees that have been infected with a fungus causing red heart disease. In southeastern Virginia, loblolly pine is most often used for cavity excavation (VDWR 2021). The excavated roost and nest trees, often used for several generations, are directly linked to woodpecker distribution, group size, and reproductive success (Ligon 1970). Thus, they are critical to the birds' survival in a given area. These birds tend to forage in large, live pines (VDWR 2021). High quality foraging and nesting habitat, determined based on preferences of the more abundant North Carolina population, consists of medium to large, old-growth pines at intermediate densities with little to no pine or hardwood midstory (Walters et al. 2002).

In Virginia, destruction of red-cockaded woodpecker habitat by the timber industry has led to marked population declines over the past several decades (Watts and Harding 2007). The entire known breeding population of red-cockaded woodpeckers in Virginia is in the Piney Grove Preserve in Sussex County, where 13 breeding groups are now being actively managed (Watts et al. 2020). This highly restricted distribution leaves the species extremely vulnerable to local extinction due to unpredictable catastrophic events such as storms or disease. As a result, beginning in 2015, several woodpeckers were translocated into the Great Dismal Swamp NWR, which also contains suitable habitat (Watts et al. 2020). As of 2019, 3 potential breeding groups of red-cockaded woodpeckers were identified in the Great Dismal Swamp NWR (Watts et al. 2020). The endangered red-cockaded woodpecker is still incredibly rare in the state. The expansion area is adjacent to the Great Dismal Swamp NWR, the site of continued active red-cockaded woodpecker management, and only 18 individuals were recorded in the NWR in 2019 (Watts et al. 2020).

While some dispersal has been reported (Watts and Harding 2007), it is very unlikely that red-cockaded woodpeckers would be found in the SPSA expansion site. This is especially true because the SPSA site is separated from the Great Dismal Swamp NWR by several roads and infrastructure for an active landfill, fragmenting any potential wildlife corridor. However, hardwoods dominate the site, and it has moderate groundcover, making it less than ideal habitat for this highly specialized bird. Based on habitat characteristics and the species' rarity, it is unlikely to be present in the SPSA expansion site.

#### *Protected Eagle Species*

According to the CCB Virginia Eagle Nest Locator, there is a bald eagle roost approximately 1 mile to the southeast of the SPSA expansion site. The nearest active bald eagle nest is located approximately 2.5 miles west of the SPSA expansion area.

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, there would be no adverse effects to protected species and habitats.

#### *Alternative B*

Alternative B involves the development of the expansion area (Cells VIII and IX) to increase the footprint of the landfill. This alternative would remove all existing wildlife habitat from the expansion area, including approximately 117 acres of wetlands. It would require the clearing of trees and vegetation and the draining of water features across the entire expansion area. This would lead to adverse effects for several of the species of concern identified here.

Direct effects to some species identified here would be anticipated during activities associated with construction of the landfill expansion. As construction occurs, collisions with work vehicles or crushing could occur. Other project actions could also cause injury or mortality to wildlife on-site. The canebrake rattlesnake, if present on-site, are anticipated to be the most affected by these temporary impacts since they are less mobile. Northern long-eared bats and tri-colored bats could also be affected by these temporary impacts. However, they would be less likely to be injured or killed during development because they could fly out of the affected area. Also, time-of-year restrictions may be required for the project; these limitations would minimize the direct impact of construction activities on bat species. The same is true of the red-cockaded woodpecker, although it is very unlikely that this species is present in the project area given its rarity throughout the state.

Additional direct, temporary, and permanent effects include disturbance due to noise, vibration, and human presence during construction, both within and adjacent to the expansion area. This disturbance could cause wildlife on or near the expansion area to disperse or potentially abandon breeding attempts, foraging opportunities, or shelter from predators. It could also cause stress for wildlife, which could have adverse behavioral and physical impacts that could lead to injury or mortality.

Alternative B would also cause direct, permanent adverse effects to the species identified here, as suitable habitat would be lost when the forested wetlands within the expansion area are cleared and drained to expand the landfill. Suitable habitat for canebrake rattlesnakes, tri-colored bats, and northern long-eared bats would be lost. Once construction is completed, the project area could no longer support these species. The construction of additional cells may adversely impact canebrakes using the SPSA property as part of their home range. SPSA is coordinating mitigation efforts with VDWR to ensure compliance with the Virginia Endangered Species Act. As recommended by VDWR, SPSA is proposing to compensate for loss of habitat by placing a conservation easement over 112.89 acres of land adjacent to the project area.

Also, as described above in the “Wetlands” section, development associated with Alternative B would create a new ecotone at the edge of the adjacent wetland areas, and the hydrology of nearby wetland areas could be adversely affected by on-site dewatering activities. This could lead to changes in the vegetation community composition, which could alter the use of the habitat by protected species.

Eagle roosts and nests in the vicinity of the Alternative B expansion area are well outside the required 660-ft. buffer. Therefore, no disturbance to protected eagles or their nests would occur as a result of this project.

#### *Alternative C*

Under Alternative C, the airspace between the existing Cells V and VI would be utilized for waste disposal, reducing the footprint of the new development and the area of wetland cleared by approximately 7.72 acres. Under Alternative C, temporary, permanent, and direct effects to protected species and their habitats would be very similar to the effects that would be incurred by Alternative B, although 7.72 fewer acres of habitat would be impacted.

The nearest active eagle nest is closer to the proposed expansion area under Alternative C than to that of Alternative B. However, at approximately 2 miles from the project site, it is still well outside of the required 660-ft. buffer. Therefore, no adverse impacts to protected eagle species are anticipated.

#### *Alternative E*

Hybrid Alternative E involves the development of a reduced portion of the expansion area (Cells VIII and IX) to increase capacity of the Regional Landfill. Within the hybrid alternative are two scenarios: 50% diversion of waste and 25% diversion of waste, allowing landfill development for the remaining amount to be landfilled. This alternative would remove all existing wildlife habitat from a portion of the expansion area, including approximately 71.76 or 96.85 acres respectively of wetlands. It would require the clearing of trees and vegetation and phased dewatering across a portion of the expansion area. Direct, temporary effects to some species would be anticipated during activities associated with construction of the landfill expansion. Under Alternative E, temporary, permanent, and direct effects to protected species and their habitats would be very similar to the effects that would be incurred by Alternatives B and C, although fewer acres of habitat would be impacted.

The nearest active eagle nest is approximately two miles from the project site and is still well outside of the required 660-ft. buffer. Therefore, no adverse impacts to protected eagle species are anticipated.

## Migratory Birds

### *Methodology*

The Migratory Bird Treaty Act of 1918 (MBTA) protects migratory birds, their parts, nests, and eggs from take, kill, capture, transport, sale, and several other actions detrimental to these species, except when authorized by the USFWS (16 USC § 703 et seq.). The MBTA provides protection for a variety of bird species native to the U.S. that are not listed at the state or federal level and are therefore not protected by the ESA.

Virginia is on the Atlantic flyway, a major migratory route spanning more than 3,000 miles from Baffin Island in Canada to northern South America (Ducks Unlimited 2021). A diverse array of bird species travel this route every fall and spring. Common migratory species that pass through Virginia on the Atlantic flyway include waterfowl such as gadwall (*Mareca strepera*), blue-winged teal (*Spatula discors*), northern shoveler (*Spatula clypeata*), northern pintail (*Anas acuta*), and American coot (*Fulica americana*); raptors such as northern harrier (*Circus hudsonius*), American kestrel (*Falco sparverius*), and sharp-shinned hawk (*Accipiter striatus*); shorebirds such as semipalmated plover (*Charadrius semipalmatus*), greater yellowlegs (*Tringa melanoleuca*), least sandpiper (*Calidris minutilla*), and short-billed dowitcher (*Limnodromus griseus*); and terrestrial songbirds such as eastern phoebe (*Sayornis phoebe*), palm warbler (*Setophaga palmarum*), gray catbird (*Dumetella carolinensis*), American robin (*Turdus migratorius*), ruby-crowned kinglet (*Regulus calendula*), chipping sparrow (*Spizella passerine*), and Baltimore oriole (*Icterus galbula*). Migratory songbirds (also called passerines) are found in hardwood and pine forested habitats; waterfowl on lakes and impoundments; shorebirds on beaches and flooded agricultural fields; and raptors across a wide variety of habitats including forests, fields, urban areas, and shorelines.

In compliance with the MBTA, searches were conducted to determine the presence or potential occurrence of the following within or near the SPSA expansion site: migratory bird species (including passerines, raptors, shorebirds, and others), waterbird nesting colonies, shorebird roosts, osprey nests, heron pairs, and suitable habitat for any migratory birds.

Resources used to identify migratory shorebirds, waterfowl, raptors, and passerines and their preferred habitat included the VDWR VaFWIS and The Cornell Lab of Ornithology eBird database (eBird). Several resources from the CCB Mapping Portal were also used to screen for known nests and roosts on or near the project area, including CCB

Shorebird Roost Registry, CCB Colonial Waterbirds mapping tool, CCB Chesapeake Bay Herons mapping tool, and CCB Osprey Watch Nest mapper.

This section discusses birds protected by the MBTA only. Federally and state listed bird species covered by the federal or state ESA, as well as protected eagle species covered by the Bald and Golden Eagle Protection Act, are discussed in the previous "Protected Species" section. These species will not be discussed further here.

### *Affected Environment*

The CCB Mapping Portal identified no waterbird colonies, shorebird roosts, or heron pairs on or near the expansion area for Alternatives B, C, and E. However, one osprey nest was identified approximately 5,000 ft. from the SPSA expansion site. The identified nest was documented by Osprey Watch, a global reporting program through which volunteers monitor and document breeding osprey (CCB 2019).

According to VaFWIS, the expansion area search radius (which included a 2-mile radius around the approximate project center) intersects two Breeding Bird Survey (BBS) blocks – the Suffolk Block and the Chuckatuck Block. The BBS occurs annually within set blocks across North America. Volunteers skilled in avian identification walk an assigned route within a BBS block during the breeding season, identifying and documenting all birds observed along the way (USGS 2021). This provides a valuable estimate of the variety and abundance of birds in a specific area. While the Suffolk and Chuckatuck Blocks do not completely overlap the project area, the BBS data from these blocks provides information on the types of birds likely to occur on-site.

The Chuckatuck Block overlaps over two-thirds of the search area. Within this block, 63 species were observed, including a number of species that are anticipated to occur in the forested wetland habitat within the expansion area, such as belted kingfisher (*Megaceryle alcyon*), black-and-white warbler (*Mniotilta varia*), red-winged blackbird (*Agelaius phoeniceus*), and green heron (*Butorides virescens*) (VDWR 2021). The Suffolk Block, which intersects only less than one-quarter of the search area, contains data on 76 species, some of which overlap with those observed in the Chuckatuck Block. These included a number of species anticipated to occur in forested wetland habitat, such as northern flicker (*Colaptes auratus*), fish crow (*Corvus ossifragus*), wood duck (*Aix sponsa*), and ovenbird (*Seiurus aurocapilla*; VDWR 2021). It should be noted, however, that the observations registered within both BBS blocks all occurred during the 1980s.

Publicly available data from eBird, a database that compiles bird species and abundance data reported by citizen scientists from around the globe, revealed no records within the expansion area. This is likely due to the limited public access to SPSA-owned land. The nearest eBird "hotspot," a location with several submitted eBird user observation lists, is the "Great Dismal Swamp NWR – Williamson Ditch" site. Seven eBird checklists have been submitted from this hotspot, which is centered around a point approximately 2 miles to the southeast of the expansion area (The Cornell Lab of Ornithology 2021). A total of 58 bird species were observed across the 7 lists submitted from this site, with the most recent observations recorded in April 2021 (The Cornell Lab of Ornithology 2021). Many of the species reported here were similar to those recorded by the BBS. Data from eBird must be treated more cautiously, however, as observations are reported from approximate locations by everyday citizens with varying skills in avian identification and count estimation. Migratory species reported at the Williamson Ditch hotspot that are anticipated to occur in forested wetlands like those on-site include prothonotary warbler (*Protonotaria citrea*), red-eyed vireo (*Vireo olivaceus*), great blue heron (*Ardea herodias*), and great crested flycatcher (*Myiarchus crinitus*) (The Cornell Lab of Ornithology 2021).

In total, the CCB Mapping Portal, eBird, and BBS data combined identified 101 distinct bird species that have been observed on or near the project area. A complete list of all species identified through these databases is provided in Table 13. The CCB Mapping Portal identified only one MBTA-protected species, the osprey (2021). As a result, the source databases indicated for each species in Table 13 consist of either the Chuckatuck Breeding Bird Survey block (CBBS), the Suffolk Breeding Bird Survey block (SBBS), or eBird; CCB Mapping Portal was not included. Of the 101 species listed in Table 13, only four species are not covered by MBTA protections. These are the European starling (*Sturnus vulgaris*), the house sparrow (*Passer domesticus*), the northern bobwhite (*Colinus virginianus*), and the rock pigeon (*Columba livia*). All others are protected by the MBTA and have some likelihood of being found in forested wetland habitat.

**Table 13. Migratory Birds Observed on or Near the SPSA Expanion Site**

| Species | Scientific Name | MBTA Protection | Source Database(s) | | |
|---|---|---|---|---|---|
| Acadian flycatcher | *Empidonax virescens* | Yes | CBBS | SBBS | |
| American coot | *Fulica americana* | Yes | | SBBS | |
| American crow | *Corvus brachyrhynchos* | Yes | CBBS | SBBS | eBird |
| American goldfinch | *Spinus tristis* | Yes | CBBS | SBBS | eBird |
| American kestrel | *Falco sparverius* | Yes | CBBS | SBBS | eBird |
| American robin | *Turdus migratorius* | Yes | CBBS | SBBS | eBird |
| Bald eagle | *Haliaeetus leucocephalus* | Yes | | SBBS | |
| Baltimore oriole | *Icterus galbula* | Yes | | SBBS | |
| Barn swallow | *Hirundo rustica* | Yes | CBBS | SBBS | |
| Barred owl | *Strix varia* | Yes | | SBBS | |
| Belted kingfisher | *Megaceryle alcyon* | Yes | CBBS | SBBS | eBird |
| Black vulture | *Coragyps atratus* | Yes | CBBS | SBBS | eBird |
| Black-and-white warbler | *Mniotilta varia* | Yes | CBBS | SBBS | |
| Black-throated green warbler | *Dendroica virens* | Yes | | SBBS | eBird |
| Blue grosbeak | *Passerina caerulea* | Yes | CBBS | | |
| Blue jay | *Cyanocitta cristata* | Yes | CBBS | SBBS | eBird |

| Species | Scientific Name | MBTA Protection | Source Database(s) | | |
|---|---|---|---|---|---|
| Blue-gray gnatcatcher | *Polioptila caerulea* | Yes | CBBS | SBBS | eBird |
| Brown creeper | *Certhia americana* | Yes | | | eBird |
| Brown thrasher | *Toxostoma rufum* | Yes | CBBS | SBBS | eBird |
| Brown-headed cowbird | *Molothrus ater* | Yes | CBBS | SBBS | |
| Brown-headed nuthatch | *Sitta pusilla* | Yes | | SBBS | |
| Carolina chickadee | *Poecile carolinensis* | Yes | CBBS | SBBS | eBird |
| Carolina wren | *Thryothorus ludovicianus* | Yes | CBBS | SBBS | eBird |
| Cedar waxwing | *Bombycilla cedrorum* | Yes | | SBBS | eBird |
| Chimney swift | *Chaetura pelagica* | Yes | CBBS | | eBird |
| Chipping sparrow | *Spizella passerina* | Yes | | SBBS | eBird |
| Common grackle | *Quiscalus quiscula* | Yes | CBBS | SBBS | |
| Common yellowthroat | *Geothlypis trichas* | Yes | CBBS | SBBS | eBird |
| Dark-eyed junco | *Junco hyemalis* | Yes | | | eBird |
| Double-crested cormorant | *Phalacrocorax auritus* | Yes | | SBBS | |
| Downy woodpecker | *Picoides pubescens* | Yes | CBBS | SBBS | eBird |
| Eastern bluebird | *Sialia sialis* | Yes | CBBS | SBBS | eBird |
| Eastern meadowlark | *Sturnella magna* | Yes | CBBS | | |
| Eastern phoebe | *Sayornis phoebe* | Yes | | | eBird |
| Eastern screech owl | *Megascops asio* | Yes | CBBS | | |
| Eastern towhee | *Pipilo erythrophthalmus* | Yes | CBBS | SBBS | eBird |
| Eastern whip-poor-will | *Antrostomus vociferus* | Yes | CBBS | | |
| Eastern wood-pewee | *Contopus virens* | Yes | CBBS | SBBS | |
| European starling | *Sturnus vulgaris* | **No** | CBBS | SBBS | eBird |
| Field sparrow | *Spizella pusilla* | Yes | | | eBird |
| Fish crow | *Corvus ossifragus* | Yes | | SBBS | |
| Golden-crowned kinglet | *Regulus satrapa* | Yes | | | eBird |
| Gray catbird | *Dumetella carolinensis* | Yes | | SBBS | eBird |
| Great black-backed gull | *Larus marinus* | Yes | | SBBS | |
| Great blue heron | *Ardea herodias* | Yes | CBBS | SBBS | eBird |
| Great crested flycatcher | *Myiarchus crinitus* | Yes | CBBS | SBBS | eBird |
| Green heron | *Butorides virescens* | Yes | CBBS | SBBS | eBird |
| Hairy woodpecker | *Picoides villosus* | Yes | | SBBS | eBird |
| Hermit thrush | *Catharus guttatus* | Yes | | | eBird |
| Hooded warbler | *Wilsonia citrina* | Yes | CBBS | SBBS | eBird |
| House finch | *Carpodacus mexicanus* | Yes | | SBBS | |
| House sparrow | *Passer domesticus* | **No** | CBBS | SBBS | |
| Indigo bunting | *Passerina cyanea* | Yes | CBBS | | |
| Killdeer | *Charadrius vociferus* | Yes | CBBS | SBBS | |
| Laughing gull | *Leucophaeus atricilla* | Yes | CBBS | SBBS | |

| Species | Scientific Name | MBTA Protection | Source Database(s) | | |
|---|---|---|---|---|---|
| Louisiana waterthrush | *Parkesia motacilla* | Yes | CBBS | SBBS | |
| Marsh wren | *Cistothorus palustris* | Yes | CBBS | | |
| Mourning dove | *Zenaida macroura* | Yes | CBBS | SBBS | eBird |
| Northern bobwhite | *Colinus virginianus* | **No** | CBBS | | |
| Northern cardinal | *Cardinalis cardinalis* | Yes | CBBS | SBBS | eBird |
| Northern flicker | *Colaptes auratus* | Yes | CBBS | SBBS | eBird |
| Northern harrier | *Circus hudsonius* | Yes | | | eBird |
| Northern mockingbird | *Mimus polyglottos* | Yes | CBBS | | |
| Northern parula | *Parula americana* | Yes | | SBBS | |
| Northern rough-winged swallow | *Stelgidopteryx serripennis* | Yes | CBBS | | |
| Orchard oriole | *Icterus spurius* | Yes | CBBS | | |
| Osprey | *Pandion haliaetus* | Yes | | SBBS | |
| Ovenbird | *Seiurus aurocapillus* | Yes | CBBS | SBBS | eBird |
| Pileated woodpecker | *Dryocopus pileatus* | Yes | CBBS | SBBS | eBird |
| Pine warbler | *Dendroica pinus* | Yes | CBBS | SBBS | |
| Prairie warbler | *Dendroica discolor* | Yes | | SBBS | eBird |
| Prothonotary warbler | *Protonotaria citrea* | Yes | | SBBS | eBird |
| Red-bellied woodpecker | *Melanerpes carolinus* | Yes | CBBS | SBBS | eBird |
| Red-eyed vireo | *Vireo olivaceus* | Yes | CBBS | SBBS | eBird |
| Red-shouldered hawk | *Buteo lineatus* | Yes | | SBBS | eBird |
| Red-tailed hawk | *Buteo jamaicensis* | Yes | CBBS | SBBS | eBird |
| Red-winged blackbird | *Agelaius phoeniceus* | Yes | CBBS | SBBS | eBird |
| Ring-billed gull | *Larus delawarensis* | Yes | | | eBird |
| Rock pigeon | *Columba livia* | **No** | CBBS | SBBS | eBird |
| Royal tern | *Thalasseus maximus* | Yes | | SBBS | |
| Ruby-crowned kinglet | *Regulus calendula* | Yes | | | eBird |
| Ruby-throated hummingbird | *Archilochus colubris* | Yes | CBBS | SBBS | |
| Scarlet tanager | *Piranga olivacea* | Yes | | SBBS | |
| Song sparrow | *Melospiza melodia* | Yes | CBBS | | |
| Spotted sandpiper | *Actitis macularius* | Yes | | SBBS | |
| Summer tanager | *Piranga rubra* | Yes | CBBS | SBBS | |
| Swainson's warbler | *Limnothlypis swainsonii* | Yes | | SBBS | eBird |
| Tufted titmouse | *Baeolophus bicolor* | Yes | CBBS | SBBS | eBird |
| Turkey vulture | *Cathartes aura* | Yes | CBBS | SBBS | eBird |
| White-breasted nuthatch | *Sitta carolinensis* | Yes | CBBS | SBBS | eBird |
| White-eyed vireo | *Vireo griseus* | Yes | CBBS | SBBS | eBird |
| White-throated sparrow | *Zonotrichia albicollis* | Yes | | | eBird |
| Wood duck | *Aix sponsa* | Yes | | SBBS | eBird |
| Wood thrush | *Hylocichla mustelina* | Yes | CBBS | SBBS | |

| Species | Scientific Name | MBTA Protection | Source Database(s) | | |
|---|---|---|---|---|---|
| Worm-eating warbler | *Helmitheros vermivorus* | Yes | | SBBS | |
| Yellow-bellied sapsucker | *Sphyrapicus varius* | Yes | | | eBird |
| Yellow-billed cuckoo | *Coccyzus americanus* | Yes | CBBS | SBBS | |
| Yellow-breasted Chat | *Icteria virens* | Yes | CBBS | | |
| Yellow-rumped warbler | *Dendroica coronata* | Yes | | | eBird |
| Yellow-throated vireo | *Vireo flavifrons* | Yes | | SBBS | |
| Yellow-throated warbler | *Dendroica dominica* | Yes | | | eBird |

CBBS = Chuckatuck Breeding Bird Survey Block; SBBS = Suffolk Breeding Bird Survey Block
eBird = Cornell Lab of Ornithology eBird Database
Sources: VDWR VaFWIS database (2021), The Cornell Laboratory of Ornithology eBird database (2021)

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, there would be no land clearing, construction, or operation of new landfill area. Therefore, no adverse effects to migratory bird species or their habitats would occur.

#### *Alternative B*

Under Alternative B, two new landfill cells would be developed to increase the disposal capacity of the existing landfill. Existing forested wildlife habitat would be removed from the expansion area, including approximately 117 acres of forested wetlands. Alternative B necessitates the clearing of trees and vegetation across the expansion area, which would lead to adverse impacts to the migratory bird species identified here.

Direct, temporary impacts on migratory birds include incidental take due to collisions with construction equipment, crushing, and other injuries or death directly related to ongoing project activities. Birds are better protected from construction-related incidental take than mammals, reptiles, and amphibians, as they can fly to disperse and avoid equipment and obstacles. However, some injury and death are anticipated.

Direct, temporary and permanent impacts on migratory birds are also anticipated as a result of the destruction of nests, eggs, and chicks during construction activities. Since this project requires the clearance of trees and vegetation, any nests, eggs, or chicks present in the areas cleared might be inadvertently taken, resulting in chick or egg mortality or injury, or abandonment of suitable breeding sites.

Additional direct, temporary effects include disturbance of birds due to noise, vibration, and human presence during construction. This would cause birds to disperse, abandoning territories, breeding attempts, foraging opportunities, or shelter. Birds migrating over the area might not stop on-site for rest and fuel, which could delay or impede their migration. Further, disturbance may induce stress, leading to behavioral and physical impacts that can cause injury or death.

Direct, permanent impacts are also anticipated as a result of habitat destruction. The clearance of forested wetlands on-site would leave many migratory birds with less habitat available for breeding, foraging, stopping over on migration, over-wintering, or territory establishment. After development of the new landfill cells is completed, the existing habitat would be gone. This would cause migratory birds dependent on the habitat within the project area to disperse to new habitat or perish.

SPSA would be required to follow time of year restrictions (TOYR) for federally protected bat species from December 15 through February 15 and April 1 through July 15 which partially overlaps with VDWR's recommended TOYR for resident and migratory songbird nesting.

##### *Alternative C*

Under Alternative C, the airspace between the existing landfill Cells V and VI would be utilized for waste disposal, reducing the footprint of the new development and the area of wetland cleared by approximately 7.72 acres. Under Alternative C, temporary and permanent effects to migratory bird species and their habitats would be very similar to the effects that would be incurred by Alternative B, although approximately 7.72 fewer acres of habitat would be impacted.

##### *Alternative E*

Under Alternative E, a portion of the expansion area would be developed depending on the amount of waste that is diverted (either 50% or 25%), reducing the footprint of the new development and the area of wetland cleared by approximately 37.88 or 12.79 acres respectively. Under Alternative E, temporary and permanent effects to migratory bird species and their habitats would be similar to the effects that would be incurred by Alternatives B and C, although fewer acres of habitat would be impacted.

### Wildlife Resources

#### *Methodology*

The Fish and Wildlife Coordination Act (16 USC § 661 et seq.) requires government agencies, including the Corps, to consider effects on fish and wildlife resources. The Norfolk District initially engaged with federal and state agencies during the scoping process and further coordination has occurred during the permit review process. Detailed on-site studies of fish and wildlife resources on the proposed expansion site were not conducted. However, the fish and wildlife species known to occur in the Hampton Roads region, and in particular, the Great Dismal Swamp, have been widely studied. Species lists for the Great Dismal Swamp NWR were obtained from both the Great Dismal Swamp NWR page on the USFWS website (USFWS 2023), as well as the "Great Dismal Swamp National Wildlife Refuge Check List" from iNaturalist, a joint initiative of the California Academy of Sciences and the National Geographic Society (2023a) that provides data from visitors to the Great Dismal Swamp NWR. Both lists were reviewed as part of this analysis.

### *Affected Environment*

The proposed expansion area provides habitat conducive to Forest Interior Dwelling Species. This habitat may be used by birds, reptiles, amphibians, and bats with a habitat preference of large contiguous forest blocks of at least 50-100 acres and 70-80% tree canopy closure and situated at least 300 feet from the forest's edge.

The Great Dismal Swamp NWR is known to host 47 species of mammals, 200 bird species, and 96 species of butterflies (USFWS 2023). The diversity found in the Great Dismal Swamp helps these species thrive. While the SPSA property does not contain the same degree of species diversity, many of the same species could be expected to live on or traverse the SPSA property. Table 14 below lists common species of mammals, amphibians, reptiles, and fish that are known to occur in the Great Dismal Swamp NWR and are therefore likely to occur at the proposed expansion site; however, the list is not exhaustive. This list was generated based on data from iNaturalist and USFWS. Protected species and migratory birds are covered in more detail in previous sections and are therefore not considered here.

**Table 14. Wildlife Species in the Great Dismal Swamp NWR**

| Species | Scientific Name | Species Occurrence |
|---|---|---|
| | **Mammals** | |
| American beaver | *Castor candensis* | Dismal Swamp |
| American black bear | *Ursus americanus* | Dismal Swamp |
| American mink | *Neogale vison* | Dismal Swamp |
| Bobcat | *Lynx rufus* | Dismal Swamp |
| Brown rat | *Rattus norvegicus* | Dismal Swamp |
| Common racoon | *Procyon lotor* | Dismal Swamp |
| Cotton mouse | *Peromyscus gossypinus* | Dismal Swamp |
| Coyote | *Canis latrans* | Dismal Swamp |
| Coypu | *Myocastor coypus* | Dismal Swamp |
| Eastern cottontail | *Sylvilagus floridanus* | Dismal Swamp |
| Eastern gray squirrel | *Sciurus carolinensis* | Dismal Swamp |
| Eastern mole | *Scalopus aquaticus* | Dismal Swamp |
| Evening bat | *Nycticeius humeralis* | Suitable habitat in Dismal Swamp |
| Golden mouse | *Ochrotomys nuttalli* | Dismal Swamp |
| Gray fox | *Urocyon cinereoargenteus* | Dismal Swamp |
| Groundhog | *Marmota monax* | Dismal Swamp |
| Hoary bat | *Lasiurus cinereus* | Suitable habitat in Dismal Swamp |
| Little brown bat | *Myotis lucifugus* | Suitable habitat in Dismal Swamp |
| Long-tailed weasel | *Mustela frenata* | Dismal Swamp |
| Marsh rabbit | *Sylvilagus palustris* | Dismal Swamp |

| Species | Scientific Name | Species Occurrence |
|---|---|---|
| Marsh rice rat | *Oryzomys palustris* | Dismal Swamp |
| Meadow vole | *Microtus pennsylvanicus* | Dismal Swamp |
| Muskrat | *Onadatra zibethicus* | Dismal Swamp |
| North American least shrew | *Blarina carolinensis* | Dismal Swamp |
| North American river otter | *Lontra canadensis* | Dismal Swamp |
| Northern short-tailed shrew | *Blarina brevicauda* | Dismal Swamp |
| Red bat | *Lasiurus borealis* | Suitable habitat in Dismal Swamp |
| Southern bog lemming | *Synaptomys cooperi* | Dismal Swamp |
| Southern flying squirrel | *Glaucomys volans* | Dismal Swamp |
| Star-nosed mole | *Condyhura cristata* | Dismal Swamp |
| Virginia opossum | *Didelphis virginiana* | Dismal Swamp |
| White-footed mouse | *Peromyscus leucopus* | Dismal Swamp |
| White-tailed deer | *Odocoileus virginianus* | Dismal Swamp |
| Woodland vole | *Microtus pinetorum* | Dismal Swamp |
| **Amphibians** | | |
| American bullfrog | *Lithobates catesbeianus* | Dismal Swamp |
| American toad | *Anaxyrus americanus* | Dismal Swamp |
| Atlantic coast leopard frog | *Lithobates kauffeldi* | Dismal Swamp |
| Atlantic coast slimy salamander | *Plethodon glutinosus* | Dismal Swamp |
| Bronze frog | *Lithobates clamitans clamitans* | Dismal Swamp |
| Carpenter frog | *Lithobates virgatipes* | Dismal Swamp |
| Cope’s gray treefrog | *Hyla chrysoscelis* | Dismal Swamp |
| Eastern American toad | *Anaxyrus americanus americanus* | Dismal Swamp |
| Eastern narrow-mouthed toad | *Gastrophryne carolinensis* | Dismal Swamp |
| Eastern newt | *Notophthalmus viridescens* | Dismal Swamp |
| Eastern red-backed salamander | *Plethodon cinereus* | Dismal Swamp |
| Eastern spadefoot | *Scaphiopus holbrookii* | Dismal Swamp |
| Gray treefrog | *Hyla versicolor* | Dismal Swamp |
| Green frog | *Lithobates clamitans* | Dismal Swamp |
| Green treefrog | *Hyla cinerea* | Dismal Swamp |
| Little grass frog | *Pseudocris ocularis* | Dismal Swamp |
| Many-lined salamander | *Sterochilus marginatus* | Dismal Swamp |
| Marbled salamander | *Ambystoma opacum* | Dismal Swamp |
| Pine woods tree frog | *Hyla femorals* | Dismal Swamp |
| Rocky Mountain toad | *Anaxyrus quericus* | Dismal Swamp |
| Southern cricket frog | *Acris gryllus* | Dismal Swamp |

| Species | Scientific Name | Species Occurrence |
|---|---|---|
| Southern dusky salamander | *Desmognathus auriculatus* | Occurs in Dismal Swamp |
| Southern leopard frog | *Lithobates sphenocephalus* | Dismal Swamp |
| Southern toad | *Anaxyrus terrestris* | Dismal Swamp |
| Spotted salamander | *Ambystoma maculatum* | Dismal Swamp |
| Spring peeper | *Pseudacris crucifer* | Dismal Swamp |
| Squirrel treefog | *Hyla squirella* | Dismal Swamp |
| Striped chorus frog | *Pseudacris triseriata* | Dismal Swamp |
| Two-toed amphiuma | *Amphiuma means* | Dismal Swamp |
| **Reptiles** | | |
| Broad-headed skink | *Plestiodon laticeps* | Dismal Swamp |
| Common five-lined skink | *Plestiodon fasciatus* | Dismal Swamp |
| Common garter snake | *Thamnophis sirtalis* | Dismal Swamp |
| Common ribbon snake | *Thamnophis saurita* | Dismal Swamp |
| Common snapping turtle | *Chelydra serpentina* | Dismal Swamp |
| Dekay's brownsnake | *Storeria dekayi* | Dismal Swamp |
| Eastern box turtle | *Terrapene carolina* | Dismal Swamp |
| Eastern copperhead | *Adkistrodon contortrix* | Dismal Swamp |
| Eastern earth snake | *Virginia valeriae valeriae* | Dismal Swamp |
| Eastern fence lizard | *Scleroporus undulatus* | Dismal Swamp |
| Eastern hognose snake | *Heterodon platirhinos* | Dismal Swamp |
| Eastern kingsnake | *Lampropeltis getula* | Dismal Swamp |
| Eastern milk snake | *Lampropeltis triangulum* | Dismal Swamp |
| Eastern mud turtle | *Kinosternon subrubrum* | Dismal Swamp |
| Eastern musk turtle | *Sternotherus odoratus* | Dismal Swamp |
| Eastern rat snake | *Pantherophis alleghaniensis* | Dismal Swamp |
| Eastern ribbon snake | *Thamnophis sauritus* | Dismal Swamp |
| Eastern worm snake | *Carphophis amoenus* | Dismal Swamp |
| Little brown skink | *Scincella lateralis* | Dismal Swamp |
| Mudsnake | *Farancia abacura* | Dismal Swamp |
| North American racer | *Coluber constrictor* | Dismal Swamp |
| Northern cottonmouth | *Agkistrodon piscivorus* | Dismal Swamp |
| Northern red-bellied cooter | *Pseudemys rubriventris* | Dismal Swamp |
| Northern redbelly snake | *Storeria occipitomaculata occipitomaculata* | Dismal Swamp |
| Northern water snake | *Nerodia sipedon sipedon* | Dismal Swamp |
| Painted turtle | *Chrysemys picta* | Dismal Swamp |
| Plain-bellied water snake | *Nerodia erthrogaster* | Dismal Swamp |
| Pond slider | *Trachemys scripta* | Dismal Swamp |

| Species | Scientific Name | Species Occurrence |
|---|---|---|
| Rainbow snake | *Farancia erytrogramma* | Dismal Swamp |
| Ring-necked snake | *Diadophis punctatus* | Dismal Swamp |
| Rough greensnake | *Opheodrys aestivus* | Dismal Swamp |
| Slender glass lizard | *Ophisaurus attenuates* | Dismal Swamp |
| Southeastern five-lined skink | *Plestiodon inexpectatus* | Dismal Swamp |
| **Fishes** | | |
| American eel | *Anguilla rostrata* | Dismal Swamp |
| Banded sunfish | *Enneacanthus obesus* | Dismal Swamp |
| Bluespotted sunfish | *Enneacanthus gloriosus* | Dismal Swamp |
| Chain pickerel | *Esox niger* | Dismal Swamp |
| Channel catfish | *Ictalurus punctatus* | Dismal Swamp |
| Creek chubsucker | *Erimyzon oblongus* | Dismal Swamp |
| Eastern mudminnow | *Umbra pygmaea* | Dismal Swamp |
| Flier | *Centrarchus macropterus* | Dismal Swamp |
| Golden shiner | *Notemigonus crysoleucas* | Dismal Swamp |
| Longnose gar | *Lepisosteus osseus* | Dismal Swamp |
| Mud sunfish | *Acantharchus pomotis* | Dismal Swamp |
| Pirate perch | *Aphredoderus sayanus* | Dismal Swamp |
| Redbreast sunfish | *Lepomis auritus* | Dismal Swamp |
| Redfin pickerel | *Esox americanus* | Dismal Swamp |
| Ruddy bowfin | *Amia calva* | Dismal Swamp |
| Swampfish | *Chologaster cornuta* | Occurs in Dismal Swamp |
| White catfish | *Ameiurus catus* | Dismal Swamp |
| Yellow perch | *Perca flavescens* | Dismal Swamp |

Sources: USFWS 2023; California Academy of Sciences and the National Geographic Society 2023a, 2023b

### *Environmental Consequences*

#### *Alternative A*

Under Alternative A, there would be no adverse effects to wildlife resources.

#### *Alternative B*

Under Alternative B, the proposed expansion area (Cells VIII and IX) would be developed to increase the footprint of the landfill. This would result in the removal of all existing wildlife habitat from the expansion area, including approximately 117 acres of wetlands. Over a period of time, all trees and vegetation would be removed, and the wetlands would be drained. This would lead to adverse effects for several of the wildlife species identified here (listed in Table 14) as well as to Forest Interior Dwelling Species.

Direct, temporary and permanent effects to some of the species included in Table 14 are anticipated during activities associated with construction of the landfill expansion. As construction occurs, collisions with work vehicles or crushing could occur. Other project actions could also cause injury or mortality to wildlife on-site. If present, the amphibians, reptiles, and small mammals identified here are anticipated to be the most affected by these impacts, as they are less mobile than other species. Although they are more capable of dispersal, bats could also be affected by these temporary impacts due to loss of roosting trees. However, they are less likely to be injured or killed during development since they could fly out of the affected area.

Additional direct, temporary and permanent effects include disturbance due to noise, vibration, and human presence during construction, both within and adjacent to the expansion area. This disturbance could cause wildlife on or near the expansion area to disperse or potentially abandon breeding attempts, foraging opportunities, or shelter from predators. It could also induce stress in wildlife, which could have adverse behavioral and physical impacts that could lead to injury or mortality.

Alternative B would also cause direct, permanent adverse effects to the species identified, as suitable habitat would be lost when the forested wetlands within the expansion area are cleared and drained to expand the landfill. Suitable habitat for most of the species listed would be lost and the project area would no longer be able to support these species. Some species could find shelter within the 742 acres of land that is proposed to be preserved. The proposed preservation areas would provide habitat for forest interior dwelling species and would provide connective corridors.

As described above in the “Wetlands” section, development associated with Alternative B would create a new ecotone at the edge of the adjacent wetland areas, and the hydrology of nearby wetland areas could be adversely affected by on-site dewatering activities. This could lead to changes in the vegetation community composition, which could alter the use of the habitat by some species. Climate change could further impact species diversity due to changes in temperature and precipitation patterns.

#### *Alternative C*

Under Alternative C, the airspace between the existing Cells V and VI would be utilized for waste disposal, reducing the footprint of the new proposed expansion area and the area of wetland cleared by approximately 7.72 acres. Under Alternative C, temporary, permanent, and direct effects to wildlife resources and their habitats would be very similar to the effects that would be incurred by Alternative B, although 7.72 fewer acres of habitat would be impacted.

#### *Alternative E*

Under Alternative E, a portion of the expansion area would be developed depending on the amount of waste that is diverted (either 50% or 25%), reducing the footprint of the new development and the area of wetland cleared by approximately 37.88 or 12.79 acres, respectively. Under this Alternative, temporary, permanent, and direct effects to wildlife resources and their habitats would be very similar to the effects that would be incurred by Alternatives B and C, although fewer acres of habitat would be impacted.

## Transportation and Traffic

### Methodology

The traffic affected environment was analyzed using available traffic count data from VDOT, the Hampton Roads Transportation Planning Organization (HRTPO), and previous studies for the flyover (HDR 2016).

### Affected Environment

The expansion area is located northeast of Suffolk, along Bob Foeller Drive, north of U.S. Routes 13/58/460, and adjacent to the Great Dismal Swamp NWR. It is currently served by one entrance at the intersection of Bob Foeller Drive/Welch Parkway and U.S. Routes 13/58/460. To access this entrance, westbound vehicles are provided a 435 ft. right turn lane and eastbound vehicles are provided a 330 ft. left turn lane at an unsignalized median opening.

#### *Vehicular Transportation*

U.S. Routes 13/58/460 is a 6-lane, median-divided freeway that serves as a bypass around Suffolk for vehicles traveling east towards Norfolk and Virginia Beach or traveling west towards Richmond and Emporia. The current posted speed limit on U.S. Routes 13/58/460 within the study area is 60 mph. According to VDOT (2020), the Average Annual Daily Traffic (AADT) on U.S. Routes 13/58/460 was 76,000 vehicles per day (vpd) in 2019. Traffic is projected to grow to 93,900 vpd by 2045.

Bob Foeller Drive is a 2-lane, undivided roadway that serves as the entrance to the existing landfill. There is a posted speed limit of 15 mph at the entrance to the existing landfill. Based on peak hour counts and forecasts conducted by others in 2021, Bob Foeller Drive carried almost 600 vpd. This volume is projected to grow to 800 vpd by 2040, including approximately 379 vehicle trips to the site per day. This increase in traffic will account for less than 1% of traffic volume traveling on the adjacent U.S. Routes 13/58/460 in 2040. A traffic study was conducted at the Regional Landfill entrance and is provided in Appendix F.

#### *Traffic Safety*

Between 2016 and 2020, there were approximately 58 total crashes around the Regional Landfill proposed expansion project site entrance, including 1 fatal crash and 2 serious injury crashes. The fatal crash involved an SPSA employee attempting to make a left turn into the entrance from the eastbound direction. A traffic study from 2016 found that there were 30 vehicles making that eastbound left turn across 3 lanes of traffic carrying over 3,200 vehicles in the afternoon peak hour (HDR 2016).

This safety concern led VDOT to develop a project to construct a new flyover east of the entrance. Eastbound vehicles would make a right-hand exit, travel over U.S. Routes

13/58/460, then merge into westbound traffic from the right, making a right turn into the Regional Landfill.

### *Other Transportation*

There are no existing pedestrian, bicycle, or public transportation facilities in the project area.

## Environmental Consequences

A flyover is currently being constructed to eliminate left turns from U.S. Routes 13/58/460 into the Regional Landfill. This will significantly increase safety around the intersection with Bob Foeller Drive leading to the Regional Landfill entrance, reducing injury crashes by approximately 50%. There would be no changes to pedestrian, bicycle, or public transportation within the expansion area.

When Cell VII is expected to reach capacity in 2037, traffic on U.S. Routes 13/58/460 is expected to increase from approximately 81,800 vpd to 89,800 vpd. With construction of the flyover, approximately 55 vehicles will access the Regional Landfill without conflicting with 3,700 vehicles traveling westbound on U.S. Routes 13/58/460 during the afternoon peak hour.

### *Alternative A*

Under Alternative A, SPSA would not expand its landfill operations into Cells VIII and IX and no new off-site landfill would be constructed. Landfill operations would continue to utilize the permitted capacity available through Cell VII.

After Cell VII reaches capacity and is closed with a final cover system, the landfill would close and traffic that was utilizing this facility would be diverted to other facilities around the state for processing and disposal. While there would likely not be an increase in the number of trucks traveling between transfer stations and other facilities, this would result in trucks traveling further to dispose of waste at these other facilities. Therefore, there would be no adverse effect on the surrounding transportation system. The adverse impacts to air quality associated with the additional miles traveled to haul waste are described in the “Air Quality and Emissions” section.

### *Alternative B*

Under Alternative B, SPSA would expand its landfill operations into an expansion area, within which two new waste disposal cells (contiguous Cells VIII and IX) would be constructed over time, in phases.

There is no anticipated increase in operations at the landfill that would cause an increase in traffic to and from the project area beyond the projected traffic volume. Therefore, there would be no adverse effect on the surrounding transportation system.

#### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations, which would secure an additional disposal capacity on top of the capacity provided by the expansion area.

The impact under Alternative C would be similar to Alternative B in that there would be no adverse effect on the surrounding transportation system.

#### *Alternative E*

Under Alternative E, two scenarios are developed in which 50% or 25% of MSW would be diverted to private area landfills after 50% or 75% of MSW, respectively, has been landfilled at the Regional Landfill. The airspace between Cells V and VII would be filled in and utilized for landfilling operations, which would secure an additional disposal capacity on top of the capacity provided by a smaller expansion area than is recommended in Alternative B. The initial impact under Alternative E would be similar to Alternatives B and C in that there would be no adverse effect on the surrounding transportation system.

After the airspace and the smaller expansion area reaches capacity and is closed with a final cover system, the landfill would close and traffic that was utilizing this facility would be diverted to other facilities around the state for processing and disposal. This would happen in approximately 11 years in the 50% scenario or approximately 16.5 years in the 25% scenario. While there would likely not be an increase in the number of trucks traveling between transfer stations and other facilities, this would result in trucks traveling further to dispose of waste at these other facilities. The adverse impacts to air quality associated with the additional miles traveled to haul waste are described in the "Air Quality and Emissions" section.

## Air Quality and Emissions

### Methodology

The air quality and greenhouse gas (GHG) affected environment was established by reviewing regulatory context, describing pollutants and emissions, and establishing current attainment statuses of the counties or cities in which the project area is located. Additionally, a review of the existing air permit for the Regional Landfill is provided. The air quality and GHG environmental consequences were assessed by evaluating and comparing emissions associated with construction and operation activities for the various alternatives.

To analyze the impacts of GHG emissions on climate change that would occur under the alternatives, the Norfolk District used CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*, which was in place at the time of analysis, and provides direction on how to apply NEPA to the analysis of GHG emissions and climate change (2023). Per CEQ's guidance, the Corps considered GHG emissions as a proxy for assessing the alternatives' impact on climate change. For its analysis, the Norfolk District also evaluated the amount of GHG emissions per year that it projects would occur under the action alternatives as well as the No-Action Alternative. GHG emissions associated with hauling activity, landfill material, and land alteration were estimated for each alternative. Further explanation of the methodology used to assess GHG emissions is presented in Appendix C.

## Affected Environment

The Clean Air Act (CAA) requires EPA to set National Ambient Air Quality Standards (NAAQS) for six air pollutants, known as criteria pollutants (42 USC § 7409). These include carbon monoxide (CO), lead (Pb), nitrogen dioxide ($NO_2$), ozone ($O_3$), particulate matter ($PM_{10}$ and $PM_{2.5}$), and sulfur dioxide ($SO_2$) (40 CFR Part 50). National Ambient Air Quality Standards are based on human health criteria for the protection of public health (primary standards) and on environmental criteria to prevent environmental and property damage and for the protection of public welfare (secondary standards; USEPA 2021d).

Virginia has established Air Quality Control Regions to monitor air quality as required by EPA under the provisions of the federal CAA. The affected environment is located in the City of Suffolk, where the existing Regional Landfill is located. SPSA also serves the cities of Chesapeake, Franklin, Norfolk, Portsmouth, and Virginia Beach, and the counties of Isle of Wight and Southampton. These counties and cities are designated as being in attainment (i.e., meeting NAAQS) for criteria pollutants (USEPA 2021c, 2021e).[7]

SPSA has a Title V Air Permit issued by VDEQ for the existing Regional Landfill. SPSA filed permit renewals with VDEQ in 2017 and 2022. Upon receiving these renewals, VDEQ requested that SPSA continue to operate under its 2012 permit. The renewals that SPSA filed would cover operations until 2027. The existing air permit describes required control measures for landfill operations, the landfill gas collection and control system, fugitive dust, and the combustion equipment that uses the collected landfill gas (four generators and a flare). As the landfill generates more than 50 megagrams per year of non-methane organic compounds, the landfill is required to operate a landfill gas collection and control system in each cell in which solid waste has been placed for a period for 5 years or while active and for two years or more if closed. The permit also requires multiple fugitive dust mitigation measures, including wetting or covering of stockpiled materials; use of asphalt, water, or chemical stabilization on haul roads; and prevention of dust exiting the facility to public roads through wheel washing, wetting, and sweeping. Compliance with the provisions of the air permit is deemed as compliance with applicable regulations, including 40 CFR 60 Subpart CC, 40 CFR 60

[7] Note that while the study area is currently in attainment of all NAAQS, the Norfolk-Virginia Beach-Newport News (Hampton Roads), VA area was previously in nonattainment of 1-Hour Ozone (1979)-NAAQS revoked and 8-Hour Ozone (1997) - NAAQS Revoked.

Subpart WWW, 40 CFR 63 Subpart AAAA, 40 CFR 63 Subpart ZZZZ, and 40 CFR 60 Subpart JJJJ.

### *Greenhouse Gases*

In nature, carbon dioxide ($CO_2$) is exchanged continually between the atmosphere, plants, and animals through the processes of photosynthesis, respiration, and decomposition, and between the atmosphere and the ocean through gas exchange. Billions of tons of carbon in the form of $CO_2$ are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural and man-made processes (i.e., sources) (NOAA 2021a, 2021b). Carbon dioxide, however, constitutes less than 0.1% of the total atmospheric gases (NASA 2019).

Similar to the glass in a greenhouse, certain gases, primarily $CO_2$, $N_2O$, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, absorb heat that is radiated from the surface of the Earth. Increases in the atmospheric concentrations of these gases can cause the Earth to warm by trapping more heat (USEPA 2021f). The common term for this phenomenon is the "greenhouse effect," and these gases are typically referred to as "greenhouse gases." GHG emissions have effects at both the regional and global scale and are thus reviewed at a regional scale. The EPA has not established ambient air standards for GHGs like they have for the criteria pollutants under the NAAQS.

The Commonwealth of Virginia has developed a Priority Climate Action Plan (VDEQ, March 2024c). The purpose of the Priority Climate Action Plan is to identify all possible actions to reduce climate pollution. It is not meant to be prescriptive in any way and does not commit the Commonwealth to any specific carbon reduction strategy or path. VDEQ regularly produces a statewide GHG inventory using the U.S. EPA State Inventory Tool (SIT), supplemented by state-specific data and methods. As of 2020, solid waste emits 2.9 million metric tons of $CO_2$ equivalent in the Commonwealth, accounting for 2.3% of the total gross emissions. Emissions from solid waste have been trending down with a 26% reduction in solid waste emissions since 2016. This decrease is primarily due to increased flaring and landfill gas energy projects that have contributed to a 23% decrease in total methane emissions.

Virginia enacted Senate Bill 94 (SB 94) in 2020. This bill establishes GHG emissions reduction goals across Virginia's economy sufficient to reach net-zero emissions by 2045. It also includes other aspects addressing climate change and the health, welfare, and safety of Virginians, including energy efficiency, distributed energy, mitigating the negative impacts of climate change and the energy transition on disadvantaged communities and prioritizing investment in these communities, ensuring reliability, among other topics.

Virginia has enacted other measures to reduce GHG emissions. The 2022 Virginia Energy Plan assesses the current state of the Commonwealth's energy economy and provides a series of recommendations for policymakers and industry participants to reduce GHG emissions from the power sector. In addition to SB 94, many climate-related goals and policies have been codified through legislation, such as the Virginia Clean Economy Act of 2020 (House Bill 1526 of 2020), which among other provisions created the state's first mandatory clean energy standard and sets renewable energy and energy resource targets for utilities (requiring a transition to a 100% clean electric grid by 2050), and defines specific levels of solar, offshore wind, and long-duration battery storage as in the public interest.

Per CEQ guidance, climate change "results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale" and that "the totality of climate change impacts is not attributable to any single action…" (CEQ 2016). With this understanding, the Corps considered GHG emissions as a proxy for assessing the alternatives' impact on climate change in the U.S.

#### *Landfill Gas Emissions and Management*

Emissions from construction and operation of a landfill occur from on-site equipment, land alteration, hauling of waste and materials. The largest source of emissions are landfill gases. Landfill gases are produced by the decomposition of organic waste under anaerobic conditions in landfills. The primary components of landfill gas are methane ($CH_4$) and carbon dioxide ($CO_2$), with methane typically comprising 50% and $CO_2$ around 50%. In addition to these major components, landfill gases also include non-methane organic compounds (NMOCs) in smaller quantities, such as air pollutants (HAPs) (USEPA 2024). Methane is a potent greenhouse gas, with a global warming potential significantly higher than carbon dioxide, making the management of landfill gas critical.

A landfill gas collection system is designed to capture and control the gases emitted from decomposing waste. This system typically consists of a network of wells and pipes installed throughout the landfill to extract the gas. The gas is then transported through a series of headers to a processing or treatment system. The collection efficiency of these systems can vary, but properly designed and maintained systems can capture approximately 50–95% of the gas generated (USEPA 2008). Efficiency depends on several factors, including the design of the collection system, the age and composition of the waste, and the maintenance practices.

Once collected, landfill gas must be treated to reduce emissions of harmful compounds. This is typically achieved using flares or combustion equipment. Flares burn the gas in an open flame, converting methane and other organic compounds into carbon dioxide and water. The destruction efficiency of flares is typically very high, often approximately 98% (USEPA 2008). In addition to flares, landfill gas can also be directed to enclosed combustion devices such as boilers, engines, or turbines, where it can be used to generate energy. The control equipment ensures that the release of harmful compounds to the atmosphere is minimized, reducing the environmental impact of landfill gas.

The SPSA Regional Landfill has implemented several measures to reduce landfill gas emissions. The facility has a landfill gas collection system in place that has an approximate collection of efficiency of 83%. The landfill is in the process of upgrading to an electronically monitored system to allow for real-time monitoring and adjustments. The entire collection system is being replaced on Cells V and VI while improvements and upgrades are being made to Cells I–IV. The conservative estimate of the increased collection efficiency for this project is 5%. Upgrades to the gas collection system are underway at the time of this filing. In addition to flaring, a renewable natural gas facility was recently opened in October 2023. As described above, these facilities turn landfill gases into pipeline-ready natural gas displacing other natural gas in the Columbia Gas system. An emission study of the RNG facility found that GHG emissions would be reduced by 18% compared to flaring and 48% compared to engine combustion.

## Environmental Consequences

### *Alternative A*

Under Alternative A, SPSA would not expand its landfill operations into Cells VIII and IX. Landfill operations would continue to utilize the permitted capacity available through Cell VII, which is expected to last until approximately 2037. After Cell VII reaches capacity and is closed with a final cover system, waste would be hauled to another landfill for processing and disposal.

#### *Construction Impacts*

Under Alternative A, Cell VII and the U.S. Routes 13/58/460 flyover ramp will be constructed according to SPSA's development plans. This construction will also occur under all other alternatives. As such, all emissions from construction activities in Alternative A are also expected to occur under the other alternatives as well. Because no further construction would occur beyond Cell VII and the flyover ramp and waste would be hauled to existing off-site landfills, Alternative A is expected to result in the least construction-related emissions of the alternatives.

#### *Operational Impacts*

Landfill operations would continue to utilize the permitted capacity available through Cell VII. After Cell VII reaches capacity, waste would be hauled to other area landfills for processing and disposal. Potential receiver facilities are listed in Table 15, along with their approximate distance from the Regional Landfill.

**Table 15. Distance to Potential Receiver Facilities in the No-Action Alternative**

| Facility | Location | Distance from SPSA Regional Landfill |
|---|---|---|
| Atlantic Waste Disposal | Waverly, VA | 45 miles |
| Bethel Landfill | Hampton, VA | 35 miles |

| Facility | Location | Distance from SPSA Regional Landfill |
|---|---|---|
| Brunswick Waste Management Facility | Lawrenceville, VA | 80 miles |

Best management practices would be employed to reduce emissions from Cell VII to ensure adherence to permit requirements until its closure in 2037. After 2037, waste would be hauled to other existing off-site landfill facilities. As these potential receiver facilities are further from the SPSA service area than the SPSA Regional Landfill, this alternative would result in higher emissions associated with waste hauling than the other alternatives. Emissions associated with hauling would generally be proportional to the distances outlined in Table 15, with the Bethel Landfill being the closest and having the lowest hauling emissions, and the Brunswick Waste Management Facility being the farthest and having the highest hauling emissions. Waste would degrade and emit landfill gases at these off-site locations. Therefore, emissions would be reduced within the immediate SPSA service area but would increase in other areas as the waste travels to and decomposes at the potential receiver facilities.

#### *Greenhouse Gases*

GHG emissions were evaluated for each of the three potential landfills that may accept waste once the SPSA Regional Landfill is closed. Emissions estimations included the hauling emissions associated with travel to each of the alternative landfills and emissions from the degrading landfill material. Landfill emissions accounted for the varying control system efficiencies at each of the alternative landfills. The resulting emissions are presented in Table 16. Depending on the chosen landfill, emissions under Alternative A would range from 1.2 million metric tons of carbon dioxide equivalent ($CO_2E$) to 1.8 million metric tons of $CO_2E$. Since the exact landfill that would be used in the No-Action Alternative is unknown and for purposes of comparison to other alternatives, an average Alternative A total emission of 1,618,254 metric tons of $CO_2E$ was calculated.

### Table 16. Alternative A Estimated GHG Emissions (MT $CO_2E$)

| Facility | Landfill Emissions |
|---|---|
| Atlantic Waste Disposal | 1,696,430 |
| Bethel Landfill | 1,201,638 |
| Brunswick Waste Management Facility | 1,413,693 |
| **Average Alternative A Landfill Emissions** | **1,437,254** |
| **Alternative A Hauling Emissions** | **181,000** |
| **Average Alternative A Total Emissions** | **1,618,254** |

Source: SCS Engineers (2024)

### *Alternative B*

Under Alternative B, SPSA would expand its landfill operations into an expansion area, within which two new waste disposal cells (contiguous Cells VIII and IX) would be constructed. Cell VIII would be constructed first, followed by Cell IX. Existing facilities at the Regional Landfill – including administration and maintenance buildings, utilities (water, sewer, and power), scales, a tire shredding facility, a household hazardous waste facility, a landfill gas recovery system, access and haul roads, leachate sewer disposal surface drainage systems, and gas management recovery systems – would continue to be used.

#### *Construction Impacts*

Before the construction of the proposed Cells VIII and IX, the land would be used to store cut material from Cell VII, to later be used as cover material for Cell VII. Under this scenario, SPSA would erect an earthen berm or other approved method to contain the stockpiled material within Cell VIII, prevent erosion, and reduce fugitive dust emissions. Use of Cell VII for storage of the material on-site would result in lower emissions than the alternative in which borrow material would be stockpiled off-site and trucked to and from the landfill as needed, increasing emissions associated with the hauling of the material.

Towards the end of Cell VII's capacity, construction of Cell VIII would begin in phases, starting with excavation to create an inward gradient landfill. Excavated materials would be stored on-site for future use as cover material, avoiding emissions associated with the hauling of material to and from an off-site storage location. Construction of the proposed landfill cells and their associated haul road would require the use of earthmoving, compacting, and paving equipment, as well as trucks for hauling materials. All construction activities would be carried out on-site, and no off-site activities are anticipated. These activities would generate fugitive dust (i.e., particulate matter) during active construction periods. Wet suppression and other management practices would be utilized to reduce fugitive dust emissions. These techniques have been shown to reduce fugitive dust emissions by as much as 95% and are required by SPSA's air permit.

Typical equipment expected to be used for the cell construction includes excavators, bulldozers, a water truck, a loader, pickup trucks, and semi-trailers. All equipment would be used on-site, and any air quality impacts would be limited to the immediate project area. Emissions associated with the combustion of gas and diesel fuels by internal combustion engines would generate local emissions of PM, $NO_2$, CO, volatile organic compounds, $SO_2$, and GHGs during the construction period.

A high-level estimate of emissions from typical landfill construction equipment has been provided in Table 17. Emissions estimates were obtained using the Nonroad module within the MOVES4 emissions model. Estimates reflect default EPA load factors and equipment populations. Time utilization factors were consistent with the noise analysis presented in this chapter. Emissions were estimated for an 8-hour workday.

### Table 17. Predicted Landfill Construction Equipment Emissions per Workday

| Construction Equipment | Load Factor (%) | Utilization Factor (%) | Emissions per Workday (lbs/day) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | NOx | VOC | CO | PM10 | PM2.5 | CO2 |
| Bulldozer | 59 | 40 | 0.35 | 0.01 | 0.06 | 0.01 | 0.01 | 344 |
| Excavator | 59 | 40 | 0.14 | 0.01 | 0.03 | 0.01 | 0.01 | 228 |
| Loader | 21 | 40 | 0.05 | 0.04 | 1.68 | <0.01 | <0.01 | 17 |
| Pick-up Truck | 59 | 40 | 2.67 | 0.05 | 0.13 | 0.04 | 0.03 | 1,032 |
| Semi-Trailer | 59 | 40 | 2.40 | 0.07 | 0.34 | 0.06 | 0.06 | 956 |
| Water Truck | 59 | 40 | 2.67 | 0.05 | 0.13 | 0.04 | 0.03 | 1,032 |
| Total | - | - | 8.29 | 0.24 | 2.36 | 0.15 | 0.15 | 3,610 |

Notes: Emissions were estimated using MOVES4 with default model inputs and assuming an 8-hour workday. Load factors represent model defaults and utilization factors were consistent with the noise analysis.

Equipment emissions would be reduced through idling restrictions; the use of Ultra Low Sulfur Diesel fuel; proper maintenance of all motor vehicles, machinery, and equipment; and proper fitting of equipment with mufflers or other regulatory-required emissions control devices. These measures help ensure that SPSA meets all emissions requirements. Other steps SPSA has taken to reduce its emissions and carbon footprint include consideration of electric vehicles as part of its vehicle fleet and replacing its landfill gas collection system to improve collection efficiency. SPSA is doing this by boring where it knows gas occurs and will also include electronic devices on each gas well head to enable real-time monitoring of temperature, gas content, and pressure, which will all be diverted to its renewable natural gas facility on-site, operated by Terreva Renewables. These measures will optimize the collection process by making it as efficient as possible.

Given the relatively low number and types of equipment that would be used for the initial construction activities and the intermittent nature of construction, emissions from construction equipment would be minor and temporary in nature. Note that the equipment and activity required to complete the construction of the new landfill cells is expected to be similar to the emissions from proposed construction activity associated with Cell IX.

#### *Operational Impacts*

During the operation of the proposed Cells VIII and IX, waste would be directed to each cell and placed in successive layers. Solid waste would first be heavily compacted so that it takes up as little room as possible in the cell. At the end of each day, a 6-in. layer of cover material would be spread over newly deposited waste. Every 14 days, SPSA would place a 12-in. layer of soil over the landfill to serve as intermediate cover. As waste levels reach a certain point, operations would move into adjacent phases of the cell and be repeated until the capacity has been reached.

Operation of the proposed landfill would comply with state regulations for fugitive emissions and air operating permit conditions. Handling, transport, and placement activities would utilize methods similar to ongoing landfill operations, resulting in similar emissions. In order to minimize fugitive dust from landfill operations, the landfill would be moisture-conditioned and the use of heavy-duty dump trucks on access roads would be contained within the boundaries of the expansion area. Other measures to control dust inside the limits of the project area may include wind breaks and barriers, wetting, and cover as permitted by the air permit. Equipment used for landfill operations would be similar to what is currently in use at the existing landfill. Therefore, there would be no substantive change in criteria pollutant and GHG emissions associated with operational equipment as compared to the existing conditions, since the existing landfill would close/cease operations and operations would be relocated to proposed Cells VIII and IX.

Alternative B is not expected to increase operational traffic to and from the site compared to the existing conditions. It is estimated that in 2037, approximately 379 site trips would occur per day. Since fleet emissions decrease with time and operational traffic is not expected to increase, mobile source emissions in the future would likely be lower than Alternative A, which would result in an increase in hauling distance as waste is taken to the potential receiver facilities.

Landfill gases emitted by the decomposing waste are controlled under the current air permit. The air permit would be amended as necessary to accommodate the proposed expansion into Cells VIII and IX. Obtaining and complying with the air permit would demonstrate compliance with all applicable federal and state air regulations. The landfill is required to operate a landfill gas collection and control system in each cell in which solid waste has been placed for a period for 5 years or while active and for 2 years or more if closed. As noted above, SPSA is replacing its landfill gas collection system to improve collection efficiency. The air permit also requires multiple fugitive dust mitigation measures, including wetting or covering of stockpiled materials; use of asphalt, water, or chemical stabilization on haul roads; and prevention of dust exiting the facility to public roads through wheel washing, wetting, and sweeping. Control measures for equipment that combusts the landfill gases would also be required by the air permit. Operational emission control measures that are currently in use are expected to be continued for the proposed expansion, such that emissions would be similar to the existing operations.

*Greenhouse Gases*

Greenhouse gas emissions for hauling, landfilling, and land alteration were estimated in Table 18 for action Alternative B in which the full expansion at the SPSA Regional Landfill would occur. Under this alternative, hauling emissions would be less than Alternative A due to the proximity of the existing landfill to regional transfer stations and landfill emissions would be equal to or less than all Alternative A landfills due to the high efficiency of the existing SPSA Regional Landfill's gas collection system. However, expansion of the Regional Landfill into the new cells would result in GHG emissions associated with land alteration. In total, the estimated Alternative B GHG emissions are 1,295,696 metric tons of $CO_2E$. As such, Alternative B would result in a net benefit of 322,558 metric tons of $CO_2E$ relative to the average Alternative A emissions.

### Table 18. Alternative B Estimated GHG Emissions (MT $CO_2E$)

| Scenario | Hauling Emissions | Landfill Emissions | Land Alteration Emissions | Total Emissions |
|---|---|---|---|---|
| Alternative B | 61,000 | 1,201,638 | 33,058 | 1,295,696 |
| | | | Average Alternative A Emissions | 1,618,254 |
| | | | **Alternative B Increment** | **-322,558** |

Source: SCS Engineers (2024)

#### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations. Construction and operation of Cells VIII and IX would still occur, but the footprint of Cell IX would be reduced relative to Alternative B.

##### *Construction Impacts*

Construction of the Cells VIII and IX would be largely similar to Alternative B, with the exception of the reduction of Cell IX's footprint. This smaller footprint would result in slightly lower emissions associated with the excavation of the area. Estimated daily construction equipment emissions were provided in Alternative B. However, Alternative C would also utilize the filled in area between Cells V and VII to dispose of waste. Developing and utilizing this airspace would require the relocation of the pump station and underground utilities, as well as infrastructure for Cell V leachate, landfill gas, and stormwater management. The relocation of these items would result in pollutant and GHG emissions from construction equipment that would not occur in the construction associated with Alternative B. Similar to Alternative B, the expansion area could be used for stockpiling and borrowing during the construction and operation of Cell VII, which would reduce emissions associated with the hauling of these materials to off-site storage locations.

##### *Operational Impacts*

Once construction to capture the airspace between Cells V and VII is complete, operational activities and site trips are expected to be similar to those described in Alternative B and associated with existing activities, resulting in similar pollutant and GHG emissions profiles. Similar control measures to those described in Alternative B would be used to reduce landfill and equipment emissions. The landfill's air permit would be modified as necessary to accommodate Alternative C. Obtaining and complying with the air permit would demonstrate compliance with all applicable federal and state air regulations.

##### *Greenhouse Gases*

Greenhouse gas emissions for hauling, landfilling, and land alteration were estimated for Alternative C in Table 19 in which the partial expansion at the SPSA Regional Landfill would occur. Under this alternative, hauling emissions would be less than Alternative A due to the proximity of the existing landfill to regional transfer stations and landfill emissions would be equal or less than all Alternative A landfills due to the high efficiency of the existing landfill's gas collection system. Also, as discussed earlier, SPSA is replacing its landfill gas collection system to improve collection efficiency even more. Hauling and Landfill emissions in Alternative C are similar to those in Alternative B. Expansion of the Regional Landfill into the new cells would result in GHG emissions associated with land alteration. These land alteration emissions in Alternative C would be slightly less than those in Alternative B due to a reduced expansion footprint. In total, the estimated Alternative C GHG emissions are 1,293,436 metric tons of $CO_2E$. As such, Alternative C would result in a net benefit of 324,818 metric tons of $CO_2E$ relative to the average Alternative A emissions and results in slightly less emissions than Alternative B.

**Table 19. Alternative C Estimated GHG Emissions (MT $CO_2E$)**

| Scenario | Hauling Emissions | Landfill Emissions | Land Alteration Emissions | Total Emissions |
|---|---|---|---|---|
| Alternative C | 61,000 | 1,201,638 | 30,798 | 1,293,436 |
| | | | Average Alternative A Emissions | 1,618,254 |
| | | | **Alternative C Increment** | **-324,818** |

Source: SCS Engineers (2024)

### *Alternative E*

Under Alternative E, two scenarios were developed in which 50% or 25% of MSW would be diverted to private area landfills after 50% or 75% of MSW, respectively, has been landfilled at the Regional Landfill. The airspace between Cells V and VII would be filled in and utilized for landfilling operations, which would secure an additional disposal capacity on top of the capacity provided by a smaller expansion area than is recommended in Alternative B.

#### *Construction Impacts*

Construction of the proposed expansion area would be largely similar to Alternatives B and C in terms of equipment and emissions sources, with the exception of a reduced intensity and duration due to the smaller footprint of the proposed expansion. Estimated daily construction equipment emissions were provided in Alternative B. This smaller footprint would result in lower emissions associated with the excavation of the area. However, Alternative E would also utilize the filled-in area between Cells V and VII to dispose of waste. Developing and utilizing this airspace would require the relocation of the pump station and underground utilities, as well as infrastructure for Cell V leachate, landfill gas, and stormwater management. The relocation of these items would result in pollutant and GHG emissions from construction equipment that would not occur in the construction associated with Alternative B (but would occur in Alternative C). Similar to Alternative B, the expansion area could be used for stockpiling and borrowing during the construction and operation of Cell VII, which would reduce emissions associated with the hauling of these materials to off-site storage locations. It is expected that construction emissions associated with the 25–50% of diverted waste would be minimal, since it would be hauled to existing developed private landfills.

*Operational Impacts*

Once construction to capture the airspace between Cells V and VII is complete, operational activities and site trips are expected to be similar to those described in Alternative B and associated with existing activities, resulting in similar pollutant and GHG emissions profiles. The exception being air emissions would last for a shorter duration then these alternatives since the Regional Landfill would hit capacity sooner, requiring waste to be diverted to the private landfills. Similar control measures to those described in Alternative B would be used to reduce landfill and equipment emissions. The landfill's air permit would be modified as necessary to accommodate Alternative E. Obtaining and complying with the air permit would demonstrate compliance with all applicable federal and state air regulations.

*Greenhouse Gases*

Greenhouse gas emissions for hauling, landfilling, and land alteration were estimated for Alternative E in Table 20 in which the partial expansion at the SPSA Regional Landfill would occur along with varying rates of waste diversion. Under this alternative half or most of the waste would go to the Regional Landfill, meaning hauling emissions would be less than Alternative A due to the proximity of the existing landfill to regional transfer stations. Landfill emissions would be more or less than the Alternative A landfills depending on the landfill considered, as the diverted waste could be sent to a private landfill with a less effective landfill gas collection system. Hauling and Landfill emissions under Alternative E are more than those under on-site Alternatives B and C because the diverted waste would be hauled farther and to landfills with less effective landfill gas collection system than the Regional Landfill. Expansion of the Regional Landfill into the new cells would result in GHG emissions associated with land alteration. These land alteration emissions in Alternative E would be slightly less than those in Alternatives B and C due to a reduced expansion footprint. In total, the estimated Alternative E (50% diversion) GHG emissions are 1,532,475 metric tons of CO2E. As such, Alternative E (50% diversion) would result in a net benefit of 85,779 metric tons of CO2E relative to the average Alternative A emissions. The estimated Alternative E (25% diversion) GHG emissions are 1,450,446 metric tons of CO2E. As such, Alternative E (25% diversion) would result in a net benefit of 167,808 metric tons of CO2E relative to the average Alternative A emissions.

**Table 20. Alternative E Estimated GHG Emissions (MT $CO_2E$)**

| Scenario | Hauling Emissions | Landfill Emissions | Land Alteration Emissions | Total Emissions |
|---|---|---|---|---|
| Alternative E 50% Diversion | 127,000 | 1,383,153 | 22,322 | 1,532,475 |
| | | | Average Alternative A Emissions | 1,618,254 |
| | | | **Alternative E 50% Increment** | **-85,779** |

| Scenario | Hauling Emissions | Landfill Emissions | Land Alteration Emissions | Total Emissions |
|---|---|---|---|---|
| Alternative E 25% Diversion | 100,000 | 1,322,473 | 27,973 | 1,450,446 |
| | | | Average Alternative A Emissions | 1,618,254 |
| | | | **Alternative E 25% Increment** | **-167,808** |

Source: SCS Engineers (2024)

## Noise

### Methodology

Sound is the rapid fluctuations in air pressure above and below ambient pressure levels. Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, work, communication, or recreation. Noise was predicted based on typical equipment used during construction and operation. Potential noise impacts were assessed based on the calculated noise levels (Leq) at the closest noise-sensitive receptors (i.e., residences), according to applicable federal noise guidelines and local noise ordinances (City of Suffolk 2016, USEPA 1974).

A variety of sound level descriptors can be used for environmental noise analyses. These descriptors relate to the way sound varies in level over time. The following sound level descriptors were used to assess potential noise impact for the alternatives:

- *Energy-average Sound Level (Leq)*: Leq is a single value, which represents the same acoustic energy as the fluctuating levels that exist over a given period of time. The Leq takes into account how loud noise events are during the period, how long they last, and how many times they occur. Leq is commonly used to describe environmental noise and relates well to human annoyance. An Leq over an 8-hour period is commonly used to evaluate construction noise and is denoted Leq[8hr] (VDOT 2015).
- *Day-night Average Sound Level (Ldn)*: Ldn is a single value that represents the same acoustic energy as the fluctuating levels that exist over a 24-hour period. The Ldn accounts for how loud sound events are, duration of sound events, how many times they occur over a 24-hour period, and whether they occur during the day (7:00 AM to 10:00 PM) or night (10:00 PM to 7:00 AM). Sound levels that occur during the night is given a 10-decibel (dB) penalty to account for the increased human sensitivity to noise at night. If sound levels are constant over a

24-hour period, the Ldn level is 6.4 dB greater than the Leq level due to the 10-dB nighttime penalty (FTA 2018).

## Affected Environment

### *Federal Noise Guideline*

The Noise Control Act of 1972 authorized federal agencies to adequately control noise that may endanger the health and welfare of the nation's population (42 USC § 4901 et seq.). In 1974, the EPA conducted a study on noise impacts relative to public health and safety (USEPA 1974). This EPA study provides guidance on the potential effects of noise that can be considered by federal, state, and local agencies; however, it does not constitute a standard or regulation.

As shown in Table 21, the EPA study concluded that a day-night average sound level of 55 A-weighted decibels (dBA; Ldn) or less for outdoor residential areas, or 55 dBA (Leq[24]) or less for outdoor areas where people spend limited amounts of time, such as schools and playgrounds, would protect public health and welfare related to potential interference with outdoor activity and annoyance (USEPA 1974). The study also concluded that a sound level of 45 dBA (Ldn) or (Leq[24]) or less for indoor residential uses and schools, respectively, would protect public health and welfare related to potential interference and annoyance (USEPA 1974). Since most buildings with windows closed provide 20 dB or more, and buildings with windows open provide 10 dB of outdoor-to-indoor sound attenuation, the exterior criteria are more stringent. Noise from the alternatives in this FEIS is therefore evaluated according to the outdoor criteria.

The EPA noise guidelines are based on the evaluation of pervasive long-term noise. Therefore, they are applied to future operational noise conditions and are not typically applied to short-term construction-period activities.

**Table 21. EPA Noise Levels Identified to Protect Public Health and Welfare**

| Receptor | Noise Level | Description |
|---|---|---|
| Outdoor | $L_{dn}$ 55 dBA | Outdoor areas that are residential; farms; areas where people spend varying amounts of time; or places in which quiet is a basis of use |
| | $L_{eq(24)}$ 55 dBA | Outdoor areas of limited time of use; school yards, playgrounds; parks; etc. |
| Indoor | $L_{dn}$ 45 dBA | Indoor residential areas |
| | $L_{eq(24)}$ 45 dBA | Indoor areas such as schools, etc. |

Source: USEPA (1974)

### *Local Noise Code*

The noise chapter of the Code of Ordinance for the City of Suffolk prohibits unnecessary, excessive, and irritating noise from all sources, to reduce the overall noise in the community (City of Suffolk 2016). Noise can be detrimental to the health, welfare, safety, and quality of life of citizens and should therefore be restricted. This policy applies to exhaust noise, commercial or industrial businesses, and construction noise. Exhaust noise is declared excessive if discharging into the open except through a muffler or other device that will effectively prevent loud or explosive noise from various types of engines (City of Suffolk 2016). For commercial or industrial businesses, operating, loading, or unloading any vehicle outdoors in zones other than industrial within 100 yards of a residential area between the hours of 10:00 PM and 6:00 AM is prohibited (City of Suffolk 2016). Construction noise outdoors in any zoning district within 100 yards of a lawfully occupied dwelling occurring between the hours of 10:00 PM and 6:00 AM is also prohibited (City of Suffolk 2016). This includes operating or causing to be operated any equipment used for construction, repair, alteration, or demolition work on buildings, structures, alleys, or appurtenances.

#### *Existing Noise Conditions*

The proposed expansion project area includes noise-sensitive receptors (i.e., residences) to the west of the Regional Landfill including Dabney Lane, Raven Street, and recently constructed residences on Petersen Way. Additional sensitive receptors are located northwest of the Regional Landfill on Nansemond Parkway, Monticello View, and Cherry Blossom Drive.

Table 22 presents the closest noise receptors to each of the project alternatives, including the distance between the receptors and the location of proposed construction and operations in the Regional Landfill. The closest receptors are typically 2,500 to 5,150 ft. away from the proposed landfill cells.

**Table 22. Sensitive Noise Receptors in Proximity to the Regional Landfill**

| Alternative | Landfill Cell | Closest Residential Receptors and Orientation to SPSA | Distance to Landfill Cell (ft.) |
|---|---|---|---|
| A | Operations activity in Cell VII | Dabney Lane, west of SPSA | 4,250 |
| B | Future Cell VIII | Nansemond Parkway, northwest of SPSA | 5,150 |
| | Future Cell IX | Nansemond Parkway, northwest of SPSA | 4,750 |
| C | Airspace between Cell V and Cell VI | Dabney Lane, west of SPSA | 2,500 |
| E | Hybrid Alternative | Dabney Lane, west of SPSA | 2,500 |

The existing noise conditions at these residential receptors primarily include sound contributions from transportation sources, including U.S. Routes 13/58/460, local roadways, and natural sources of sound such as birds and wind blowing through the trees and ground cover. Noise complaints have not been made about the Regional

Landfill itself. The receptors are separated from the operating landfill cells by 200 feet of forest and woodlands. Existing noise conditions have been estimated based on the Federal Transit Administration's (FTA) 2018 guidance manual, *Transit Noise and Vibration Impact Assessment Manual*.

This methodology estimates existing noise conditions according to the proximity of receptors to major transportation sources such as highways or general background noise levels based on population density (FTA 2018). The residences closest to the Regional Landfill on Dabney Lane, Raven Street, and Petersen Way are generally within approximately 150 ft of U.S. Routes 13/58/460. The estimated existing noise levels for residences northwest of the Regional Landfill are 40 dBA (Leq and Ldn) based on a population density of Suffolk of between 100 and 300 people per square mile.

### Environmental Consequences

The project alternatives proposed for the Regional Landfill include the construction activity at landfill cells. Construction at a landfill cell typically includes bulldozers, excavators, loaders, pick-up trucks, semi-trailers, and water trucks. Depending on the alternative, as described above in the construction phasing section, a proposed cell would be constructed one at a time. Operation of a SPSA landfill cell typically includes the use of compactors, dozers, mobile cranes, scrappers, skid steers, trucks, and wheel loaders. As stated in the "Transportation and Traffic" section, the increase in truck traffic in the region is negligible because of the significant truck traffic that already exists, therefore there would be no substantial change in the traffic noise condition.

Construction noise is evaluated at noise-sensitive locations based on the maximum sound emissions of equipment, distance from the equipment (source) to noise-sensitive receptors, and the presence of intervening objects such as buildings. Sound propagation has been assumed to propagate as a point source from the construction area, assuming a 7.5-dB reduction for every doubling of distance (assuming soft ground).

Table 23 presents a list of typical equipment used during the construction and operation of landfills, including the maximum sound level at 50 ft. and utilization factors (the percentage of time the equipment would be operating at full load), as well as the energy-average noise level of equipment at distances of 50, 500, 2,000, and 5,000 ft.

Noise levels from most construction equipment would be 50 to 55 dBA (Leq) at a distance of 500 ft, 35 to 40 dBA (Leq) at a distance of 2,000 ft., and from 25 to 30 dBA (Leq) at a distance of 5,000 ft. Conservatively assuming that all construction equipment may operate simultaneously, the cumulative noise level at 5,000 ft. would be 38 dBA (Leq) during construction and 37 dBA (Leq) during operations.

**Table 23. Predicted Landfill Operation and Construction Noise Levels**

| Activity | Equipment | $L_{max}$ at 50 ft. (dBA) | Utilization Factor (%) | Noise Level (Leq, dBA) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 50 ft. | 500 ft. | 2,000 ft. | 5,000 ft. |
| Construction | Bulldozer | 85 | 40 | 81 | 56 | 41 | 31 |
| | Excavator | 85 | 40 | 81 | 56 | 41 | 31 |
| | Loader | 80 | 40 | 76 | 51 | 36 | 26 |
| | Pick-up Truck | 55 | 40 | 51 | 26 | 11 | 1 |
| | Semi-Trailers | 84 | 40 | 80 | 55 | 40 | 30 |
| | Water Truck | 84 | 40 | 80 | 55 | 40 | 30 |
| Operation | Compactor | 80 | 20 | 73 | 48 | 33 | 23 |
| | Dozer | 85 | 40 | 81 | 56 | 41 | 31 |
| | Mobile Crane | 85 | 16 | 77 | 52 | 37 | 27 |
| | Scrapper | 85 | 40 | 81 | 56 | 41 | 31 |
| | Skid Steer | 85 | 40 | 81 | 56 | 41 | 31 |
| | Trucks | 84 | 40 | 80 | 55 | 40 | 30 |
| | Wheel Loader | 84 | 40 | 80 | 55 | 40 | 30 |
| Construction Noise (Cumulative Leq) | | | | 88 | 63 | 48 | 38 |
| Operations Noise (Cumulative Leq) | | | | 87 | 62 | 47 | 37 |

Sources: USDOT (2006), FTA (2018)

Construction activities are expected to be intermittent and occur in phases for each alternative. Each alternative would be expected to have similar equipment and duration of operating equipment for both the construction phase and landfill operation. Table 24 presents the results of the noise impact assessment at the closest receptor locations to the west and northwest for each alternative for the Regional Landfill.

**Table 24. Noise Impact Assessment at the Closest Sensitive Receptor**

| Alternative | Closest Receptors | Distance (ft.) | Construction Noise Level (dBA, Leq) | Operational Noise Level (dBA, Leq) | Estimated Daytime Ambient Noise Level (dBA, Leq) |
|---|---|---|---|---|---|
| A | Dabney Lane | 4,250 | 39 | 40 | 65 |
| | Nansemond Parkway | 5,200 | 37 | 39 | 40 |
| B | Dabney Lane | 6,250 | 36 | 38 | 65 |
| | Nansemond Parkway | 4,750 | 37 | 39 | 40 |
| C | Dabney Lane | 2,500 | 44 | 46 | 65 |
| | Nansemond Parkway | 3,000 | 42 | 44 | 40 |
| E | Dabney Lane | 2,500 | 44 | 46 | 65 |
| | Nansemond Parkway | 3,000 | 42 | 44 | 40 |

The following presents the noise impact assessment for each alternative.

### *Alternative A*

Under Alternative A, SPSA would not expand its landfill operations into Cells VIII and IX. Landfill operations would continue to utilize the currently permitted capacity available through Cell VII, which is expected to last until approximately 2037. After Cell VII reaches capacity and is closed, the existing Regional Landfill would remain operational as a transfer station and waste would be hauled to other area landfills. As shown in Table 24, construction and operational noise would be 37 to 39 dBA at receptors to the northwest near Nansemond Parkway and 39 to 40 dBA at receptors to the west near Dabney Lane. Noise levels would be substantially lower than the 40 dBA nighttime ambient conditions and the 65 dBA daytime ambient conditions at receptors to the west and slightly lower than ambient conditions at receptors to the northwest. Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact under Alternative A and no need for mitigation.

### *Alternative B*

Under Alternative B, SPSA would expand its existing landfill operations into two new contiguous waste disposal cells (Cells VIII and IX) which would be constructed over time. As shown in Table 24, construction and operational noise would be 37 to 39 dBA at receptors to the northwest near Nansemond Parkway and 36 to 38 dBA at receptors to the west near Dabney Lane. Noise levels would be substantially lower than the predicted 40 dBA ambient conditions at receptors to the west and slightly lower than ambient conditions at receptors to the northwest. Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact in conjunction with Alternative B and no need for mitigation.

### *Alternative C*

Similar to Alternative B, Alternative C would include expansion into Cells VIII and IX but would also include utilizing the airspace between Cells V and VII for landfilling operations. As shown in Table 24, construction and operational noise would range from 42 to 44 dBA at receptors to the northwest near Nansemond Parkway and 44 to 46 dBA at receptors to the west near Dabney Lane. Noise levels would be substantially lower than ambient conditions at receptors to the west and slightly higher than (up to 4 dBA) ambient conditions at receptors to the northwest.

Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact under Alternative C and no need for mitigation.

### *Alternative E*

Alternative E is a hybrid approach that combines features from each of the alternatives. Alternative E includes hauling of waste and expansion of future cells. Similar to Alternative A, either 25% or 50% of waste would be diverted to private landfills. The remaining 75% or 50% of waste would be managed at the Regional Landfill in the proposed airspace between Cells V and VII and a reduced footprint of future Cells VIII and IX proposed in Alternatives B and C. As noted in the Transportation and Traffic section above, the number of trucks is not expected to increase from hauling the 25% or 50% of MSW waste on U.S. Route 460; therefore, traffic noise was not analyzed.

For the construction and operation of the future proposed cell, the predicted sound levels would be the same if the proposed cells handled 50% or 75% of waste managed on site. As shown in Table 24, construction and operational noise would range from 42 to 44 dBA at receptors to the northwest near Nansemond Parkway and 44 to 46 dBA at receptors to the west near Dabney Lane. Noise levels would be substantially lower than ambient conditions at receptors to the west and slightly higher than (up to 4 dBA) ambient conditions at receptors to the northwest.

Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact under Alternative E and no need for mitigation.

## Cultural Resources

### Methodology

As required by Section 106 of the NHPA (54 USC § 306108), potential impacts on cultural resources were evaluated based on changes to the character-defining features of the resources, which are the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places (National Register). This approach is derived from the Secretary of the Interior's Standards for the Treatment of Historic Properties and the regulations of the Advisory Council on Historic Preservation implementing provisions of the NHPA (36 CFR Part 800). Character-defining features contribute to a property's integrity, which is composed of its location, design, setting, materials, workmanship, feeling, and association.

The data collected through the methods described below for each alternative location were used to identify cultural resources present in the project area and to establish their baseline condition. The existing conditions of these resources were then compared with the alternatives described in Chapter 2 to determine the impacts on cultural resources within the project area.

Compliance with Section 106 of the NHPA is ongoing, and a draft Memorandum of Agreement to address the adverse effects this project would have on cultural resources is attached as Appendix H. See "Chapter 4: Consultation and Coordination" for a summary of the Section 106 process as well as a summary of consultation with Tribal Nations.

### *Alternatives B, C & E*

In July 2021, the James River Institute for Archaeology, Inc. (JRIA) completed a preliminary Phase IA cultural resources assessment to support development of the DEIS (JRIA 2021). The area studied by JRIA for the expansion of the existing landfill site, as defined in the Phase IA report, consists of approximately 143 acres to the north and east of the existing landfill area, including the expansion area (Cells VIII and IX) and a proposed borrow and stormwater management area (Figure 5). The project area is located adjacent to the Great Dismal Swamp NWR; historically, land encompassing the project area was part of the Great Dismal Swamp.

As part of the cultural resources assessment, JRIA researched the archival resources of the Virginia Department of Historic Resources (VDHR) to compile documentation on all previously inventoried historic resources, including archaeological sites, historic structures, and historic districts within the study area vicinity (JRIA 2021). A regional archaeological context specific to the Great Dismal Swamp NWR was developed, and documentary research and analysis of historic maps and aerial photographs was conducted to determine which portions of the study area have the highest sensitivity for both prehistoric and historic archaeological resources. The documentary research was then followed by a pedestrian survey of the study area to determine current site conditions and assess the potential for archaeological resources.

Archaeologists from JRIA conducted a pedestrian survey of the project area on July 20, 2021, to assess general site conditions (soil wetness, vegetative cover, etc.); identify visible artifact deposits, architectural remains, and landscape features; and evaluate the potential for mesic islands or other areas of slightly elevated topography within the typical swamp landscape that might have proved attractive to prehistoric or historic occupation, particularly by Native Americans and escaped African American maroon communities (JRIA 2021).

In the winter of 2023-2024, archaeologists from Gray & Pape Heritage Management (Gray & Pape) conducted fieldwork and shovel tests for a Phase IB investigation to determine if any intact archaeological resources are present in the project area. During this fieldwork, special attention was given to identifying any mesic islands or other landforms that may have supported more frequent use in the Precontact and early historic periods (Gray & Pape 2024a).

Gray & Pape also completed an ethnographic evaluation, ethnobotanical mapping, and GIS mapping to provide data and findings related to identification of a Traditional Cultural Place (TCP) within the Great Dismal Swamp in consultation with the Nansemond Indian Nation. TCPs are properties that are eligible for listing in the National Register based on their association with the cultural practices, beliefs, lifeways, arts, crafts, or social institutions of living communities. The results of this evaluation and mapping effort helped guide and develop the proposed boundaries and significance of the identified TCP (Gray & Pape 2024b).

Through the efforts described above, cultural resources were identified in consultation with consulting parties under Section 106 of the NHPA. Among these consulting parties are the Nansemond Indian Nation, which has historical ties to the Great Dismal Swamp and nearby Nansemond River. A detailed summary of this consultation process is included in “Chapter 4: Consultation and Coordination” including additional details on the efforts to identify ethnographic resources and the TCP.

### Affected Environment

There are no historic structures, buildings, or districts within or immediately adjacent to the expansion area for Alternatives B, C, and E as confirmed by VDHR’s Virginia Cultural Resource Information System (V-CRIS) database. Two historic districts and nine individual historic properties are documented within a one-mile radius; however, due to topography and dense vegetation, the project area is not within the viewshed of these historic properties (VDHR 2013).

To date, no archaeological sites have been recorded in the VDHR V-CRIS database either on the property or in close proximity to it (Figure 33). Five archaeological sites have been recorded within a one-mile radius of the project area, three of which were within the Regional Landfill property but outside of the study area for cultural resources (VDHR 2013). Only one site has been evaluated and determined eligible for listing in the National Register, although it is located well outside of the study area for cultural resources (VDHR 2013).

Documentary research indicated that the project area was part of a relatively large plantation property throughout the nineteenth and early twentieth centuries. During this time, the project area remained forested, undeveloped, and unoccupied, although it was repeatedly timbered. This relative absence of historic activity was confirmed by the pedestrian survey, which identified no visible evidence of surface artifact concentrations, architectural remains, or historic landscape features (JRIA 2021).

The archaeological research context and predictive modeling for prehistoric and historic sites within the Great Dismal Swamp NWR suggests that the areas of highest probability for prehistoric and historic-period sites within the study area would consist of areas of slightly greater elevation, which would have been the most attractive occupation and activity areas for the various groups associated with the Great Dismal Swamp NWR over time. The Phase IA pedestrian survey did not identify any areas of slightly higher elevation sizeable enough to have supported more than a limited, temporary prehistoric or historic use or occupation (JRIA 2021).

A desktop analysis of topographic survey data indicated that two areas totaling approximately 44 acres within the study area for cultural resources are somewhat more elevated than the rest of the land. As a result, these two areas could reasonably be assumed to offer moderate potential for archaeological resources. These would most likely consist of small, temporary Native American resource procurement campsites dating to the Archaic through Early Woodland periods, or historic sites associated with timbering or other ephemeral uses. By virtue of their lower elevation, the hydric soils within the remainder of the study area (approximately 99 acres) can be assumed to have low probability for archaeological sites. In the Phase IA report, JRIA concluded that there are no areas which could be considered to have high archaeological potential within the study area for cultural resources (JRIA 2021).

Following the results of the Phase IA study, additional archaeological investigations were conducted in the winter of 2023–2024 to determine if any intact archaeological resources are present in the project area. During this fieldwork, special attention was given to identifying any mesic islands or other landforms that may have supported more frequent use in the Precontact and early historic periods. This investigation identified no such landforms or mesic islands. Features identified during fieldwork included a historic road trace and drainage ditches; however, the Phase IB report found that they did not represent larger archaeological sites and are not eligible for listing in the National Register of Historic Places. In summary, no archaeological sites, isolated finds, or other potentially eligible archaeological resources were identified within the project area (Gray & Pape 2024a).

In consultation with the Nansemond Indian Nation, which has ancestral ties to the Great Dismal Swamp and nearby Nansemond River, the Mawinsowa Swamp TCP was identified encompassing the project area and surrounding vicinity. The Mawinsowa Swamp TCP that encompasses the project area was determined eligible for listing in the National Register under Criterion A (resources that are associated with events that have made significant contributions to the broad patterns of our history) and D (resources that yielded, or may be likely to yield, information important to prehistory or history). The Nansemond Indian Nation indicates that the “Great Dismal Swamp is a landscape of incredible historical, cultural, ecological, and spiritual importance to our Nation, from deep Pre-Contact times until the present day.” The Great Dismal Swamp and land surrounding the Nansemond River historically provided food along with wild plants that were used for medicine, construction of houses, fishing nets, mats, and baskets, as well for producing musical instruments, arrows, spears, tattoo needles, and hair combs. The Nansemond Indian Nation identified several themes relating to their historic or current use of the TCP. The themes identified are:

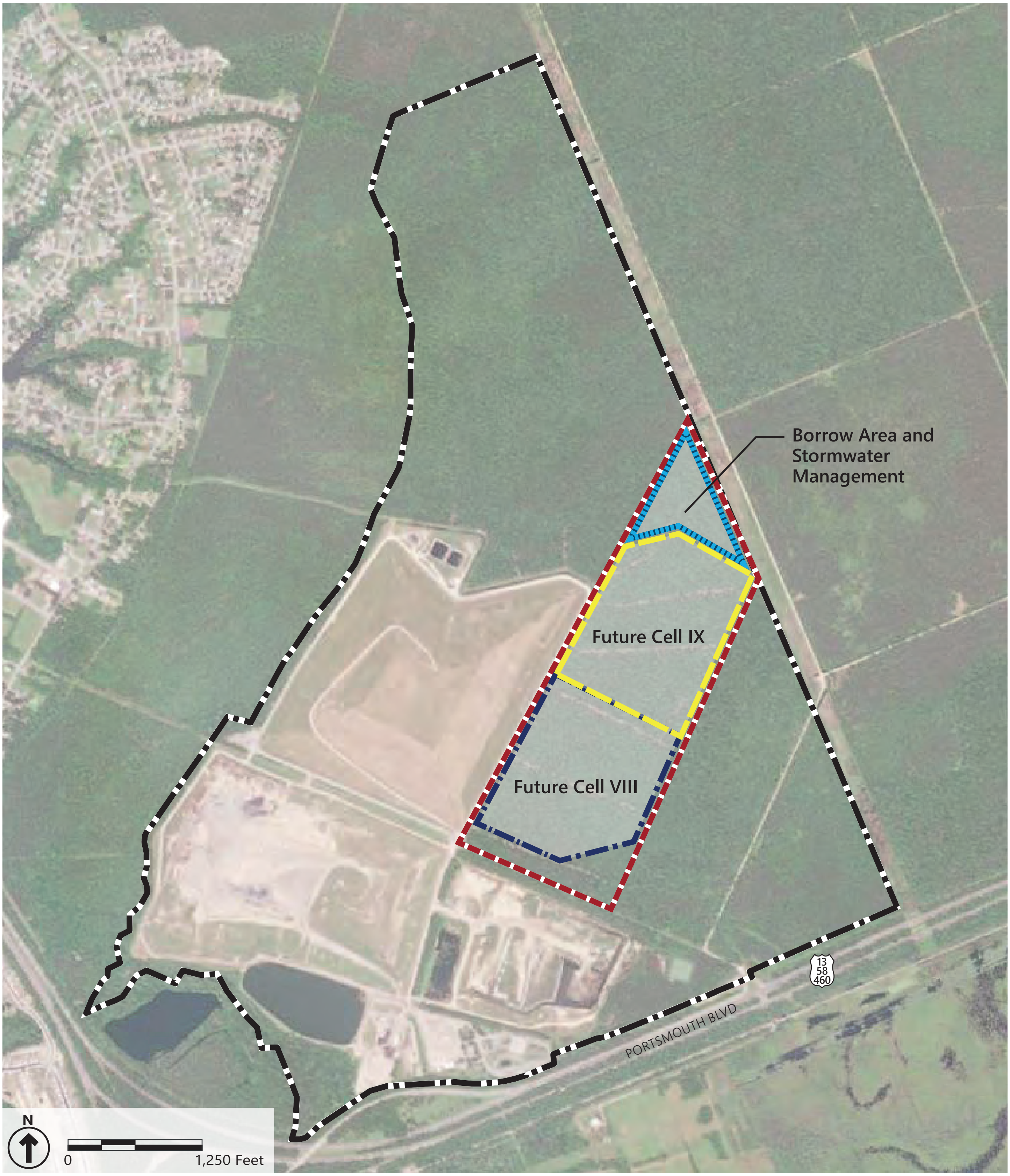
- hunting and fishing for food subsistence and economic sufficiency;
- plant gathering for food subsistence, medicinal use, and structural use;
- transportation and way-finding;
- resistance;
- recreation;
- sovereignty; and
- spiritual significance.

Based on these themes, landscape analyses studies were completed, and the following contributing resources were identified within the proposed project area:

- gathering sites for subsistence, medicinal, and functional plants
- hunting and fishing grounds
- historic manmade landscape features/transportation and way-finding features

The Mawinsowa Swamp TCP fully encompasses the proposed project area; however, it does not encompass the entirety of the Great Dismal Swamp, as identification of a comprehensive Great Dismal Swamp TCP is beyond the scope of the proposed SPSA project. The boundaries for the Mawinsowa Swamp TCP were established utilizing data focused on the northwestern portion of the Great Dismal Swamp and its margins, where water flows north or west from the swamp to the Nansemond River. This data included wetlands, digital elevation models, soils, hydrologic unit code maps, and archaeological site locations. The total area encompassed by the TCP is approximately 10,430 acres.

Source: Nearmap Imagery Dated February 10, 2022




LEGEND

- SPSA Property Boundary
- Cultural Resources Study Area
- Proposed Cell VIII
- Proposed Cell IX
- Proposed Borrow Area and Stormwater Management

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 33

**Study Area for Cultural Resources - SPSA Regional Landfill Proposed Expansion Area**

## Environmental Consequences

### *Alternative A*

Under Alternative A, there would be no impact on cultural resources as a result of continued permitted landfill use into Cell VII because the area has been previously disturbed for landfill facilities; therefore, no intact archaeological resources would occur within the project area. There would be no new disturbance or development within the identified TCP under Alternative A. Additionally, there would be no impacts on cultural resources as a result of closing and covering Cell VII and transporting waste to another existing landfill because these actions would also occur in areas already disturbed. No historic buildings, historic structures, or archaeological resources exist within the project area; therefore, there would be no impacts on those resources. When considered as a whole, Alternative A would not result in any impacts on cultural resources within the vicinity of the project area because it would take place on land that was previously disturbed.

### *Alternative B*

Under Alternative B, there would be no impact on historic buildings, historic structures, or archaeological resources because none exist within the vicinity of the project area. If previously unknown archaeological resources were discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources were identified and documented and an appropriate mitigation strategy developed in consultation with VDHR, associated Virginia Indian Tribes and consulting parties, as appropriate.

Implementation of Alternative B would adversely impact the ancestral tribal lands that were once part of the Great Dismal Swamp region. Because Alternative B proposes extensive ground disturbance and construction in an undeveloped area within the Mawinsowa Swamp TCP, implementation of this alternative would result in the irrevocable loss of features that contribute to the integrity of the TCP. Effects of Alternative B would include habitat fragmentation and loss of habitat for associated plants and wildlife species. Additionally, Alternative B would result in the loss of access to a portion of the Mawinsowa Swamp TCP by members of the Nansemond Indian Nation. The TCP encompasses an area of approximately 10,430 acres. Of these 10,430 acres, approximately 35–40% has been previously developed, primarily as residential and commercial areas. Alternative B would result in an approximately 1.3% increase in the developed area of the TCP.

Through the Section 106 consultation process, the Norfolk District determined that there would be an *adverse effect* on the Mawinsowa Swamp TCP as a result of this project, which was concurred with by the State Historic Preservation Officer on October 24, 2024, and by the Nansemond Indian Nation on September 23, 2024 (Gray & Pape 2024c). See “Chapter 4: Consultation and Coordination” for additional information regarding the findings of the Section 106 process.

#### *Alternative C*

Under Alternative C, the impacts would be the same as described under Alternative B. Implementation of Alternative C would adversely impact the ancestral tribal lands that were once part of the Great Dismal Swamp region, including the Mawinsowa Swamp TCP, as described under Alternative B.

#### *Alternative E*

Under Alternative E, the impacts would be similar to those described under Alternatives B and C, but the impact on the Mawinsowa Swamp TCP would be slightly smaller due to the smaller area of disturbance. There would be an approximately 0.69% increase in developed area within the TCP under the 50% diversion scenario; under the 25% diversion scenario, the increase in developed area within the TCP would be approximately 0.93%.

## Socioeconomics

The proposed expansion into Cells VIII and IX is part of SPSA's long-term plan for providing critical disposal capacity for the region and is consistent with the RSWMP for southeastern Virginia, which identifies the need for future expansion of the active facility (HRPDC 2023). New landfill development at an off-site location would also address needed disposal capacity. This section considers the alternatives' potential to impact the socioeconomic environment.

### Methodology

The study area for socioeconomics is SPSA's service area, which includes approximately 2,000 square miles located in the Virginia cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the counties of Isle of Wight and Southampton. SPSA serves a population of 1,195,613 residents, which generate over one million tons of municipal solid waste per year. SPSA's Regional Landfill property comprises approximately 833 acres, of which 376 acres are within the active facility boundary currently permitted by VDEQ. Demographic and population data were obtained from HRPDC's RSWMP for southeastern Virginia (2023). Capital and operational expenses associated with developing, closing, and operating a landfill were estimated for each alternative. Additional information related to the methodology of the cost analysis is available in Appendix D.

### Affected Environment

Economic forecasts by the HRPDC indicate expected future economic growth and development for the SPSA planning area. The region is expected to grow nearly 8%, from 1,205,287 to 1,302,086 people, from 2020 to 2045 (HRDPC 2023). This equates to an average annual growth rate of 0.33%, or approximately 3,926 people per year (HRDPC 2023).

The largest city in the region is Virginia Beach, with over 38% of the population (HRDPC 2023). Chesapeake is the second most populated, with almost 21% of the population (HRDPC 2023). The City of Suffolk and Isle of Wight County are projected to experience the greatest average annual growth rate from 2020 to 2040, at 2.6% and 1.9%, respectively (HRDPC 2023). The population growth rate is significant for planning purposes since the amount of waste generated increases as population increases.

As stated in the HRPDC's RSWMP (2023), projections of population growth, regional employment, and number of households can help define what kinds and amounts of waste the region would generate.

Effective solid waste management is necessary not only from an environmental standpoint, but also from an economic standpoint. The purpose of the project is to allow SPSA to maintain an approximately 20-year disposal capacity until 2060 which equates to roughly 16 million CY. SPSA is responsible for the management of the safe and environmentally sound disposal of regional waste for its member localities. Therefore, land use, environmental impacts and long-term economic impacts are important factors. Insufficient landfill space or high costs due to property acquisitions, long-haul transport of waste, and private market rate disposal fees (a negotiated dollar per ton fee paid to regional private landfills to accept SPSA's incoming waste) could negatively impact economic stability within the SPSA service area. Negative economic impacts could also include increased operating costs which are passed on to citizens living in SPSA's member communities.

Because SPSA currently owns and operates the Regional Landfill, seven transfer stations, and all associated assets, it has control over operating and use efficiencies. These efficiencies enable SPSA to minimize costs, reducing the economic burden passed down to citizen members. For example, tipping fees are calculated by adding the cost of transfer stations plus the cost of transporting the waste plus the cost of disposing the waste and then divided by the tonnage of waste managed. Therefore, there are inherent efficiencies to be obtained throughout the process that reduce the tipping fee amount.

Additional detail is discussed in the Environmental Consequences section below and detailed in Appendix D which provides an in-depth analysis of operational and capital costs for each alternative.

#### *Employment*

According to HRPDC's RSWMP (2023), employment is expected to increase at an average annual rate of approximately 0.88% through 2040, resulting in an overall increase of 19%. Employment is projected to increase in each locality. Isle of Wight County is projected to experience the greatest percentage growth in employment, followed by Southampton County and the City of Suffolk. Employment is an important forecasting variable because growth reflects an increase in economic activity, which in turn leads to increased consumption and waste generation.

### *Households*

According to projections by the HRPDC, the number of households in the region is expected to increase by about 18% through 2040 at an average annual rate of 0.84% (HRPDC 2023). The largest percentage expansion in population and households is forecasted for the City of Suffolk and Isle of Wight County. Generally, each home, regardless of the number of residents, contributes a certain amount of waste, such as junk mail and yard waste. Additional detail on waste generation per capita is provided in Appendix E.

## Environmental Consequences

### *Alternative A*

Under Alternative A, SPSA would not expand its landfill operations. Landfill operations would continue to utilize the permitted capacity available through Cell VII, which is expected to last until approximately 2037. After Cell VII reaches capacity, the Regional Landfill would be closed with a final cover system and waste would be hauled to one of three other private regional landfills for processing and disposal. Alternative A is not expected to impact employment or households. Generally, SPSA would transfer to a long-hauling operation, but employees would still be needed at transfer stations and to transfer MSW. Some transition is employment could occur, but it would be minimal compared to the overall employment within the region. Alternative A would not be expected to affect the number of households in the region.

Landfill capital and operational costs were evaluated for all alternatives considered. Costs associated with this alternative are passed directly to the citizens living in SPSA's member communities. For Alternative A, the cost analysis included the three private regional landfills that may accept SPSA's waste once the Regional Landfill is closed. Capital expenses for Alternative A range from $53,640,000 to $83,815,000, depending on the selected landfill, and include:

- Current value of transfer equipment purchase/replacement costs
- Operational expenses for Alternative A range from $36,662,000 to $42,668,000 per year, depending on the selected landfill, and include:
- Individual departments' costs for SPSA's operating system such as the accounting department, purchasing department, human resources, information technology, fleet maintenance and operation, and the cost of operating each transfer station, etc.
- Annual hauling costs (estimated for three private regional landfills)
- Contract disposal costs (a negotiated dollar per ton fee paid to regional private landfills to accept SPSA's incoming waste)

As described in Chapters 1 and 2, SPSA determined that solid waste capacity should be increased by incorporating an additional 16 million CY of capacity to meet the project purpose and need. Based on an annual depletion rate of 460,000 tons per year at an in-place density of 1,400 pounds per cubic yard, SCS Engineers (a landfill engineering company and the Norfolk District's landfill expert partner) estimates that 657,100 cubic yards per year would be consumed. Therefore, the approximate 16 million CY of capacity would provide roughly 24.4 years of disposal life.

Since operating costs are incurred each year that the landfill is in operation, the operating costs were multiplied across a 24.4-year timeframe. Cost estimates are presented in Table 25, capital expenses plus 24.4 years of operating expenses range between $948,192,800 and $1,124,914,200 depending on which of three off-site private landfills would accommodate SPSA's waste. Since the exact landfill that would be used in Alternative A is unknown and for purposes of comparison to other alternatives, an average Alternative A total cost of $1,046,596,933 was calculated.

**Table 25. Alternative A Estimated Capital and Operational Expenses ($)**

| Facility | Total Capital Costs | Total Operational Costs per year (24.4) | Cumulative Operational Costs | Total Costs |
|---|---|---|---|---|
| Atlantic Waste Disposal | 80,265,000 | 40,427,000 | 986,418,800 | 1,066,683,800 |
| Bethel Landfill | 53,640,000 | 36,662,000 | 894,552,800 | 948,192,800 |
| Brunswick Waste Management Facility | 83,815,000 | 42,668,000 | 1,041,099,200 | 1,124,914,200 |
| **Average Alternative A Costs** | | | | **1,046,596,933** |

Source: SCS Engineers (2024)

### *Alternative B*

Under Alternative B, SPSA would expand its landfill operations into an expansion area, within which two new waste disposal cells (contiguous Cells VIII and IX) would be constructed. Cell VIII would be constructed first, followed by Cell IX. Existing facilities at the Regional Landfill – including administration and maintenance buildings, utilities (water, sewer, and power), scales, a tire shredding facility, a household hazardous waste facility, a landfill gas recovery system, access and haul roads, leachate sewer disposal, stormwater management systems, and gas management recovery systems – would continue to be used. Alternative B would not have an impact on population or housing trends. Employment opportunities and the "ripple effect" from businesses that follow the development are expected to be minor.

Capital costs for Alternative B are $159,141,000 and include the following items:

- Landfill cell development and closure costs (cost of closing a landfill once it reached capacity, primarily including construction of final cover system and environmental controls)
- Transfer equipment purchase/replacement costs
- Associated wetland mitigation credit purchase, estimated at a 2:1 ratio, assuming $40,000 per credit
- Operational costs for Alternative B are $21,619,000 per year and include:
- Individual departments' costs for SPSA's operating system such as the accounting department, purchasing department, human resources, information technology, fleet maintenance and operation, and the cost of operating each transfer station, etc.
- Annual hauling costs (similar to the existing RLF hauling costs, primarily associated with moving waste from the transfer station network to the Regional Landfill)

The expansion area would increase landfill capacity by 16 million CY to meet the project purpose and need. Based on anticipated depletion and density rates, SCS Engineers anticipates that the expansion would provide roughly 24.4 years of disposal life. Since operating costs are incurred each year that the landfill is in operation, the operating costs were multiplied across a 24.4-year timeframe. Costs associated with this alternative are passed directly to the citizens living in SPSA's member communities. Cost estimates are presented in Table 26. Capital expenses plus 24.4 years of operating expenses total $686,644,600.

**Table 26. Alternative B Estimated Capital and Operational Expenses ($)**

| Scenario | Total Capital Costs | Total Operational Costs per year (24.4) | Cumulative Operational Costs | Total Costs |
|---|---|---|---|---|
| Alternative B | 159,141,000 | 21,619,000 | 527,503,600 | 686,644,600 |
| Average Alternative A Costs | | | | 1,046,596,933 |
| **Alternative B Increment** | | | | **-359,952,333** |

Source: SCS Engineers (2024)

Under Alternative B, the calculated cost estimates would be less than Alternative A because of the proximity of the existing Regional Landfill to transfer stations. Alternative B proposes expansion of the Regional Landfill to develop new cells. The expansion results in impacts to wetlands and therefore requires the purchase of mitigation credits. Alternative A requires increased hauling and a larger vehicle fleet to manage the hauling need. Because SPSA operates as a not-for-profit, semi-governmental landfill, they can establish their own fee structure whereas Alternative A requires paying private market rate disposal fees. Therefore, Alternative B would result in a net cost benefit of approximately $359,952,333 relative to the average cost for Alternative A.

### *Alternative C*

Under Alternative C, the airspace between Cells V and VII would be filled in and utilized for landfilling operations. Construction and operation of Cells VIII and IX would still occur, but the footprint of Cell IX would be reduced relative to Alternative B. All other impacts from Alternative C would be very similar to impacts from Alternative B, as the impacts would occur in the same location but with a reduced wetland footprint, achieved by utilizing the site differently. Similar to Alternative B, there would be no impact on population or housing trends, and the impact on employment opportunities is expected to be minor.

Similar to capital and operational costs calculated for Alternative B, capital costs for Alternative C total $158,523,000 and include the following:

- Landfill cell development and closure costs (cost of closing a landfill once it reached capacity, primarily including construction of final cover system and environmental controls)
- Transfer equipment purchase/replacement costs
- Associated wetland mitigation credit purchase, estimated at a 2:1 ratio, assuming $40,000 per credit
- Operational expenses for Alternative C total $21,619,000 per year and include:
- Individual departments' costs for SPSA's operating system such as the accounting department, purchasing department, human resources, information technology, fleet maintenance and operation, and the cost of operating each transfer station, etc.
- Annual hauling costs (similar to the existing RLF hauling costs, primarily associated with moving waste from the transfer station network to the Regional Landfill)

The expansion area would increase landfill capacity by 16 million cubic yards to meet the project purpose and need. Based on anticipated depletion and density rates, SCS Engineers anticipates that the expansion would provide roughly 24.4 years of disposal life. Since operating costs are incurred each year that the landfill is in operation, the operating costs were multiplied across a 24.4-year timeframe. Costs associated with this alternative are passed directly to the citizens living in SPSA's member communities. Cost estimates are presented in Table 27. Capital expenses plus 24.4 years of operating expenses total $686,026,800.

**Table 27. Alternative C Estimated Capital and Operational Expenses ($)**

| Scenario | Total Capital Costs | Total Operational Costs per year (24.4) | Cumulative Operational Costs | Total Costs |
|---|---|---|---|---|
| Alternative C | 158,523,000 | 21,619,000 | 527,503,600 | 686,026,600 |
| Average Alternative A Costs | | | | 1,046,596,933 |
| **Alternative C Increment** | | | | **-360,570,333** |

Source: SCS Engineers (2024)

Under Alternative C, the calculated cost estimates would be similar to those in Alternative B. Expansion of the Regional Landfill into the new cells would result in wetland impacts requiring purchase of mitigation credits. The associated mitigation credit purchase for Alternative C would be slightly less than Alternative B due to a reduced expansion footprint. Alternative C would result in a net cost benefit of approximately $360,570,333 relative to Alternative A which would require increased hauling and a larger vehicle fleet to manage the hauling need. SPSA operates as a not-for-profit semi-governmental landfill and manages their own fee structure. Alternative A requires paying private market rate disposal fees.

### *Alternative E*

Under Alternative E, SPSA would divert either 50% or 25% of MSW, to one of the three private area landfills and the remaining MSW would be landfilled at the Regional Landfill. The expansion site area would have a smaller footprint than Cells VII and IX, as described under Alternatives B and C. Similar to Alternative C, the airspace between Cells V and VII would also be infilled and utilized for landfilling operations. Infilling this airspace would secure an additional 1.52 million CY of disposal capacity, reducing the need for capacity provided by the expansion site to 14.48 million CY. Construction and operation for the hybrid expansion area would generally follow the stages described under Alternative B. Under the 50% diversion scenario, the required disposal capacity would be 7.24 million CY. The expected life of a cell this size would last approximately 11 years. A cell with this capacity would require a footprint of 53.76 acres. Under the 25% diversion scenario, the required cell disposal capacity would be 10.86 million CY, which would be expected to have a 16.5-year lifespan. The required footprint for a cell this size would be 72.85 acres.

Similar to Alternatives B and C, there would be no impact on population or housing trends, and the impact on employment opportunities is expected to be minor.

For Alternative E, the cost analysis included the three private landfills that could be used to divert SPSA's waste from the Regional Landfill under the 50% and 25% diversion scenarios. Capital expenses for Alternative E range from $107,805,800 to $137,211,000, depending on the selected landfill and diversion scenario, and include:

- Landfill cell development and closure costs (cost of closing a landfill once it reached capacity, primarily including construction of final cover system and environmental controls)
- Transfer equipment purchase/replacement costs
- Associated wetland mitigation credit purchase, estimated at a 2:1 ratio, assuming $40,000 per credit
- Operational expenses for Alternative E range from $237,809,000 to $571,751,200 per year, depending on the selected landfill and diversion scenario, and include:
    - Individual departments' costs for SPSA's operating system such as the accounting department, purchasing department, human resources, information technology, fleet maintenance and operation, and the cost of operating each transfer station, etc.
    - Annual hauling costs (estimated for three private landfills)
    - Contract disposal costs (a negotiated dollar per ton fee paid to regional private landfills to accept SPSA's incoming waste)

Alternative E scenarios would achieve additional landfill capacity of approximately 16 million CY to meet the project purpose and need. Capacity would be achieved through a combination of expanding the Regional Landfill and landfilling waste and diverting and hauling waste to private area landfill facilities. Based on anticipated depletion and density rates, SCS Engineers anticipates that 16 million CY of expansion would provide roughly 24.4 years of disposal life.

Since operating costs are incurred each year that the landfill is in operation, the operating costs were multiplied across a 24.4-year timeframe. However, the hybrid diversion scenarios divide the total 24.4-year operating window into two parts: estimated site life years where the landfill would be active and estimated hauling life years in which the landfill would be closed and waste would be hauled. Cost estimates are presented in Table 28. Capital expenses plus 24.4 years of operating expenses range between $774,544,000 to $932,223,800. Since the exact landfill and diversion scenario that would be used in Alternative E is unknown, the average cost of Alternative E was calculated for both the hybrid 50 and hybrid 25 scenarios and would be approximately $772,723,600 and $805,928,000, respectively.

**Table 28. Alternative E Estimated Capital and Operational Expenses ($)**

| Facility-Hybrid 50 | Total Capital Costs | Operational Costs for Landfilling Years (11 years) | Operational Costs for Hauling Years (13.4 years) | Cumulative Operational Costs | Total Costs |
|---|---|---|---|---|---|
| Atlantic Waste | 120,915,800 | 237,809,000 | 541,721,800 | 779,531,800 | 900,446,800 |
| Bethel | 107,805,800 | 237,809,000 | 491,270,800 | 729,079,800 | 836,885,800 |
| RSI Brunswick | 122,663,800 | 237,809,000 | 571,751,200 | 809,560,200 | 932,224,000 |
| **Average Alternative E Hybrid 50 Costs** | | | | | **772,723,600** |
| **Facility-Hybrid 25** | **Total Capital Costs** | **Operational Costs for Landfilling Years (16.5 years)** | **Operational Costs for Hauling Years (7.9 years)** | **Cumulative Operational Costs** | **Total Costs** |
| Atlantic Waste | 136,151,000 | 356,713,500 | 319,373,300 | 676,086,800 | 812,237,800 |
| Bethel | 128,201,000 | 356,713,500 | 289,629,800 | 646,343,300 | 774,544,300 |
| RSI Brunswick | 137,211,000 | 356,713,500 | 337,077,200 | 693,790,700 | 831,001,700 |
| **Average Alternative E Hybrid 25 Costs** | | | | | **805,928,000** |
| Average Alternative A Costs | | | | | 1,046,596,933 |
| | **Alternative E Hybrid 50 Increment** | | | | **-273,873,333** |
| | **Alternative E Hybrid 25 Increment** | | | | **-240,668,933** |

Source: SCS Engineers (2024)

Under Alternative E, the calculated cost estimates would be less than those in Alternative A. Expansion of the Regional Landfill into the new cells would result in wetland impacts requiring purchase of mitigation credits. The associated mitigation credit purchase for both Alternative E scenarios would be less than Alternatives B and C due to a reduced expansion footprint. Alternative E would result in a net cost benefit of $273,873,333 for Hybrid 50 and $240,668,933 for Hybrid 25 relative to Alternative A which would require increased hauling and a larger vehicle fleet to manage the hauling need. SPSA operates as a not-for-profit semi-governmental landfill and manages their own fee structure. Alternatives A, B, C and E require paying private market rate disposal fees.

To provide an additional point of cost comparison, the Norfolk District utilized SCS to exam the cost per cubic yard. This perspective considers the additional dimension of volume instead of only considering tonnage of waste. SCS concluded that as the footprint of a landfill increases, the total capacity that can be developed on a per acre basis increases and decreases as the footprint gets smaller. Inversely, the dollar/cy capacity generated decreases as the footprint increases. In other words, larger landfills are more cost-effective than smaller landfills from an airspace (or capacity) utilization perspective. SCS evaluated the efficiency of the cell development costs for the applicant's preferred alternative (Alternative C) and the Hybrid Alternative scenarios (Alternative E) in terms of the estimated cell development costs divided by the resulting airspace generated ($/CY capacity). Additional detailed results are presented in Appendix D, Table 7. The applicant's preferred alternative (Alternative C) cell development costs are approximately $4.62/CY airspace generated versus the two hybrid scenarios analyzed in Alternative E, which range from $5.36 to $5.94/CY. The Alternative E hybrid scenarios are 16% to 28% more costly on a $/CY airspace developed than the applicant's preferred alternative (Alternative C).

## Local Community

Norfolk District analyzed the impacts on the local communities. As discussed previously, this section has been revised since publication of the DEIS to recognize that certain Executive Orders have been rescinded. This analysis was conducted using the guidance, as described below, which was in effect when the analysis was conducted during 2023 and 2024.

### Methodology

Norfolk District utilized guidance outlined by the CEQ under NEPA (USEPA 2015) to address potential Local Community Impacts. The guidelines intend to encourage meaningful public participation by minority or low-income communities in the environmental review process. The methodology primarily follows the approach identified in EPA's *Promising Practices for EJ Methodologies in NEPA Reviews* (Federal Interagency Working Group on Environmental Justice 2016). The VDOT's *Consultant Resource Guidance Document on Socioeconomics and Environmental Justice* (2016) for VDOT NEPA studies was also used in developing the analysis of Local Community Impacts, as described in detail below.

The assessment of potential Local Community impacts for the project involved the following:

- Identification of potential adverse environmental impacts and the area to be affected (i.e., establishing the Local Community study area).
- Determination of whether potential adverse environmental impacts are likely to affect the Local Community (i.e., assessing whether low-income, minority, or linguistically isolated communities are present in the Local Community study area).
- Evaluation of any significant adverse environmental impact on the potential Local Community study area.
- Avoidance or minimization of any adverse environmental impact to the greatest extent practicable.

## Delineation of the Local Community Study Area (Study Area)

Modern landfills are well-engineered and managed facilities designed to responsibly manage the disposal of solid waste. They are located, designed, and monitored to protect the environment from contaminants which are present in the waste stream. Monitoring systems are required to identify signs of groundwater contamination and landfill gas through the requirements established under the Resource Conservation and Recovery Act (RCRA), Subtitle D (USEPA 2021a). Because of design and monitoring requirements defined in RCRA Subtitle D regulations, solid waste landfills are carefully regulated, managed, and designed to protect the environment from contaminants often found in the waste stream (USEPA 2021a). Restrictions associated with Virginia Solid Waste Management Regulations, detailed in 9 VAC 20-81-120, restrict siting a landfill disposal unit or leachate storage unit within 200 ft. of any residence, school, daycare center, hospital, nursing home, or recreational park area.

The study area is intended to encompass the area most likely to be affected by the proposed project. The study area was defined for analysis, associated with Alternatives B, C and E. The study area includes all census block groups located within one mile of the project boundary of the expansion area on the Regional Landfill property. The one-mile radius is consistent with the study areas employed for technical analyses associated with landfill practices, such as odor and aesthetics. For the purposes of this analysis, U.S. Census Bureau block group data was reviewed. Block groups are the smallest census geography with data available for this analysis. As shown in Figure 34, the study area included six census block groups. Block groups with a high percentage of minority, low-income, or linguistically isolated populations are highlighted in this figure as defined below. The study area depicted in Figure 34, associated with Alternatives B, C, and E, is referred to as the SPSA Regional Landfill study area.

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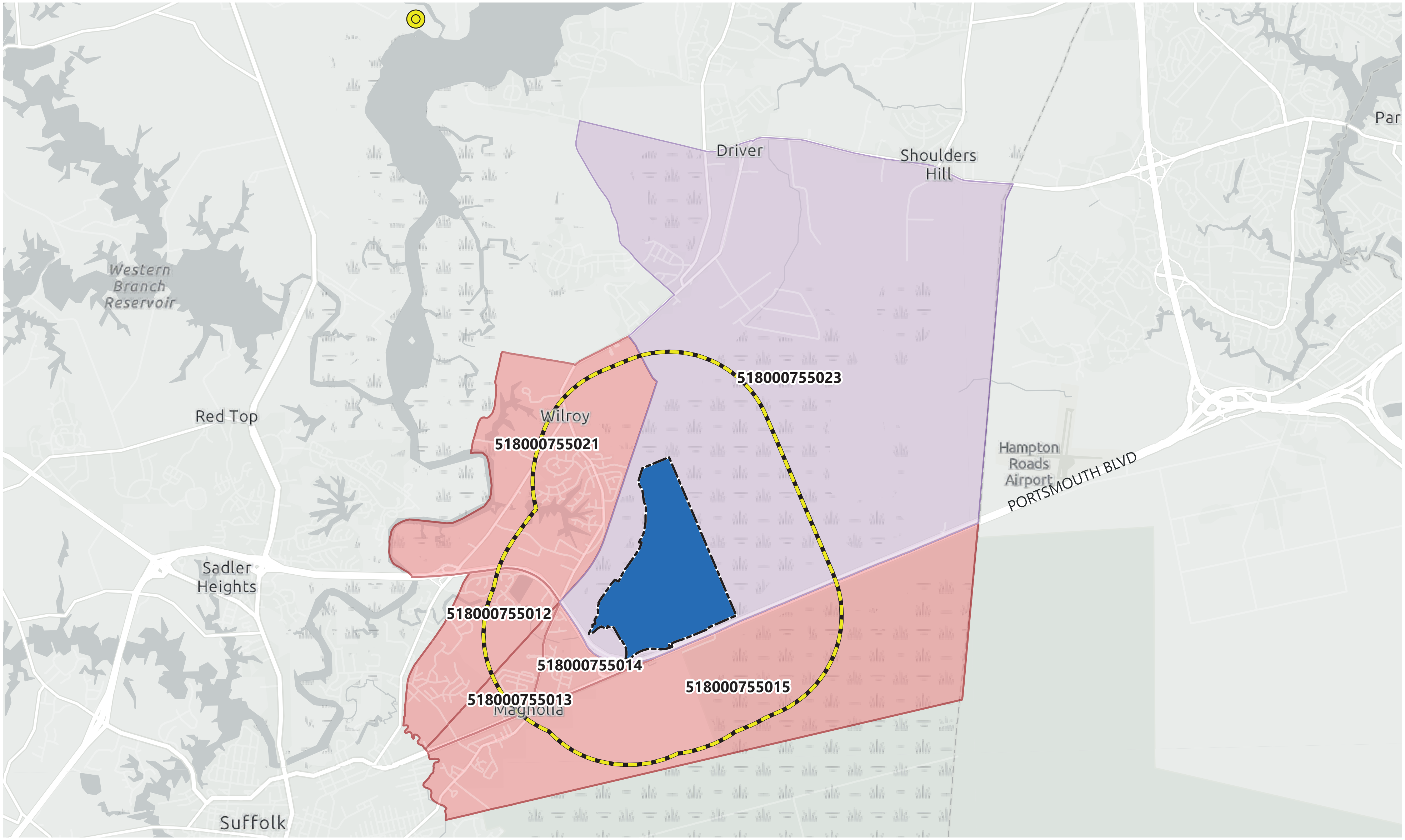
Source: ESRI Basemap Grey Canvas; EJSCREEN: ACS 2015-2019




**LEGEND**

SPSA Property Boundary (546.9 acres)
1 Mile Radius
Block Group
Local Community Area
VA Tribe Point

N

0 1 Miles

US Army Corps of Engineers

Environmental Impact Statement for Proposed Expansion of SPSA Landfill

FIGURE 34

**Study Area for Local Community Analysis - SPSA Regional Landfill**

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## Local Communities within the Study Area

- Potentially vulnerable or underserved communities, including minority, low-income and linguistically isolated populations, were considered in this analysis. Minority and low-income communities were defined in accordance with the strategies identified in the Federal Interagency Working Group on Environmental Justice's *Promising Practices for EJ Methodologies in NEPA Reviews* (2016) and in the VDOT *Consultant Resource Guidance Document on Socioeconomics and Environmental Justice* (2016). Additionally, the Norfolk District considered linguistically isolated populations for this analysis, defined in accordance with *Promising Practices for EJ Methodologies in NEPA Reviews* (Federal Interagency Working Group on Environmental Justice 2016). The definitions used in this analysis are described as follows:
- *Minority Population*: Minority populations are defined as all individuals who list their racial status as a race other than white alone, list their ethnicity as Hispanic or Latino, or a combination of the two. This analysis defined a minority community as a census block group with a minority population equal to or greater than 50%, or a minority population, by percentage, that is "meaningfully greater" than the Virginia state average of 38%. The minority population for a census block group was be found to be "meaningfully greater" than the Virginia state average when the percentage of minority individuals within the census block group was 10% greater than the percentage of minorities residing within the state of Virginia (38%). Thus, census block groups with equal to or greater than 41.8% of people identifying as minorities were considered minority populations. All census block groups in the study areas were evaluated using this threshold, and minority populations were identified by block group. Associated data is detailed as the percent minority in Table 29.
- *Low-Income Population*: Guiding principles in both the *Promising Practices for EJ Methodologies in NEPA Reviews* (Federal Interagency Working Group on Environmental Justice 2016), as well as the EPA's EJSCREEN web tool (USEPA 2022) were utilized to identify low-income populations in the study areas. A low-income household was defined as a household with an income less than or equal to twice the federal poverty level (USEPA 2019). The federal poverty level thresholds vary based on household size. For example, the 2021 U.S. Census Bureau federal poverty level was defined as $26,500 for a family of four (ASPE 2021). The benchmark used by EJSCREEN to determine low-income status for four-person households was therefore $53,000, twice the federal poverty level for a household of four (USEPA 2019). The percentage of low-income households within the study area was compared with the percentage of low-income communities in the state of Virginia (25%) to determine which block groups in the study area contained low-income populations. Thus, for the purpose of this analysis, a low-income community was defined as a census block group having a low-income population equal to or greater than 25% of the total population. All census block groups in the study areas were evaluated using this threshold, and

low-income populations were identified. Associated data are detailed as the percent low-income in Table 29.

- *Linguistically Isolated Populatio*n: A linguistically isolated population consists of households in which all members aged 14 years and older have difficulty speaking English proficiently. This analysis defined linguistically isolated populations as a census block group with a linguistically isolated population equal to or greater than 5% of the total population. All census block groups in the study areas were evaluated using this threshold, and linguistically isolated populations were identified by block group. Associated data is detailed as percent linguistically isolated in Table 29.

### Affected Environment-Local Communities within the Study Area

Demographic information was derived from the U.S. Census Bureau 2015-2019 American Community Survey (ACS) 5-year profile (U.S. Census Bureau 2019) and the EPA webtool EJSCREEN (USEPA 2021b). The first step in the process was the identification of minority, low-income, and linguistically isolated populations within the study area. Block groups with demographic data that met the thresholds for minority, low-income, and linguistically isolated communities, as described above, were identified in this analysis.

Six block groups overlap the SPSA Regional Landfill study area associated with Alternatives B, C, and E. Demographic data from these six block groups was analyzed. Based on the methodology described above, the data describing the population in five of the study area’s six block groups exceeded the threshold for definition as minority populations; and three of the study area’s six block groups exceeded the threshold for definition as low-income populations. None of the study area’s six census block groups exceeded the threshold for definition as a linguistically isolated population. As shown in Table 29, all census block groups in the Regional Landfill study area, with the exception of the block group in which the existing Regional Landfill is located (Block Group 518000755023), were identified as minority and/or low-income communities.

### Table 29. Local Communities

| Alternatives B, C, and E: On-site Landfill Expansion | | | | |
|---|---|---|---|---|
| **Census Block Group** | **Population** | **Percent Minority** | **Percent Low-Income** | **Percent Linguistically Isolated** |
| 518000755023* | 883 | 36% | 11% | 0% |
| 518000755015 | 949 | **92%** | **64%** | 0% |
| 518000755014 | 667 | **46%** | **32%** | 2% |
| 518000755013 | 1,085 | **51%** | **63%** | 0% |
| 518000755012 | 1,786 | **52%** | 14% | 1% |
| 518000755021 | 1,948 | **59%** | 13% | 0% |
| **Total** | **6,946** | | | |

Source: U.S. Census Bureau (2019)

*Block Group containing the project area

**Gray shading** indicates a percentage greater than or equal to the definitions set for minority, low-income, or linguistically isolated populations; see "Local Communities within the Study Area" for additional information on definitions.

## Environmental Consequences

Data as presented above and as verified using an EJSCREEN Report for each census block group indicate there are higher rates of the presence of minority and low-income populations within the study areas than the state averages of 38% and 25%, respectively (USEPA 2021b). Thus, the current SPSA Landfill operates within an area in which five of the six block groups are considered minority and/or low-income communities. This analysis considers how the alternatives would impact these communities compared to baseline conditions.

### *Alternative A*

Under Alternative A, there would be no land clearing, construction, or operation of new landfill area. The existing Regional Landfill would remain in operation as a transfer station but no landfilling activities would occur. The environmental topics analyzed include the following: water resources, biological resources, transportation and traffic, air quality and emissions, noise, cultural resources, and socioeconomics.

#### *Water Resources*

Under Alternative A, long-term adverse effects to water resources, including surface hydrology, sea level rise, or storm surge are not anticipated. No long-term adverse effects are anticipated to the floodplain, groundwater, or water quality.

#### *Biological Resources*

Under Alternative A, no wetland filling would occur. Once capacity in Cell VII is achieved in 2037, the landfill would be closed and capped. Waste would then be diverted to other disposal sites. Therefore, no wetland impacts would occur at the Regional Landfill location and no permit action from the Norfolk District would be required.

#### *Transportation and Traffic*

While there would likely not be an increase in the number of trucks traveling between transfer stations and other facilities, this would result in trucks traveling further to dispose of waste at these other facilities. Therefore, there would be no adverse effect on the surrounding transportation system.

#### *Air Quality and Emissions*

Alternative A is expected to result in the least construction-related emissions of the alternatives. However, the potential receiver facilities are further from the SPSA service area than the SPSA Regional Landfill, resulting in higher emissions associated with waste hauling than the other alternatives. Waste would still degrade and emit landfill gases at these off-site locations. Therefore, emissions would be reduced within the immediate SPSA service area but would increase in other areas as the waste travels to and decomposes at the potential receiver facilities. Greenhouse gas emissions estimations included the hauling emissions associated with travel to each of the alternative landfills and emissions from the degrading landfill material. Overall, Alternative A would have the highest greenhouse gas emissions related to emissions of other alternatives.

#### *Noise*

Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact under Alternative A and no need for mitigation.

#### *Cultural Resources*

Under Alternative A, there would be no impact on cultural resources as a result of continued use of the permitted landfill and there would be no new disturbance or development within the identified TCP.

#### *Socioeconomics*

Costs associated with this alternative are passed directly to the citizens living in SPSA's member communities. Costs associated with Alternative A are the highest compared to all other alternatives.

#### *Summary of Local Community Impacts: Alternative A*

Although Alternative A would result in higher GHG emissions and higher costs than all other alternatives considered, but the environmental analysis topics reviewed did not result in adverse impacts. Upon conclusion of the environmental impact topic analysis and after public outreach, the Norfolk District determined that the study area would be largely unchanged from the baseline and under Alternative A, there would be no anticipated impacts on the local community.

### *Alternatives B & C*

Alternatives B and C include the expansion of the Regional Landfill, requiring land clearing, construction, and development of landfill cells. The study area would be most affected by these alternatives. To determine potential adverse impacts, the following environmental topics were analyzed: water resources, biological resources, transportation and traffic, air quality and emissions, noise, cultural resources, and socioeconomics.

#### *Water Resources*

Surface water hydrology in the project area is primarily driven by direct precipitation, with very little contributing watershed upslope. Long-term adverse effects of runoff are expected to be mitigated by the design and implementation of stormwater management facilities. Treated surface water would eventually discharge into Burnetts Mill Creek, resulting in a hydroperiod comparable to pre-existing conditions. Approximately 0.11 acres of floodplain are anticipated to be affected by the construction of perimeter roadways and long-term adverse effects to the base flood elevation are not anticipated. At the regional scale, groundwater flow would be largely unaltered, with no impact on flow and discharge to Burnetts Mill Creek and long-term adverse effects to groundwater are not anticipated. No adverse effects to public or private water supply wells are anticipated. Sea level rise may raise groundwater levels higher than present elevations but would not significantly alter groundwater flow directions, velocities, or discharge locations. Short-term and long-term adverse effects to surface water hydrology are anticipated under Alternatives B and C. Long-term adverse effects of this projected increase in runoff are expected to be offset by the design and implementation of stormwater management facilities, which would include a treatment train of perimeter ditches and traditional stormwater ponds that must comply with state regulations for water quality and quantity. Both short and long-term effects to hydrology would ultimately be offset through implementation of SPSA's proposed mitigation plan which includes on-site and off-site preservation and conservation.

#### *Biological Resources*

Alternative B would result in 117.36 acres of forested wetland impacts and Alternative C would result in approximately 109.64 acres of wetlands impacts. Under both alternatives, compensatory mitigation would be required to replace the wetland acreage at a 2:1 ratio. Mitigation bank credits and preservation of existing lands is proposed.

These alternatives would remove all existing wildlife habitat that would be used by protected species and migratory birds within the expansion area. Direct, temporary and permanent effects to some species would occur due to construction, noise, vibration, human presence, and loss of habitat both within and adjacent to the expansion area. Adverse impacts to biological resources are anticipated. However, impacts would be reduced through avoidance and minimization which would occur through utilization of best management practices on site. The proposed preserved lands under the mitigation plan would serve as wildlife habitat, allow for continued growth of the forest, provide buffers to the surrounding neighborhoods, help protect downstream water quality, and serve as a connection between Burnetts Mill Creek and the Great Dismal Swamp.

*Transportation and Traffic*

Under alternatives B and C, there is no anticipated increase in operations at the landfill that would cause an increase in traffic to and from the project area beyond the projected traffic volume. Therefore, there would be no adverse effect on the surrounding transportation system.

*Air Quality and Emissions*

Given the relatively low number and types of equipment that would be used for the initial construction activities and the intermittent nature of construction, emissions from construction equipment would be minor and temporary in nature. Alternatives B and C are not expected to increase operational traffic to and from the site compared to the existing conditions. Operational emission control measures that are currently in use are expected to be continued for the proposed expansion, such that emissions would be similar to the existing operations. Alternatives B and C are similar and would have less greenhouse gas emissions than Alternative A because less hauling is proposed.

*Noise*

Noise levels would be substantially lower than the ambient conditions in adjacent communities. Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact in conjunction with Alternatives B and C.

*Cultural Resources*

Under Alternatives B and C, there would be no impact on historic buildings, historic structures, or archaeological resources because none exist within the vicinity of the project area. Alternatives B and C would adversely impact the ancestral tribal lands that were once part of the Great Dismal Swamp region, including the identified TCP. The adverse impacts to the TCP would be mitigated through a proposed plan memorialized within an MOA.

*Socioeconomics*

Costs associated with these alternatives are passed directly to the citizens living in SPSA's member communities. Alternatives B and C are similar in cost and would be less expensive than Alternative A.

*Summary of Local Community Impacts: Alternatives B and C*

Upon conclusion of the environmental impact topic analysis and after public outreach, the Norfolk District determined that Alternatives B and C are anticipated to result in adverse impacts to surface water hydrology, biological resources and cultural resources. No adverse impacts to the other topics considered were found.

The resulting adverse impacts to surface water hydrology, wetlands, protected species, migratory birds, and wildlife resources would be offset through mitigation including avoidance, minimization, compensation and best management practices. SPSA's proposed compensatory mitigation plan includes the conservation of 742.56 acres of primarily forested wetland habitat. A large portion of conserved lands would benefit local communities in the study area by providing permanent buffers and screening from existing and proposed landfill activities and by preventing future development. The resulting adverse impacts to cultural resources would be mitigated through the terms of the MOA.

Public input was considered and no concerns or opposition were raised by the surrounding communities during public outreach. Alternatives B and C include the expansion of an existing facility in which all proposed adverse impacts would be mitigated. The Norfolk District does not anticipate adverse impacts to the local community under these alternatives.

### *Alternative E*

Under Alternative E, two scenarios are developed in which 50% or 25% of MSW would be diverted to private area landfills after 50% or 75% of MSW, respectively, has been landfilled at the Regional Landfill. A smaller expansion area in combination with increased hauling would result in a reduction in truck volume to the Regional Landfill, minimizing associated traffic and noise impacts. Because the reduced expansion area would be within the footprint of Cells VIII and IX, the environmental consequences for Alternative E are similar to those described under Alternatives B and C.

#### *Water Resources*

Similar to Alternatives B and C, short-term and long-term adverse effects to surface water hydrology are anticipated as a result of Alternative E. Long-term adverse effects of this projected increase in runoff are expected to be offset by the design and implementation of stormwater management facilities, which would include a treatment train of perimeter ditches and traditional stormwater ponds that must comply with state regulations for water quality and quantity. Both short- and long-term effects to hydrology would ultimately be offset through implementation of SPSA's proposed mitigation plan which includes on-site and off-site preservation and conservation.

#### *Biological Resources*

Under Alternative E, 96.85 acres of wetlands would be removed under a 25% diversion scenario and 71.76 acres of wetlands would be removed under a 50% diversion scenario. Under both scenarios, compensatory mitigation would be required to replace the wetland acreage at a 2:1 ratio. Mitigation bank credits and preservation of existing lands is proposed. Adverse impacts anticipated as a result of Alternative E are similar in nature to those described in Alternatives B and C.

*Transportation and Traffic*

While there would likely not be an increase in the number of trucks traveling between transfer stations and other facilities, this would result in trucks traveling further to dispose of waste at these other facilities. Therefore, there would be no adverse effect on the surrounding transportation system.

*Air Quality and Emissions*

Alternative E is expected to result in the lower construction-related emissions than Alternatives B and C because of the reduced landfill footprint. However, when the smaller landfill reaches capacity and SPSA transitions to a hauling operation, the potential receiver facilities are further from the SPSA service area than the SPSA Regional Landfill, resulting in higher emissions associated with waste hauling than the other alternatives. Waste would still degrade and emit landfill gases at these off-site locations. Therefore, emissions would be reduced within the immediate SPSA service area but would increase in other areas as the waste travels to and decomposes at the potential receiver facilities. Greenhouse gas emissions estimations included the hauling emissions associated with travel to each of the alternative landfills and emissions from the degrading landfill material. Overall, Alternative E would have higher greenhouse gas emissions than Alternatives B and C but less than Alternative A.

*Noise*

Noise levels would be substantially lower than the ambient conditions in adjacent communities. Operational noise conditions would be well below the EPA noise guideline of 55 dBA. Therefore, there would be no noise impact in conjunction with Alternative E.

*Cultural Resources*

Under Alternative E, there would be no impact on historic buildings, historic structures, or archaeological resources because none exist within the vicinity of the project area. Alternative E would adversely impact the ancestral tribal lands that were once part of the Great Dismal Swamp region, including the identified TCP. The adverse impacts to the TCP would be mitigated through a proposed plan memorialized within an MOA.

*Socioeconomics*

Costs associated with these alternatives are passed directly to the citizens living in SPSA's member communities. Alternative E would be less expensive than Alternative A but more expensive than Alternatives B and C.

*Summary of Local Community Impacts: Alternative E*

Upon conclusion of the environmental impact topic analysis and after public outreach, the Norfolk District determined that Alternative E would result in adverse impacts to surface water hydrology, biological resources and cultural resources, similar to those described under Alternatives B and C. No adverse impacts to the other topics considered were found.

The resulting adverse impacts to surface water hydrology, wetlands, protected species, migratory birds, and wildlife resources would be offset through mitigation including avoidance, minimization, compensation and best management practices. A compensatory mitigation plan, scaled to accommodate the impacts associated with Alternative E, would include conservation of primarily forested wetland habitat. A large portion of conserved lands would benefit communities in the study area by providing permanent buffers and screening from existing and proposed landfill activities and by preventing future development. The resulting adverse impacts to cultural resources would be mitigated through the terms of the MOA.

Public input was considered, and no concerns or opposition were raised by the surrounding communities during public outreach. Alternative E includes hauling waste to private facilities and the expansion of an existing facility. All proposed adverse impacts would be mitigated. The Norfolk District does not anticipate adverse impacts to the local community within the study area.

## Cumulative Actions Considered

### Historic Fill of Wetlands

Virginia has lost approximately 40% of its pre-colonial wetlands (USGS 1996). A study of wetland trends in southeastern Virginia between 1994 and 2000 showed a net loss of 2,100 acres (1.3%). More acres of vegetated wetlands were actually lost, but that loss was partially offset by gains in constructed pond and open water areas. The loss of palustrine wetlands was primarily due to conversion to uplands, while estuarine wetlands were lost through conversion to open water (Tiner et al. 2005). Several major causes of wetland loss in Virginia include conversion to other land cover types, sea level rise and subsidence, hydrologic alterations, fragmentation, agriculture, transportation projects, and shoreline stabilization and armoring.

Urbanization in the Hampton Roads region of Virginia has adversely affected wetlands and other WOTUS by destroying and degrading wetlands, streams, rivers, ponds, or lakes, many of which were likely historic Great Dismal Swamp features. Development in the region has progressed over time, and streams have been channelized and cleared of meanders that were once available storage for periodic overflow. Stormwater detention ponds and roadside drainage conveyances were also constructed to help prevent flooding but created wetland conditions in historically dry areas.

In the reasonably foreseeable future, wetlands and other WOTUS will be most threatened in southeast Virginia on undeveloped lands that are under development pressure. The condition of wetlands and other WOTUS in urbanized areas east of the Great Dismal Swamp National Wildlife Refuge (NWR), which lies a few miles south of the Regional Landfill, is not expected to change dramatically in the future, as these areas are highly urbanized.

The Hampton Roads drainage basin, HUC 02080208 was the geographic scope considered for Alternatives B, C and E. This geographic area was selected because it is large enough to predict development trends and valid permit data is available. Approximately 36% of the watershed area in HUC 02080208 / Hampton Roads is wetland. The watershed contains over 115,032 acres of wetlands and approximately 1,079 stream miles, comprised of perennial, intermittent, and ephemeral tributaries.

The temporal scope covers 10 years of Corps permit data from ORM2, the Corps' database. During the period of November 25, 2014, through November 25, 2024, Norfolk District issued 1,884 permits in the Hampton Roads watershed (02080208). These permits consisted of 742 nationwide permits, 920 regional permits, 183 programmatic general permits and 39 individual permits. Over the past 10 years, Norfolk District authorized 112 acres of permanent wetland impacts and 26,468 linear ft. of stream impacts. Norfolk District required 326 acres of wetland mitigation, 3,718 linear ft. of stream mitigation credits, and an additional 534 credits, which are most likely linear ft. based, within HUC 02080208 during this 10-year review period.

During the last 10 years, the largest wetland impacts were due to individual permits, such as for the Western Branch Reservoir Dam project, the Warehouse and Fulfillment Center on Northgate Commerce Parkway, the Virginia Regional Commerce Park, Centerpoint Intermodal Center, the widening of a 3.5-mile corridor of Route 58, Old Mill Road Bridge replacement, and the Copeland Road electric substation. These projects individually impacted less than 10 acres of wetlands and waters, and mostly less than 2 acres. Impacts to wetlands and waters were compensated at approved wetland mitigation banks or in-lieu fee programs within the watershed.

For the SPSA flyover, the Norfolk District authorized VDOT to permanently impact 3.33 acres of forested wetlands, 0.18 acres of scrub shrub wetlands, 0.15 acres of emergent wetlands, and 1.07 acres of roadside ditches. The Virginia Department of Transportation was also authorized to temporarily impact 1.71 acres of forested wetlands, 0.26 acres of scrub shrub wetlands, 0.08 acres of emergent wetlands, and 1.323 acres of roadside ditches to construct the flyover ramp to accommodate the left turning traffic entering the SPSA landfill from Route 58. The Virginia Department of Transportation purchased 15.14 credits from an approved mitigation bank to compensate for the wetland impacts. This project is currently being constructed.

A proposed transportation project at Bowers Hill in Chesapeake would potentially impact over 100 acres of wetland. This is a worst-case scenario estimate as the project is still being designed and the wetland impacts would most likely be substantially reduced before the project is submitted for permit review in 5-10 years. The applicant would be required to provide compensatory mitigation for all impacts.

Norfolk District authorized permanent impacts to 0.84 acres of forested wetlands, 0.26 acres of emergent wetlands, 1.03 acres of open water, and 1,462 linear feet of non-tidal stream and temporary impacts to 0.12 acres of forested wetlands associated with the construction of road crossings, industrial warehouses and associated parking, and stormwater management features for the Port 460 Logistics Center. Approximately 3,279 linear feet of former streams that were impounded decades ago would be restored as on-site mitigation. The other impacts to WOTUS were compensated through mitigation bank credit purchase. This project is currently being constructed.

Other future projects within the watershed would include commercial developments, residential subdivisions, warehouse and other storage lots, as well as infrastructure upgrades to utility lines and roadways. These projects would have the potential to individually and cumulatively impact wetlands and WOTUS in the watershed. Project impacts would be minimized to the greatest extent practicable and then compensatory mitigation would be used to offset the impacts. The projection for this watershed is that authorizations would continue at the current rate or potentially increase, because development has occurred continuously in the projects study area and is expected to continue. Natural resource issues of particular concern from Corps-authorized activities and other activities not authorized by the Corps are habitat loss, land-clearing, and hardening of surfaces, which contribute to increased runoff and sediment inputs to streams and wetlands.

### Previous Cell Construction at the Regional Landfill

According to the Norfolk District’s 1977 aerial photographs, the location of the Regional Landfill’s administration buildings, entrance roads, and the majority of Cell VI and approximately one-quarter of Cell V were previously active agricultural fields when the landfill property was purchased by SPSA (USACE 1977). This equates to slightly more than 100 acres of agricultural fields that were used for the Regional Landfill. Of the 270 acres of forested area that was previously developed into cells at the Regional Landfill, approximately 200 acres may have once been wetlands. Much of the land that was previously agricultural may have been wetlands that were historically part of the Great Dismal Swamp. Cell VII has already been permitted and its construction resulted in 12 acres of wetland impact, and material from Cell VII is currently being excavated to be used as cover on Cell VI (SPSA 2019). As compensation for 12 acres of wetland impacts related to the development of Cell VII, SPSA preserved 50 acres of forested wetlands, enhanced 36 acres of recently clearcut wetlands, and restored 12 acres of forested wetlands in the southeastern corner of the Regional Landfill property. Cell VII is anticipated to be operational between 2027 and 2037. Cell VII will be constructed according to SPSA’s development plans. Once it reaches capacity, it will be closed with a final cover system. Cell VII, located immediately south of the proposed expansion site, will span 73 acres, with a 56.1-acre waste boundary (SPSA 2019). Previous cell construction has the potential to affect water resources, biological resources, transportation and traffic, cultural resources, and air quality and greenhouse gases.

### VDOT Flyover Project

The VDOT flyover project is intended to alleviate safety issues for vehicles turning into the Regional Landfill. The flyover is being constructed between eastbound and westbound U.S. Routes 13/58/460, to eliminate left turns into the Regional Landfill and to provide an alternative for traffic to enter the landfill without using the median crossing on this road (HDR 2016). This route is a high-speed corridor and the intersection at the entrance of the landfill also serves as the first point for a U-turn for vehicles traveling from the west (SPSA 2021c). Furthermore, this new flyover is a requirement of SPSA's 2017 CUP from the City of Suffolk, which requires a "grade separated entrance" into the landfill before Cell VII can be filled with waste (SPSA 2021c). Without the flyover, SPSA will not be able to expand the Regional Landfill into Cell VII. SPSA has indicated it would need the flyover regardless of whether the expansion into Cells VIII and IX is authorized and constructed, since the flyover is required for Cell VII.

The location of the flyover is near the intersection of U.S. Routes 13/58/460, approximately 3,000 ft. east of the landfill entrance at the intersection of Bob Foeller Drive and Welsh Parkway (Suffolk News Herald 2021). The flyover design includes an eastbound exit ramp for traffic entering the landfill from the east, while traffic exiting the landfill will continue to use existing roads (Suffolk News Herald 2021). The design speed for the flyover is 35 miles per hour (mph) (Suffolk News Herald 2021). It is likely the project will affect rights-of-way to four properties and that utilities in the area will need to be relocated (Suffolk News Herald 2021).

Construction began in August 2024, with completion anticipated in late 2026 (VDOT 2024). SPSA's cost for constructing the new flyover is approximately $40 million, which it is funding by increasing municipal tipping fees, which began in FY 2022. This individual project has the potential to affect transportation and traffic, biological resources (wetlands), noise, and socioeconomics.

The VDOT flyover project is anticipated to permanently impact 3.33 acres of forested wetlands, 0.15 acre of emergent wetlands, 0.18 acre of scrub-shrub wetlands, and 1.07 acres of roadside ditches. Temporary impacts would include 1.71 acres of forested wetlands, 0.08 acre of emergent wetlands, 0.26 acres of scrub-shrub wetlands, and 1.32 acres of roadside ditches. VDOT would minimize wetland impacts by incorporating a 2:1 slope for the fill embankments and by tightening the footprint of the exit loop to the maximum allowable. Culverts placed within the embankment slopes would maintain hydrology on both sides of the embankment. Tree clearing would be avoided within the center of the exit loop. VDOT purchased 15.14 acres of mitigation credits for the project.

### Columbia Gas Transmission Line Project – Proposed Virginia Reliability Project and Commonwealth Energy Connector Project

On September 15, 2023, staff of the Federal Energy Regulatory Commission (FERC) published the Final Environmental Impact Statement for the Virginia Reliability Project and Commonwealth Energy Connector Project which reviews environmental impacts resulting from proposed pipeline replacement and expansion project. The project involves the replacement of approximately 49.2 miles of existing 12-inch-diameter VM-107 and VM-108 pipelines with 24-inch diameter pipeline. This would mostly occur within Columbia's existing right-of-way in Sussex, Surry, Southampton, and Isle of Wight Counties, as well as the Cities of Suffolk and Chesapeake, Virginia. The project would require clearing and trenching through wetlands in some locations, although many of the larger crossings would be directionally drilled to avoid wetland and WOTUS impacts. The Columbia Gas Transmission Line project is located within the James River, Chowan River, and Dismal Swamp basins. On June 28, 2024, Norfolk District authorized a total of 0.12 acres of permanent non-tidal wetland impacts, a total of 0.08 acres of permanent tidal wetland impacts, a total of 18.89 acres of conversion wetland impacts, a total of 129.98 acres of temporary wetland impacts, and a total of 71 linear feet of stream impacts. As compensation for wetland impacts, the applicant was required to re-establish 19.05 acres of forested wetlands (19.05 credits at 1:1 ratio) at a permittee responsible mitigation area, purchase three wetland credits from the White Marsh Environmental Bank, purchase 0.1 wetland credits from the New Mill Creek Tidal Mitigation Bank, and as compensation for impacts to 71 linear feet of stream channel, the applicant was required to purchase 59 stream credits, from the Cheroenhaka Wetland and Stream Mitigation Bank. Construction on this project and the related permittee responsible mitigation bank have begun.

### SPSA Proposed Master Plan

As part of SPSA's CUP with the City of Suffolk for the construction of Cell VII, it provided a master plan to identify all potential future phases of development at the existing landfill. This plan is illustrated in Figure 5 (SPSA 2019). The areas proposed for Cells X-XII are predominantly wetlands and comprise approximately 217.21 acres. SPSA has proposed to preserve the 217.21-acre future expansion area through a conservation easement held by a third-party entity. Preservation of the 217.21-acre area, including the standing timber, is part of SPSA's mitigation proposal and this preservation precludes these future cumulative impacts.

## Potential Cumulative Impacts

### Water Resources

Past, present, or reasonably foreseeable actions considered with the potential to affect water resources in the vicinity of the Regional Landfill include the historic filling of wetlands, Columbia Gas pipeline replacement and expansion project, the VDOT flyover project, the SPSA proposed master plan, and the Cell VII construction at the Regional Landfill. Implementation of Alternative A would not further contribute to the loss of water resources or to the degradation of water quality stemming from prior filling of wetlands associated with previous development of the Regional Landfill. Implementation of the VDOT flyover project and construction of Cell VII would not put water resources at greater risk of degradation with continued operation of the Regional Landfill under Alternative A, provided the landfill liner and leachate management systems continue to operate as designed.

Alternatives B, C, and E are similar with respect to their potential impacts to water resources and would not add to adverse cumulative impacts associated with further development of the VDOT flyover project, the SPSA master plan, or the development of Cell VII. The development of additional landfill cells would further alter local surface water and groundwater flow patterns that were initially altered by historic filling operations at the Regional Landfill. Short-term and long-term adverse effects to surface water hydrology are anticipated under Alternatives B and C. Long-term adverse effects of this projected increase in runoff are expected to be offset by the design and implementation of stormwater management facilities, which would include a treatment train of perimeter ditches and traditional stormwater ponds that must comply with state regulations for water quality and quantity. Both short and long-term effects to hydrology would ultimately be offset through implementation of SPSA's proposed mitigation plan which includes on-site and off-site preservation and conservation. As noted in previous sections of Chapter 3, only a small portion of floodplain area is anticipated to be affected by the applicant's preferred alternative from the construction of perimeter roadways. The anticipated change in flood storage capacity resulting from development of Cells VIII and IX would be minimal, and landfill runoff would be conducted to the on-site stormwater management system. SPSA has proposed to preserve the 217.21-acre future expansion area through a conservation easement held by a third-party entity. Preservation of the 217.21-acre area, including the standing timber, would provide a beneficial impact to downstream resources.

Under Alternatives B, C, and E, sea level rise may raise groundwater levels higher than present elevations but would not significantly alter surface water or groundwater flow directions, velocities, or discharge locations. Preservation of SPSA's future expansion area would provide additional flood storage which could mitigate the effects of sea level rise.

## Biological Resources

### Wetlands

Past, present, or reasonably foreseeable actions that would affect wetlands include the VDOT flyover project, SPSA proposed master plan, historic fill of wetlands, and landfill development in Cell VII. Because Alternative A does not result in wetland impacts, it would not contribute to the incremental loss of wetlands from urbanization and development when added to past development of the SPSA facility and future development including the VDOT flyover project. The past, present, and reasonably foreseeable future actions described in this cumulative impacts analysis would continue to adversely affect wetlands. For example, past agricultural practices, such as clearing, draining, and filling, have impacted wetlands and other WOTUS throughout the region. Similarly, suburban sprawl has resulted in the filling of wetlands, impacting wetland functions on local and regional scales.

Alternative B would impact wetlands by removing wetlands, similar to past construction and operation at the landfill facility. To the extent that the cumulative impacts occur within the same watershed as the SPSA facility, there could be a cumulative loss of wetland function on a watershed scale. Cumulative impacts are expected to be minimized through compliance with state and federal laws and regulations that protect wetlands (e.g., CWA, Section 404), which mandate avoidance and minimization of wetland impacts and compensatory mitigation. Future actions that directly and indirectly affect these wetlands and other WOTUS would also be subject to mitigation as required by the CWA and EO 11990 (1977). SPSA purchased 83 credits from the Chesapeake Mitigation Bank, which is approximately 6.5 miles east of the expansion site. Like the proposed expansion site, the Chesapeake Mitigation Bank was constructed within historic Great Dismal Swamp, but now drains north to the Elizabeth River. The mitigation is within the same overall watershed (Hampton Roads) as Alternative B but would also provide benefits to the Great Dismal Swamp since the bank involved restoration of wetlands associated with the Great Dismal Swamp. Additionally, SPSA purchased 76 wetland credits from the Davis Wetlands Bank, which is approximately 15 miles southeast of the proposed expansion site. This bank also restored wetlands within historic Great Dismal Swamp area. The bank's service area includes most portions of the historic Great Dismal Swamp; however, it does not drain north towards the Hampton Roads watershed.

The 217.21 acres within the previously proposed Cells X, XI, and XII would no longer be developed as part of the landfill and would instead be preserved in perpetuity. An 8.40-acre buffer directly adjacent to Cells VIII & IX would be designated as canebrake rattlesnake habitat. The remaining 208.81 acres would count towards the wetland preservation. SPSA has acquired the Nahra Property on the northwestern perimeter of the Regional Landfill. The Nahra Property is in the primary HUC of the Regional landfill and contains approximately 205.75 acres of preservable area outside of existing maintained easements. The Nahra Property, which contains wetlands and uplands, would help minimize future cumulative impacts from any future landfill expansion or from other commercial/industrial development. Conservation easements on the subject acreage would ensure that the areas remain forested providing wildlife habitat and the other benefits provided by forested wetlands Preservation and conservation efforts would offset the proposed loss of wetland functions and values.

Alternatives C and E would also remove wetlands, but it would remove a smaller area of wetland than Alternative B. Therefore, it would not contribute as much to cumulative wetland impacts. Mitigation as described above in Alternative B would be similar for Alternative C and E and would utilize a combination of approaches.

### Protected Species

Past, present, or reasonably foreseeable actions that would impact protected species on or near the project area include the historic fill of wetlands, the VDOT flyover project, and the SPSA proposed master plan. These actions all have similar impacts – incidental take of protected species, as well as the destruction or degradation of suitable habitat for these species.

Historically, forested wetlands like the habitat on-site have been lost or fragmented to accommodate the development of roads, buildings, and infrastructure. The development of wetlands has restricted the range of many species that depend on this habitat type, reducing the area they can inhabit and restricting mobility between sites by fragmenting existing parcels of land The construction of Cells VIII and IX requires the clearing of approximately 110 acres of forested wetlands and would further reduce the area of suitable forested wetland habitat available to protected species. The VDOT flyover project would also disrupt and fragment habitat, as well as increase the area of impervious surfaces near the site, which may increase stormwater runoff and pollutant loading into nearby wetlands. However, the impact of flyover construction is anticipated to be minimal compared to historic wetland fill and the on-site action alternatives.

Alternative A would not contribute to the loss of protected species, nor to the destruction or degradation of their habitat. Alternatives B, C, and E would have very similar cumulative impacts, with Alternatives C and E impacting fewer acres of wetland habitat than Alternative B. Alternatives B, C, and E would impact protected species through incidental take and habitat destruction and degradation. Alternatives B, C, and E would result in a cumulative loss of forested wetland habitat and a reduction in the numbers of protected species anticipated on or near the project area. The cumulative impacts of Alternatives B, C, and E would be mitigated by compliance with the ESA, state threatened and endangered species regulations (Code of Virginia 2020, 2021), the Bald and Golden Eagle Protection Act, and the MBTA.

Further, if a permit is issued, SPSA would commit to a comprehensive mitigation plan to offset these cumulative impacts. SPSA's proposed mitigation plan focuses on their preferred alternative (Alternative C) which proposes compensation for permanent impacts to 109.64 total acres of nontidal vegetated wetlands through the purchase of 159 credits from an established bank and the preservation of at least 602.80 acres of forested wetland. SPSA proposes the conservation of 742.56 acre of primarily forested wetland habitat with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for canebrake rattlesnake habitat. All preservation sites were historically part of the Great Dismal Swamp and are within one mile of the proposed impact area. The preservation areas provide buffers to the surrounding neighborhoods, help protect downstream water quality and serve as a connection between Burnetts Mill Creek and the Great Dismal Swamp.

Preservation of on-site wetlands would allow for storage capacity for floodflow alteration and nutrient cycling and would serve to recharge the aquifer. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The seasonal ponding that creates the PUB system in Cells X, XI, and XII serves as the ideal habitat and breeding ground for amphibians.

There are 23.81 acres of wetlands surrounding the limits of disturbance for the development of Cells VIII and IX. This area was included in the study limits but would not be disturbed as a result of the project. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII. SPSA proposes to include this acreage as a part of the on-site PRM preservation for canebrake rattlesnake mitigation. Switch cane (*Arundinaria tecta*) and/or giant cane (*Arundinaria gigantea*) were documented on-site, and these cane thickets are prime habitat for the canebrake rattlesnake. The cane thickets provide cover allowing them to avoid predators and hunt grey squirrels, which is their main source of food (VDWR 2011). The area being preserved specifically for the canebrake rattlesnake is connected to the on-site wetland preservation areas, which enables wildlife to freely move throughout the habitats without having to cross through urbanized areas. The swamp provides ridges and glades and during the fall months a significant amount of leaf litter. These are all prime habitat conditions for the canebrake rattlesnake (VDWR 2011).

There are 12.87 acres of bald cypress swamp habitat located between the Nahra property and SPSA property in the southwest corner of the site that would be preserved. This mineral flat system acts as a groundwater recharge system and also discharges minimal groundwater in the area of Burnett's Mill Creek. The bald cypress-tupelo swamp on site allows for storage capacity for floodflow alteration, nutrient cycling, carbon sequestration and acts as a sponge to hold onto water, sediment and pathogens flowing downstream. Burnetts Mill Creek can support the presence of fish and potentially shellfish on the property. Cypress-tupelo swamps are known habitats for many threatened and endangered endemic species, including the globally uncommon, state-rare eastern big-eared bat (*Corynorhinus rafinesquii macrotis*) and southeastern myotis (*Myotis austroriparius*), which both find roosting habitat in these mature forests. They are also an important habitat for many species of waterfowl, such as wood duck, mallards, heron species, warblers, and other songbirds—all of which use cypress swamps as habitat during their breeding season. Additionally, cypress swamps are also known to contain abundant crayfish, beavers, muskrats, and numerous other animal species (VDCR 2024). Bald Cypress-Tupelo Swamps are considered rare natural communities according to the VDCR Natural Heritage Program. The Bald Cypress-Tupelo Swamp on-site has an overstory dominated primarily by Red Maple (*Acer rubrum*) and Bald Cypress *(Taxodium distichum*) trees. The herb layer was dominated by Switchcane (*Arundinaria tecta*) and Lizards-tail *(Saururus cernuus)*, which are also characteristic species of Cypress-Tupelo Swamps. Burnett's Mill Creek runs through the southwestern section of the on-site preservation areas providing a unique habitat for amphibians and insects to reside.

SPSA has acquired the Nahra Property on the northwestern perimeter of the Regional Landfill. The Nahra Property is in the primary HUC of the Regional landfill and contains approximately 205.75 acres of preservable area outside of existing maintained easements. The Nahra property acts as a groundwater recharge system in the mineral flat wetland areas while the PUB wetlands on-site allow for discharge of groundwater, storage capacity for floodflow alteration, nutrient cycling, and support the presence of fish and potentially shellfish. These open water features are surrounded by mature hardwood trees that provide suitable habitat for bald eagles to nest. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding.

SPSA is in the process of purchasing a 282.92-acre property south of the SPSA property called Magnolia Farms. Mineral flat wetlands on-site would provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. Additionally, the Magnolia Farms property is adjacent to the Great Dismal Swamp National Wildlife Refuge, allowing an extension and connectivity of wetland habitat and wildlife that is protected in the refuge.

Additional detail is provided in SPSA's *Compensatory Mitigation Plan*, attached as Appendix G.

### Transportation and Traffic

Alternative A would divert traffic that had been using the Regional Landfill facility to other facilities around the state for processing and disposal. The VDOT flyover project would eliminate traffic safety concerns at the entrance to the Regional Landfill, therefore cumulative actions considered would have the potential to result in beneficial impacts to the existing transportation system in the project area.

Cumulative actions considered in association with Alternatives B, C and E are similar to those described in Alternative A and would result in beneficial impacts on the surrounding transportation system through the alleviation of safety concerns at the Regional Landfill entrance. Adverse impacts are not anticipated as a result of any of the on-site alternatives (see Traffic & Transportation section above for a full description of direct impacts under Alternatives A, B, C, and E). The Port 460 project and other warehouse projects have the potential to increase truck traffic, which could have potential adverse effects in the future in combination with the applicant's preferred alternative.

### Air Quality and Emissions

Alternative A would likely result in the least construction-related emissions because no further construction would occur beyond the development of Cell VII and the flyover. On the operational side, best management practices would have to be employed to reduce landfill gas emissions from Cell VII, in order to adhere to permit requirements until its closure in 2037. Following its closure, waste would need to be hauled to other area landfills for processing and disposal under this alternative, which would result in higher emissions associated with waste hauling resulting in some adverse impacts to air quality, compared to other alternatives.

Alternatives B, C, and E would result in some adverse impacts to air quality due to construction activities. SPSA has proposed to preserve 742.56 acres of primarily forested wetlands. Preservation of this area, including the standing timber, provides a beneficial impact.

For Alternatives A, B, C, and E, all cumulative actions, when considered incrementally, could have the potential to result in cumulative impacts to air quality in the future.

### Noise

For Alternatives A, B, C, and E, all cumulative actions, when considered incrementally, could have the potential to result in cumulative impacts to noise in the future. However, the impacts are expected to be nominal when considering existing conditions.

### Cultural Resources

There would be no cumulative impacts on cultural resources under Alternative A. Because Alternative A would have no impacts on cultural resources, it would not contribute to any impacts that would result from the cumulative actions considered.

The actions considered have the potential to result in cumulative impacts to cultural resources under Alternatives B, C, and E as described below.

The historic fill of wetlands through development and urbanization within the Hampton Roads region since the colonial period has resulted in a loss of the ancestral lands of Virginia Indian Tribes. This historic fill and development of Cells I through VI into an area that was once part of the Great Dismal Swamp region has resulted in a loss of tribal ancestral lands and the traditional cultural landscape that was a place of refuge during the colonial violence and expansion in the 17th century as well as a crucial region for resources and settlements well into the 19th century. Previous cell construction at the Regional Landfill also contributes to the further loss of this landscape. During this previous development, two archaeological sites (VDHR IDs 44SK0119 and 44SK0121) affiliated with the pre-contact Native American period were impacted in the area where Cells V and VI currently exist (VDHR 2020a, 2020b, 2020c).

The SPSA Proposed Mitigation Plan would contribute beneficial impacts to the overall cumulative impact on cultural resources if the conservation easement is established. A conservation easement would protect this portion of ancestral lands of the Virginia Indian Tribes from further loss due to development in this area.

VDOT assessed the impacts the flyover project would have on cultural resources during planning for that project. As documented in the Joint Permit Application for the VDOT flyover project dated February 14, 2023, it was determined that there would be no adverse effect on cultural resources (VDOT 2023); VDHR concurred with that determination on October 22, 2021. Therefore, the VDOT flyover project would not result in any cumulative impacts on cultural resources.

## Socioeconomics

Implementation of Alternative A would put existing socioeconomic factors at risk of increased cost to residents to manage waste. Factors include increased tipping fees, high costs due to increased hauling distance, purchasing of long-haul equipment, and the cost to construct the VDOT flyover project. Tipping fees have been increased to fund the flyover project and will be reduced upon construction completion to cover normal operating and capital costs. Since costs are ultimately passed on to citizens, these factors could result in temporary adverse cumulative impacts on the economic stability of the SPSA service area.

Alternatives B and C would result in higher costs to residents due to temporary increased tipping fees for the construction of the VDOT flyover. However, these impacts would be temporary and would be reduced upon construction completion. Under Alternatives B and C, the tipping fees would be reduced as compared to Alternative A. Additionally, there would be no increase in hauling distance and no necessary purchase of long-haul equipment resulting in lower costs than Alternative A.

Alternative E would also result in higher costs to residents due to temporary increased tipping fees for the construction of the VDOT flyover. However, these impacts would be temporary and would be reduced upon construction completion. Hauling to an alternate private landfill would be required and would result in increased costs, which are passed directly onto citizens.

Costs associated with Alternative A are the highest compared to all other alternatives. Costs associated with Alternatives B and C are similar and would be the lowest. Costs associated with Alternative E would be substantially greater than Alternatives B and C but would be lower than Alternative A.

## Local Community

Cumulative impacts on the Local Community under all alternatives considered remained open to feedback received during the public comment process, community informational meetings, and public hearings. Public outreach for the project was extensive. A public notice advertised two public information meetings which were held on June 21st and 22nd of 2023 and two public hearings which were held on July 26th and 27th of 2023. Individual flyers detailing project information were sent to all residential property owners within a one-mile radius of the existing Regional Landfill and within one mile of SH30. The informational flyer was also provided to area community centers, places of worship, and local governments. Meeting dates and times were shared via the Norfolk District's social media account. No concerns or opposition were raised by the surrounding community relating to expansion of the existing Regional Landfill during public outreach. However, public interest factors and concerns shared by the citizens during the public hearings were one component of the dismissal of SH30 from further review.

Additional preservation areas and conservation easements that are a component of the SPSA mitigation plan would provide a benefit to the surrounding Local Community. The preservation areas would enhance the existing buffering from activities associated with the proposed landfilling activity.

## Environmentally Preferable Alternative Under NEPA

Agencies are required to identify the environmentally preferable alternative or alternatives from the alternatives considered in the EIS (40 CFR § 1502.14(f)). The environmentally preferable alternative is the alternative that best promotes the national environmental policy as expressed in section 101 of NEPA, which outlines a national policy "to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." 42 U.S.C. § 4331(a). Based on the analysis provided in this FEIS, the Norfolk District finds that the No-Action (Alternative A) is the environmentally preferred alternative as it would have the least impact on wetlands and Tribal concerns.

The environmentally preferable alternative is not the designated LEDPA. As discussed in Chapter 2, the Norfolk District has determined that the No-Action (Alternative A) is not practicable. The Norfolk District will complete a public interest review and 404(b)(1) analysis to determine the LEDPA in the Record of Decision.

Table 30 below provides a comparison of the alternatives.

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### Table 30. Alternatives Summary Table

| | On-site Capacity (CY) | Off-site Hauled Capacity (CY) | Cell Footprint (AC) | Support Area Footprint (AC) | Total Wetland Impact (AC) | Years of Landfill Life (Approximate) | Years of Hauling (Approximate) | Greenhouse Gas Emissions (MT $CO_2E$) | Average Operational and Capital Cost ($millions) |
|---|---|---|---|---|---|---|---|---|---|
| Alternative A | 0 | 16,000,000 | 0 | 0 | 0 | 0 | 24 | 1,618,254 | 1,046,596,933 |
| Alternative B | 16,000,000 | 0 | 91.60 | 25.76 | 117.36 | 24 | 0 | 1,295,696 | 686,644,600 |
| Alternative C | 16,000,000* | 0 | 84.28 | 25.36 | 109.64 | 24 | 0 | 1,293,436 | 686,026,600 |
| Alternative E: Hybrid 50% | 7,240,000* | 8,760,000 | 53.76 | 18.00 | 71.76 | 11 | 13.4 | 1,532,475 | 772,723,600 |
| Alternative E: Hybrid 25% | 10,860,000* | 5,140,000 | 72.85 | 24.00 | 96.85 | 16.5 | 7.9 | 1,450,446 | 805,928,000 |

*Includes 1.52 million CY of airspace between Cells V and VII.

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# Chapter 4: Consultation and Coordination

Project coordination involved collaboration with the public, as well as with local, state, and federal officials. Coordination took place to ensure the public and all stakeholders remain well informed and engaged throughout the project, and to satisfy requirements under NEPA and other agency requirements. This chapter describes the public involvement and agency consultation undertaken leading up to and during the preparation of this FEIS. A combination of activities, including alternatives development and planning workshops, public scoping, and agency briefings, helped to guide the project team in developing this FEIS. This chapter provides a detailed list of the various consultations initiated during the development of the FEIS.

The project team has made a diligent effort to involve the interested and affected public in this planning and NEPA process. This involvement, known as scoping, occurs at the beginning of the process to identify the range of issues, resources, and alternatives to address in the environmental assessment. Public scoping is conducted to address these elements. State and federal agencies were contacted to uncover any additional planning issues and to fulfill statutory requirements, as described below.

## Public Scoping

NEPA requires an early and open process for identifying the significant issues related to a proposed action and determining the scope of issues to be addressed in NEPA documentation. This process is referred to as scoping and is one of several public involvement aspects of the NEPA EIS process.

Initial public scoping for the EIS was conducted from July 31 through September 14, 2020. In accordance with the Corps' *Interim Army Procedures for National Environmental Policy Act (NEPA)* in response to the coronavirus (COVID-19) pandemic, the Norfolk District conducted the scoping on a virtual platform allowing continuous online access throughout the scoping period.

The Notice of Intent for the DEIS was issued on July 27, 2020, in the *Federal Register* (Vol. 85, No. 144). In this notice, the Norfolk District invited the public to participate in scoping for the DEIS and announced the accessibility of the project's virtual meeting room.

Subsequently, based on comments received and further analysis, the Norfolk District refined the preliminary range of alternatives and identified two on-site alternatives, as well as six potential off-site alternatives for potential evaluation in the EIS. The Norfolk District then invited members of the public to visit the virtual public scoping room during an additional scoping period held from December 17, 2020, through January 18, 2021.

## Agency and Tribal Coordination

Consultation took place with a number of federal, state, and local agencies, as well as interested federally recognized Indian tribes in Virginia. Coordination with agencies helped identify necessary compliance, relevant guiding regulations, as well as required permits. Coordination is ongoing. Below is a list of agencies consulted before and during the process of preparing this FEIS.

### Federal

#### Corps

Permitting of the proposed improvements will be required under Section 404. The project does not require review under Section 10 of the Rivers and Harbors Act since the work would not occur in a navigable waterway. In addition, no review is required under Section 14 of the Rivers and Harbors Act (33 USC § 408), because the activity, in whole or in part, would not alter, occupy, or use a Corps Civil Works project.

#### EPA

Coordination between the Norfolk District and EPA Region 3 is detailed below.

On April 15, 2020, the Norfolk District sent an initial letter to agencies introducing the proposed project and indicating that the project would be evaluated through the EIS process. EPA attended the May 7, 2020, Agency Scoping meeting. On May 29, 2020, the Norfolk District sent a follow up message requesting comments from the agencies. In response, EPA provided scoping comments for the project on June 8, 2020. EPA expressed concerns about fully evaluating alternatives, on-site and off-site. EPA discussed the screening criteria for the alternatives analysis and other measures that could reduce the waste flow.

The Norfolk District held a Consulting Party meeting, pursuant to Section 106 of the NHPA, on February 26, 2021, to provide background information on the project and address questions. The meeting was attended by tribal representatives and EPA. The Norfolk District held a second Consulting Party meeting with the Tribes on June 23, 2021, and a third Consulting Party meeting on October 13, 2021, and EPA attended all meetings. The discussions centered around the Section 106 process, but the Norfolk District also discussed impacts from the project and the alternatives.

The Norfolk District and EPA met on March 3, 2021, for a preliminary review of the alternatives analysis. EPA suggested looking closer at the potential stream impacts for the off-site alternatives. The Norfolk District and EPA met again on June 2, 2021, to further discuss the SPSA Off-Site Alternatives Analysis completed by VHB on behalf of the Norfolk District for the EIS process. The meeting was with both the NEPA and wetlands branches within the respective divisions of EPA Region 3. VHB discussed the previous alternative analysis and ranking and then analyzed how the top six sites were determined. The Norfolk District considered whether there are other criteria that could be reviewed to better differentiate between the six off-site alternatives.

On October 6, 2021, the Norfolk District and EPA met with the VDEQ Solid Waste Management staff. The group discussed the solid waste disposal process and the recycling requirements. The Hampton Roads Planning District Commission is responsible for the region's solid waste disposal plan. The applicant hosted a tour of the Regional Landfill in Suffolk and the proposed expansion site on December 7, 2021. Representatives from EPA attended. The Norfolk District and EPA also visited the SU02 alternative site to review the wetland delineation and discuss this alternative site.

The Norfolk District arranged an online meeting attended by the Consulting Tribes and EPA on March 15, 2022. The Norfolk District requested that SPSA and their consultant (HDR) provide an overview and answer questions. SPSA discussed their purpose and need for the project, including information about diverting municipal waste and HDR provided an overview of the on-site alternatives analysis. EPA questioned the on-site alternatives analysis and requested that additional clarification be provided about why some of the on-site alternatives were dropped from further review.

The Norfolk District and EPA met on February 9, 2022, and April 6, 2022, to further consider the off-site alternatives analysis. Due to practicability concerns with the top six off-site alternatives, EPA recommended going back to the 29 sites that were previously reviewed to determine if there were any viable options. The Norfolk District and EPA also discussed the on-site alternatives and ways to minimize impacts on-site. EPA questioned whether the natural gas lines that traverse the SPSA property would be moved off-site because if the gas lines were completely removed, some of the on-site alternatives could be viable.

The Norfolk District and EPA met on May 4, 2022, to discuss potential functional assessments for the project site and review several functional assessment options. On May 5, 2022, the Norfolk District and EPA met again to review the need for a functional assessment and other topics that specifically need to be addressed in the DEIS. EPA mentioned the need for a section on carbon sequestration and the effects of losing trees. The group also discussed storm resiliency and secondary impacts and determined that a starting point would be to evaluate the sites using the Wetland Attribute Form. At a July 6, 2022, meeting Norfolk District and EPA further discussed the need to address carbon sequestration and carbon storage in the DEIS. The Norfolk District requested clarification on the most appropriate method to evaluate these factors considering that there are multiple ways to review each topic.

On July 21, 2022, the Norfolk District and EPA met to discuss the alternatives being evaluated. EPA agreed that SU02 would not be the least environmentally damaging practicable alternative, since that the potential wetland impact would mostly likely be greater than the applicant's proposed alternative. EPA expressed concerns about cumulative impacts, especially from potential future impacts. EPA indicated that waste reduction needs to be further studied.

On October 26, 2022, Norfolk District and EPA met concerning the Environmental Justice (EJ) analysis. EPA stated that Norfolk District could not conclude that there would be no impacts to an EJ community until meaningful EJ outreach was completed. Norfolk District provided direct mailers to affected areas, including community centers, places of worship, and other meeting points. The Norfolk District considered conducting two public hearings to fully ensure outreach.

Norfolk District and EPA met on March 8, 2023, to discuss the Norfolk District plans concerning the proposed public meetings and public hearings. Norfolk District planned to schedule two public information meetings with question/answer sessions at the beginning of the DEIS comment period and then two public hearings near the end of the comment period. It also discussed potential functional assessment methodologies. The goals of a functional assessment would be to determine how the wetlands are functioning and then later assess whether any proposed compensation offsets potential loss of functions. The Norfolk District agreed that the preservation site adjoining the proposed expansion area would be a good reference site. The Norfolk District Commander committed to providing a preliminary copy of the DEIS for review to the Consulting Tribes and EPA. The Norfolk District provided the preliminary DEIS to the Consulting Tribes and EPA on April 5, 2023.

On April 25, 2023, the Norfolk District held a virtual meeting to discuss the preliminary DEIS with the Consulting Tribes and EPA. The discussion centered around the amount of wetland impacts and the potential for future cumulative impacts. EPA expressed concerns about SPSA proposing additional impacts to wetlands in the future as shown on the SPSA Master Plan. The Norfolk District received comments on the preliminary DEIS from EPA on May 3, 2023. Many of EPA's preliminary comments were addressed in the DEIS before publication.

On August 15, 2023, EPA provided two comment letters in response to the public notice for the DEIS and the joint permit application. The comments are addressed in the *DEIS Comment Response Summary* attached to the FEIS (Appendix J). In the August 15, 2023 letter, EPA-Water Division also expressed concerns that the project may result in substantial and unacceptable impacts to aquatic resources of national importance as covered in Part IV, paragraph 3(a), of the 1992 Clean Water Act (CWA) Section 404(q) Memorandum of Agreement between the EPA and the Department of Army. EPA and the Norfolk District met on August 30, 2023, to discuss the comment letters that were received from EPA. EPA specifically expressed concerns about the methane quantities from SPSA that were reported in the DEIS. After discussion with SPSA, the Norfolk District discovered that the high quantiles were based on a reporting error. EPA requested clarification on the timing of the Columbia Gas pipeline realignment. EPA thought that the recent gas line project was for moving all of the gas lines within the alignment that traverse the SPSA property. However, the project was for moving one of the gas lines. The other gas lines within the easement will remain. EPA asked that the Norfolk District clarify the status within the FEIS. The Norfolk District discussed alternatives for the project and the possibility of a combination of alternatives.

On September 11, 2023, EPA provided the Part (b) elevation letter under the 1992 Clean Water Act Section 404(q) Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army. The purpose of a November 1, 2023, meeting with EPA was to update them on Norfolk District's review of comments and conclusions and to discuss some next steps. Norfolk District provided an update on the tribal coordination. The Norfolk District discussed the idea of screening out the alternative site, SH30 or dismissing it from further review in the FEIS. Norfolk District has indicated that SH30 is not a practicable alternative due to numerous concerns. EPA did not disagree with Norfolk District's assessment of SH30. Norfolk District also discussed reviewing a hybrid alternative in the FEIS. The hybrid would be a combination of the No-Action Alternative and the applicant's preferred alternative. Some hauling would occur along with a reduced landfill footprint. EPA agreed to the idea of reviewing a hybrid alternative. EPA also asked about the mitigation plan and expects a more comprehensive plan in the FEIS. The Norfolk District discussed planning a site visit to the proposed preservation areas.

On November 29, 2023, Norfolk District provided an update to EPA concerning the meeting with the Nansemond Indian Nation. During the meeting, SCS also outlined the steps for developing a hybrid alternative. The Norfolk District discussed how waste could be diverted. On February 7, 2024, the Norfolk District provided an outline of Gray & Pape's GIS-based analysis to incorporate archaeological data from the permit area and the three-mile buffer around the SPSA project area and the ethnography and ethnobotanical work. The Norfolk District copied EPA on the message, which provided an overview of the TCP study and introduced the potential need for a Memorandum of Agreement (MOA) for the project. During a February 8, 2024, call, the Norfolk District updated EPA on the progress with the hybrid alternative. The Norfolk District discussed scheduling a time to further review this alternative. On March 5, 2024, the Norfolk District provided additional information to EPA concerning the hybrid alternative, which consists of a Hybrid 50 scenario and a Hybrid 25 scenario. The potential acreage of the alternative scenarios and life expectancy were discussed. EPA indicated that the support facility acreages should be sized to match the proposed scenario. The Norfolk District planned to make that change to the hybrid analysis. The Norfolk District and EPA met to discuss the functional assessment on April 29, 2024. The Norfolk District concluded that it needed a meeting with HDR, and also discussed setting up a site visit to see the proposed preservation areas.

On May 1, 2024, the Norfolk District held the sixth Consulting Party meeting, which was virtually attended by EPA. The purpose of the meeting was to update the Consulting Tribes and EPA on the EIS process, discuss ongoing studies of a hybrid alternative and the proposed mitigation plan. Gray & Pape discussed the Phase IB results and briefly addressed the ethnography/ethnobotanical work. The Norfolk District also discussed the need for an MOA for the project due to potential impacts on the TCP that the Norfolk District was working on with the Nansemond Indian Nation.

The Norfolk District, EPA and VDEQ met with HDR and SPSA personnel to review the proposed preservation sites on June 26, 2024. The Norfolk District looked at Cells X, XI, and XII, as well as the Nahra property and the Magnolia Springs site. All parties were satisfied that the sites appeared to be good candidates for preservation and that the sites contained similar functions and values as the proposed expansion site. The Nahra property contains high quality cypress swamp, which extends into the current SPSA property. The cypress swamp on the SPSA site was not part of the mitigation plan, but the Norfolk District suggested including that area if possible.

On July 10, 2024, the Norfolk District and EPA met to discuss the functional assessment that was performed by HDR. EPA had specific questions about some of the data plots. EPA had some questions and comments about the assessment. EPA stated that they would send their comments in writing, so HDR could address them. EPA indicated that they would most likely prefer that the HGM be performed on the proposed preservation areas, but they were open to discussion. The mitigation plan should demonstrate how preservation could compensate for lost wetland functions. The plan should discuss habitat functions. EPA commented that the cypress swamp area that the Norfolk District saw during the site visit would be nice to include as preservation in the mitigation plan. During the meeting, the Norfolk District also discussed its evaluation of the Hybrid alternative scenarios. EPA had questions about the private landfills where waste would be hauled under this alternative and EPA asked for some clarifications about how cost was calculated.

On July 19, 2024, EPA requested additional information about the HGM study, specifically about some of the calculations. Based on discussions with EPA, the Norfolk District requested that HDR provide a further analysis of the functions and values of the preservation site compared to the proposed impact site. The purpose of the October 17, 2024, meeting with the Norfolk District and EPA was to discuss HDR's memo entitled *Comparison of Functions and Values for Proposed SPSA Landfill Expansion Cells 8 & 9 and Preservation Areas*. EPA indicated that if the Norfolk District does not require an HGM on the preservation areas, the mitigation plan should discuss how the proposed preservation could replace functions that would be removed by the applicant's preferred alternative. EPA provided specific recommendations to address. The Norfolk District also discussed the proposed canebrake rattlesnake mitigation and the long-term maintenance requirements. EPA agreed that SPSA could be the long-term steward as long as the site has a conservation easement held by a third-party who retained the ability to monitor and enforce the restrictions.

On October 22, 2024, EPA provided written comments concerning HDR's *Comparison of Functions and Values for Proposed SPSA Landfill Expansion Cells 8 & 9 and Preservation Areas.* The comments provided specific details about items that need to be addressed in a final mitigation plan.

### USFWS: Section 7 Consultation

On April 15, 2020, the Norfolk District sent an initial letter to agencies introducing the proposed project and indicating that the project would be evaluated through the EIS process. Representatives from the USFWS attended the May 7, 2020, Agency Scoping meeting.

On June 5, 2023, the Norfolk District used IPaC to obtain an official USFWS species list from the Virginia Ecological Services Field Office, which identified the listed and proposed species that may be affected by the project as the following: federally listed endangered Northern long-eared Bat (NLEB) (*Myotis septentrionalis*); proposed to be federally listed endangered Tricolored Bat (*Perimyotis subflavus*); federally listed endangered Red-cockaded woodpecker (*Picoides borealis*);  and candidate species Monarch Butterfly (*Danaus plexippus*). The Norfolk District used the Northern Long-eared Bat Range wide Determination Key (DKey) and reached the determination of "May Affect, Not Likely to Adversely Affect (NLAA)" for the NLEB on June 5, 2023. The project would adhere to Time of Year Restrictions (TOYR) of no work occurring from December 15th to February 15th and April 15th to July 30th of any given year to minimize impacts to the NLEB. The determination was submitted to the USFWS through IPaC for the 15-day comment period and no comments were received. For the other listed species, the Norfolk District initiated Section 7 consultation during the joint permit application review through the public notice coordination on June 16, 2023. The Norfolk District concluded that no suitable habitat is present for the Red-cockaded woodpecker, which generally selects mature loblolly trees that are 70 to 90 years of age for nesting. No known nesting colonies of this species are present within the project area. Very limited habitat would be present for the candidate species, monarch butterfly.

The Norfolk District requested an updated species list and an updated Concurrence letter for the NLAA determination for the NLEB from IPaC on October 13, 2023. No comments were received from USFWS within the 15-day comment period. The Norfolk District reached a May Affect, Not Likely to Adversely Affect determination for the Tricolored Bat (*Perimyotis subflavus*). Additional conferencing for the Tricolored Bat was initiated on October 19, 2023, for a 60-day period. USFWS provided a comment for the coordination related to the Tricolored bat on December 19, 2023. The Norfolk District provided the revised Species Conclusion Table and on December 20, 2023, USFWS concurred. The project would adhere to TOYR of no work occurring from December 15th to February 15th and April 15th to July 30th of any given year to minimize impacts to the Tricolored Bat. The Norfolk District requested an updated species list on November 4, 2024. The same species identified above were present on the updated list. The USFWS has updated the Northern Long-eared Bat (NLEB) and Tricolored Bat (TCB) Guidance and Determination Key Standing Analysis. Therefore, the Norfolk District analyzed the project using the new IPaC Dkey on November 4, 2024. The analysis resulted in a "may affect" determination for Northern Long-eared Bat and Tricolored Bat.

The Norfolk District completed a Biological Assessment and submitted the document to USFWS on November 5, 2024. USFWS responded on November 21, 2024, and indicated that if the project adhered to the TOYRs from December 15th to February 15th and April 1st to July 15th, then they concur with a NLAA determination. Norfolk District updated the Species Conclusion Table. USFWS also requested additional information concerning the project specific conditions to ensure that Red-cockaded woodpecker habitat was not present. Norfolk District provided representative photos of the project site and indicated that the site contains a mix of pines and hardwood species, with an understory of Arundinaria tecta, red maple and sweetgum saplings, American Holly, and greenbrier. The site was last logged in two phases approximately 39–44 years ago. Red-cockaded woodpeckers prefer open mature pine forests and select mature loblolly that are 70–90 years old, so it is unlikely that suitable habitat is present within the action area. USFWS concurred on December 4, 2024.

### NOAA National Marine Fisheries Service (NMFS)

The project site does not contain species that would be covered under Section 7 of the ESA within the jurisdiction of NMFS; therefore, no coordination will be required. In addition, no essential fish habitat is designated within the project area, so coordination will not be required under the Magnuson-Stevens Fishery Conservation and Management Act.

### FEMA

FEMA review is anticipated for confirmation of no net rise based on fill from the waste disposal footprint within the floodplain.

### NHPA

Section 106 of the NHPA requires a consultative process to identify historic properties; assess project impacts to historic properties; and avoid, minimize, or mitigate adverse effects prior to approval to use federal funds. The Norfolk District coordinated the Determination of Effects with the State Historic Preservation Officer and federally recognized Indian tribes in Virginia who have requested consulting party status. Coordination for a Traditional Cultural Place (TCP) identified by the Nansemond Indian Nation is detailed in the Tribal Nations section below. The Norfolk District coordinated the adverse effect with the Advisory Council on Historic Preservation (ACHP) on November 6, 2024. On November 18, 2024, ACHP provided a letter and concluded that *Appendix A, Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of their regulations, “Protection of Historic Properties” (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act, does not apply to this undertaking. Therefore, ACHP does not believe that their participation in the consultation to resolve adverse effects is needed. However, if requested by the SHPO or a consulting party, ACHP would participate in the MOA process. Section 106 will culminate in a Memorandum of Agreement to address an adverse effect to the identified TCP.

## State

### VDEQ

The project may require various approvals from VDEQ to demonstrate compliance with several acts and authorities, such as the Virginia Coastal Zone Management Program (EO 35, 2014), stormwater management regulations (9 VAC 25-880), Section 401 of the CWA, and Solid Waste Compliance Program. According to 9 VAC 20-81-120, landfill development impacting greater than two acres of wetlands is prohibited. Special exemptions in subsection A(i) of Virginia statute § 10.1-1408.5 would allow SPSA to expand the Regional Landfill in the City of Suffolk even if wetland impacts are greater than two acres. Relatedly, the exemption in Virginia Code § 10.1-1408.5(F) also applies to this project, which grants an exemption to 9 VAC 20-81-120. Thus, off-site alternatives with greater than two acres of wetland impacts could potentially be approved through the subsection F exemption process. The Norfolk District recognizes that exemption F of section § 10.1-1408.5 may be procedurally unclear or difficult and that additional information concerning this exemption process may more narrowly define the off-site alternative's practicability. The Norfolk District coordinated with VDEQ regarding that specific exemption process, and VDEQ communicated its understanding that legislative action would be required for the exemption.

### Virginia Marine Resources Commission (VMRC)

The project may require approval from VMRC for activities occurring over, under, or on state-owned land.

### VDHR

Consultation has occurred under Section 106 of the NHPA, as described above and in the Tribal Nations section below.

## Local

Suffolk Wetlands Board: The project may require review and approval from the Suffolk Wetlands Board, in accordance with Chapter 13 of Title 28.2 of the Code of Virginia.

### Suffolk Chesapeake Bay Preservation Act

A Chesapeake Bay Preservation Area *(*CBPA) is defined as any land designated by the city, pursuant to Part III of the management regulations, 9 VAC 25-830-70 et seq., and VA Code § 62.1-44.15:74. A CBPA consists of a resource protection area and a resource management area. There are CBPAs located throughout the proposed project area. Coordination and compliance efforts with Suffolk's Environmental Services office are anticipated.

### Southampton County Environmental Services Division

The Environmental Services Division is responsible for administering local Erosion and Sediment Control and Stormwater Management programs to ensure compliance with state and federal regulations.

## Tribal Nations

The Norfolk District initiated consultation with the following Tribes on July 31, 2020:

- Chickahominy Indian Tribe
- Chickahominy Indian Tribe – Eastern Division
- Monacan Indian Nation
- Nansemond Indian Nation
- Pamunkey Tribe
- Rappahannock Indian Tribe, Inc.
- Upper Mattaponi Indian Tribe

In a letter dated January 12, 2021, all the above Tribes requested to be Consulting Parties for the EIS. The Norfolk District held a Consulting Party meeting with the Tribes on February 26, 2021, to provide background information on the project and address questions. The meeting was attended by representatives from the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, Nansemond Indian Nation, the Upper Mattaponi Tribe, and Cultural Heritage Partners, as well as EPA and VDHR. The Norfolk District held a second Consulting Party meeting with the Tribes on June 23, 2021, which was attended by the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, the Nansemond Indian Nation, the Pamunkey Tribe, the Upper Mattaponi Tribe, Cultural Heritage Partners, and Daniel Sayers from American University, as well as EPA and VDHR. The purpose of the second meeting was for JRIA to discuss the proposed archeological investigations and to provide information on the six alternative sites. A third Consulting Party meeting was held on October 13, 2021, and the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, the Nansemond Indian Nation, the Pamunkey Tribe, the Rappahannock Tribe, the Upper Mattaponi Tribe, Cultural Heritage Partners, Daniel Sayers from American University, EPA, and VDHR attended. JRIA presented the findings of their Phase IA work on the proposed SPSA Expansion site.

The applicant hosted a tour of the Regional Landfill in Suffolk and the proposed expansion site on December 7, 2021. The Nansemond Indian Nation and the Pamunkey Tribe attended, as well as Cultural Heritage Partners who represented the Nansemond Indian Nation, the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, the Monacan Indian Nation, the Rappahannock Tribe, and the Upper Mattaponi Tribe. Representatives from the Norfolk District, including the District Commander, EPA, and VDEQ attended.

On January 3, 2022, the Chief of the Nansemond Indian Nation met with COL Hallberg and Norfolk District staff. The Chief expressed concerns about the proposed Regional Landfill expansion and indicated that the Nation is concerned about the proposed wetland impacts and the cumulative impacts from potential future expansions. The Nation has ties to the Great Dismal Swamp (GDS) and the Nansemond River, and the project could affect both resources. The Nation has been part of the group providing feedback on the National Heritage Landmark within the GDS. The Nation wanted reassurance that the Norfolk District would be taking a hard look at alternatives, including other locations, better technology, how to minimize disturbance, appropriate mitigation and would include tribal engagement.

In accordance with the Great Dismal Swamp National Heritage Area Act, which was signed into law in January 2023, the Secretary of Interior is directed to assess the suitability and feasibility of designating the Great Dismal Swamp and its associated sites as a National Heritage Area (Kaine 2022). This study is to be done in consultation with state and local organizations and governmental agencies, tribal governments, non-profit organizations, and other appropriate entities (Kaine, no date). National Heritage Areas are private-public partnerships that support historic preservation, conservation, recreation, tourism, and educational projects. This study process is currently underway and, if designated, the Great Dismal Swamp would receive technical and limited financial assistance from the National Park Service (Kaine, no date).

The Consulting Tribes requested a presentation on the environmental impacts of the proposed project. The Norfolk District arranged an online meeting attended by the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, the Nansemond Indian Nation, the Pamunkey Tribe, the Upper Mattaponi Tribe, and Cultural Heritage Partners on March 15, 2022. The meeting was also attended by EPA, the Norfolk District Commander, and Norfolk District staff. The Norfolk District requested that SPSA and their consultant (HDR) provide an overview and answer questions. SPSA discussed their purpose and need for the project, including information about diverting municipal waste and HDR provided an overview of the on-site alternatives analysis. HDR also explained how a landfill is constructed, including construction sequencing and the liner placement, leachate management and stormwater controls.

The Norfolk District Commander committed to providing a preliminary copy of the DEIS for review to the Consulting Tribes and EPA. The Norfolk District provided the preliminary DEIS to the Consulting Tribes and EPA on April 5, 2023. On April 25, 2023, the Norfolk District held a virtual meeting to discuss the preliminary DEIS with the Consulting Tribes. The Chickahominy Tribe-Eastern Division, the Nansemond Indian Nation, the Pamunkey Tribe, the Upper Mattaponi Tribe, Cultural Heritage Partners, and EPA attended. The discussion centered around the amount of wetland impacts and the potential for future cumulative impacts. The Tribes and EPA expressed concerns about SPSA proposing additional impacts to wetlands in the future as shown on the SPSA Master Plan.

The Norfolk District received comments on the preliminary DEIS from the Pamunkey Tribe on April 26, 2023, and the Nansemond Indian Nation on May 1, 2023. The Pamunkey Tribe expressed concerns about the project and indicated the need to find an alternative. The Nansemond Indian Nation indicated that they believe the alternative site, SH30 was the practicable alternative. The Nansemond also reiterated their concerns for impacts to the Dismal Swamp and their ancestral lands of significance to the Tribe. They also expressed their concerns that additional studies to identify culturally significant resources should be completed. On September 6, 2023, the Norfolk District discussed the need for ethnography studies with the applicant and the applicant started discussions with JRIA to perform that work. On September 28, 2023, the Norfolk District reached out to the Tribes to indicate that the Norfolk District had determined that an ethnography study would help inform the decision as part of the EIS process.

On October 11, 2023, the Nansemond Indian Nation provided the Norfolk District with a letter which indicated that the Tribe believed a TCP of significance to the Tribe is present within the project area. The letter explained in greater detail the Tribe's position on the presence of a TCP in the APE and requested that the Norfolk District provide a landscape analysis to address the identification of this potential historic property.

On October 12, 2023, the Norfolk District invited the Consulting Tribes to provide their input on the proposed Phase IB Workplan for the proposed Expansion Site. The Norfolk District also reached out to the Delaware Nation on October 19, 2023, and they requested to continue to consult on the project. The Nansemond Indian Nation, the Delaware Nation and the Pamunkey Tribe requested to review the workplan and the Norfolk District sent it for review on November 3, 2023. Any comments that were received were incorporated into the workplan. Gray & Pape completed the Phase IB fieldwork between December 4, 2023, and January 12, 2024.

On November 6, 2023, the Norfolk District Commander requested a consultation meeting with the Chief of the Nansemond Indian Nation. On November 22, 2023, the Norfolk District Commander met with the Chief of the Nansemond Indian Nation to indicate that the Norfolk District would like to work with the Nansemond Indian Nation to identify the TCP that is potentially within the project area and determine effects from the proposed project on the TCP. The Norfolk District also provided an update on the EIS process and indicated that it would be reviewing a hybrid alternative but would also be dropping the off-site alternative from further review, because it determined it was not a practicable alternative.

On December 11, 2023, the Norfolk District contacted the Delaware Nation and the Pamunkey Tribe to request a meeting to provide an update similar to the one provided to the Nansemond Indian Nation on November 22, 2023. Both Tribes requested a written update via email due to their predicted availability for a meeting. The Norfolk District addressed the hybrid alternative and the off-site alternate as discussed above.

The Norfolk District met with the Chief of the Nansemond Indian Nation and staff, as well as Cultural Heritage Partners on December 28, 2023, to develop a strategy for evaluating the TCP. Gray & Pape was tasked with the ethnography study, including the ethnobotanical work that would be conducted on the proposed expansion site. In December 2023, the Norfolk District oversaw the initiation of the landscape analysis by Gray & Pape previously requested by the Nansemond Indian Nation.

On February 7, 2024, the Norfolk District provided an outline of Gray & Pape's GIS-based analysis to incorporate archaeological data from the permit area and the 3-mile buffer around the SPSA project area and the ethnography and ethnobotanical work. The message, which was sent to the Delaware Nation, the Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, the Monacan Indian Nation, the Nansemond Indian Nation, the Pamunkey Tribe, Rappahannock Tribe, the Upper Mattaponi Tribe, and Cultural Heritage Partners, provided an overview of the TCP study and introduced the potential need for a Memorandum of Agreement (MOA) for the project. The Norfolk District requested a response from the Tribes who were interested in being part of the development of an MOA. On March 5, 2024, the Pamunkey Tribe responded and indicated that they support continued research on the project area and look forward to reviewing forthcoming reports.

On February 15, 2024, the Norfolk District met with the Nansemond Indian Nation and Cultural Heritage Partners. Gray & Pape provided an overview of the ethnohistorical work and discussed the proposed ethnobotanical study. The Nation and Cultural Heritage Partners provided insight on how to identify a boundary for the TCP and agreed to assist Norfolk District in identifying the boundary. Cultural Heritage Partners felt that Gray & Pape's work would inform the boundary decision. The Nation indicated that they preferred continuing consultation conversations for the TCP with just the Norfolk District at this point and would be agreeable to the TCP information being provided to all Consulting Tribes later in the process.

The Norfolk District sent the draft Phase IB to the Nansemond Indian Nation, the Delaware Nation and the Pamunkey Tribe on April 8, 2024, and no comments were received from the Tribes. The initial Phase IB was submitted to VDHR for review on April 10, 2023, and the Norfolk District received preliminary comments from VDHR.

On May 1, 2024, the Norfolk District held the sixth Consulting Party meeting, which was virtually attended by the Chickahominy Tribe, the Nansemond Indian Nation, the Pamunkey Tribe, Cultural Heritage Partners, EPA, VDHR, Norfolk District Commander, and SPSA. The purpose of the meeting was to update the Consulting Tribes on the EIS process, discuss ongoing studies of a hybrid alternative and the proposed mitigation plan. Gray & Pape discussed the Phase IB results and briefly addressed the ethnography/ethnobotanical work. The Norfolk District also discussed the need for an MOA for the project due to potential impacts on the TCP that it was working on with the Nansemond Indian Nation. The Norfolk District did not provide specific details about the TCP at the request of the Nansemond Indian Nation.

On May 2, 2024, the Norfolk District Commander reached out directly to the Chief of the Nansemond Indian Nation. The District Commander indicated that the Norfolk District agrees a TCP of importance to the Nation is present on or near the proposed SPSA Expansion Site and the Norfolk District would like to work with the Nation to determine the boundaries of the TCP and any adverse direct or indirect effects on the TCP. The Norfolk District would like to work with the Nation and the applicant to develop an acceptable resolution that would include development of an MOA. The District Commander proposed to meet with the Nation and SPSA to further discuss the path forward and that meeting occurred on May 7, 2024. The Norfolk District discussed the features of the proposed expansion site that would make it part of the TCP, including the plants and landscape position. The ongoing study is meant to answer the questions of what makes the area a TCP. The Nation committed to providing a Statement of Significance (SoS) for the TCP and the Norfolk District agreed to continue working to identify the contributing elements of the TCP that are present within the area. The Norfolk District also started the discussion about mitigation for potential impacts to the TCP. SPSA is proposing to purchase the Magnolia Springs property and deed it to the Nansemond Indian Nation. The Chief of the Nansemond Indian Nation indicated that the decision to accept the site would be a decision made by the Tribal Council.

During a June 4, 2024, meeting, Gray & Pape presented their initial findings from the Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Study. The study is intended to help all parties determine where and what and where is the TCP. Gray & Pape conducted two rounds of ethnobotanical studies on the proposed expansion site, in March and May 2024. The proposed Expansion Site, which could be classified as a non-riverine wet hardwood forest, contains subtle forest cover differences, most likely due to past logging. Gray & Pape indicated that a large percent of the plants on-site were listed on Shufer’s list of edible plants of the Great Dismal Swamp. The Nation’s association with the river and its tributaries has been demonstrated through land use and a diverse set of procurement activities.

On June 19, 2024, the Nansemond Indian Nation provided the Norfolk District with a SoS for the proposed TCP. The Nansemond Indian Nation have indicated that the “Great Dismal Swamp is a landscape of incredible historical, cultural, ecological, and spiritual importance to our Nation, from deep Pre-Contact times until the present day.” Tribal members provided input on how the Dismal Swamp and the lands surrounding the Nansemond River provided food for subsistence and economic sufficiency. Tribal members also gathered important wild plants and tended to gardens in these areas. The Nansemond Indian Nation indicated that plants were gathered as food sources, medicine, for construction of houses, fishing nets, mats, and baskets, as well as used for making musical instruments, arrows and spears, tattoo needles, and hair combs. The Nansemond Indian Nation have indicated that their SoS is a preliminary document intended to help the Norfolk District evaluate contributing resources and adverse effects specifically for the SPSA project. The information they provided was not comprehensive for an overall Great Dismal Swamp Traditional Cultural Place, which is yet to be specifically identified and would be outside the scope of the SPSA project.

On June 25, 2024, the Norfolk District met with Cultural Heritage Partners, who was representing the Nansemond Indian Nation. The Norfolk District discussed the potential boundaries of the TCP. The Nansemond wanted additional information about the relationship between the archeology sites on the Suffolk Scarp and the landscape of the site. The Norfolk District looked at connectivity of drainages, vegetation, and topography in relation to the known archeology sites. Based on information provided, Gray & Pape provided some TCP boundary map scenarios for review by the Nansemond Indian Nation and Cultural Heritage Partners.

On July 15, 2024, Gray & Pape submitted to the Norfolk District the draft Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Mapping study, which addressed several of the landscape analysis efforts requested by the Tribe in October 2023. The report was provided to the Nansemond Indian Nation on July 15, 2024.

July 16, 2024, the Norfolk District met with Cultural Heritage Partners, who was representing the Nansemond Indian Nation. Cultural Heritage Partners agreed that it should incorporate the Nansemond Indian Nation's SoS into the Gray & Pape report. On July 8, 2024, Cultural Heritage Partners had informed the Norfolk District that the Nation requested that the SoS not be attached to any documents but should be referenced and/or paraphrased. The Norfolk District reviewed the draft boundary scenarios produced by Gray & Pape and discussed changes.

At the Norfolk District's direction, Gray & Pape provided maps showing potential boundaries for the proposed TCP to the Nansemond Indian Nation on July 19, 2024. The maps provided three scenarios for the TCP boundary based on discussions with the Nansemond Indian Nation and Cultural Heritage Partners.

On August 13, 2024, the Norfolk District met with Cultural Heritage Partners, who was representing the Nansemond Indian Nation. Cultural Heritage Partners indicated that the Nation preferred the larger TCP boundary which included the tributaries to the Nansemond River that provide a connection between their ancestral lands, the Nansemond River, and the Great Dismal Swamp. That TCP boundary would include many important areas to the Tribe. It also includes the Cross Swamp property, which is Nansemond ancestral lands that have been returned to Tribal ownership. The effects of the project include habitat fragmentation and the loss of access to site.

On September 11, 2024, Gray & Pape provided a revised Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Mapping study. The report discusses the SoS provided by the Nansemond and identifies a boundary for the proposed TCP and contributing resources within the proposed TCP.

The boundaries of the Mawinsowa Swamp Traditional Cultural Place extend from south of U.S. Route 58 (Portsmouth Boulevard) to Cross Swamp in the City of Suffolk.

The Nansemond's SoS and the Gray & Pape Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Mapping study outline several themes that pertain to their historic and/or current use of the TCP. These themes are:

- Hunting and Fishing for Food Subsistence and Economic Sufficiency;
- Plant Gathering for Food Subsistence, Medicinal Use, and Structural Use;
- Transportation and Way-finding;
- Resistance;
- Recreation;
- Sovereignty; and
- Spiritual Significance.

The landscape analyses studies completed for this undertaking concludes that the APE contains the following contributing resources:

- Gathering Sites for Subsistence, Medicinal, and Functional Plants
- Hunting and Fishing Grounds
- Historic Manmade Landscape Features/ Transportation and Way-finding Features

A Determination of Effects on the Mawinsowa Swamp Traditional Cultural Place was prepared by Gray & Pape on behalf of the Norfolk District on September 26, 2024, with the recommendation of a finding that the project would have an *adverse effect* on the TCP. This determination was concurred with by the State Historic Preservation Officer on October 24, 2024, and previously by the Nansemond Indian Nation on September 23, 2024. The Norfolk District provided Gray & Pape's revised Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Mapping study and the Determination of Effects on the Mawinsowa Swamp Traditional Cultural Place, and coordinated individually with the Delaware Nation, Chickahominy Indian Tribe, Chickahominy Indian Tribe – Eastern Division, Monacan Indian Nation, Pamunkey Tribe, Rappahannock Indian Tribe, Inc., and Upper Mattaponi Tribe Indian Tribe on September 26, 2024. The Norfolk District requested comments on the documents and asked if any of the Consulting Tribes would like to participate in the MOA process. On November 1, 2024, Norfolk District followed up with the Tribes and reiterated the request for comments and asked about participation in the MOA process. The Delaware Nation contacted the Norfolk District on November, 4, 2024 and indicated that they would defer to the Nansemond Indian Nation regarding the MOA development. As of the date of this publication, no other comments from the Consulting Tribes were received and none of the Tribes have requested to participate in the MOA development process, except for the Nansemond Indian Nation. The Norfolk District, in consultation with the Nansemond Indian Nation, the SHPO, and SPSA, have developed a draft MOA which defines the resolution of adverse effects to cultural resources. A draft MOA is included as Appendix H.

## Public review

The Norfolk District published the DEIS on June 16, 2023. The DEIS was distributed to interested individuals, agencies, and organizations and was available for public and agency review for 60 days. The Norfolk District conducted two public information sessions in June 2023 and two public hearings in July 2023. The meetings were held in the City of Suffolk, Virginia (proposed expansion location) and in the Town of Ivor, which is in Southampton County, Virginia (near the proposed alternative site SH30). The Norfolk District will accept comments on the FEIS for 30 days following publication in the Federal Register.

The FEIS is available on the internet at the following links:
https://www.nao.usace.army.mil/Missions/Regulatory/

http://projects.vhb.com/spsa-eis

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# Appendix A: Off-Site Alternatives Analysis Technical Memo

| | | | |
|---|---|---|---|
| To: | U.S. Army Corps of Engineers | Date: | April 13, 2022 |
| | | Project #: | 34602.00 |
| From: | VHB | Re: | Off-Site Alternatives Analysis |

This memorandum was prepared in support of the environmental impact statement (EIS) process for the proposed expansion of the Southeastern Public Service Authority (SPSA) Regional Landfill in Suffolk, Virginia. It documents analysis conducted to support the development of a reasonable range of alternatives by identifying sites other than the existing Regional Landfill that could potentially meet SPSA's need for expanded landfilling capacity.

Potential sites were evaluated in four phases:

1. Phase I – identifying parcels greater than 300 acres, along accessible roadways, outside the 100-year floodplain.
2. Phase II – evaluating fatal flaws (detailed below) in the sites identified in Phase I.
3. Phase III – ranking the remaining sites based on general development criteria.
4. Phase IV – further screening the remaining sites based on site-specific development criteria and scoping comments.

**Site Selection Criteria by Phase**

| Phase I | Phase II (Fatal Flaws) | Phase III | Phase IV |
|---|---|---|---|
| 300 acres of undeveloped land | Has an airport/airfield on it | Land Use Compatibility | Wetland Impacts (based on conceptual landfill footprint) |
| Within SPSA Service Area | Has more than 129 acres of wetlands (i.e., the amount of wetlands potentially impacted by the proposed action) | Roadway Capacity | Stream Impacts |
| Within two miles on either side of a major highway corridor | Is split by a road | Natural Visual Screening | Proximity to Residential Land Uses |
| Outside of the 100-year floodplain | | Zoning Consistency | Soil Balance |
| | | Site Configuration | Leachate Management |
| | | Site Ownership | Development Flexibility |
| | | Sewer Availability | Waste Hauling |
| | | Wetland Impacts (based on estimated total area of wetlands on site) | Owners, Community, or Local Government Concerns |
| | | Transportation Costs | Site Access |
| | | Ease of Development | |
| | | Proximity to Airport/Airfield | |
| | | Cultural Resources | |
| | | Natural Resources | |
| | | Environmental Justice | |

The Phase I-III analysis identified six sites to be carried forward for further analysis. The Phase IV analysis evaluated and ranked these 6 sites based on site-specific characteristics. Details of the analysis and selection process are documented in the sections below.

## PHASE I ANALYSIS – POTENTIAL SITE IDENTIFICATION

Phase I consisted of the identification of parcels that could potentially suit SPSA's needed use and should be carried forward for Phase II analysis. The following criteria were used to locate potentially suitable sites:

- At least 300 acres of contiguous undeveloped land. The area can consist of multiple parcels with multiple owners and should be reasonably compact.
- Within the SPSA Service Area
- Within 2 miles of a major highway corridor (defined as Primary Roads and interstates)
- Outside of the 100-year Floodplain

This selection process identified 58 sites to carry forward into Phase II analysis. These 58 sites are shown in Figure 1 in the appendix.

## PHASE II ANALYSIS – FATAL FLAWS

Each of the 58 sites identified in Phase I were examined for the following fatal flaws:

1. Current location of an airport/airfield
2. Greater than 129 acres of wetlands based on National Wetland Inventory (NWI) mapping (the amount of wetlands potentially impacted by SPSA's proposed action)
3. Is bisected by a road or other linear infrastructure

Sites that had at least one fatal flaw were removed from further analysis. These eliminated sites are shown in Figure 2 in the appendix, color coded by elimination criteria. Phase II analysis resulted in 29 parcels being carried forward for Phase III of the analysis. These 29 parcels are illustrated in purple and with an identified site number in Figure 2.

## PHASE III ANALYSIS – FAVORABILITY RANKING APPROACH

Based on the results of the Phase I and II analyses, 29 sites were carried forward for analysis in Phase III, illustrated in Figure 2 in the appendix. A system of 14 weighed criteria was used in Phase III to rank these 29 sites. The categories were identified in the Alternative Landfill Siting Study conducted in 1989 and 1990 and supplemented through recent coordination with regulatory agencies. These categories were used for the Phase III ranking.

Each criterion was assigned a weight reflecting the importance granted to it when considering the suitability of a site. Weights ranged from one to five, with five being the greatest importance and one being the least importance. A numeric input was then assigned to the site, using a scale of highly acceptable (+1), acceptable (0), or unfavorable (-1). Finally, a score was assigned to the site by multiplying the weight by the numeric input. Weighted inputs for all 14 categories were then summed and sites were ranked by their total weighted scores (see matrix in Attachment A). The highest possible score that a site could attain is 47.

The following paragraphs describe each of the criteria (with the assigned weight in parentheses), and how the 29 sites ranked under each criterion.

### *Land Use Compatibility (5)*

Existing and future land use mapping as defined in the comprehensive plan for the relevant jurisdiction was used to determine whether a site's land use was suitable for landfill construction. Vacant or agricultural uses were rated highly acceptable; predominantly vacant, predominantly agricultural, or industrial uses were rated acceptable; residential/commercial/office uses were rated unfavorable. Of the 29 sites analyzed in Phase III, all but 2 were rated highly acceptable. The 2 remaining sites were low-density residential (future land use, and thus do not contain any residential uses currently), thus rated acceptable. No sites were rated unfavorable.

***Zoning Consistency (3)***

Zoning was separated into categories that were either desirable or undesirable. As such there were no zoning categories that were rated only acceptable. Agricultural and Industrial zoning districts were rated highly acceptable and Residential/Commercial/Office zoning districts were rated unfavorable. All but 4 sites were found to be highly acceptable under this criterion. The 4 remaining sites were zoned for a rural agricultural conservation district, and as such, rated unfavorable.

***Roadway Capacity (3)***

Sites with existing direct access from a 4-lane or more primary road were rated highly acceptable. Parcels with direct access from a 2-lane primary road were rated acceptable. Parcels with direct access from anything else was rated unfavorable. Two of the 29 sites were rated highly acceptable, 1 site was rated unfavorable, and the remaining 26 sites were rated acceptable.

***Natural Visual Screening (3)***

This category refers to the availability of a forested visual and auditory buffer around the site. The evaluation of each site was conducted using aerial photography. One site had no existing screening and was deemed unfavorable. Ten sites have existing screening and were rated highly acceptable. Eighteen parcels have some level of mixed screening and were rated acceptable.

***Site Configuration (3)***

Fifteen of the 29 sites were single-parcel and had a compact shape (rectangular) generally appropriate for use as a landfill site. As such, they were rated highly acceptable. The other 14 parcels were noted as having a complex shape, a U shape, or a long side facing a major road that would make development as a landfill more challenging. Such sites were rated only acceptable. No sites were rated unfavorable.

***Site Ownership (1)***

Each site's ownership - privately or publicly owned – was reviewed. Because all the sites in the Phase III analysis were privately owned, site ownership was not a differentiator among them in this phase of the analysis. All sites were rated highly acceptable.

***Sewer Availability (2)***

The approximate distance to the nearest municipal sanitary sewer system was calculated for each of the 29 sites. The distance from one site is less than 2 miles (rated highly acceptable); the distance from 3 sites is between 2 and 4 miles (rated acceptable); and the distance to each of the remaining 25 sites is more than 4 miles (rated unfavorable).

***Wetland Impact (5)***

By definition, all sites in Phase III of the analysis contain 129 acres of wetland or less based on NWI mapping. Among the 29 sites, those made up of no more than 25 percent hydric soils and no more than 10 percent NWI wetlands were given a highly favorable rating. Sites made up of between 25 and 50 percent hydric soils and no more than 20 percent NWI wetlands were given an acceptable rating. Sites made up of more than 50 percent hydric soils or more than 20 percent NWI wetlands were given an unfavorable rating. Using this approach, 11 sites were highly acceptable, 14 were acceptable, and 4 were unfavorable.

### *Transportation Costs (2)*[1]

A high-level conceptual analysis of the costs associated with hauling waste from SPSA's transfer station network to each of the 29 sites was conducted. Estimated hauling costs ranged from $5 million per year to just over $8 million per year depending on the site. Sites with hauling costs of $6 million per year or more were rated acceptable and sites with hauling costs under $6 million per year were rated highly acceptable. This approach resulted in 20 sites being given an acceptable rating for transportation cost and 9 sites receiving a highly acceptable rating. No sites were rated unfavorable.

### *Ease of Development (2)*

Site topography; existing structures that would have to be demolished; and underground/other utilities that may have to be relocated influence how easily a site could be developed and are included in this category. None of the 29 sites contained slopes greater than 10 percent. Aerial imagery, supplemented by a windshield survey, was used to determine the presence of utilities and existing structures. Sites without buildings or utilities were rated highly acceptable, sites without buildings but possibly contained utilities were rated acceptable, and sites that had buildings and likely had utilities (would need to be confirmed on site) were rated unfavorable. Using this approach, 10 sites were rated highly acceptable; 6 were rated acceptable; and 13 parcels were rated unfavorable.

### *Proximity to Airport/Airfield (3)*

US Environmental Protection Agency landfill siting criteria establish a threshold of within 10,000 feet of any airport runway used by turbojet aircraft, or within 5,000 feet of any runway end used by piston-type aircraft only for requirements pertaining to bird strike hazards. Sites located outside of the applicable distance threshold were rated highly acceptable. Sites outside of 75 percent of that threshold were rated acceptable. Any site closer than that was rated unfavorable. Because all the sites in the Phase III analysis were outside of the applicable distance threshold, proximity to an airport/airfield was not a differentiator among them in this phase of the analysis. All sites in this phase of the analysis were rated highly acceptable.

### *Cultural Resources (5)*

Any site with a known historic property (based on a search of the Virginia Cultural Resources Information System [VCRIS]) on it was given an unfavorable rating. Sites that do not contain a known historic property and are adjacent to one were rated highly favorable. Sites adjacent to a known historic property were rated acceptable. On this basis, 10 sites were rated highly acceptable, 8 sites were rated acceptable, and 11 sites were rated unfavorable.

### *Natural Resources (5)*

Each of the 29 sites was reviewed for the documented presence of conservation easements or conservation sites based on publicly available resources (using Critical Habitat as defined by USFWS and the Natural Heritage Mapping Site). Sites that did not contain, or were not adjacent to, a conservation easement or site were rated highly acceptable; sites that were adjacent to conservation sites or stream conservation units were rated acceptable; and sites that overlapped a conservation easement or site were rated unfavorable. Using this approach, 20 parcels were not in a conservation easement or site and were rated highly acceptable. Another 3 parcels were adjacent to conservation easements and rated acceptable. The remaining 6 parcels were rated unfavorable as some portion of the site was in a conservation easement or site.

---

[1] This analysis used SPSA's current budgeted personnel and truck/trailer census, as well as personnel, materials, and expenses from the Fleet Maintenance and Transportation departments as the basis for the cost evaluation. The additional personnel and equipment that would be needed to support hauling operations for each site were estimated and added to existing expenses to generate a total conceptual hauling cost for each site. Total average yearly capital expenses for a 10-year period were also considered. These variables were applied to the total mileage from each site to each existing transfer station to determine the annual hauling cost associated with the site.

### *Environmental Justice (5)*

This category included sites that were in block groups that were identified as containing minority or low-income populations based on Census data (American Community Survey, 2014-2018). Minority includes all races that are non-white and Hispanic populations that are white. Minority was determined for any block group where 50% or more of the population is minority or any block group where minority population is at least 10 percentage points higher than the county average. Low income includes any block group where the percentage of the population in any of the poverty categories – Below Poverty Level, Very Poor or Near Poor equals or exceeds 25% of the total population of that block group. Low income also includes any block group where the percentage of the population in any of the poverty categories – Below Poverty Level, Very Poor or Near Poor - exceeds the county average by five percentage points or more.

Using this approach, 17 of the sites were found to be in block groups with high minority population and all 29 sites were found to be in block groups with high low-income populations. The 12 parcels that were in low-income block groups but not in minority block groups were rated acceptable, while the remaining 17 parcels were rated unfavorable. No sites were rated highly acceptable.

## RESULTS OF PHASE III ANALYSIS – FAVORABILITY RANKING

Upon completion of the analysis, 6 sites scored greater than 20 points (27, 25, 22, 22, 21, and 20 points). Based on the analysis of the off-site parcels during Phase III, the 6 selected sites for further study are summarized below by the following favorability characteristics, in order of total score, and illustrated in Figure 3 in the appendix. A figure for each site is also shown in the appendix.

| Top Six Favorability Rankings | |
|---|---|
| Site | Total Score |
| SU02 | 27 |
| SH33 | 25 |
| SH23 | 22 |
| SH32 | 22 |
| SH09 | 21 |
| SH29 | 20 |

### *SU02 (Rank #1)*

Site SU02, illustrated on Figure 4 in the appendix, was rated highly acceptable for 12 of the 14 criteria and unfavorable for 2 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 27. The cultural resource, a road corridor, associated with this property overlaps a very small portion of the southern edge of the property.

| Ratings for SU02 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Land Use Compatibility (5) | | Cultural Resources (5) |
| Roadway Capacity (3) | | Environmental Justice (5) |
| Natural Screening (3) | | |
| Zoning Consistency (3) | | |
| Site Configuration (3) | | |
| Site Ownership (1) | | |
| Sewer Availability (2) | | |
| Wetland Impact (5) | | |
| Transportation Costs (2) | | |
| Ease of Development (2) | | |
| Proximity to Airport/Airfield (3) | | |
| Natural Resources (5) | | |

### *SH33 (Rank #2)*

Site SH33, illustrated on Figure 5 in the appendix, was rated highly acceptable for 10 of the criteria, acceptable for 3 of the criteria, and unfavorable for 1 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 25.

| Ratings for SH33 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Natural Screening (3) | Land Use Compatibility (5) | Sewer Availability (2) |
| Zoning Consistency (3) | Roadway Capacity (3) | |
| Site Configuration (3) | Environmental Justice (5) | |
| Site Ownership (1) | | |
| Wetland Impact (5) | | |
| Transportation Costs (2) | | |
| Ease of Development (2) | | |
| Proximity to Airport/Airfield (3) | | |
| Cultural Resources (5) | | |
| Natural Resources (5) | | |

### *SH23 (Rank #3)*

Site SH23, illustrated on Figure 6 in the appendix, was rated highly acceptable for 8 of the criteria, acceptable for 4 of the criteria, and unfavorable for 2 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 22.

| Ratings for SH23 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Land Use Compatibility (5) | Roadway Capacity (3) | Sewer Availability (2) |
| Zoning Consistency (3) | Natural Screening (3) | Environmental Justice (5) |
| Site Ownership (1) | Site Configuration (3) | |
| Wetland Impact (5) | Transportation Costs (2) | |
| Ease of Development (2) | | |
| Proximity to Airport/Airfield (3) | | |
| Cultural Resources (5) | | |
| Natural Resources (5) | | |

### *SH32 (Rank #4)*

Site SH32, illustrated on Figure 7 in the appendix, was rated highly acceptable for 10 of the criteria, acceptable for 3 of the criteria, and unfavorable for 1 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 22.

| Ratings for SH32 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Land Use Compatibility (5) | Roadway Capacity (3) | Sewer Availability (2) |
| Natural Screening (3) | Site Configuration (3) | |
| Zoning Consistency (3) | Environmental Justice (5) | |
| Site Ownership (1) | | |
| Wetland Impact (5) | | |
| Transportation Costs (2) | | |
| Ease of Development (2) | | |
| Proximity to Airport/Airfield (3) | | |
| Cultural Resources (5) | | |
| Natural Resources (5) | | |

### *SH09 (Rank #5)*

Site SH09, illustrated on Figure 8 in the appendix, was rated highly acceptable for 8 of the criteria, acceptable for 3 of the criteria, and unfavorable for 3 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 21.

| Ratings for SH09 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Land Use Compatibility (5) | Roadway Capacity (3) | Sewer Availability (2) |
| Zoning Consistency (3) | Natural Screening (3) | Ease of Development (2) |
| Site Configuration (3) | Transportation Costs (2) | Environmental Justice (5) |
| Site Ownership (1) | | |
| Wetland Impact (5) | | |
| Proximity to Airport/Airfield (3) | | |
| Cultural Resources (5) | | |
| Natural Resources (5) | | |

### *SH29 (Rank #6)*

Site SH29, illustrated on Figure 9 in the appendix, was rated highly acceptable for 7 of the criteria, acceptable for 5 of the criteria, and unfavorable for 2 of the criteria. The favorability ratings for this site are summarized in the table below. Based on the weighting of the criteria, the parcel had a total score of 20.

| Ratings for SH29 | | |
|---|---|---|
| Highly Acceptable (1) | Acceptable (0) | Unfavorable (-1) |
| Land Use Compatibility (5) | Roadway Capacity (3) | Sewer Availability (2) |
| Zoning Consistency (3) | Natural Screening (3) | Environmental Justice (5) |
| Site Ownership (1) | Site Configuration (3) | |
| Wetland Impact (5) | Transportation Costs (2) | |
| Proximity to Airport/Airfield (3) | Ease of Development (2) | |

| | | |
|---|---|---|
| Cultural Resources (5) | | |
| Natural Resources (5) | | |

## PHASE IV ANALYSIS – SITE-SPECIFIC CRITERIA ANALYSIS

Following the completion of Phase III, further analysis and ranking of the 6 remaining sites were conducted based on site-specific operational opportunities or constraints afforded by each of them. This was performed in 2 steps, separated by a period of public scoping, as described below.

### *Phase IVa – Conceptual Footprint Analysis.*

As a first step, the analysis evaluated whether each site could accommodate a landfill of sufficient size to meet the proposed expansion's purpose and need (16-million-cubic-yard capacity) while minimizing impacts on wetlands. To that end:

- Wetlands on each site were mapped using the best available mapping and data (some limited, high-level ground-truthing was conducted for SU02 only; owners denied access to all the other sites).
- High-level conceptual landfill footprints were developed and overlain on each site in a manner that minimized wetland impacts. The conceptual footprints included waste disposal footprint, supporting facilities, borrow and stockpiling areas, stormwater management areas, and access roads.

Sites that could not adequately accommodate a conceptual footprint without resulting in wetland impacts greater than, or equal to, the proposed expansion at the existing landfill would be eliminated from further consideration.

The result of this analysis is shown in the appendix (Figures 10 to 15). Phase IVa screening showed that all 6 sites could accommodate a landfill of the requisite size with less impact to wetlands than the proposed expansion at the existing SPSA landfill. Therefore, no sites were eliminated at this stage. The following table shows the wetland area each layout would affect.

| Phase IVa – Potential Wetland Impacts | |
|---|---|
| Site | Estimated Wetland Impacts (Acres) |
| SU02 | 4.9* |
| SH33 | 9.0 |
| SH23 | 10.1 |
| SH09 | 18.7 |
| SH32 | 38.6 |
| SH29 | 51.0 |

* VHB conducted only limited, high-level ground-truthing for SU02, based primarily on desktop review with limited field investigation.

Following the completion of Phase IVa, the 6 sites and updated information on the alternatives development process to date were made available for public review and comment during a 30-day scoping period (from December 17, 2020 through January 18, 2021). Comments received were considered, as applicable, during the next phase. After comments were reviewed, a Phase IVb ranking system was developed to help further refine the alternatives analysis.

### *Phase IVb – Site Ranking Analysis*

In Phase IVb, the 6 sites were evaluated and ranked according to the following criteria:

- **Total Wetland Impacts.** This criterion ranks the sites according to the estimates shown in the above table from the lowest (ranked first) to the highest (ranked last) acreage of impacted wetlands. While, as explained above, this criterion alone was not sufficient to eliminate any of the sites, it is an important consideration when ranking them for purposes of further screening. Rankings are shown in the table below.

| Site | Estimated Wetland Impacts (Acres) | Rank |
|---|---|---|
| SU02 | 4.9 | 1 |
| SH33 | 9.0 | 2 |
| SH23 | 10.1 | 3 |
| SH09 | 18.7 | 4 |
| SH32 | 38.6 | 5 |
| SH29 | 51.0 | 6 |

- **Stream Impacts.** This criterion measures potential impacts on streams based on the linear length of stream within the conceptual landfill footprint for each site. The sites were ranked from shortest (ranked first) to longest (ranked last) length of stream affected. Rankings are shown in the table below. For this criterion, the sites fall in only 2 categories.

| Site | Estimated Stream Impacts (Linear Feet) | Rank |
|---|---|---|
| SU02 | 0 | 1 |
| SH33 | 1,960 | 2 |
| SH23 | 1,960 | 2 |
| SH09 | 0 | 1 |
| SH32 | 0 | 1 |
| SH29 | 0 | 1 |

- **Proximity to Residential Land Uses**. This criterion consists of the number of residential parcels within a 1-mile radius of the site. Parcel use was identified using publicly available real property or tax records. The criteria are generally conservative because the administrative designation of a parcel detailed as in residential use does not necessarily mean it is actually used as such. The sites were ranked based on the total number of residential parcels within the radius, from smallest (ranked first) to greatest (ranked last). Rankings are shown in the table below.

| Site | Number of Residential Parcels within 1-Mile Radius | Rank |
|---|---|---|
| SU02 | 110 | 6 |
| SH33 | 98 | 5 |
| SH23 | 14 | 1 |
| SH09 | 20 | 2 |
| SH32 | 31 | 4 |
| SH29 | 24 | 3 |

- **Soil Balance**. This criterion is an estimate of the amount of soil needed to operate the landfill (estimated at approximately 20 percent of total landfill capacity; soil is used as cover material to build up the cells as waste is added) compared to the amount of borrowed soil each site can be anticipated to yield. The latter amount was estimated based on the following assumptions: all suitable upland areas within each site could be used for borrow (or cover) material and could be excavated to a depth of 60 feet. The sites were ranked based on what proportion of the needed soil could be borrowed from the site, from the greatest percentage (ranked first) to the smallest (ranked last). Rankings are shown in the table below.

| Site | Percentage of Soil Potentially Available on Site | Rank |
|---|---|---|
| SU02 | 100% | 1 |
| SH33 | 63% | 5 |
| SH23 | 99% | 2 |
| SH09 | 79% | 3 |
| SH32 | 47% | 6 |
| SH29 | 69% | 4 |

- **Leachate Management**. Leachate from the operation of the landfill would have to be transported to an existing discharge point for conveyance to an appropriate treatment facility. This criterion measures the distance from each site to the nearest potentially usable discharge point. The sites were ranked from closest (ranked first) to a potential discharge point to farthest (ranked last). Rankings are shown in the table below.

| Site | Distance to Nearest Available Discharge Point (Miles) | Rank |
|---|---|---|
| SU02 | 1.6 | 1 |
| SH33 | 20.7 | 5 |
| SH23 | 6.8 | 2 |
| SH09 | 17 | 4 |
| SH32 | 21.4 | 6 |
| SH29 | 8.1 | 3 |

- **Development Flexibility**. Although, as noted above, all sites have sufficient room to construct an adequately sized landfill with less impact on wetlands than the proposed expansion at the existing landfill, sites with additional areas of potentially usable uplands can provide added flexibility for the design of the new facility. Therefore, this criterion estimates the total area of uplands potentially usable outside the conceptual landfill footprint. Potentially usable areas were identified taking into account size, configuration, and relationship to the conceptual landfill footprint. The sites were ranked from greatest total area of potentially usable uplands (ranked first) to smallest (ranked last). Rankings are shown in the table below.

| Site | Potentially Available Uplands (Acres) | Rank |
|---|---|---|
| SU02 | 89 | 1 |
| SH33 | 58 | 3 |
| SH23 | 49 | 4 |
| SH09 | 38 | 5 |
| SH32 | 67 | 2 |
| SH29 | 19 | 6 |

- **Waste Hauling**. The greater the distance a facility is from the source of waste production (i.e., population centers), the less economically and environmentally efficient the landfill becomes. Hauling waste to a landfill distant from main population centers would result in more truck miles traveled and associated impacts, such as greenhouse gas emissions. Therefore, this criterion estimates the total number of miles waste disposal trucks would travel every year to transport waste from SPSA's various transfer stations to the landfill. The sites were ranked from fewest annual truck miles traveled (ranked first) to most annual truck miles traveled (ranked last). Rankings are shown in the table below.

| Site | Waste Hauling Mileage (Million Miles per Year) | Rank |
|---|---|---|
| SU02 | 1.30 | 1 |
| SH33 | 1.77 | 2 |
| SH23 | 2.38 | 5 |
| SH09 | 2.83 | 6 |
| SH32 | 1.84 | 3 |
| SH29 | 1.93 | 4 |

- **Owners, Community, or Local Government Concerns.** This criterion ranks sites based on public scoping comments, including feedback from the site owners and from local governments, if received. For each site, comments were organized in 3 broad categories (as applicable): supportive; cautionary; or hostile. Sites that elicited supporting comments were ranked higher than those that elicited cautionary comments, which in turn were ranked higher than those that elicited hostile comments. Rankings are shown in the table below. The main basis for each ranking is summarized in the "Notes" column. For this criterion, sites fall into 3 categories only.

| Site | Notes | Rank |
|---|---|---|
| SU02 | Owner allowed access to the site and is potentially open to selling. | 1 |
| SH33 | Owner refused access to the site and strongly stated a lack of interest in the property being considered. County stated that getting the needed permits may be challenging. | 3 |
| SH23 | Owner refused access to the site with no further comment. County stated that getting the needed permits may be challenging. | 2 |
| SH09 | Owner refused access to the site in terms that suggest a lack of interest in the property being considered. County stated that getting the needed permits may be challenging. | 2 |
| SH32 | Owner refused access to the site with no further comment. County stated that getting the needed permits may be challenging. | 2 |
| SH29 | Owner refused access to the site with no further comment. County stated that getting the needed permits may be challenging. | 2 |

- **Site Access**. With one exception (SU02), direct vehicular access to the potential sites is through small, unstriped or 2-lane rural roads. Landfill construction and operation would substantially increase truck traffic along these roads. This criterion measures the length of rural road that would be affected by this change. It was calculated by measuring the distance from the site entrance to the nearest 4-lane roadway. The sites were ranked from closest to a 4-lane roadway (ranked first) to farthest (ranked last). Rankings are shown in the table below.

| Site | Distance to Nearest 4-Lane roadway (Miles) | Rank |
|---|---|---|
| SU02 | 0 | 1 |
| SH33 | 0.64 | 2 |
| SH23 | 3.5 | 5 |
| SH09 | 4.8 | 6 |
| SH32 | 2.9 | 4 |
| SH29 | 1.8 | 3 |

### *Phase IV Analysis Results*

A point system was used to obtain a summary total ranking for each site. When ranked first, a site was awarded 6 points; when ranked second, it was awarded 5 points; when ranked third, it was awarded 4 points; and so on. When ranked sixth, a site was awarded 1 point.

The points assigned for each criterion were then added to generate a total score for each site. The sites were then assigned a final rank based on the score, as shown in the table below.

| Site | Total Score | Rank |
|---|---|---|
| SU02 | 49 | 1 |
| SH33 | 33 | 3 |
| SH23 | 37 | 2 |
| SH09 | 29 | 6 |
| SH32 | 30 | 5 |
| SH29 | 31 | 4 |

With a score of 49, Site SU02 ranked first across all criteria but 1. It ranked last for the Proximity to Residential Land Uses criterion because the number of residential parcels within 1 mile of it is substantially higher than for any of the other sites. Additionally, some of these residences are immediately adjacent to the site.

The second ranking site, SH23, had a score of 37. It was less consistently ranked across the criteria than Site SU02 but ranked highest for the Proximity to Residential Land Uses criterion and second for the Leachate Management and Soil Balance criteria.

The other sites had substantially lower scores. Although SH33, with a score of 33, was a close third to SH23 and ranked second for Wetland Impacts, it had some significant shortcomings. In particular, it ranked last for the Owners, Community, or Local Government Concerns criterion due to strongly worded opposition from the owner to being considered. It also ranked last but one for the Proximity to Residential Land Uses criterion, the Leachate Management criterion, and the Soil Balance criteria.

After discussing the results of Phase IV of the Alternatives Analysis, the Corps decided to carry the top 6 sites into the Draft EIS for further analysis.

The analyses presented in this memorandum were conducted based on desktop reviews using existing information available at the time of the analysis. VHB conducted only limited, high-level ground-truthing for SU02. The more detailed analyses to be conducted as part of Draft EIS preparation, including more comprehensive field reviews if allowed by the property owners, may result in further refinement of some of the metrics used in the present analysis, including the total amount of wetland potentially affected. If so, this will be documented in the Draft EIS.

# Off-Site Alternatives Appendix

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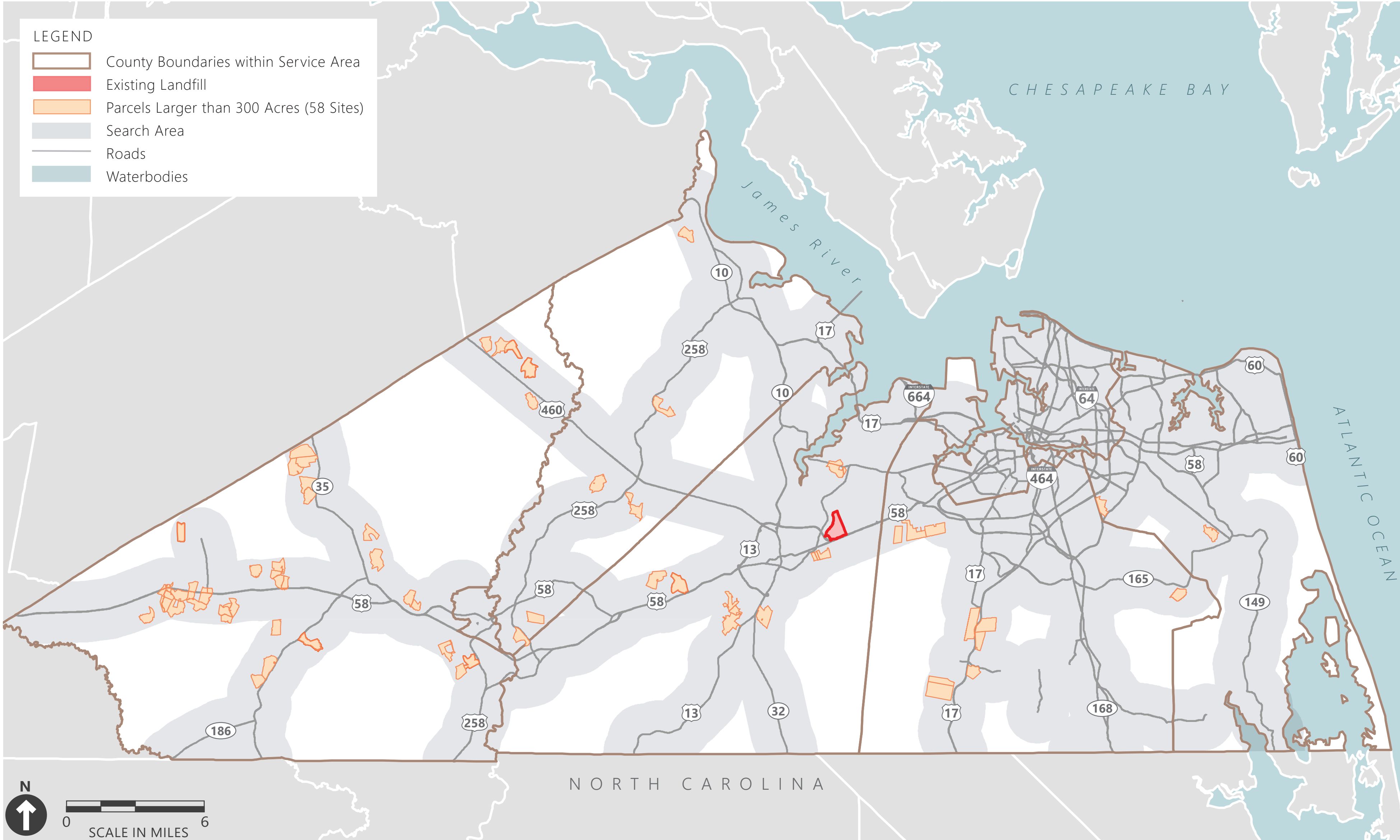


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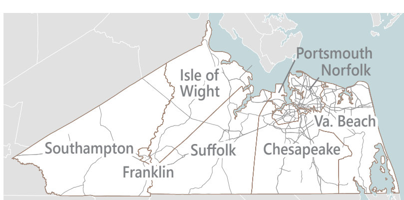


# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 1

**Phase I Analysis Results**

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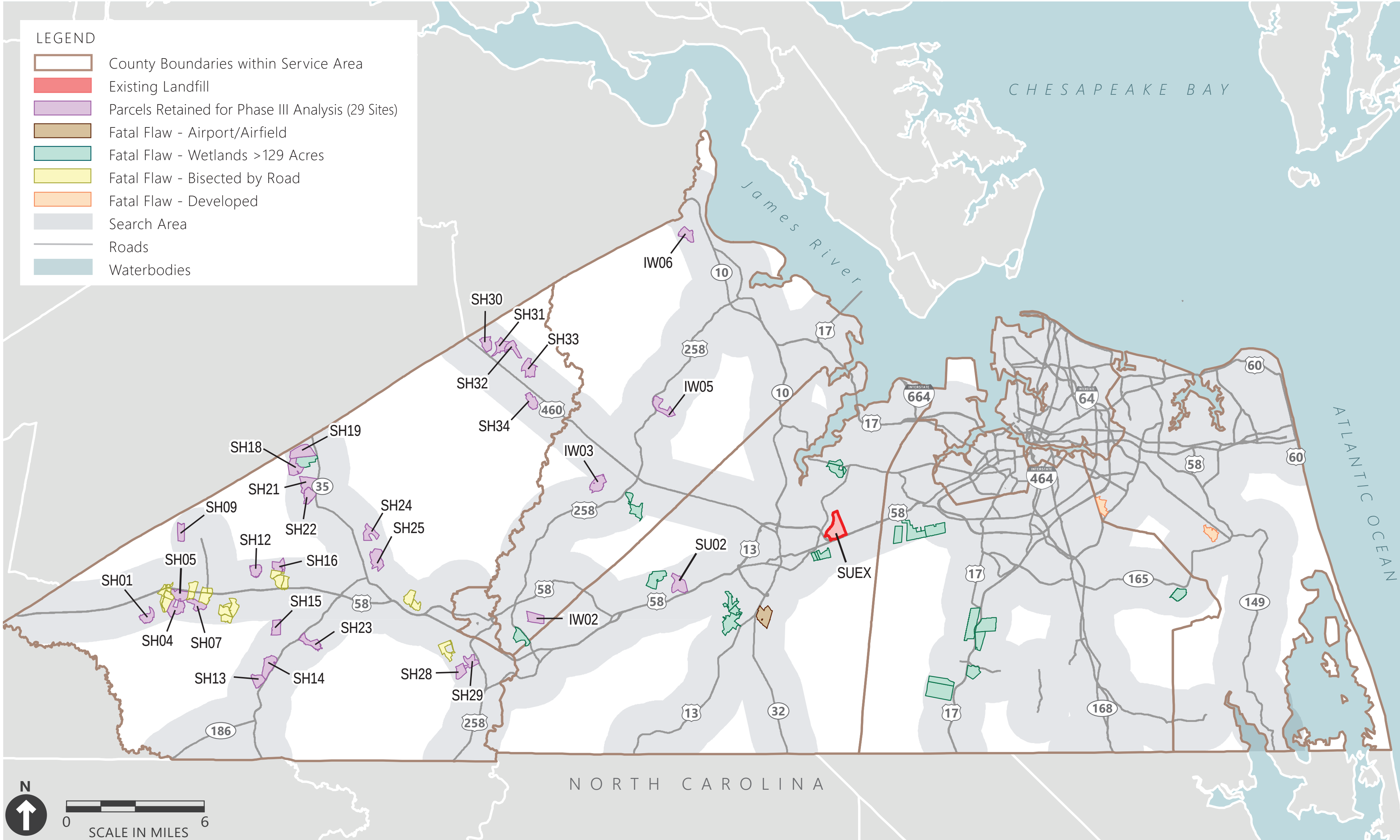


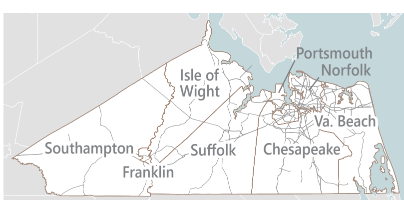


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# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 2

**Phase II Analysis Results**

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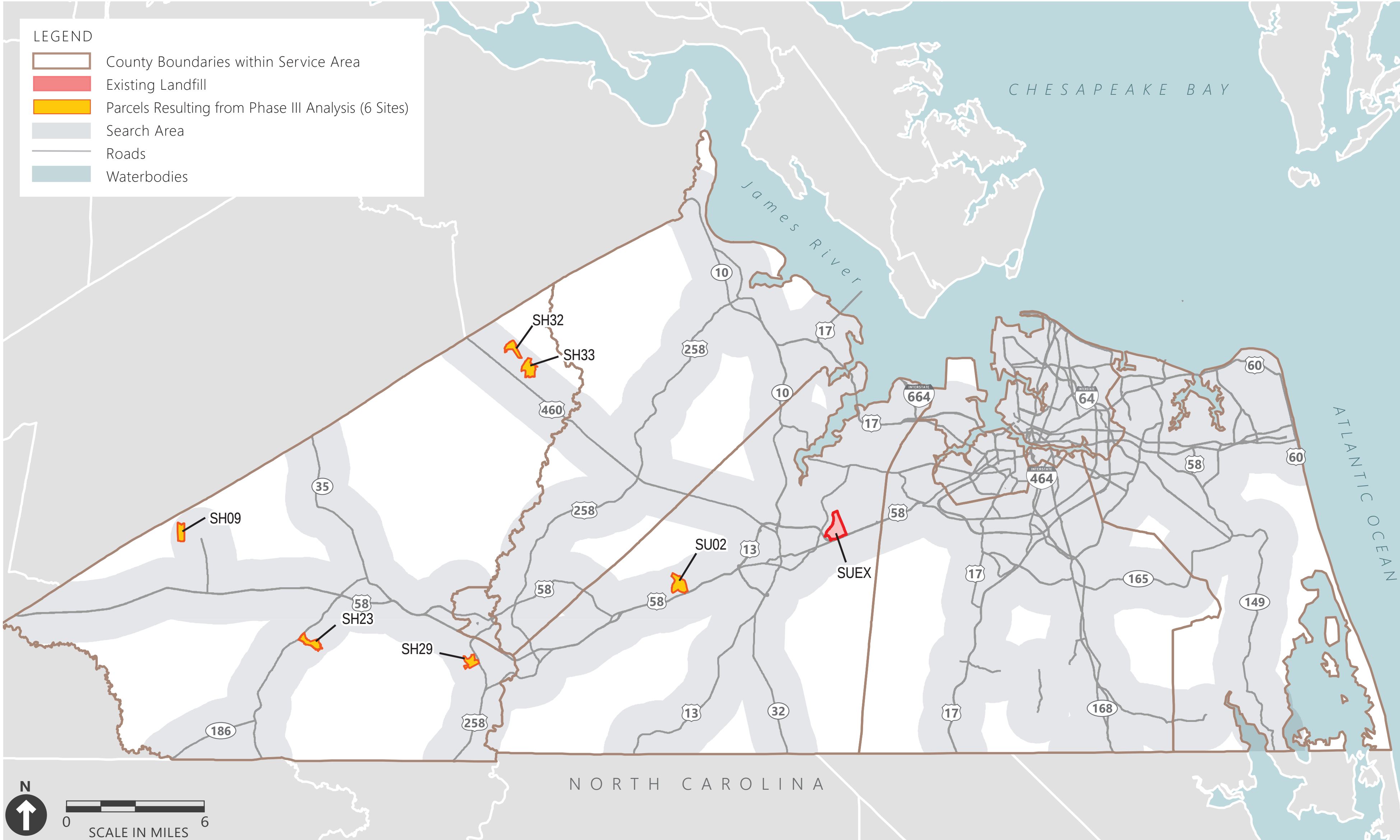


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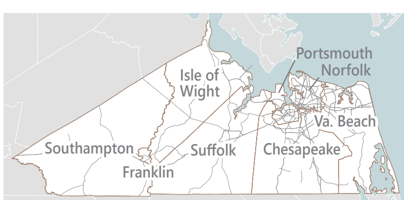


# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 3

**Phase III Analysis Results**


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## OFF-SITE ALTERNATIVES ANALYSIS
Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 4

**Site SU02**


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FIGURE 5

**Site SH33**

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# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 6

**Site SH23**


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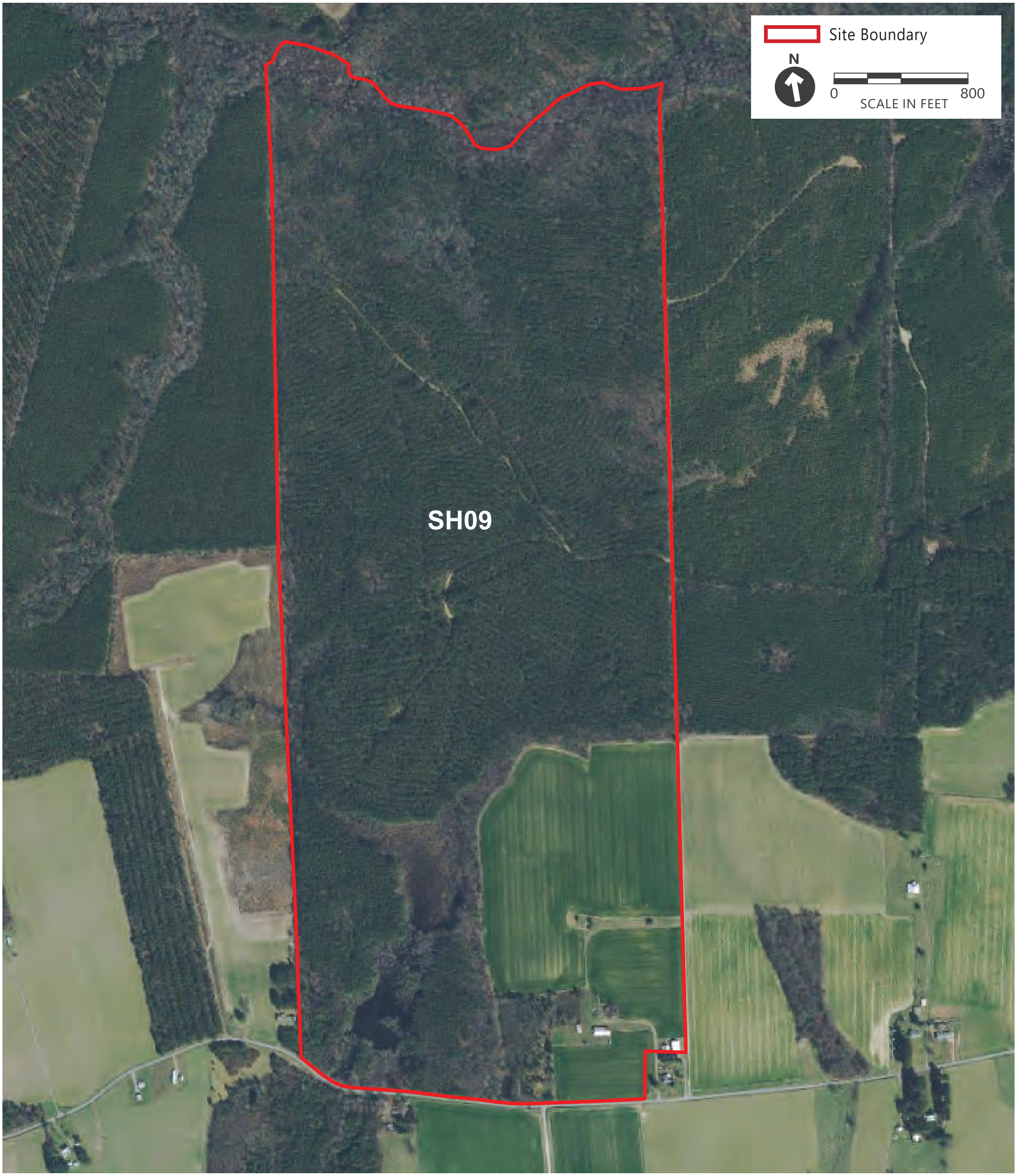
Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 7

**Site SH32**

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**OFF-SITE ALTERNATIVES ANALYSIS**

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 8

**Site SH09**


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**OFF-SITE ALTERNATIVES ANALYSIS**

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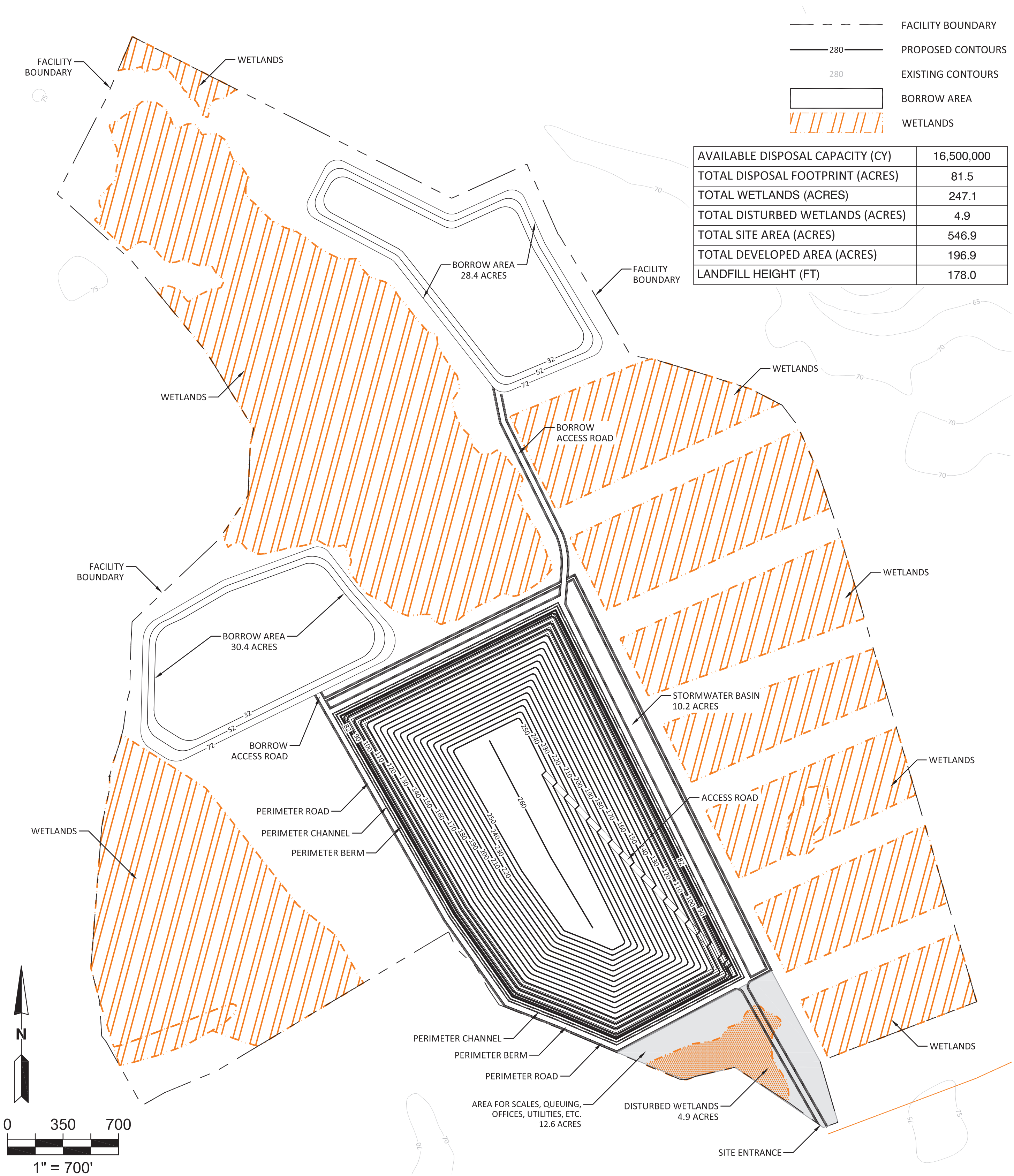
FIGURE 9

**Site SH29**




| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,500,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 81.5 |
| TOTAL WETLANDS (ACRES) | 247.1 |
| TOTAL DISTURBED WETLANDS (ACRES) | 4.9 |
| TOTAL SITE AREA (ACRES) | 546.9 |
| TOTAL DEVELOPED AREA (ACRES) | 196.9 |
| LANDFILL HEIGHT (FT) | 178.0 |

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# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 10

**Site SU02 - SPSA Alternative Site Plan**

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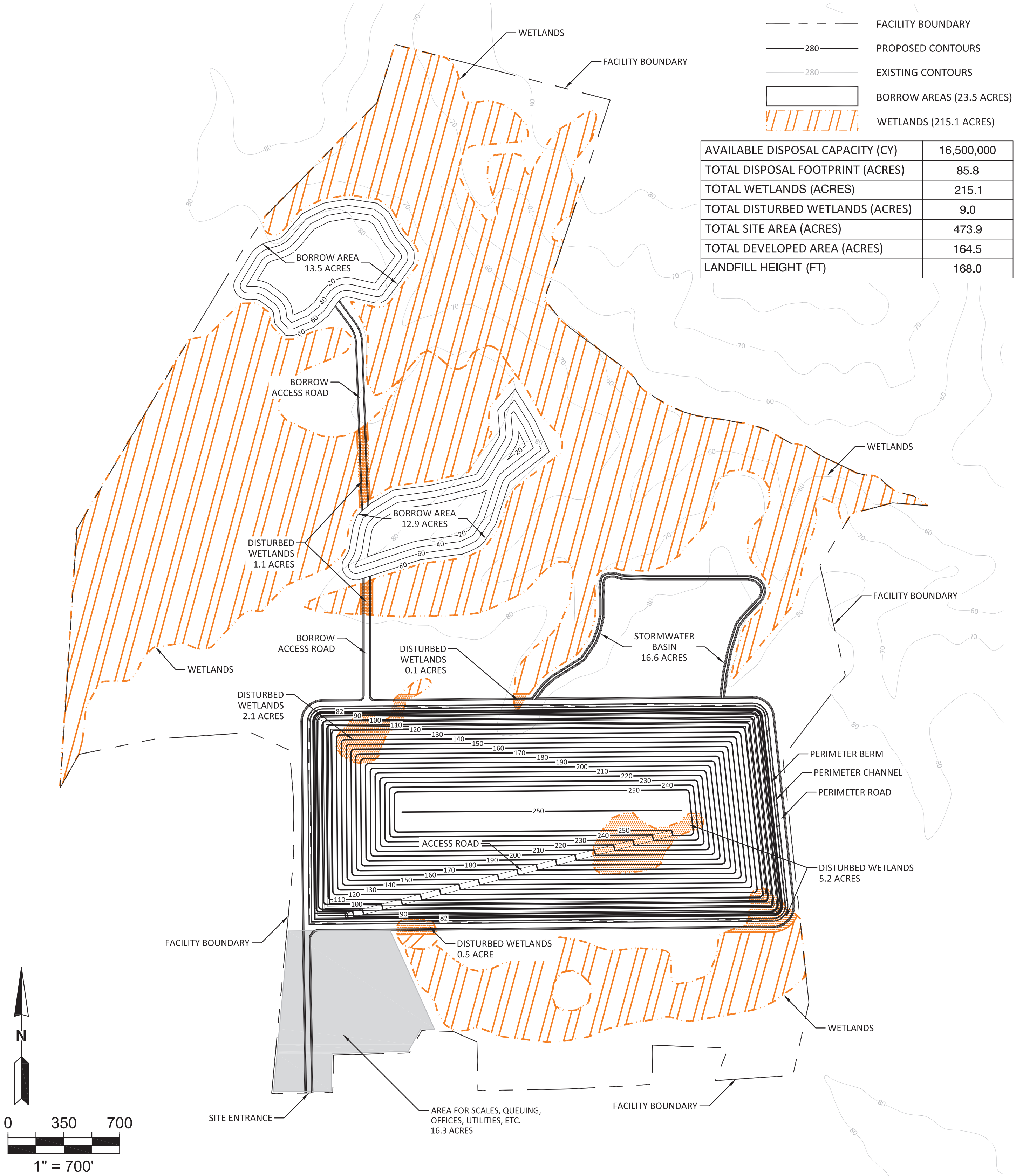


| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,500,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 85.8 |
| TOTAL WETLANDS (ACRES) | 215.1 |
| TOTAL DISTURBED WETLANDS (ACRES) | 9.0 |
| TOTAL SITE AREA (ACRES) | 473.9 |
| TOTAL DEVELOPED AREA (ACRES) | 164.5 |
| LANDFILL HEIGHT (FT) | 168.0 |

# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

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FIGURE 11

**Site SH33 - SPSA Alternative Site Plan**

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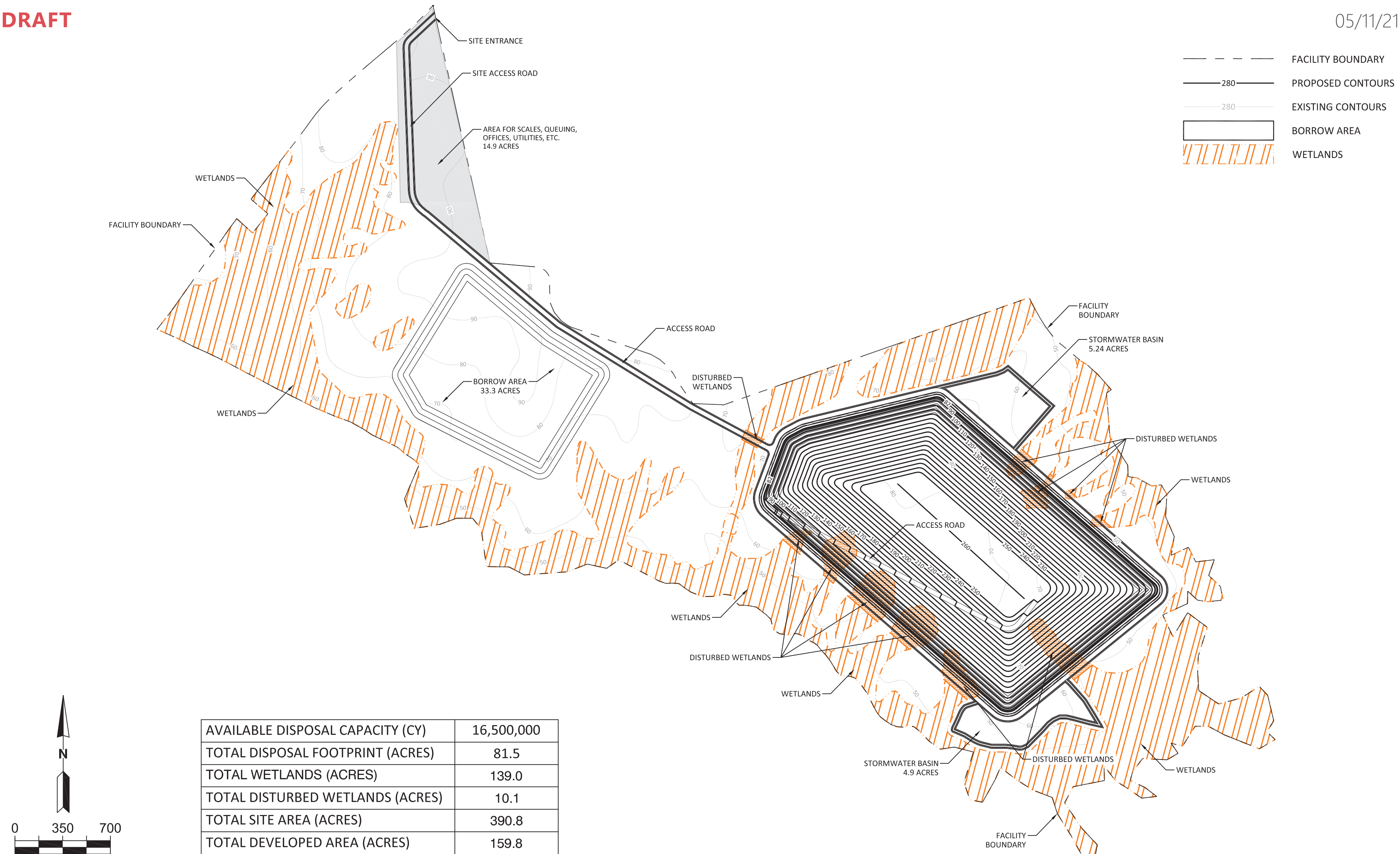


| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,500,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 81.5 |
| TOTAL WETLANDS (ACRES) | 139.0 |
| TOTAL DISTURBED WETLANDS (ACRES) | 10.1 |
| TOTAL SITE AREA (ACRES) | 390.8 |
| TOTAL DEVELOPED AREA (ACRES) | 159.8 |
| LANDFILL HEIGHT (FT) | 178.0 |

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# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 12

**Site SH23 - SPSA Alternative Site Plan**

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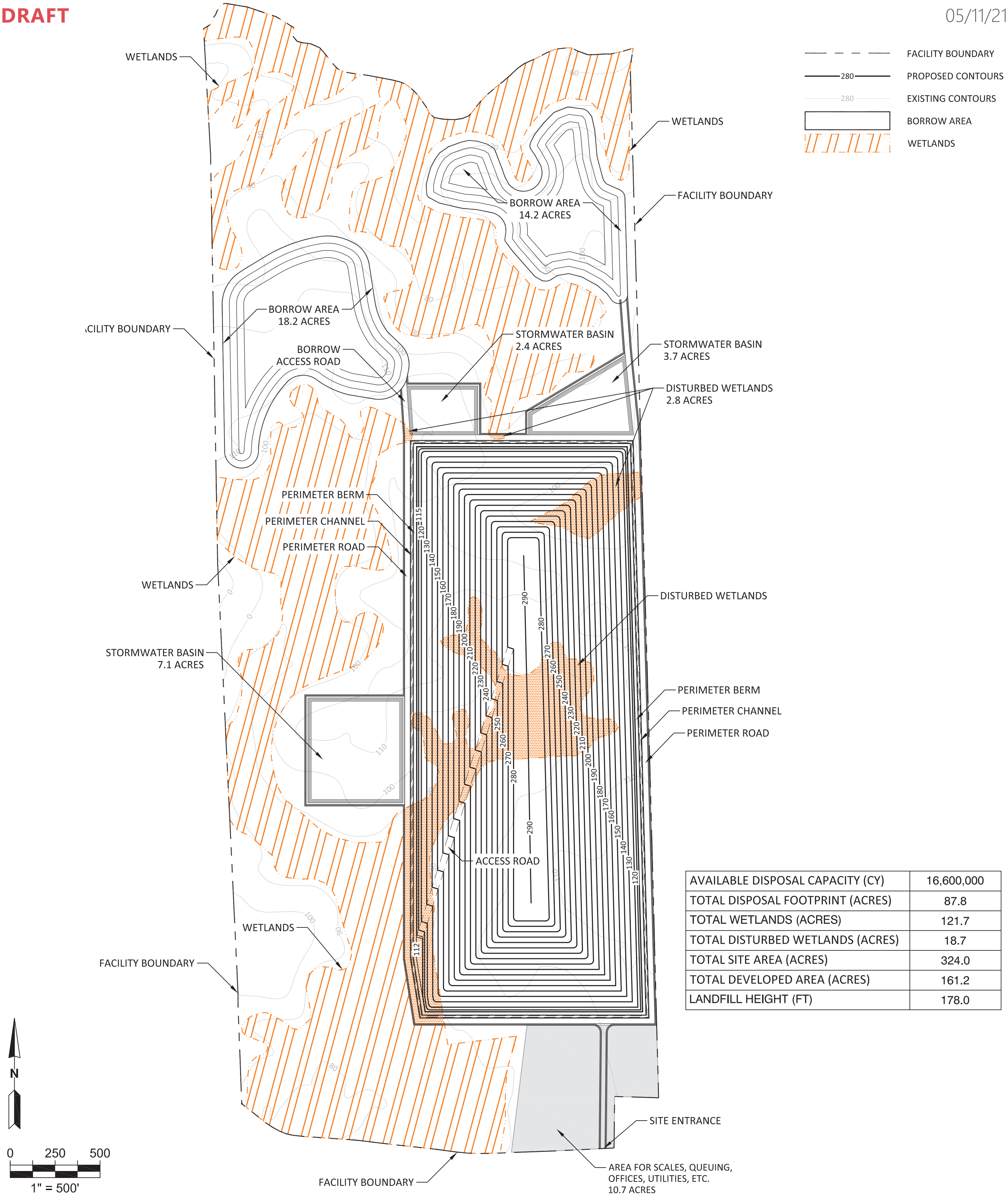


| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,600,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 87.8 |
| TOTAL WETLANDS (ACRES) | 121.7 |
| TOTAL DISTURBED WETLANDS (ACRES) | 18.7 |
| TOTAL SITE AREA (ACRES) | 324.0 |
| TOTAL DEVELOPED AREA (ACRES) | 161.2 |
| LANDFILL HEIGHT (FT) | 178.0 |

# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

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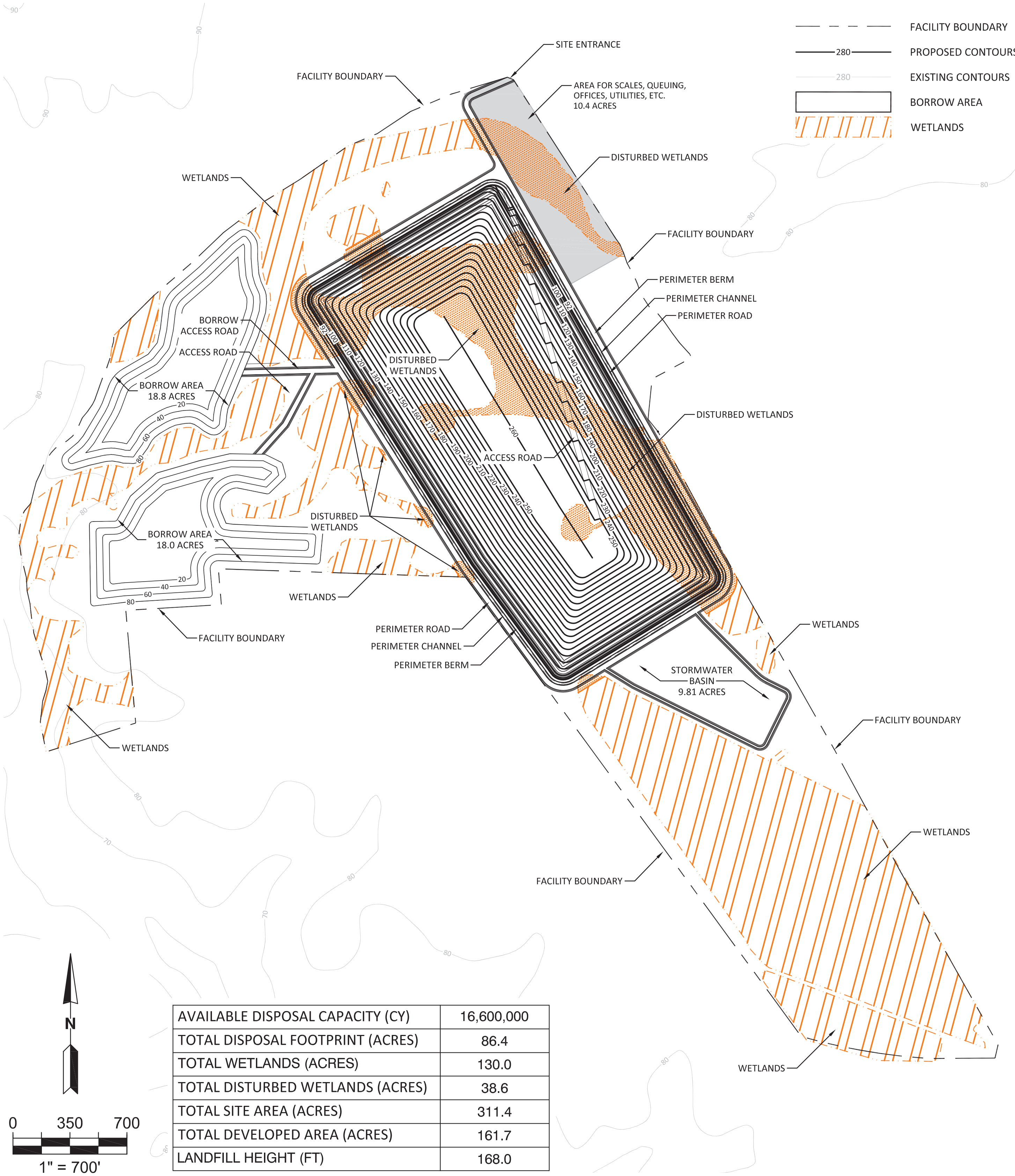
FIGURE 13

**Site SH09 - SPSA Alternative Site Plan**




| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,600,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 86.4 |
| TOTAL WETLANDS (ACRES) | 130.0 |
| TOTAL DISTURBED WETLANDS (ACRES) | 38.6 |
| TOTAL SITE AREA (ACRES) | 311.4 |
| TOTAL DEVELOPED AREA (ACRES) | 161.7 |
| LANDFILL HEIGHT (FT) | 168.0 |

US Army Corps of Engineers

# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 14

**Site SH32 - SPSA Alternative Site Plan**

DRAFT

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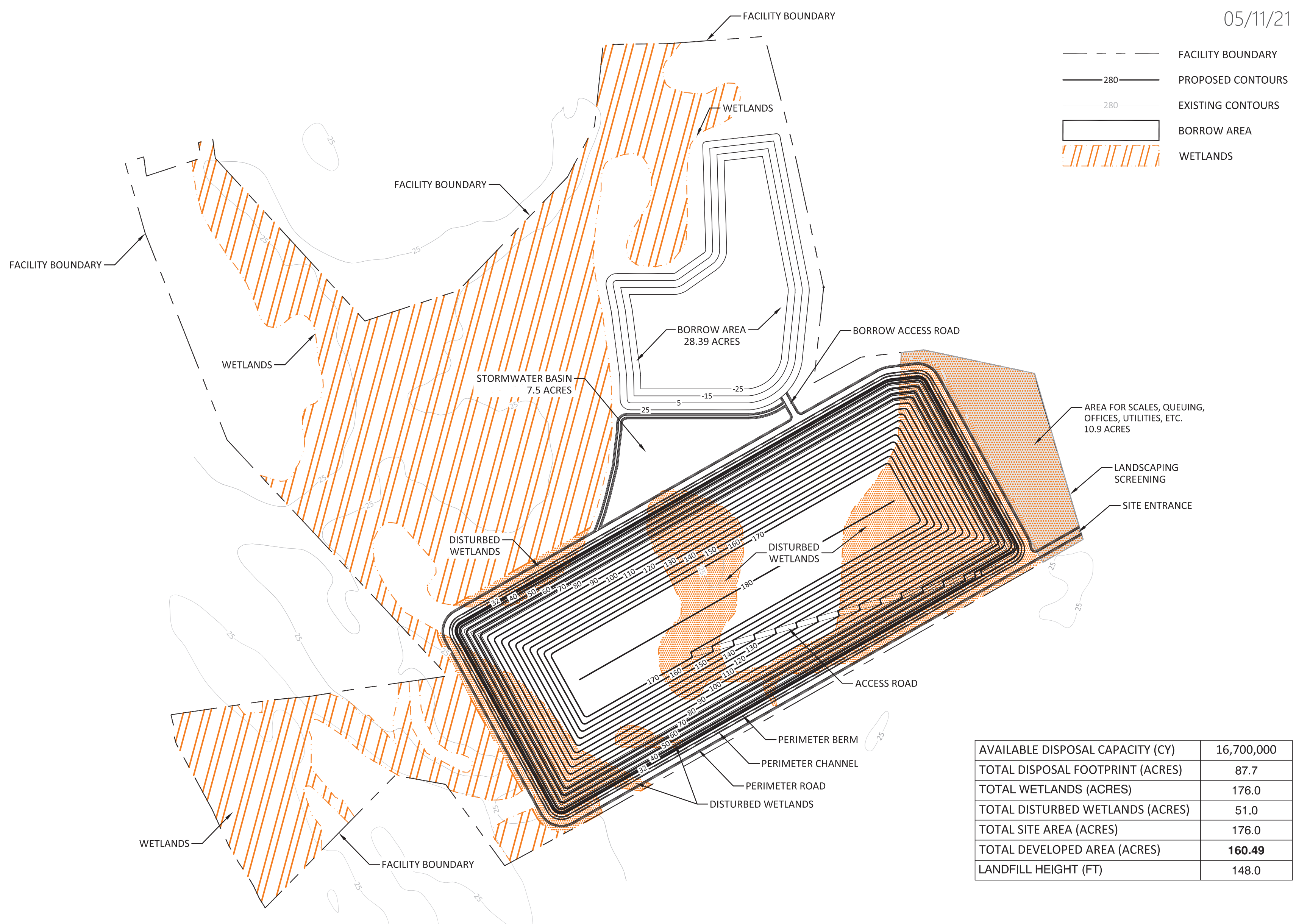


| | |
|---|---|
| AVAILABLE DISPOSAL CAPACITY (CY) | 16,700,000 |
| TOTAL DISPOSAL FOOTPRINT (ACRES) | 87.7 |
| TOTAL WETLANDS (ACRES) | 176.0 |
| TOTAL DISTURBED WETLANDS (ACRES) | 51.0 |
| TOTAL SITE AREA (ACRES) | 176.0 |
| TOTAL DEVELOPED AREA (ACRES) | **160.49** |
| LANDFILL HEIGHT (FT) | 148.0 |

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# OFF-SITE ALTERNATIVES ANALYSIS

Environmental Impact Statement for Expansion of SPSA Landfill

FIGURE 15

**SiteSH29 - SPSA Alternative Site Plan**

# Appendix B: On-Site Alternatives Technical Memo

# On-Site Alternatives Analysis Technical Memorandum

## Regional Landfill - Cells VIII and IX Landfill Expansion

Draft Environmental Impact Statement

Southeastern Public Service Authority

*Suffolk, Virginia*

August 2022

# Contents



## Figures

# Appendices

# 1 Background and Purpose

To be adequately prepared to meet the needs of its member communities, it is necessary for the Southeastern Public Service Authority (SPSA) to increase the solid waste disposal capacity at the Regional Landfill by incorporating an additional 129 acres (identified as Cells VIII and IX and support areas for roadway and stormwater management) of the landfill property within the active facility boundary. The proposed expansion into Cells VIII and IX is part of SPSA's long-term plan for providing critical disposal capacity for the region and is consistent with the Regional Solid Waste Management Plan (RSWMP) for Southeastern Virginia which identifies the need for future expansion of the active facility. The proposed expansion will impact wetland areas and is subject to federal and state wetland permitting for the over 100 acres of proposed disturbance.

The development and use of Cells VIII and IX will require a Joint Permit from the U.S. Army Corps of Engineers (USACE) and Virginia Department of Environmental Quality (VDEQ) under the Clean Water Act Section 401 and 404. Due to the scope of the proposed impacts, an Environmental Impact Statement (EIS) is required to be prepared. The EIS requires the development and analysis of potential on-site and off-site alternatives to the proposed development. HDR has completed an analysis of nine on-site alternatives, including a proposed 129-acre solid waste boundary expansion. The purpose of this memorandum is to summarize the alternatives evaluated, including the advantages and disadvantages of each, whether the alternative is practicable, potential wetlands avoided, and estimated costs.

The nine alternatives developed in coordination with USACE-Norfolk District are:

1. Cells VIII and IX Expansion
2. Relocate Natural Gas Main and Overlap onto Closed Cells I-IV
3. Mechanically Stabilized Earthen (MSE) Wall around South and West Boundary of Cells V & VI
4. MSE Wall and Gas Main Relocation and fill to 200′
5. MSE Wall and Gas Main Relocation and Fill to 240′
6. Capture Airspace between Cell V and VII
7. MSE Wall around Cells V, VI and VII
8. Relocate Gas Main and Fill between Cells VII and VIII
9. Relocate Gas Main and Construct 30′ High MSE Wall around Cells V, VI, VII, and VIII

Site Plan sketches and cross sections for each alternative are included in Appendix A.

# 2 Alternatives Assessment

## 2.1 Cells VIII and IX Expansion (Alternative 1)

The proposed base alternative is for the horizontal expansion of 92.9 acres of lined area that would be comprised of Cells VIII and IX. The proposed expansion area including stormwater management area, perimeter berms, and roadway would comprise129 acres of land. The proposed expansion would be north of the 56-acre Cell VII and the Columbia Natural Gas Pipeline Easement, east of the 100-acre Closed Cells I–IV, west of the existing 50 acres of preserved wetlands, and south of the existing electric transmission line. The proposed eastern boundary of the landfill cells is offset from the preserved wetland area by 200 feet to minimize disturbance of the wetland as a result of temporary dewatering required to construct the expansions. It is anticipated that each of the cells would be developed in four phases. See Figure 1 for a conceptual site plan for the proposed expansion.

The proposed expansion would provide an estimated 16M cubic yards (CY) of capacity which would extend the life of the Regional Landfill to about 2060 based on estimated waste acceptance rates and in place waste densities. The landfill cells would be permitted and constructed as an inward gradient landfill similar to Cells V and VI and the planned Cell VII. In this design, the base liner system is constructed below the groundwater table through temporary dewatering. After construction and initial operation, the groundwater dewatering system is ceased and groundwater is permitted to come in contact with the underside of the base liner system, establishing pressure beneath the liner and preventing any leachate from migrating out of the containment system should there be a defect undetected during construction and operations.

### 2.1.1 Advantages

- Coordinates well with Cell VII operations and utilization of access roads and leachate and stormwater infrastructure
- Provides area in close proximity for stockpile storage and borrow area to support Cell VII construction, operations, and closure
- Could be completed and operated using conventional construction and operational methods and be readily permittable by VDEQ
- Would not impact any existing infrastructure on-site
- Could be sequenced in a manner to utilize on-site soil resources for construction and operation through phased expansion in each cell
- Provides a location away from existing residences and buffered by existing wetland areas to the east

### 2.1.2 Disadvantages

- Would impact approximately 119 acres of forested wetlands, which would require a comprehensive mitigation plan to offset

To compare the proposed wetland impacts of the proposed alternative with other on-site alternatives, HDR determined an approximate landfill capacity per acre of wetland impact. The airspace provided by a 100-foot-wide cross section through the middle of Cell VII is calculated to be 573,260 CY over the 3.35-acre area. This is equivalent to 171,046 CY/acre of landfill footprint or wetland disturbance (Figure 2). The calculated wetland offset for other on-site alternatives was based on the estimated disposal airspace provided be each alternate and the resulting volume and area reduction in the proposed 92.9-acre expansion of Cells VIII and IX, while still maintaining 16M CY of capacity. A summary of the potential wetland avoidance for each alternative is included in Appendix B.

### 2.1.3 Costs to Implement

The estimated cost to construct the proposed 92.9-acre Cell VIII and IX landfill expansion, including soil excavation, based liner system, leachate collection and management system, and engineering permitting and design in 2022 dollars is $72.6M. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 119.03 acres of impact is $7.1M. The total cost for Alternative 1 is estimated to be $79.8M at a cost of $4.99/CY of waste disposal capacity.

The cost estimates for construction of landfill expansion on a per acre basis was calculated from HDR's Class III Cell VII Construction Cost Estimate prepared in 2019 and inflated to 2022 dollars utilizing the VDEQ inflation indices for solid waste financial assurance. Detailed construction cost estimates for each alternative were also prepared, including mitigation and engineering costs. A summary of the alternative costs and the detailed estimates referenced for each alternative is included in Appendix C.

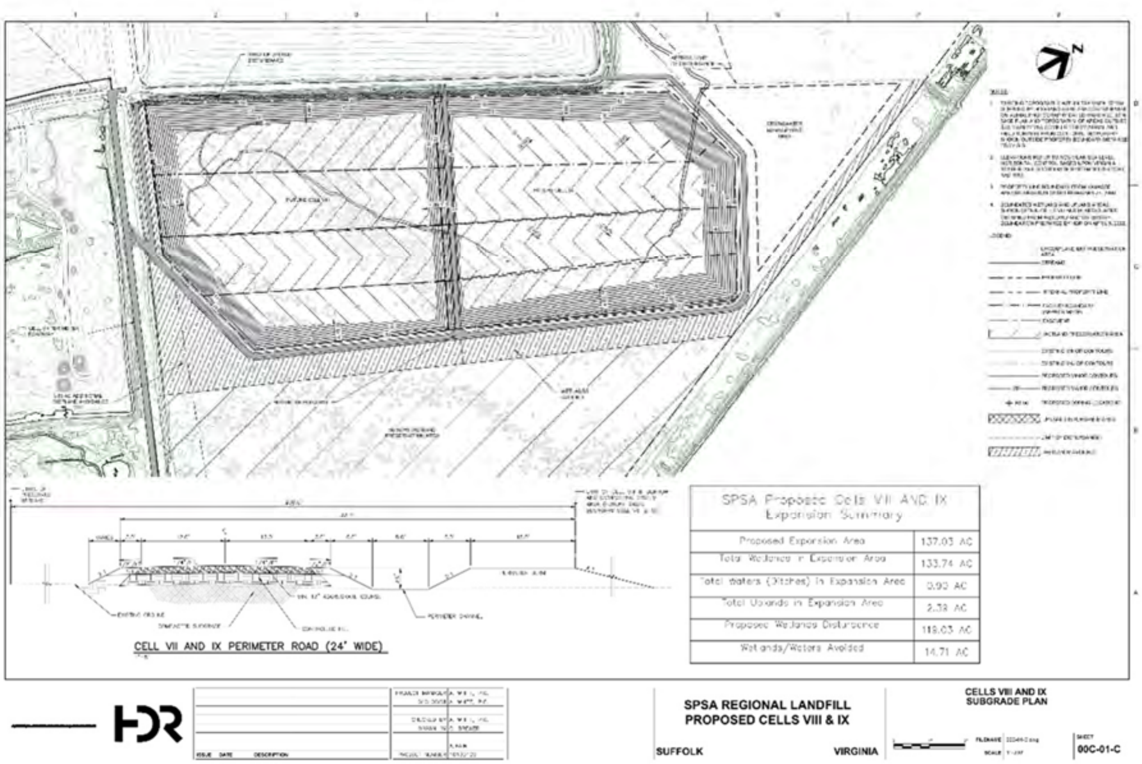


**Figure 1 Alternative 1 Site Plan**

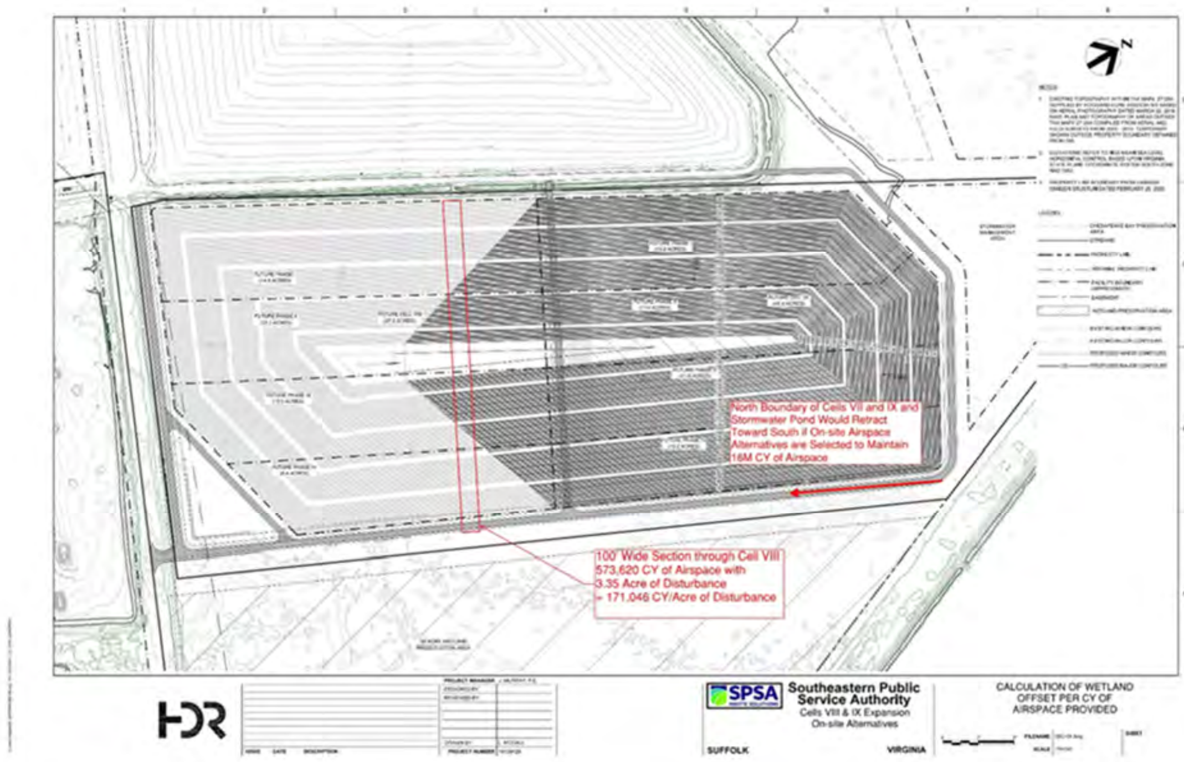


**Figure 2 Wetland Offset Calculation**

## 2.2 Relocate Natural Gas Main and Overlap onto the Closed Cells I–IV (Alternative 2)

This proposed alternative is for construction of a piggy-back landfill onto the southern portion of closed Cells I–IV that faces Cells V and VI (Figure 3). The proposed expansion would include an 8.5-acre base liner system in the area to the north of Cells V and VI and 19.5-acre overlay liner system constructed atop the final cover system of the Cells I–IV and a 17.8-acre overlay liner system on the northern slopes of Cells V and VI. This alternative would provide an estimated 2.87M CY in capacity. The existing base liner system of Cells I–IV is an older design and would not meet current regulatory requirements; therefore, any new waste placed in this footprint would be required to have a new base liner and leachate collection system. The impacts of the additional weight of the new waste and liner and final cover system on the existing base liner and leachate collection system would need to be evaluated and issuance of a permit for a piggy-back landfill at this location is not a certainty. In addition to a new base liner, this alternative would require relocation of the existing Columbia Natural Gas Main, reconstruction of the existing landfill gas collection system beneath the piggy-back landfill and significant modifications to the existing leachate collection system side risers (two total) on the north side of Cells V and VI to maintain operation and maintenance access for these submersible pumps, or abandonment of the leachate collection system and constructing an impermeable cover (final cover and overlay liner) over the waste to preclude additional leachate generation to these sumps.

The relocation or extension of the leachate collection system side risers through the proposed waste filling would be very difficult to complete, adding over 200 feet of riser pipe, and would not guarantee long-term access for leachate removal from the existing Cell V and VI sumps. The extensions of the risers and leachate forcemain and pump connections during filling operations would be subject to stresses from the waste materials placed over and around them, that could jeopardize the integrity of the access riser piping and maintenance of the pumps. Further, the additional 200 feet or more riser pipe would increase the difficulty in removing and reinstalling the submersible leachate pumps for periodic maintenance.

With these challenges, we do not consider this alternative to be practical until the Cell V and VI leachate generation rate is reduced to a point where the leachate removal is no longer necessary, and the pumps can be decommissioned. The time required for the leachate generation rate to essentially cease is anticipated to be well over 30 years and beyond the time frame required for providing waste disposal capacity. To preclude leachate from entering the collection areas and sumps that are abandoned, an overlay liner system would need to be constructed over the Cells V and VI final grades the overlap area and final closure constructed in areas adjacent to the overlap area.

### 2.2.1 Advantages

- Would not require impacts to wetlands and could result in a net reduction of 16.8 acres of wetland impacts with a reduced Cells VIII and IX footprint
- Construction and operation of filling of waste materials in this area could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials
- Stormwater run-off could be directed to existing infrastructure to the west and east
- Leachate management from new lined 19.7-acre and 17.8-acre slopes and 8.5-acre base area could be managed with two additional leachate sumps and side riser pumps

### 2.2.2 Disadvantages

- Would require relocation of the existing Columbia Natural Gas Main (36-inch diameter pipe) at an estimated cost in excess of $22M.
- Would require extension of two leachate pump station riser pipes and controls in Cells V and VI to either outside the landfill waste surface footprint or up through the waste filling with a vertical manhole to maintain access to the submersible pump in the sump. These extensions would require an additional 200 feet or more of riser pipe, which would make it very difficult if not impractical to continue to maintain these sump pumps that would be 400 linear feet away from the access point. This is a significant challenge with this alternative.
- The practicality of extending the leachate sump risers and providing assurance that the pumps can continue to be maintained is low. This alternative would require that the Cell V and Cell VI sump risers be decommissioned. This would only be viable if the leachate generation had ceased in their respective leachate collection system areas following construction of closure system above, and several years for generation to cease. Leachate generation reis likely to continue for more than 30 years after closure. This would also require that an overlay liner system be installed/maintained beneath the

waste disposal area to preclude leachate from entering the Cell V and VI leachate collection system that is abandoned.

- Existing LFG collection system on Closed Cells I–IV in the areas of the overlay liner system would need to be modified to lower the vertical well and move well head control to outside the limits of the liner system. This would prohibit maintenance of these well locations in future and may lead to abandonment of these collection points.
- Existing LFG collection header from Cells V and VI currently connects to the header on the closed Cells I–IV in the middle of the proposed base liner area of this alternative. This header pipe and condensate trap would require relocation and modification of collection line locations that connect to it.
- Enhanced LFG collection system would be required beneath and at the edges of the piggy-back landfill liner to capture LFG and relieve pressure from beneath the liner system
- Regulatory approval of this piggy-back alternative and modifications to the existing leachate management system in Cells V and VI is not a certainty

### 2.2.3 Costs to Implement

The estimated cost to construct the proposed base liner and overlay liner systems is $28.6M. The cost to relocate the natural gas main is estimated to be $22.2M. With this alternative, Cells VIII and IX could be reduced by 16.8 acres to 76.12 acres and would cost $59.53M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 102.25 acres of impact is $6.1M. The total cost for Alternative 2 is estimated to be $116.4M at a cost of $7.28/CY of waste disposal capacity or 48% higher than Alternative 1. The cost for wetland avoidance is estimated to be $2.18M per acre.

### 2.2.4 Practicality

This alternative is not practical due to the significant impacts it would have on the existing leachate collection system on the north side of Cells V and VI. Extensions of the side riser pipes to maintain access would render these impractical to maintain following construction of the base liner system and after vertical extensions of manhole up through the waste. The vertical extension would require re-connection of power, controls, supervisory control and data acquisition (SCADA), LFG collection, and leachate forcemains with each lift of waste placement. The decommissioning of the leachate collection system in the areas of Cells V and VI would make this alternative constructable but would require that closure be constructed and several years, likely well over 30 years, for the leachate generation to cease so that the side risers and pump stations could be removed. The length of time required for cessation of leachate generation is well beyond the time that additional disposal capacity is required and therefore this alternative is not practical.

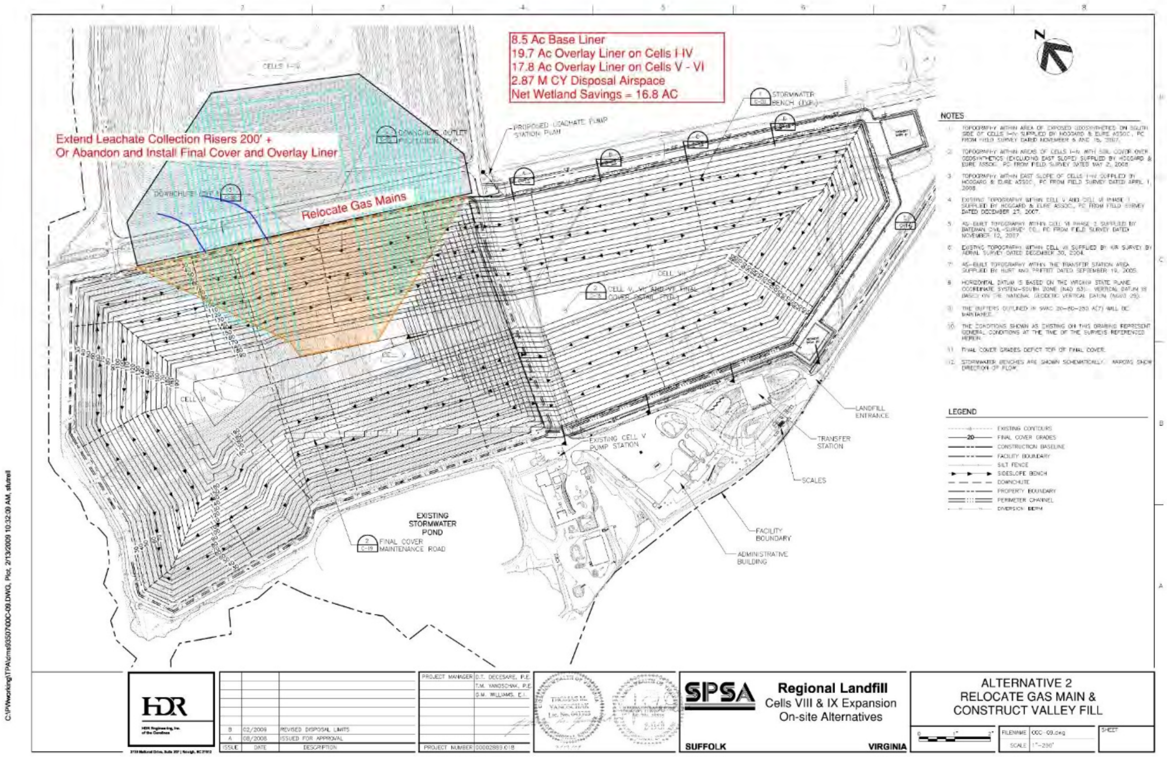


**Figure 3 Alternative 2 Site Plan**

## 2.3 MSE Wall around South and West Boundary of Cells V and VI (Alternative 3)

This proposed alternative is for construction of an MSE wall around the western and southern limits of Cells V and VI. MSE walls are frequently utilized in transportation projects to provide vertical grade adjustment in a narrow footprint (bridge abutment) where conventional soil berms are restricted due to site constraints. Application of MSE walls for solid waste landfill expansions has been permitted by some state regulatory agencies to avoid disturbance of existing infrastructure or wetlands or to confirm with regulatory setbacks of waste boundary lines from property lines when horizontal expansion is not a viable option. There is limited experience with permitting of MSE walls at Virginia solid waste landfills. The MSE wall would include a conventional inboard slope of 3:1 that the base landfill liner system can be constructed on, and the outboard slope would be 0.5:1 (Figure 4). Due to constraints of existing stormwater pond and property line and wetlands on the western side of Cell VI, the berm is limited to 30 feet in height, which would require a 140-foot-wide impact along its length for an impact of 14.9 acres of wetlands.

The berm would be constructed with structural fill and many layers of geotextile fabrics to provide the stability required to withstand the lateral forces of the landfill on the inside. See Figure 5 for a typical section of MSE Wall in a landfill application.

**Figure 4 MSE Wall**
Source: Pinnacle Design Build

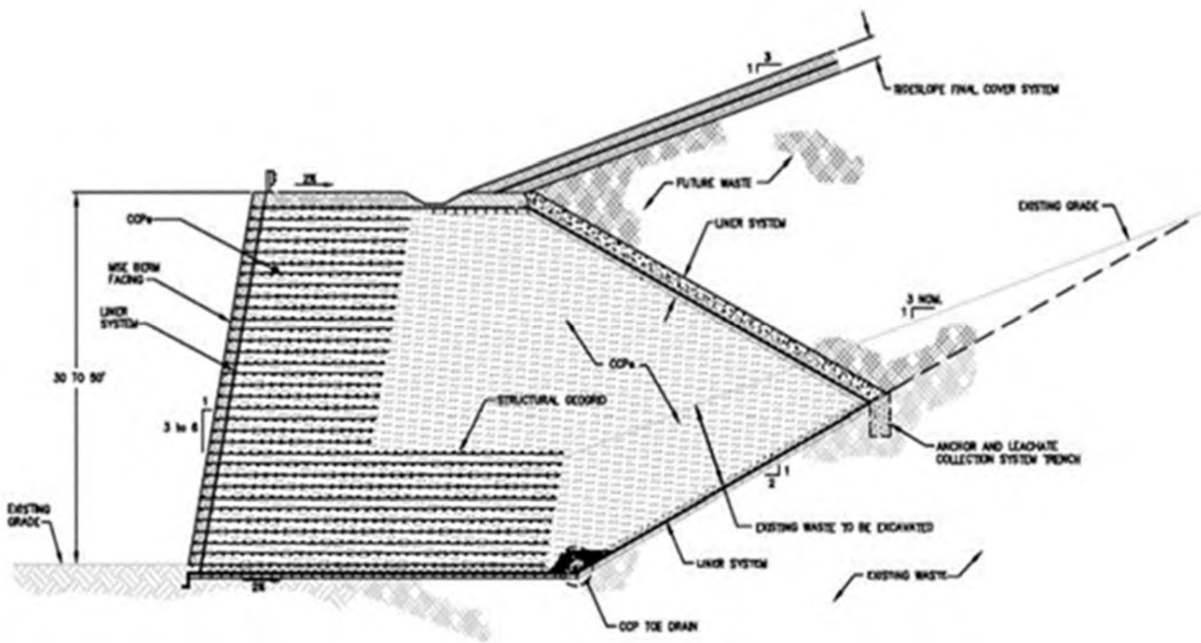


**Figure 5 MSE Wall Section**
Source: WOCA 2013

This alternative would include construction of a 9.0-acre base liner system on the inboard slope of the MSE wall that would be connected to the existing base liner system of Cell VI. This alternative would provide an estimated 2.2M CY of capacity through the 30 vertical feet of additional filling over the existing final waste grades of Cell VI (Figure 6 and Figure 7). The final elevation of the waste filling and final cover for this alternative with operating equipment would be Elevation 220 per the current Federal Aviation Administration (FAA) requirements for the permitted Cells V, VI, and VII. To comply with this requirement SPSA has established a maximum waste and final cover elevation of 200. The construction of the MSE wall would result in wetland impacts on the western and southern boundaries where the area to support the 30-foot-high berm would extend into wetland and pond area by an estimated 14.9 acres. Lowering the height by 10 to 15 feet to eliminate any wetland impacts would significantly reduce the airspace volume provided to where it would not be a consideration to complete.

### 2.3.1 Advantages

- Base liner system would be connected to existing base liner and leachate from new 9.0-acre area would drain into existing leachate collection systems and sumps.
- Leachate side slope riser pipes would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration

### 2.3.2 Disadvantages

- Would have a net impact to wetlands over and above the wetlands avoided for the same disposal volume for Alternative 1 and result in an additional 2 acres of wetland impact
- Construction of the MSE wall would require the use of operational cover soil from the site borrow area or import of approximately 450,000 CY of structural fill materials.
- Additional capacity provided with this alternative would be constrained by the geometry of the slope filling as well as the top elevation of 200 restricted by the FAA.
- Waste filling operations would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot+) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.
- Permitting and design for this alternative would be complicated and regulatory approval of the MSE wall and modifications to the existing leachate management system in Cells V and VI is not a certainty.

### 2.3.3 Costs to Implement

The estimated cost to construct the proposed MSE wall is $21.1M. With this alternative, Cells VIII and IX could be reduced by 12.9 acres to 80.04 acres and would cost $62.6M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 121.05 acres of impact is $7.26M. The total cost for Alternative 3 is estimated to be $90.97M at a cost of $5.69/CY of waste disposal capacity or 14% higher than Alternative 1, without any benefit of wetlands avoided.

### 2.3.4 Practicality

This alternative is not practical due to the significant costs for construction of the MSE wall and relocation of existing infrastructure relative to the airspace that it provides. In addition, this alternative would result in greater net wetland impacts than proposed Alternative 1.

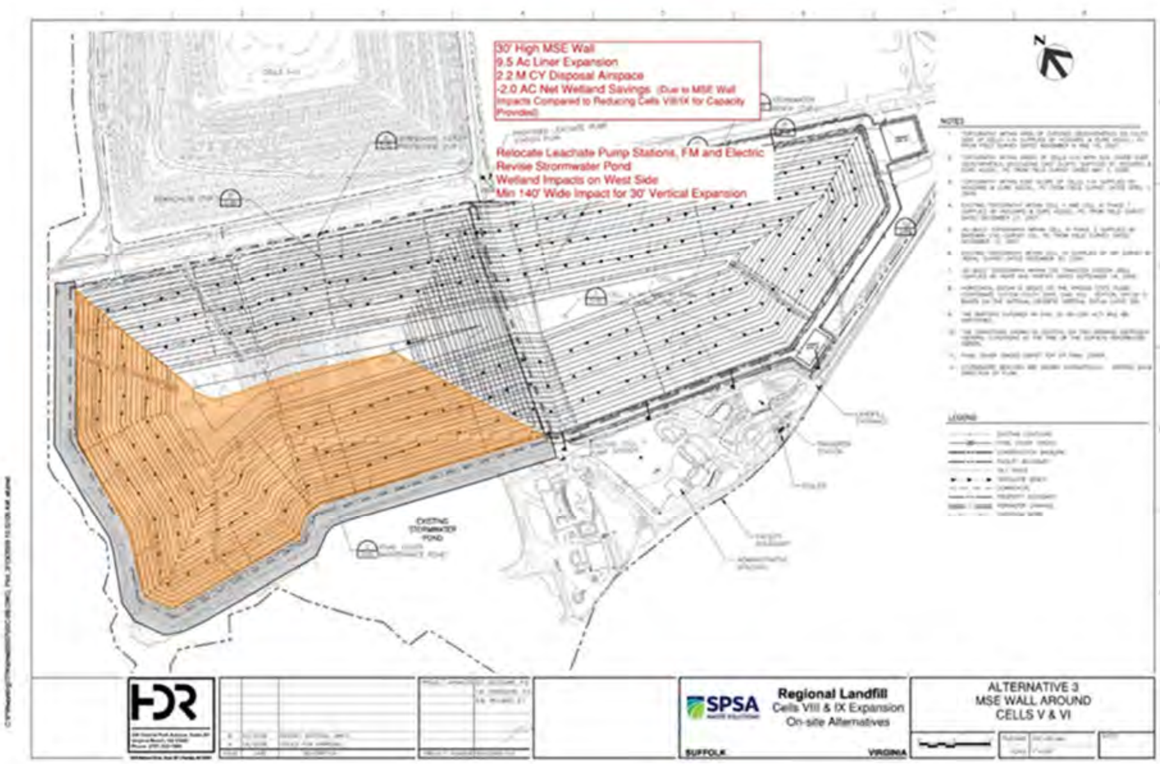


**Figure 6 Alternative 3 Site Plan**

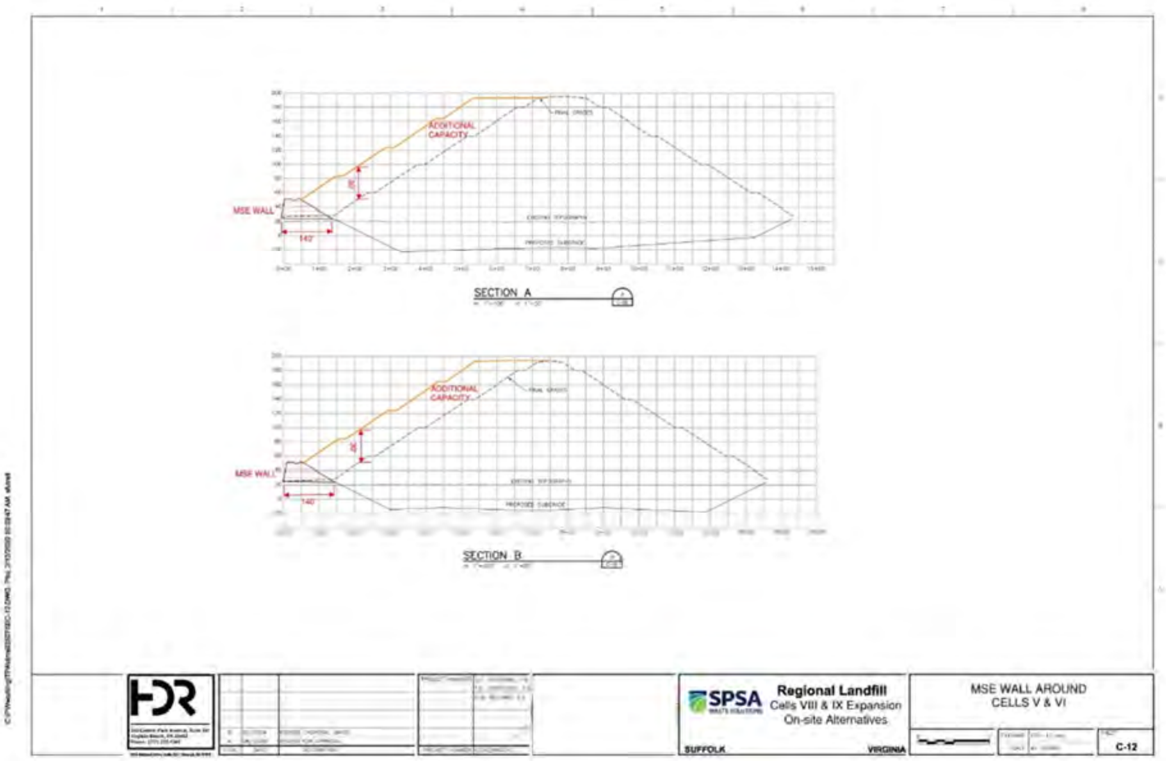


**Figure 7 Alternative 3 Section**

## 2.4 MSE Wall and Relocate Gas Main, Fill to 200′ (Alternative 4)

This proposed alternative is a combination of Alternatives 2 and 3 and includes construction of a 8.5-acre base liner system in the area to the north of Cells V and VI, 19.5-acre overlay liner system constructed atop of the final cover system of the Cells I–IV, a 17.8-acre overlay liner system on the northern slopes of Cells V and VI, and a 9.0-acre base liner system on the inboard slope of the MSE wall that would connect to the existing base liner system of Cell VI and an MSE wall around the western and southern limits of Cells V and VI (Figure 8 and Figure 9).

The proposed expansion would include. This alternative would provide an estimated 5.2M CY of capacity through the piggy-back landfill and 30 vertical feet of additional filling over the existing final waste grades of Cell VI. The final elevation of the waste filling and final cover for this alternative would be Elevation 200 per the current FAA requirements for the permitted Cells V, VI, and VII.

### 2.4.1 Advantages

- Would not require impacts to wetlands and could result in a net reduction of 15.5 acres of wetland impacts with a reduced Cells VIII and IX footprint.
- Construction and operation of filling of waste materials on the northern area could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials. Filling on the west and south would be more difficult.

- Leachate management from new 19.5-acre and 17.8-acre lined slopes and 8.5-acre base area of the piggy-back landfill could be managed with two additional leachate sumps and side riser pumps.
- Base liner system of the MSE wall would be connected to existing base liner and leachate from new 9.0-acre area would drain into existing leachate collection systems and sumps.
- Leachate side slope riser pipes at the MSE wall would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration in the MSE wall locations.

### 2.4.2 Disadvantages

- Would require relocation of the existing Columbia Natural Gas Main (36-inch diameter pipe) at an estimated cost in excess of $22M
- Would require extension of two leachate pump station riser pipes and controls in Cells V and VI to either outside the landfill waste surface footprint or up through the waste filling with a vertical manhole to maintain access to the submersible pump in the sump. These extensions would require an additional 200 feet or more of riser pipe, which would make it very difficult if not impractical to continue to maintain these sump pumps that would be 400 linear feet away from the access point. This is a significant challenge with this alternative.
- The practicality of extending the leachate sump risers and providing assurance that the pumps can continue to be maintained is low. This alternative would require that the Cell V and Cell VI sump risers be decommissioned. This would only be viable if the leachate generation had ceased in their respective leachate collection system areas following construction of closure system above, and several years for generation to cease. Leachate generation reis likely to continue for more than 30 years after closure. This would also require that an overlay liner system be installed/maintained beneath the waste disposal area to preclude leachate from entering the Cell V and VI leachate collection system that is abandoned.
- Existing LFG collection system on Closed Cells I–IV in the areas of the piggy-back liner system would need to be modified to lower the vertical well and move well head control to outside the limits of the liner system. This would prohibit maintenance of these well locations in future and may lead to abandonment of these collection points.
- Existing LFG collection header from Cells V and VI currently connects to the header on the closed Cells I–IV in the middle of the proposed base liner area of this alternative. This header pipe and condensate trap would require relocation and modification of collection line locations that connect to it.
- Enhanced LFG collection system would be required beneath and at the edges of the piggy-back landfill liner to capture LFG and relieve pressure from beneath the liner system
- Would have a net impact to wetlands over and above the wetlands avoided for the same disposal volume for Alternative 1 and result in an additional 2 acres of wetland impact
- Construction of the MSE wall would require the import of approximately 450,000 CY of structural fill materials.

- Additional capacity provided with this alternative would be constrained by the geometry of the slope filling as well as the top elevation of 200 restricted by the FAA.
- Waste filling operations in the MSE wall area would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.
- Permitting and design for this alternative would be complicated and regulatory approval of the piggy-back alternative and modifications to the existing leachate management system in Cells V and VI, and the MSE wall and modifications to the existing leachate management system in Cells V and VI is not a certainty.

### 2.4.3 Costs to Implement

The estimated cost to construct the proposed base liner, overlay liners and MSE wall is $49.7M. The cost to relocate the natural gas main is estimated to be $22.2M. With this alternative, Cells VIII and IX could be reduced by 30.4 acres to 62.5 acres and would cost $48.8M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 103.6 acres of impact is $6.2M. The total cost for Alternative 4 is estimated to be $127.0M at a cost of $7.93/CY of waste disposal capacity or 59% higher than Alternative 1. The cost for wetland avoidance is estimated to be $3.04M per acre.

### 2.4.4 Practicality

This alternative is not practical due to the significant impacts it would have on the existing leachate collection system on the north side of Cells V and VI. Extensions of the side riser pipes to maintain access would render these impractical to maintain following construction of the base liner system and after vertical extensions of manhole up through the waste. The vertical extension would require re-connection of power, controls, supervisory control and data acquisition (SCADA), LFG collection, and leachate forcemains with each lift of waste placement. The decommissioning of the leachate collection system in the areas of Cells V and VI would make this alternative constructable but would require that closure be constructed and several years, likely well over 30 years, for the leachate generation to cease so that the side risers and pump stations could be removed. The length of time required for cessation of leachate generation is well beyond the time that additional disposal capacity is required and therefore this alternative is not practical. This alternative is also not practical due to the significant capital costs for the overlay liners, base liner, and MSE wall, relative to the airspace generated and the time required to abandon the northern Cell V and VI leachate infrastructure. In addition, this alternative is reliant on receiving relief from the FAA for the maximum fill height of the landfill.

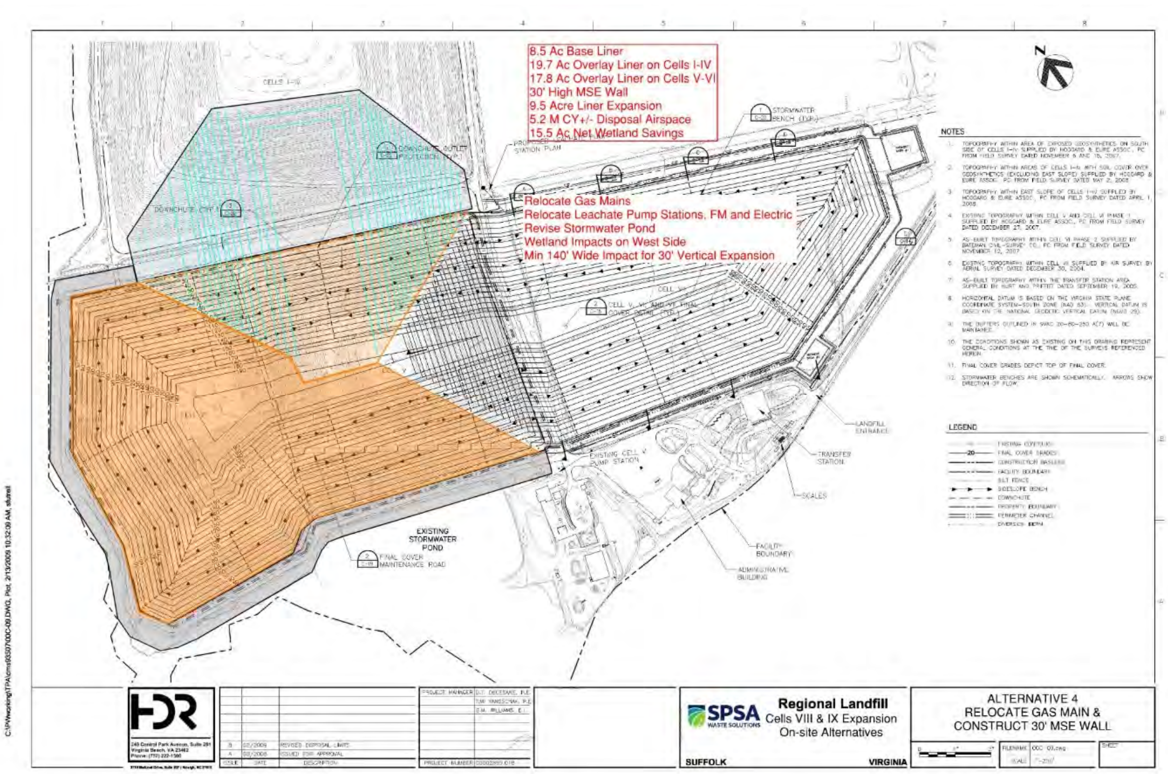


**Figure 8 Alternative 4 Site Plan**

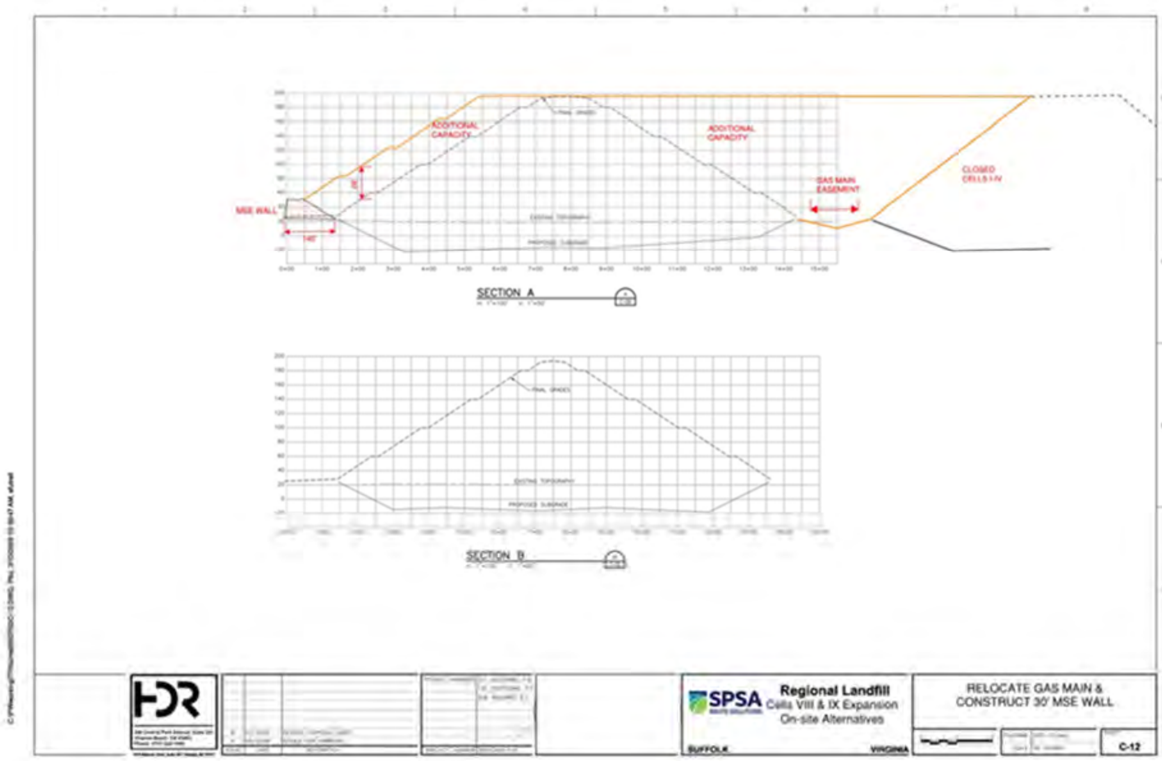


**Figure 9 Alternative 4 Section**

## 2.5 MSE Wall and Relocate Gas Main, Fill to 240′ (Alternative 5)

This proposed alternative is Alternative 4 with an increase in the fill height to elevation 240. This would require approval from FAA as it exceeds the 220-foot elevation currently stipulated in their approval for Cells V, VI, and VII (with equipment on top of landfill). This alternative would include construction of a 8.5-acre base liner system in the area to the north of Cells V and VI, 19.5 acres of overlay liner system constructed atop of the final cover system of the Cells I–IV, a 17.8-acre overlay liner system on the northern slopes of Cells V and VI, and a 9.0-acre base liner system on the inboard slope of the MSE wall that would be connected to the existing base liner system of Cell VI an overlay liner onto the southern portion of closed Cells I–IV, an overlay liner system on the northern slopes of Cells V and VI, and an MSE wall around the western and southern limits of Cells V and VI (Figure 10 and Figure 11).

This alternative would provide an estimated 6.2M CY of capacity through the piggy-back landfill and 30 vertical feet of additional filling over the existing final waste grades on the slope of Cell VI, and 40 vertical feet of filling over the permitted waste grades of Elevation 200 on the top deck of Cell VI. The final elevation of the waste filling and final cover for this alternative would be Elevation 240 and would require special approval from FAA, which may not be achievable.

### 2.5.1 Advantages

- Would not require impacts to wetlands and could result in a net reduction of 21.3 acres of wetland impacts with a reduced Cells VIII and IX footprint.

- Construction and operation of filling of waste materials on the northern area and top deck could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials. Filling on the west and south would be more difficult.
- Leachate management from new 19.5-acre and 17.8-acre lined slopes and 8.5-acre base area of the landfill could be managed with two additional leachate sumps and side riser pumps.
- Base liner system of the MSE wall would be connected to existing base liner and leachate from new 9.0-acre area would drain into existing leachate collection systems and sumps.
- Leachate side slope riser pipes at the MSE wall would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration in the MSE wall locations.

### 2.5.2 Disadvantages

- Would require relocation of the existing Columbia Natural Gas Main (36-inch diameter pipe) at an estimated cost in excess of $22M.
- Would require extension of two leachate pump station riser pipes and controls in Cells V and VI to either outside the landfill waste surface footprint or up through the waste filling with a vertical manhole to maintain access to the submersible pump in the sump. These extensions would require an additional 240 feet or more of riser pipe, which would make it very difficult if not impractical to continue to maintain these sump pumps that would be 440 linear feet away from the access point. This is a significant challenge with this alternative.
- The practicality of extending the leachate sump risers and providing assurance that the pumps can continue to be maintained is low. This alternative would require that the Cell V and Cell VI sump risers be decommissioned. This would only be viable if the leachate generation had ceased in their respective leachate collection system areas following construction of closure system above, and several years for generation to cease. Leachate generation reis likely to continue for more than 30 years after closure. This would also require that an overlay liner system be installed/maintained beneath the waste disposal area to preclude leachate from entering the Cell V and VI leachate collection system that is abandoned.
- Existing LFG collection system on Closed Cells I–IV in the areas of the overlay liner system would need to be modified to lower the vertical well and move well head control to outside the limits of the liner system. This would prohibit maintenance of these well locations in future and may lead to abandonment of these collection points.
- Existing LFG collection header from Cells V and VI currently connects to the header on the closed Cells I–IV in the middle of the proposed base liner area of this alternative. This header pipe and condensate trap would require relocation and modification of collection line locations that connect to it.
- Enhanced LFG collection system would be required beneath and at the edges of the piggy-back landfill liner to capture LFG and relieve pressure from beneath the liner system

- Construction of the MSE wall would require the import of approximately 450,000 CY of structural fill materials.
- Additional capacity provided with this alternative would be constrained by the geometry of the slope filling. The filling on the top deck of an additional 40 vertical feet is possible with the geometry of the fille slopes but would require relief from FAA to increase the maximum height 40 feet above the 200-foot elevation stipulated by the FAA.
- Waste filling operations in the MSE wall area would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.
- Permitting and design for this alternative would be complicated and regulatory approval of the piggy-back alternative and modifications to the existing leachate management system in Cells V and VI, and the MSE wall and modifications to the existing leachate management system in Cells V and VI is not a certainty.
- Approval from the FAA to increase the fill height to Elevation 240 is not a certainty.

### 2.5.3 Costs to Implement

The estimated cost to construct the proposed overlay liners and MSE wall is $49.68M. The cost to relocate the natural gas main is estimated to be $22.2M. With this alternative, Cells VIII and IX could be reduced by 36.2 acres to 56.65 acres and would cost $44.3M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 97.7 acres of impact is $5.8M. The total cost for Alternative 5 is estimated to be $122.0M at a cost of $7.63/CY of waste disposal capacity or 53% higher than Alternative 1. The cost for wetland avoidance is estimated to be $1.98M per acre.

### 2.5.4 Practicality

This alternative is not practical due to the significant impacts it would have on the existing leachate collection system on the north side of Cells V and VI. Extensions of the side riser pipes to maintain access would render these impractical to maintain following construction of the base liner system and after vertical extensions of manhole up through the waste. The vertical extension would require re-connection of power, controls, supervisory control and data acquisition (SCADA), LFG collection, and leachate forcemains with each lift of waste placement. The decommissioning of the leachate collection system in the areas of Cells V and VI would make this alternative constructable but would require that closure be constructed and several years, likely well over 30 years, for the leachate generation to cease so that the side risers and pump stations could be removed. The length of time required for cessation of leachate generation is well beyond the time that additional disposal capacity is required and therefore this alternative is not practical. In addition, this alternative is also not practical due to the significant capital costs for the overlay liners, base liner, and MSE wall, relative to the airspace generated and it is reliant on receiving relief from the FAA for the maximum fill height of the landfill.

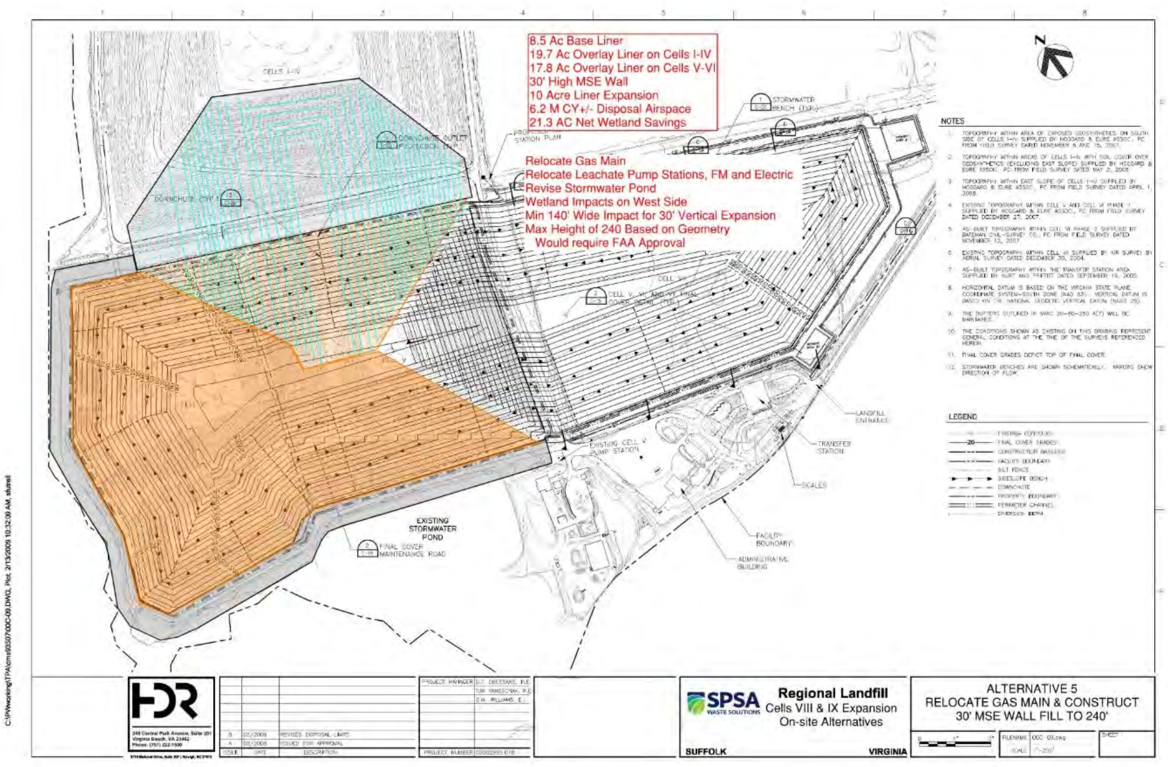


**Figure 10 Alternative 5 Site Plan**

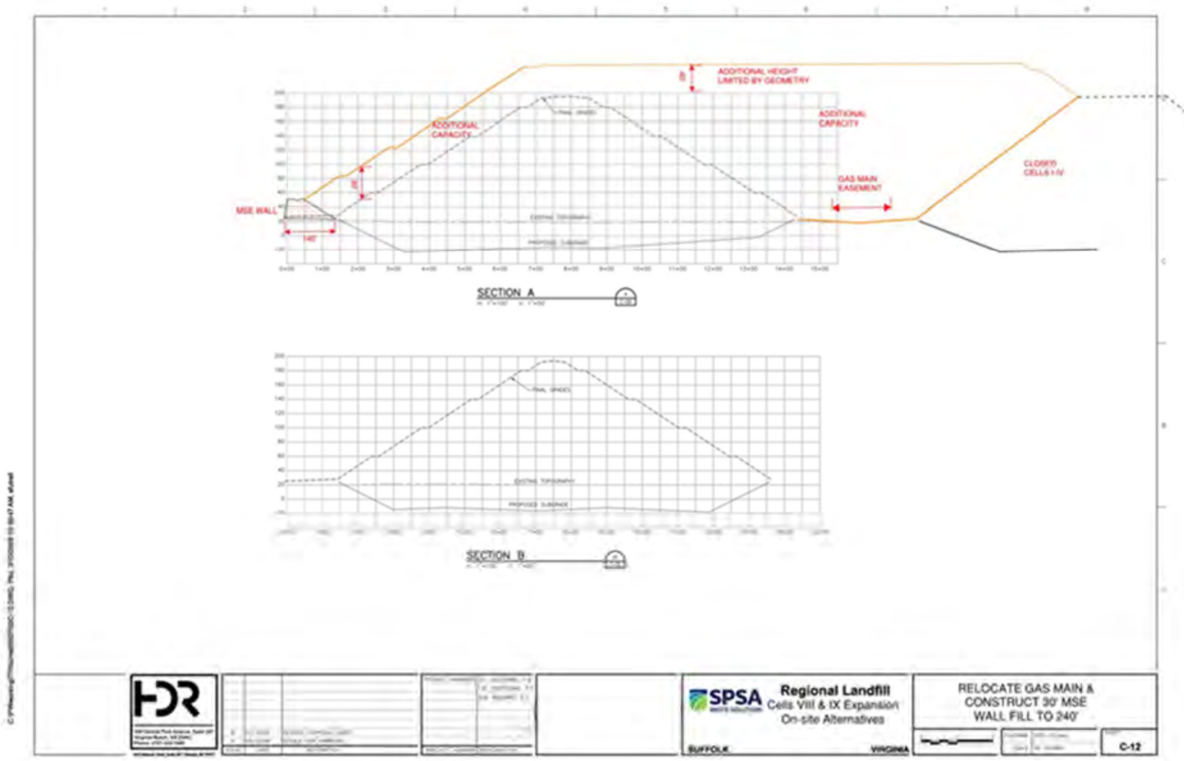


**Figure 11 Alternative 5 Section**

## 2.6 Capture Airspace between Cell V and VII (Alternative 6)

This proposed alternative is for modification of the design of Cell VIII to include a Phase 3 between Cell V and Cell VII that could be constructed subsequent to operations in Cell VIII or IX. Cell VII is permitted to be constructed to connect with Cell V and utilize the overlap filling against the final slopes of Cell V for disposal capacity. The area immediately to the east of Cell V contains a number of underground utilities and the perimeter roadway serves for the primary access for trucks to the leachate lagoons. This alternative would defer the relocation of the infrastructure and abandonment of the access roadway for a number of years. A major modification to the Cell VII solid waste permit would be required to modify the base grading plan so that Phases 1 and 2 could be constructed and operated without overlap onto Cell V fill slopes. The proposed alterative would include construction of an approximate 5.35-acre base liner system to the east of Cell V that would connect with the western boundary of Cell VII, Phase 1 (Figure 12 and Figure 13). This alternative would result in deferring approximately 1.52M CY of waste materials.

### 2.6.1 Advantages

- Would not require impacts to wetlands and could result in a net reduction of 8.9 acres of wetland impacts with a reduced Cells VIII and IX footprint.
- Construction and operation of filling of waste materials in this area could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials

- Leachate management from new lined slope and base area could be managed with connection into one or two of the leachate sumps and side riser pumps planned for Cell VII.

### 2.6.2 Disadvantages

- Would require extension of the Cell V – Quad 2 leachate pump station riser pipes and their controls to outside the landfill footprint. This extension would require an additional 200 feet or more of riser pipe, which would make it very difficult, and likely not practical to continue to maintain these sump pumps that would then be 400 linear feet away from the access point. This is a significant challenge with this alternative.
- Existing leachate forcemain to and from the Cell V lift station would need to be relocated to outside the expansion area.
- Regulatory approval of the modification to Cell VII should be achievable.
- Once constructed, access around the site and to the borrow area would be impacted.

### 2.6.3 Costs to Implement

The estimated cost to construct the base liner in this area and relocate the infrastructure is $5.25M. With this alternative, Cells VIII and IX could be reduced by 8.9 acres to 84.0 acres and would cost $65.71M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 110.15 acres of impact is $6.6M. The total cost for Alternative 6 is estimated to be $77.6M at a cost of $4.85/CY of waste disposal capacity or 3 percent lower than Alternative 1 due to the benefit this alternative has with reliance on existing infrastructure in Cell VII that reduces its cost. The cost for wetland avoidance is estimated to be ($251,295) per acre.

### 2.6.4 Practicality

This alternative is practical, as it is located with the area already permitted for landfill expansion and would not require relocation of natural gas main or additional wetland impacts.

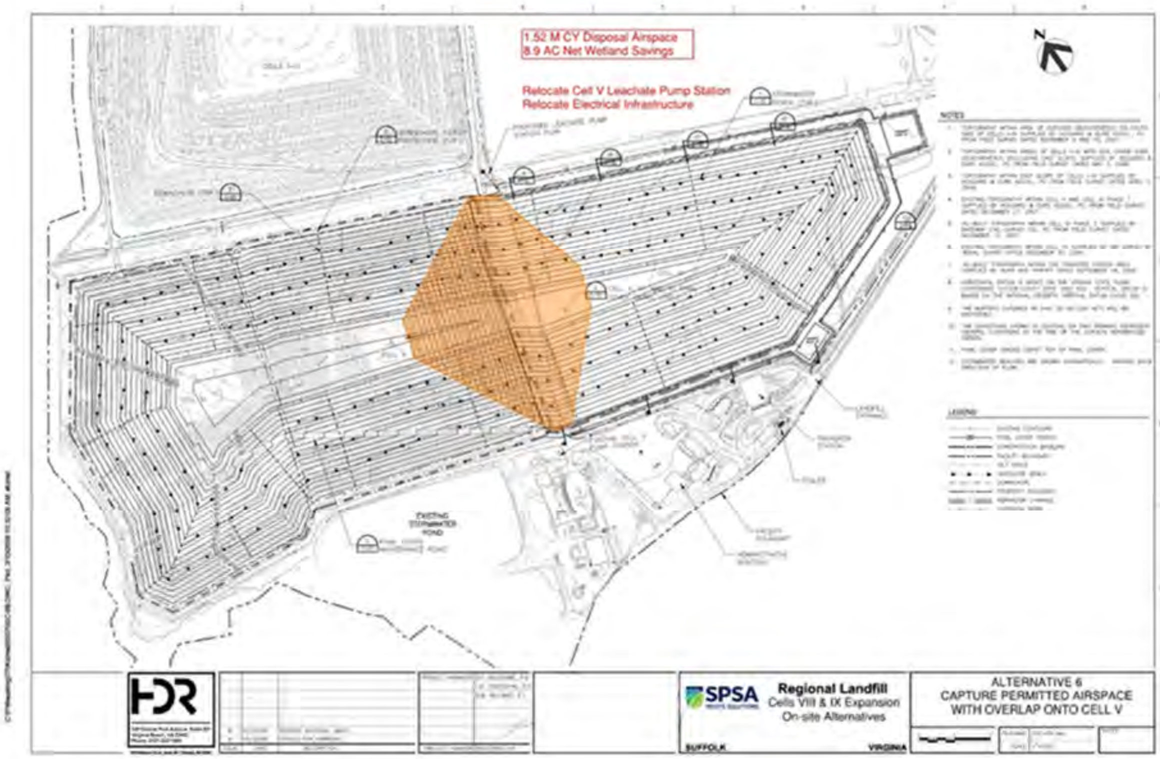


**Figure 12 Alternative 6 Site Plan**

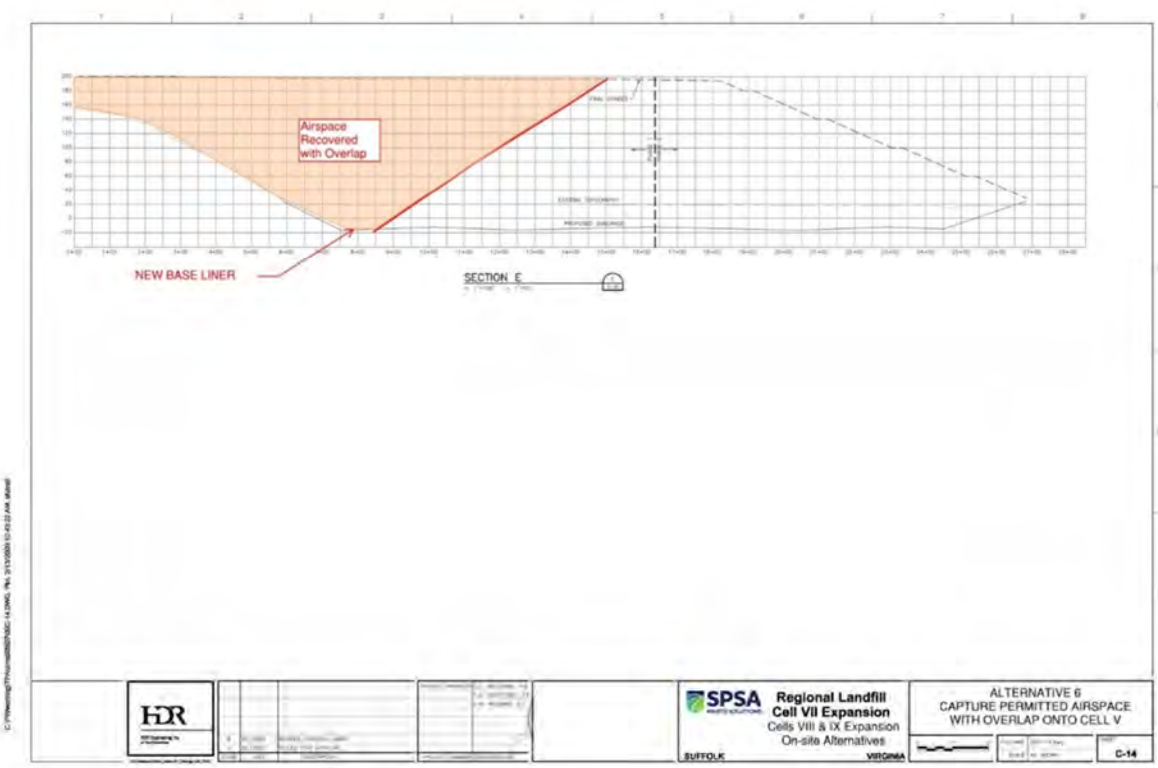


**Figure 13 Alternative 6 Section**

## 2.7 MSE Wall Around Cells V, VI, and VII (Alternative 7)

This proposed alternative is a combination of Alternatives 3 and 6 and includes construction of an MSE wall around the western and southern limits of Cells V, VI and VII (Figure 14 and Figure 15).

The proposed expansion would include a 15.0-acre base liner system on the inboard slope of the MSE wall that would be connected to the existing base liner system of Cells V, VI, and VII as well as the 5.35-acre base liner are for Alternative 6. This alternative would provide an estimated 5.5M CY of capacity through the vertical feet of additional filling over the existing final waste grades of Cell V, VI and VII. The final elevation of the waste filling and final cover for this alternative would be Elevation 200 per the current FAA requirements for the permitted Cells V, VI, and VII.

### 2.7.1 Advantages

- Would result in a net reduction of 17.3 AC of wetland impacts with a reduced Cells VIII and IX footprint.
- Base liner system of the MSE wall would be connected to existing base liner and leachate from new 15.0-acre area would drain into existing leachate collection systems and sumps.
- Would require extension of seven leachate pump station riser pipes in Cells V, VI, and VII and their controls on the base liner of the MSE wall. The risers would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration in the MSE wall locations.

### 2.7.2 Disadvantages

- Construction of the MSE wall would require the use of operational cover soil from the site borrow area or import of approximately 750,000 CY of structural fill materials.
- Additional capacity provided with this alternative would be constrained by the geometry of the slope filling as well as the top elevation of 200 restricted by the FAA.
- Waste filling operations would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric, and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.

- Permitting and design for this alternative would be complicated and regulatory approval of the MSE wall and modifications to the existing leachate management system in Cells V, VI, and VII is not a certainty.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric, and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.

### 2.7.3 Costs to Implement

The estimated cost to construct the proposed MSE wall and the Alternative 6 base liner is $33.63M. With this alternative Cells VIII and IX could be reduced by 32.2 acres to 60.7 acres and would costs $47.5M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 101.75 acres of impact is $6.1M. The total cost for Alternative 7 is estimated to be $87.25M at a cost of $5.45/CY of waste disposal capacity or 9 percent higher than Alternative 1. The cost for wetland avoidance is estimated to be $431,000 per acre.

### 2.7.4 Practicality

This alternative is not practical due to the complications to site access for operational filling and the significant costs for the construction of the MSE wall, complications on filling operations and the relocation of existing infrastructure relative to the airspace that it provides.

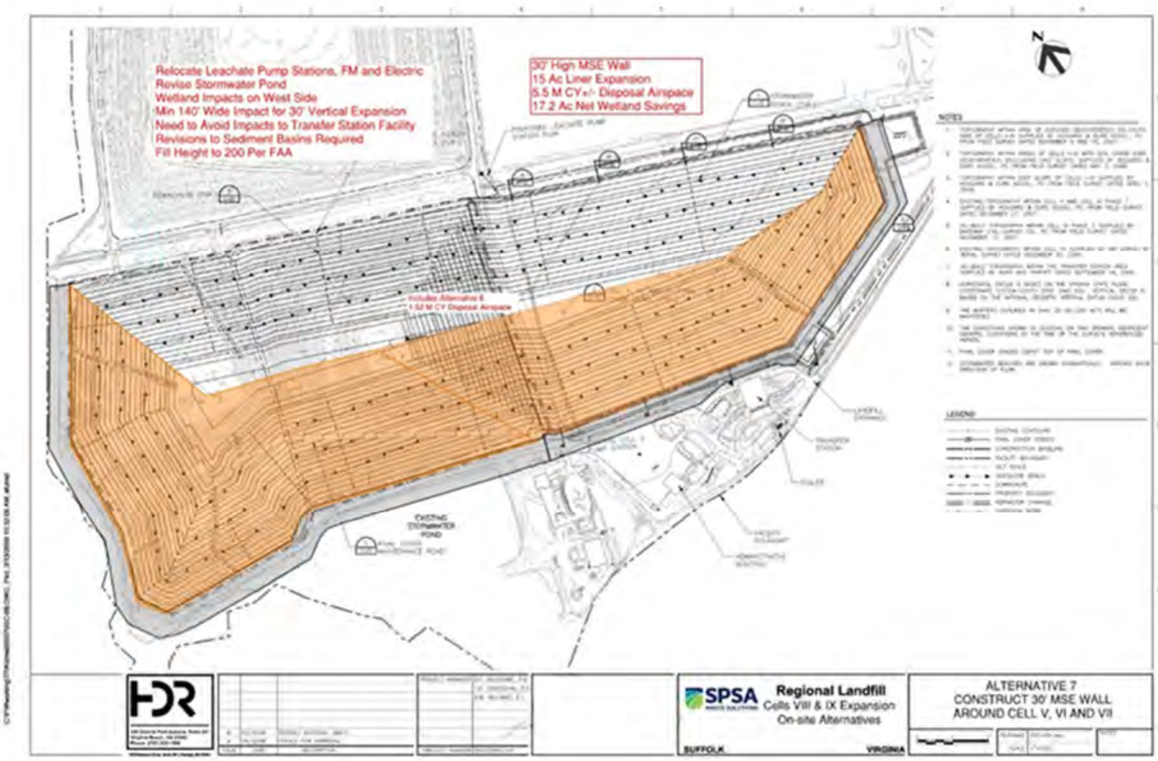


**Figure 14 Alternative 7 Site Plan**

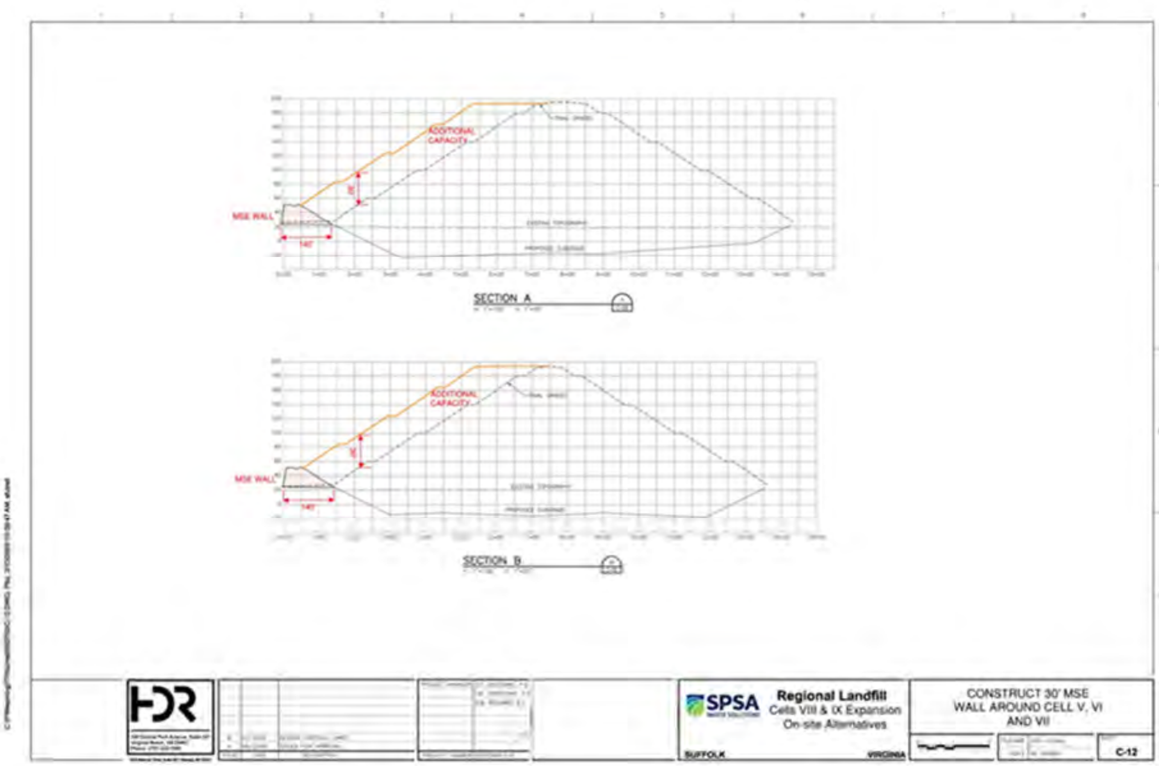


**Figure 15 Alternative 7 Section**

## 2.8 Relocate Natural Gas Main and Fill between Cells VII and VIII (Alternative 8)

This proposed alternative is a combination of Alternatives 2 and 7 with construction of a base liner system between Cells VIII and VIII. This alternative would include construction of a 8.5-acre base liner system in the area to the north of Cells V and VI, 19.5-acre piggy-back liner system constructed atop of the final cover system of the Cells I–IV, an 17.8-acre overlay liner system on the northern slopes of Cells V and VI, a 15.0-acre base liner system on the inboard slope of the MSE wall that would be connected to the existing base liner system of Cells V, VI, and VII and a 4.7-acre base liner between Cells VII and VII (Figure 16 and Figure 14).

This alternative would provide an estimated 9.76M CY of capacity through the overlay landfill and MSE wall with 30 vertical feet of additional filling over the existing final waste grades on the slope of Cells V, VI, and VII and the valley fill between Cells VII and VIII. The final elevation of the waste filling and final cover for this alternative would be Elevation 200 per the current FAA requirements for the permitted Cells V, VI, and VII.

### 2.8.1 Advantages

- Would result in a net reduction of 62.4 AC of wetland impacts with a reduced Cells VIII and IX footprint.
- Construction and operation of filling of waste materials on the northern area and top deck could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials. Filling on the west and south would be more difficult.
- Leachate management from new 19.5-acre lined slope, 18.7-acre overlay liner and new base areas could be managed with three additional leachate sumps and side riser pumps.
- Base liner system of the MSE wall would be connected to existing base liner and leachate from new 15.0-acre area would drain into existing leachate collection systems and sumps.
- Leachate side slope riser pipes at the MSE wall would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration in the MSE wall locations.
- Leachate management from the 4.7-acre area between Cells VII and VIII could be managed with a single side slope riser pump station.

### 2.8.2 Disadvantages

- Would require relocation of the existing Columbia Natural Gas Main (36-inch diameter pipe) at an estimated cost in excess of $22M.
- Would require extension of two leachate pump station riser pipes and controls in Cells V and VI to either outside the landfill waste surface footprint or up through the waste filling with a vertical manhole to maintain access to the submersible pump in the sump. These extensions would require an additional 240 feet or more of riser pipe, which would make it very difficult if not impractical to continue to maintain these sump pumps that would be

440 linear feet away from the access point. This is a significant challenge with this alternative.

- The practicality of extending the leachate sump risers and providing assurance that the pumps can continue to be maintained is low. This alternative would require that the Cell V and Cell VI sump risers be decommissioned. This would only be viable if the leachate generation had ceased in their respective leachate collection system areas following construction of closure system above, and several years for generation to cease. Leachate generation reis likely to continue for more than 30 years after closure. This would also require that an overlay liner system be installed/maintained beneath the waste disposal area to preclude leachate from entering the Cell V and VI leachate collection system that is abandoned.
- Existing LFG collection system on Closed Cells I–IV in the areas of the piggy-back liner system would need to be modified to lower the vertical well and move well head control to outside the limits of the liner system. This would prohibit maintenance of these well locations in future and may lead to abandonment of these collection points.
- Existing LFG collection header from Cells V and VI currently connects to the header on the closed Cells I–IV in the middle of the proposed base liner area of this alternative. This header pipe and condensate trap would require relocation and modification of collection line locations that connect to it.
- Enhanced LFG collection system would be required beneath and at the edges of the piggy-back landfill liner to capture LFG and relieve pressure from beneath the liner system
- Construction of the MSE wall would require the import of approximately 750,000 CY of structural fill materials.
- Additional capacity provided with this alternative would be significantly constrained by the geometry of the slope filling and top deck elevations and the available footprint for base liner area between Cells VII and VIII.
- Waste filling operations in the MSE wall area would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric, and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site would be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.

- Permitting and design for this alternative would be complicated and regulatory approval of the piggy-back alternative and modifications to the existing leachate management system in Cells V, VI and VI and the MSE wall is not a certainty.
- Capacity gained from connection of Cells VII and VIII would be limited due to their geometries and the avoidance of the existing 100-year floodplain. It would only provide an estimated 1.39M CY additional capacity above what Alternative 7 could provide.

### 2.8.3 Costs to Implement

The estimated cost to construct the proposed overlay liners, MSE wall and new base liner areas is $67.1M. The cost to relocate the natural gas main is estimated to be $22.2M. With this alternative, Cell IX could be eliminated and the total expansion area reduced by 62.4 acres to 33.72 acres and would cost $26.37M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 56.6 acres of impact is $3.4M. The total cost for Alternative 8 is estimated to be $119.0M at a cost of $7.44/CY of waste disposal capacity or 49% higher than Alternative 1. The cost for wetland avoidance is estimated to be $628,374 per acre.

### 2.8.4 Practicality

This alternative is not practical due to the significant impacts it would have on the existing leachate collection system on the north side of Cells V and VI. Extensions of the side riser pipes to maintain access would render these impractical to maintain following construction of the base liner system and after vertical extensions of manhole up through the waste. The vertical extension would require re-connection of power, controls, supervisory control and data acquisition (SCADA), LFG collection, and leachate forcemains with each lift of waste placement. The decommissioning of the leachate collection system in the areas of Cells V and VI would make this alternative constructable but would require that closure be constructed and several years, likely well over 30 years, for the leachate generation to cease so that the side risers and pump stations could be removed. The length of time required for cessation of leachate generation is well beyond the time that additional disposal capacity is required and therefore this alternative is not practical. In addition, this alternative is also not practical due to the significant capital costs for the overlay liners, base liner, and MSE wall, relative to the airspace it provides.

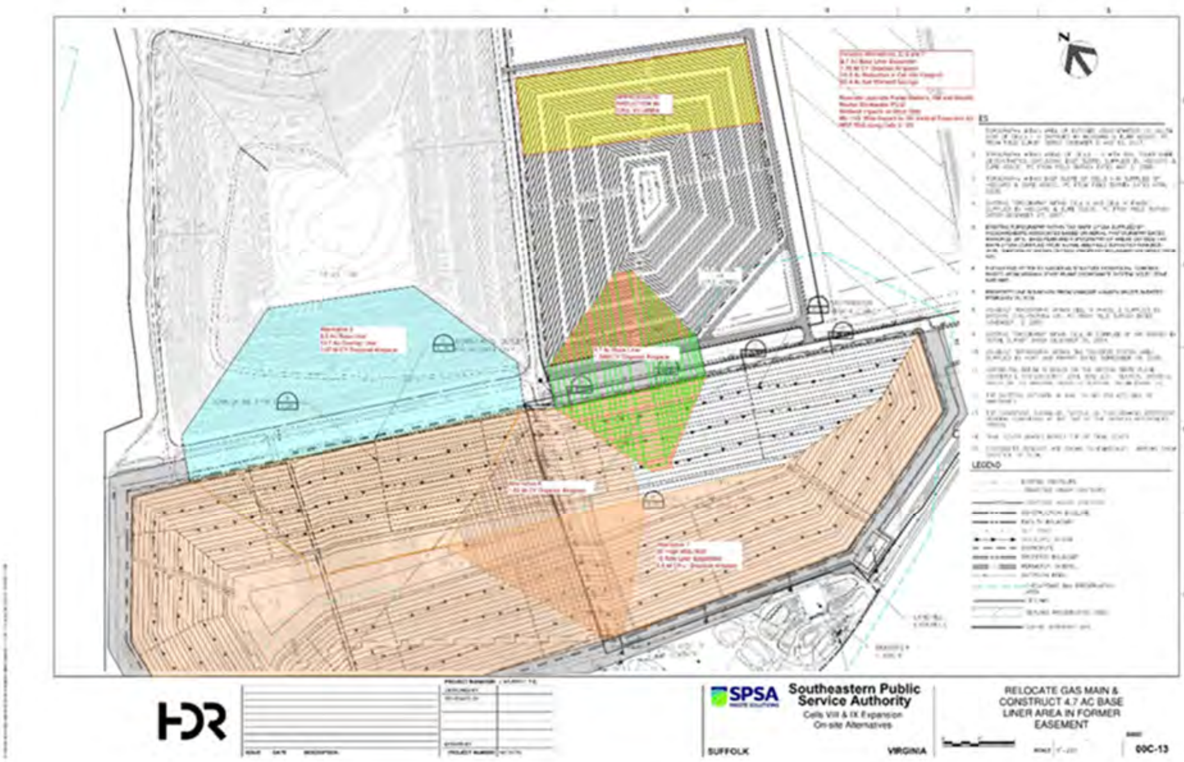


**Figure 16 Alternative 8 Site Plan**

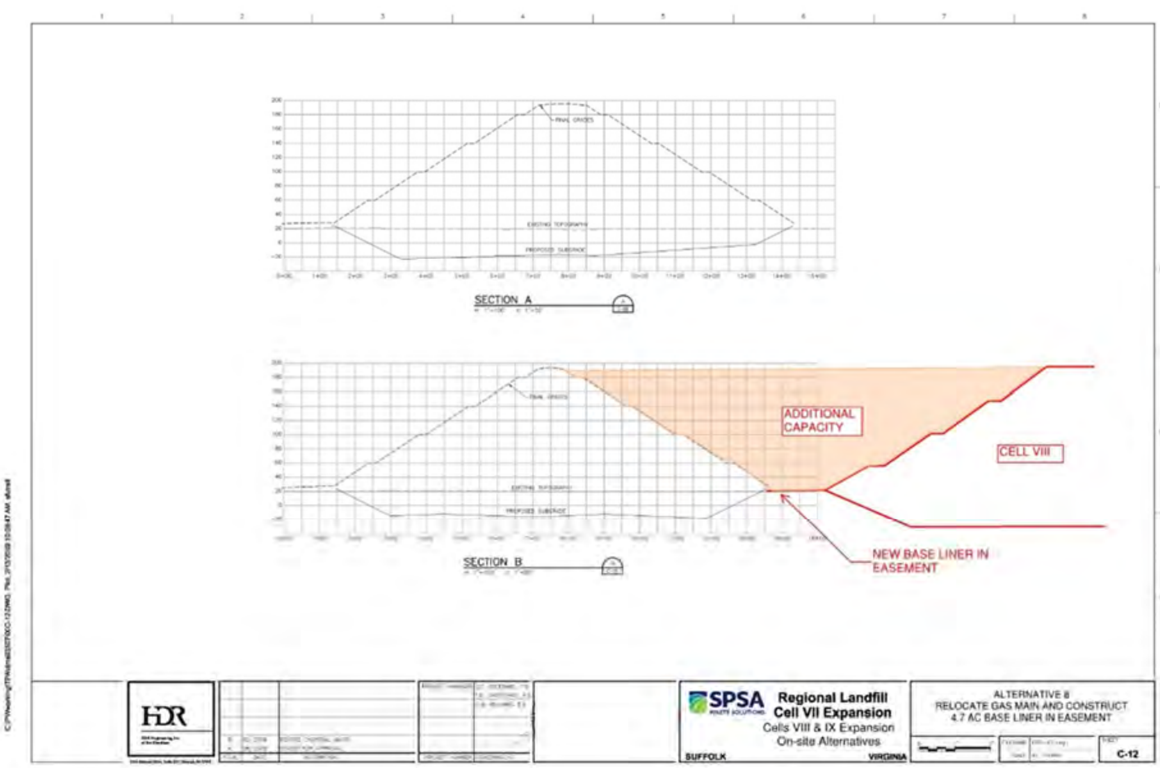


**Figure 17 Alternative 8 Section**

## 2.9 Relocate Natural Gas Main and Construct 30′ High MSE Wall around Cells V, VI, VII and VIII (Alternative 9)

This proposed alternative is similar to Alternative 8 with the addition of an MSE wall on the eastern boundary of Cell VIII. This alternative would include construction of a piggy-back landfill and an MSE wall around the western and southern limits of Cells V, VI, and VII and eastern limits of Cells VII and VIII and connection of Cells VII and VIII (Figure 18).

The proposed expansion would include the 8.5-acre base liner system in the area to the north of Cells V and VI, 19.5-acres overlay liner system constructed atop of the final cover system of the Cells I–IV, a 17.8-acre overlay liner on Cells V and VI, a 15.0-acre base liner system on the inboard slope of the MSE wall that would be connected to the existing base liner system of Cells V, VI, and VII and a 4.7-acre base liner between Cells VII and VII. This alternative would provide an estimated 9.76M CY of capacity through the piggy-back landfill and 30 vertical feet of additional filling over the existing final waste grades on the slope of Cells V, VI, and VII and the valley fill between Cells VII and VIII. The final elevation of the waste filling and final cover for this alternative would be Elevation 200 per the current FAA requirements for the permitted Cells V, VI, and VII.

### 2.9.1 Advantages

- Would result in a net reduction of 62.4 acres of wetland impacts with a reduced Cells VIII and IX footprint.
- Construction and operation of filling of waste materials on the northern area and top deck could be done using conventional methods and not require special provisions for access of equipment to deliver waste materials. Filling on the west and south would be more difficult.
- Leachate management from new 19.5-acre lined slope, 17.8 acre overlay liner and new base areas could be managed with three additional leachate sumps and side riser pumps.
- Base liner system of the MSE wall would be connected to existing base liner and leachate from new 17.6-acre area would drain into existing leachate collection systems and sumps.
- Leachate side slope riser pipes at the MSE wall would be extended 90 linear feet and pump stations relocated to the new limit of waste. Access to leachate sumps is reasonably maintained with this configuration in the MSE wall locations.
- Leachate management from the 4.7-acre area between Cells VII and VIII could be managed with a single side slope riser pump station.

### 2.9.2 Disadvantages

- Would require relocation of the existing Columbia Natural Gas Main (36-inch diameter pipe) at an estimated cost in excess of $22M.
- Would require extension of two leachate pump station riser pipes and controls in Cells V and VI to either outside the landfill waste surface footprint or up through the waste filling with a vertical manhole to maintain access to the submersible pump in the sump. These extensions would require an additional 240 feet or more of riser pipe, which would make

it very difficult if not impractical to continue to maintain these sump pumps that would be 440 linear feet away from the access point. This is a significant challenge with this alternative.

- The practicality of extending the leachate sump risers and providing assurance that the pumps can continue to be maintained is low. This alternative would require that the Cell V and Cell VI sump risers be decommissioned. This would only be viable if the leachate generation had ceased in their respective leachate collection system areas following construction of closure system above, and several years for generation to cease. Leachate generation reis likely to continue for more than 30 years after closure. This would also require that an overlay liner system be installed/maintained beneath the waste disposal area to preclude leachate from entering the Cell V and VI leachate collection system that is abandoned.
- Existing LFG collection system on closed Cells I–IV in the areas of the piggy-back liner system would need to be modified to lower the vertical well and move well head control to outside the limits of the liner system. This would prohibit maintenance of these well locations in future and may lead to abandonment of these collection points.
- Existing LFG collection header from Cells V and VI currently connects to the header on the closed Cells I–IV in the middle of the proposed base liner area of this alternative. This header pipe and condensate trap would require relocation and modification of collection line locations that connect to it.
- Enhanced LFG collection system would be required beneath and at the edges of the piggy-back landfill liner to capture LFG and relieve pressure from beneath the liner system.
- Construction of the MSE wall would require the import of approximately 980,000 CY of structural fill materials.
- Additional capacity provided with this alternative would be significantly constrained by the geometry of the slope filling and top deck elevations and the available footprint for base liner area between Cells VII and VIII.
- Waste filling operations in the MSE wall area would be more difficult than a horizontal expansion as filling would initially be in a valley and the horizontal tipping pad would be limited to less than 200 feet due to slope geometries.
- Stormwater run-off from existing exterior side slopes would need to be diverted away from active filling areas below to reduce run-on and leachate production in the MSE wall area.
- Stormwater run-off from completed side slopes would be managed with new perimeter channel and large vertical (30-foot +) drain manholes through the berm to discharge the collected stormwater.
- Existing leachate forcemain, underground electric, and SCADA communication lines would need to be relocated to atop the MSE wall following construction.
- Access around the perimeter of the site will be constrained with the narrow roadway at the top of the MSE. A wider perimeter road would require additional MSE wall width and additional wetland impacts along the perimeter, further negating any wetland offset for this alternative.

- Permitting and design for this alternative would be complicated and regulatory approval of the piggy-back alternative and modifications to the existing leachate management system in Cells V, VI, and VI and the MSE wall is not a certainty.
- Capacity gained from connection of Cells VII and VIII would be limited due to their geometries and the avoidance of the existing 100-year floodplain. It would only provide an estimated 1.39M CY additional capacity above what Alternative 7 can provide.
- The MSE wall construction on eastern side of Cell VIII would only provide an additional 600,000 CY of disposal volume.

### 2.9.3 Costs to Implement

The estimated cost to construct the proposed overlay liners, MSE wall and new base liner areas is $73.1M. The cost to relocate the natural gas main is estimated to be $22.2M. With this alternative, Cell IX could be eliminated, and the total expansion area reduced by 64.1 acres to 32.02 acres and would cost $25.05M to construct. Assuming a wetland mitigation ratio of 2:1 and a cost of $30,000 per acre, the mitigation costs for the estimated 54.9 acres of impact is $3.3M. The total cost for Alternative 9 is estimated to be $123.6M at a cost of $7.72/CY of waste disposal capacity or 55% higher than Alternative 1. The cost for wetland avoidance is estimated to be $682,736 per acre.

### 2.9.4 Practicality

This alternative is not practical due to the significant impacts it would have on the existing leachate collection system on the north side of Cells V and VI. Extensions of the side riser pipes to maintain access would render these impractical to maintain following construction of the base liner system and after vertical extensions of manhole up through the waste. The vertical extension would require re-connection of power, controls, supervisory control and data acquisition (SCADA), LFG collection, and leachate forcemains with each lift of waste placement. The decommissioning of the leachate collection system in the areas of Cells V and VI would make this alternative constructable but would require that closure be constructed and several years, likely well over 30 years, for the leachate generation to cease so that the side risers and pump stations could be removed. The length of time required for cessation of leachate generation is well beyond the time that additional disposal capacity is required and therefore this alternative is not practical. In addition, this alternative is also not practical due to the significant capital costs for the overlay liners, base liner, and MSE wall, relative to the airspace it provides.

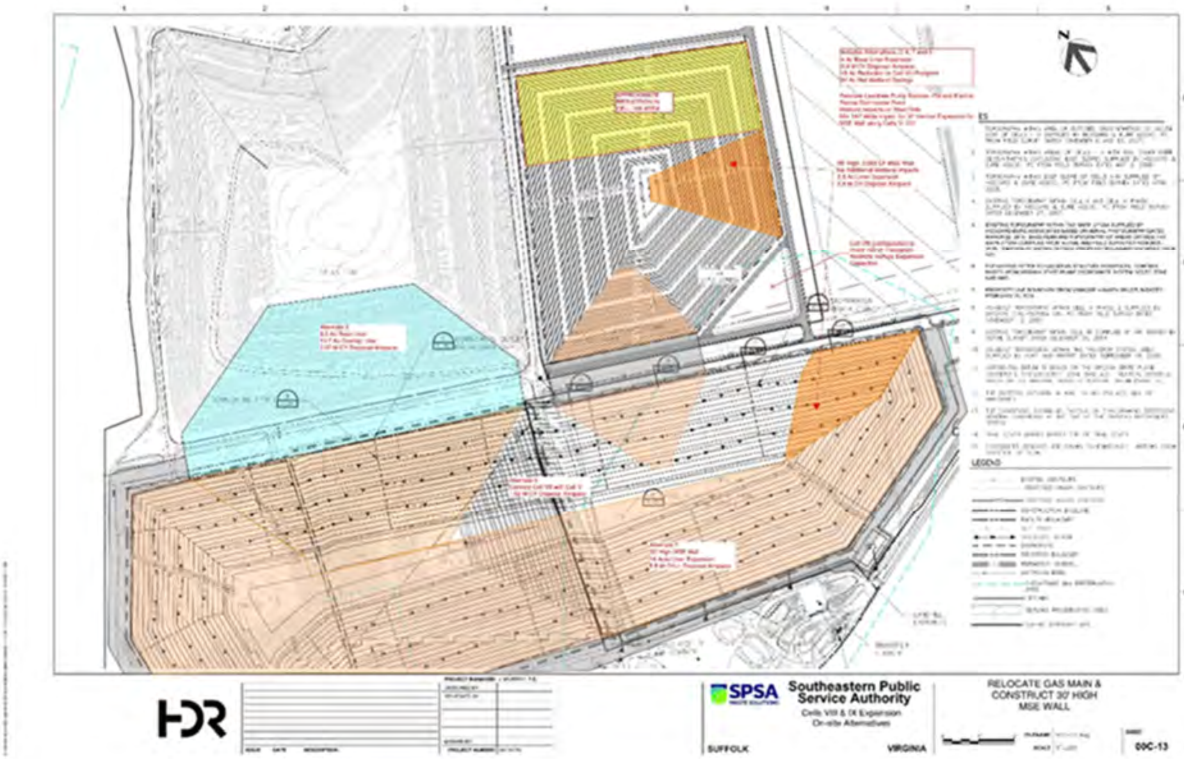


**Figure 18 Alternative 9 Site Plan**

# 3 Conclusions and Recommendations

While Alternative 1 is the preferred alternative by SPSA to provide 16M CY of waste disposal capacity, SPSA recognizes that that the 119 acres of forested wetland impacts required to develop the 92.9-acre Cell VIII and IX landfill area are substantial. HDR evaluated eight on-site landfill expansion alternatives to assess the potential for reducing wetland impacts associated with developing the 16M CY of waste disposal capacity being sought by SPSA. Each of the other alternatives evaluated, while technically constructable, present significant challenges for permitting, operation of existing leachate and landfill gas infrastructure, and landfill operations. Existing Cells V, VI, and VIII have previously been permitted and constructed within the constraints presented by the site. Vertical and horizontal expansions to these disposal areas are severely constrained due to presence of property lines, existing wetlands, or existing underground utility infrastructure, as highlighted in the analysis. When reviewing the costs to construct additional capacity with these alternatives, the relative cost per acre of wetland avoided ranged from over \$400,000 to \$2.5M per acre. These costs are substantial and when considering the cost to develop wetlands of equivalent ecological value to those being disturbed, a public authority like SPSA would have difficulty justifying these additional project costs to its member communities.

Alternative 6 is the one viable and practical alternative that could be considered. The approximate 1.5M CY of disposal capacity provided by this alternative is part of the 10.8M CY currently permitted disposal capacity for Cell VII. Alternative 6 would simply defer the construction of the base liner and filling in this area to a later date. Deferring this capacity would allow SPSA to comply with their objective to provide 40 years of disposal capacity for the region and would reduce the proposed footprint of Cells VIII and IX by 8.9 acres. This alternative would require a major permit modification to the Cell VII permitted design to incorporate a third phase of development. The total cost to construct this alternative in combination with a reduced Cell VIII and IX footprint, provides a slight reduction in the cost per CY of disposal from the implementation costs for Alternative 1 ($4.85 vs $4.99/CY) since the disposal capacity associated with this base liner area takes advantage of capacity available over slope of existing areas constructed or to be constructed.

In order to incorporate practical solutions to reduce the proposed wetland impact, HDR recommends the Draft EIS incorporate the development of a reduced Cells VIII and IX area of approximately 84 acres and the work associated with Alternative 6 as the Least Environmentally Damaging Practicable Alternative.

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# A

## Appendix A Alternative Site Plans and Section

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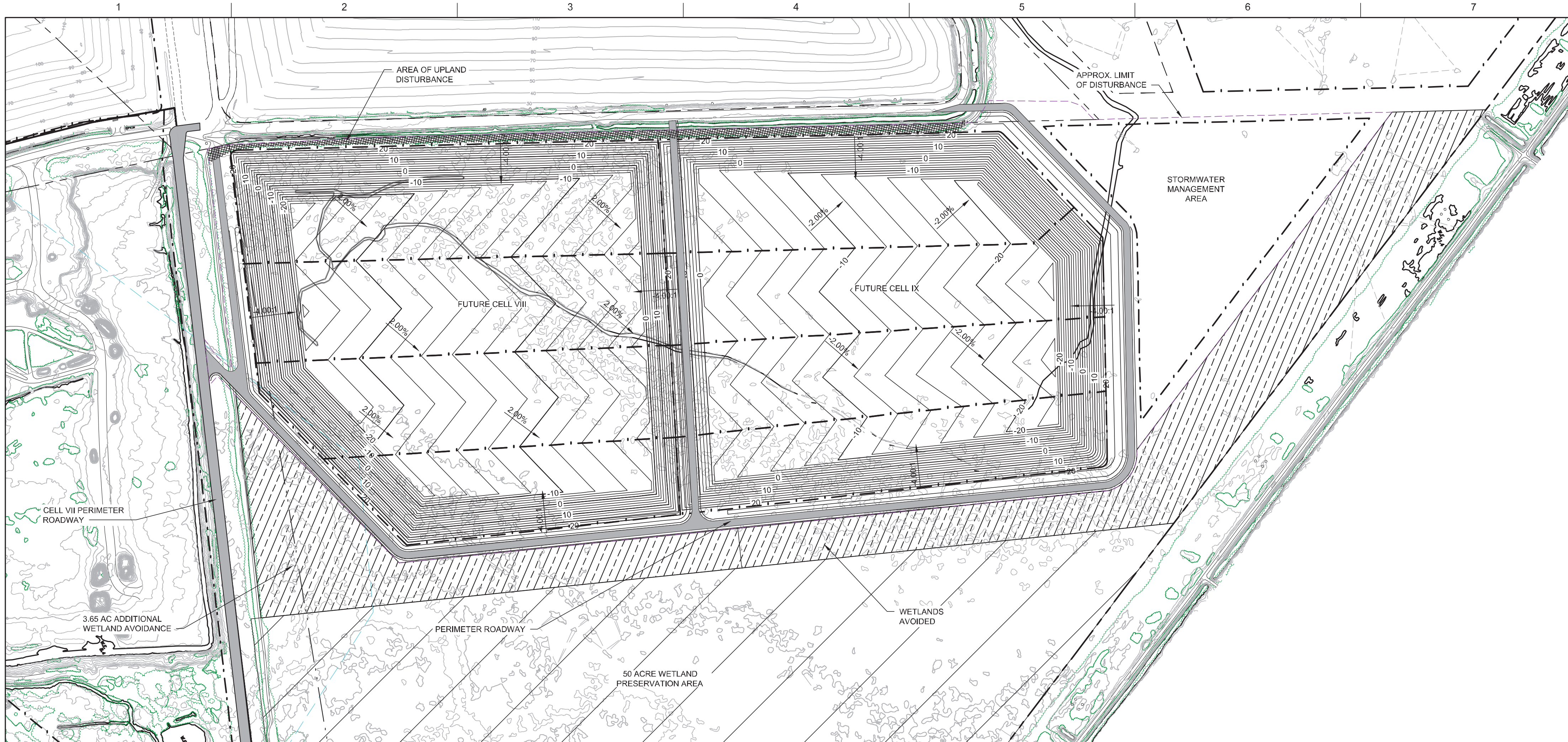
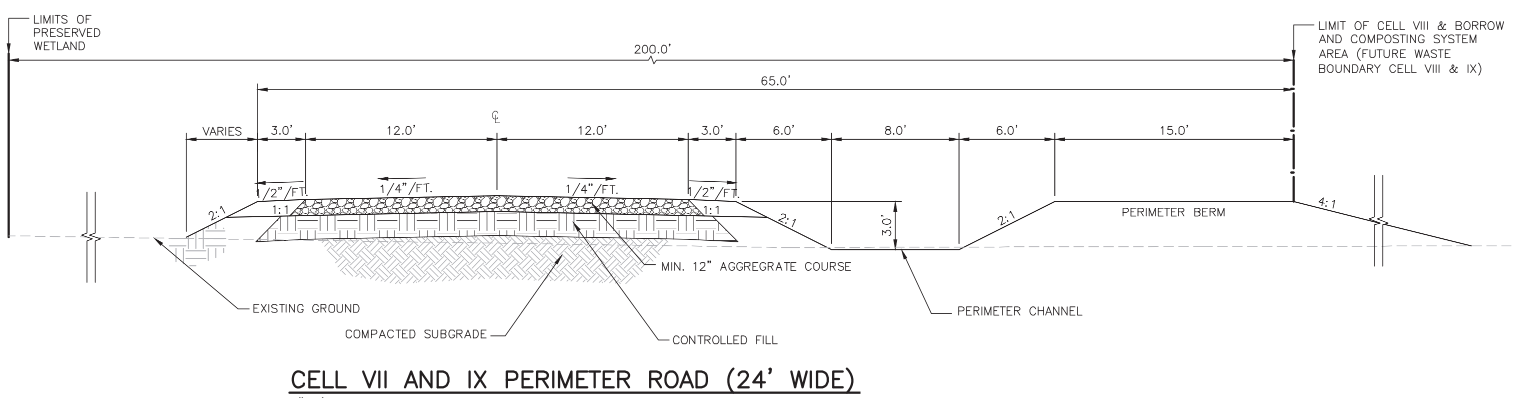



NOTES:

1. EXISTING TOPOGRAPHY WITHIN TAX MAP# 27*28A SUPPLIED BY HOGGARD-EURE ASSOCIATES BASED ON AERIAL PHOTOGRAPHY DATED MARCH 22, 2016. BASE PLAN AND TOPOGRAPHY OF AREAS OUTSIDE TAX MAP# 27*28A COMPILED FROM AERIAL AND FIELD SURVEYS FROM 2005 - 2015. TEMPORARY SHOWN OUTSIDE PROPERTY BOUNDARY OBTAINED FROM GIS.
2. ELEVATIONS REFER TO NGS MEAN SEA LEVEL HORIZONTAL CONTROL BASED UPON VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NAD 1983.
3. PROPERTY LINE BOUNDARY FROM VANASSE HANGEN BRUSTLIN DATED FEBRUARY 29, 2000.
4. DELINEATED WETLAND AND UPLAND AREAS SHOWN WITHIN CELLS VIII AND IX AREAS WERE OBTAINED FROM WETLAND AND WATERWAY DELINEATION PREPARED BY HDR ON APRIL 5, 2022.

LEGEND:

- CHESAPEAKE BAY PRESERVATION AREA
- STREAMS
- PROPERTY LINE
- INTERNAL PROPERTY LINE
- FACILITY BOUNDARY (APPROXIMATE)
- EASEMENT
- WETLAND PRESERVATION AREA
- EXISTING MINOR CONTOURS
- 20 EXISTING MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- -20 PROPOSED MAJOR CONTOURS
- PZ-06 PROPOSED BORING LOCATIONS
- UPLAND DISTURBANCE AREA
- LIMIT OF DISTURBANCE
- WETLANDS AVOIDED




CELL VII AND IX PERIMETER ROAD (24' WIDE)
1"=5'

| SPSA Proposed Cells VIII AND IX Expansion Summary | |
|---|---|
| Proposed Expansion Area | 137.03 AC |
| Total Wetlands in Expansion Area | 133.74 AC |
| Total Waters (Ditches) in Expansion Area | 0.90 AC |
| Total Uplands in Expansion Area | 2.39 AC |
| Proposed Wetlands Disturbance | 109.96 AC |
| Wetlands/Waters Avoided | 23.78 AC |

HDR

| | | | |
|---|---|---|---|
| ISSUE | DATE | DESCRIPTION | |

PROJECT MANAGER J. MURRAY, P.E.
DESIGNED BY
REVIEWED BY
DRAWN BY A. FAIR
PROJECT NUMBER 10139129

SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

ALTERNATIVE 1
PROPOSED CELLS VIII AND IX WITH REVISED ACCESS ROAD FOR ADDITIONAL WETLAND AVOIDANCE

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SCALE 1"=200'
SHEET 00C-01-B


## NOTES

1. TOPOGRAPHY WITHIN AREA OF EXPOSED GEOSYNTHETICS ON SOUTH SIDE OF CELLS I–IV SUPPLIED BY HOGGARD & EURE ASSOC., PC FROM FIELD SURVEY DATED NOVEMBER 6 AND 15, 2007.
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12. STORMWATER BENCHES ARE SHOWN SCHEMATICALLY. ARROWS SHOW DIRECTION OF FLOW.

## LEGEND

- EXISTING CONTOURS
- FINAL COVER GRADES
- CONSTRUCTION BASELINE
- FACILITY BOUNDARY
- SILT FENCE
- SIDESLOPE BENCH
- DOWNCHUTE
- PROPERTY BOUNDARY
- PERIMETER CHANNEL
- DIVERSION BERM

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| | T.M. YANOSCHAK, P.E. |
| | G.M. WILLIAMS, E.I. |
| PROJECT NUMBER | 00002889.018 |

COMMONWEALTH OF VIRGINIA
THOMAS M. YANOSCHAK
Lic. No. 043303
PROFESSIONAL ENGINEER

SPSA

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

ALTERNATIVE 2
RELOCATE GAS MAIN &
CONSTRUCT VALLEY FILL

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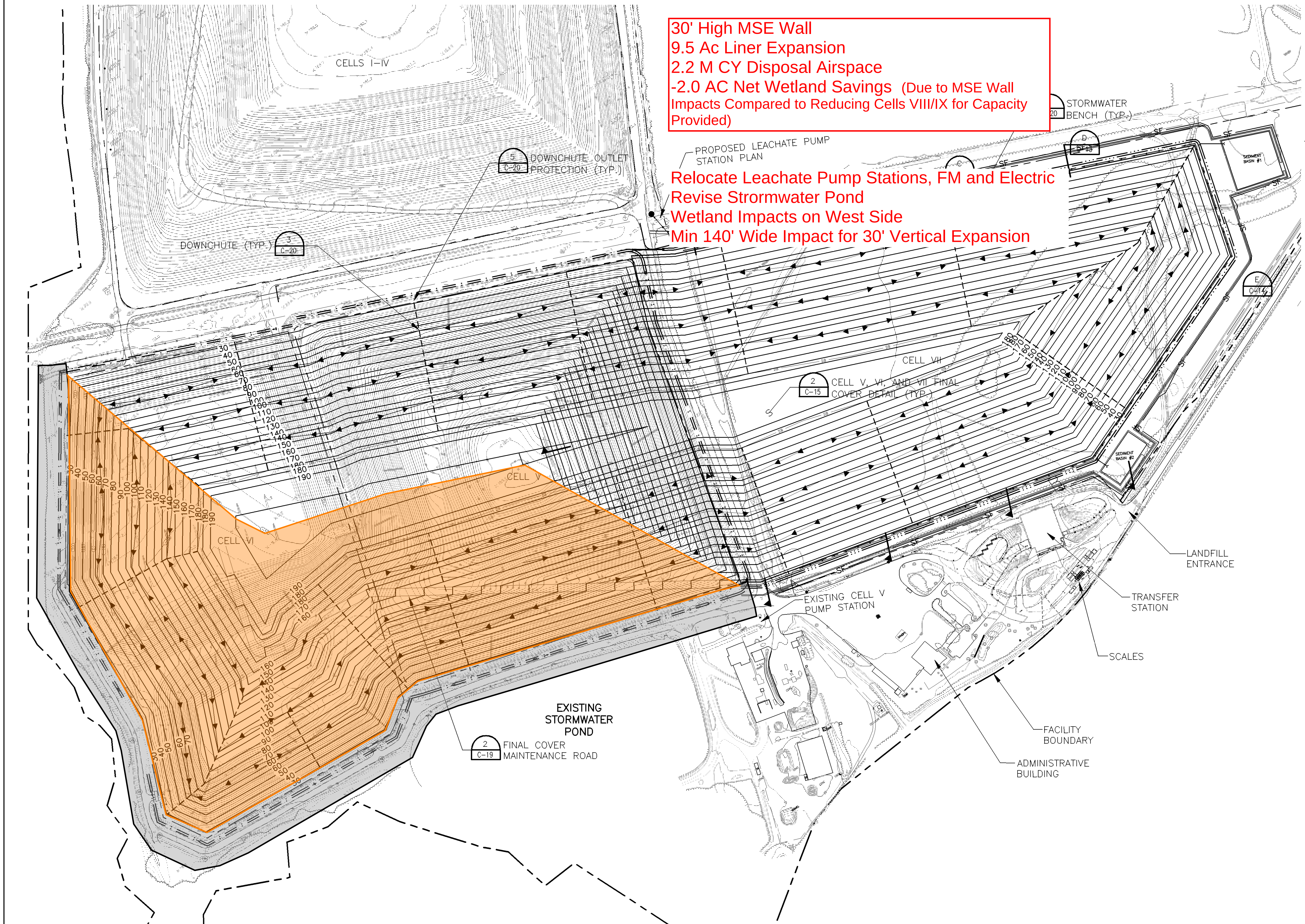


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- FACILITY BOUNDARY
- SILT FENCE
- SIDESLOPE BENCH
- DOWNCHUTE
- PROPERTY BOUNDARY
- PERIMETER CHANNEL
- DIVERSION BERM

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| PROJECT NUMBER | 00002889.018 |

SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

ALTERNATIVE 3
MSE WALL AROUND
CELLS V & VI

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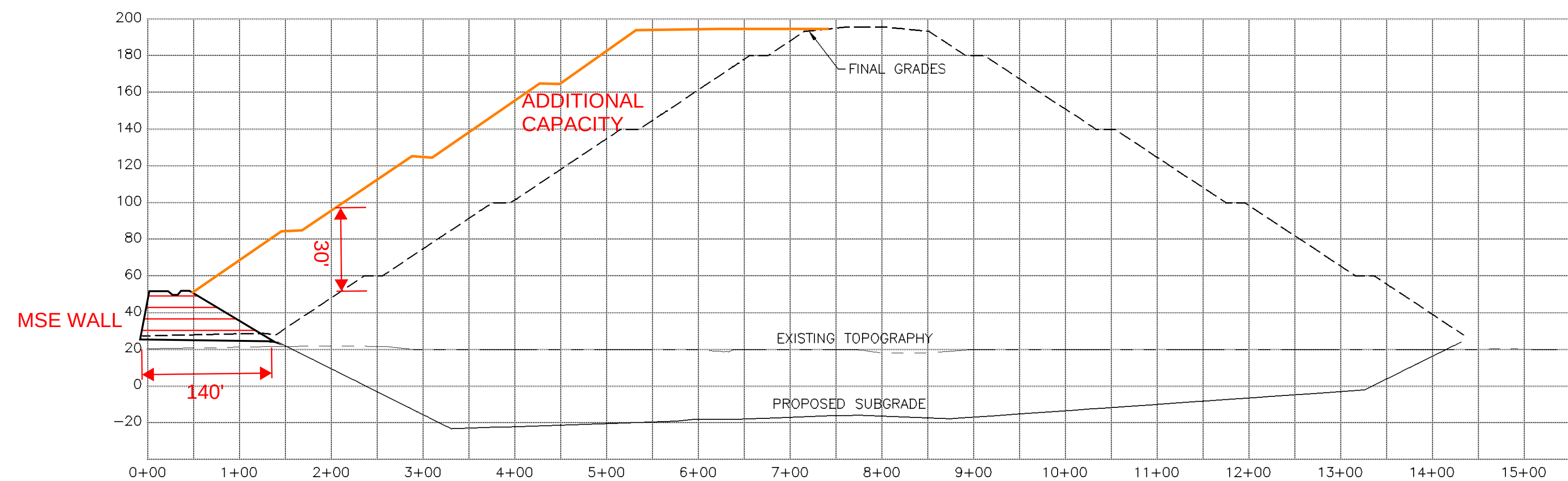


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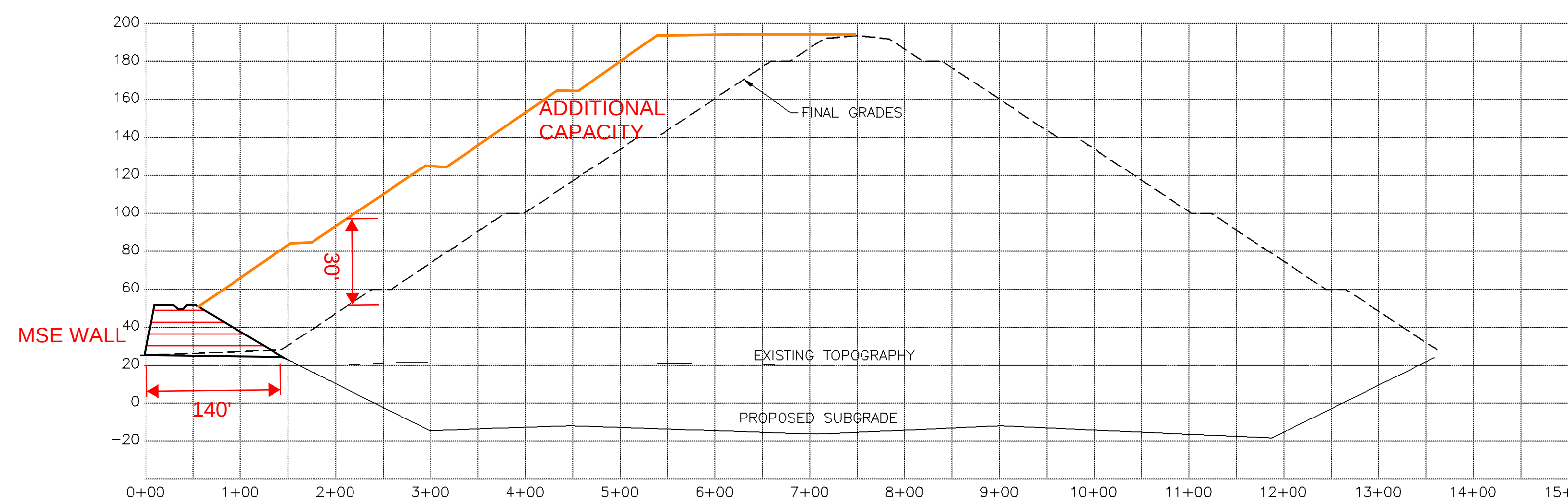


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SPSA WASTE SOLUTIONS

**Regional Landfill**

Cells VIII & IX Expansion

On-site Alternatives

**SUFFOLK** **VIRGINIA**

MSE WALL AROUND
CELLS V & VI

0 1" 2"

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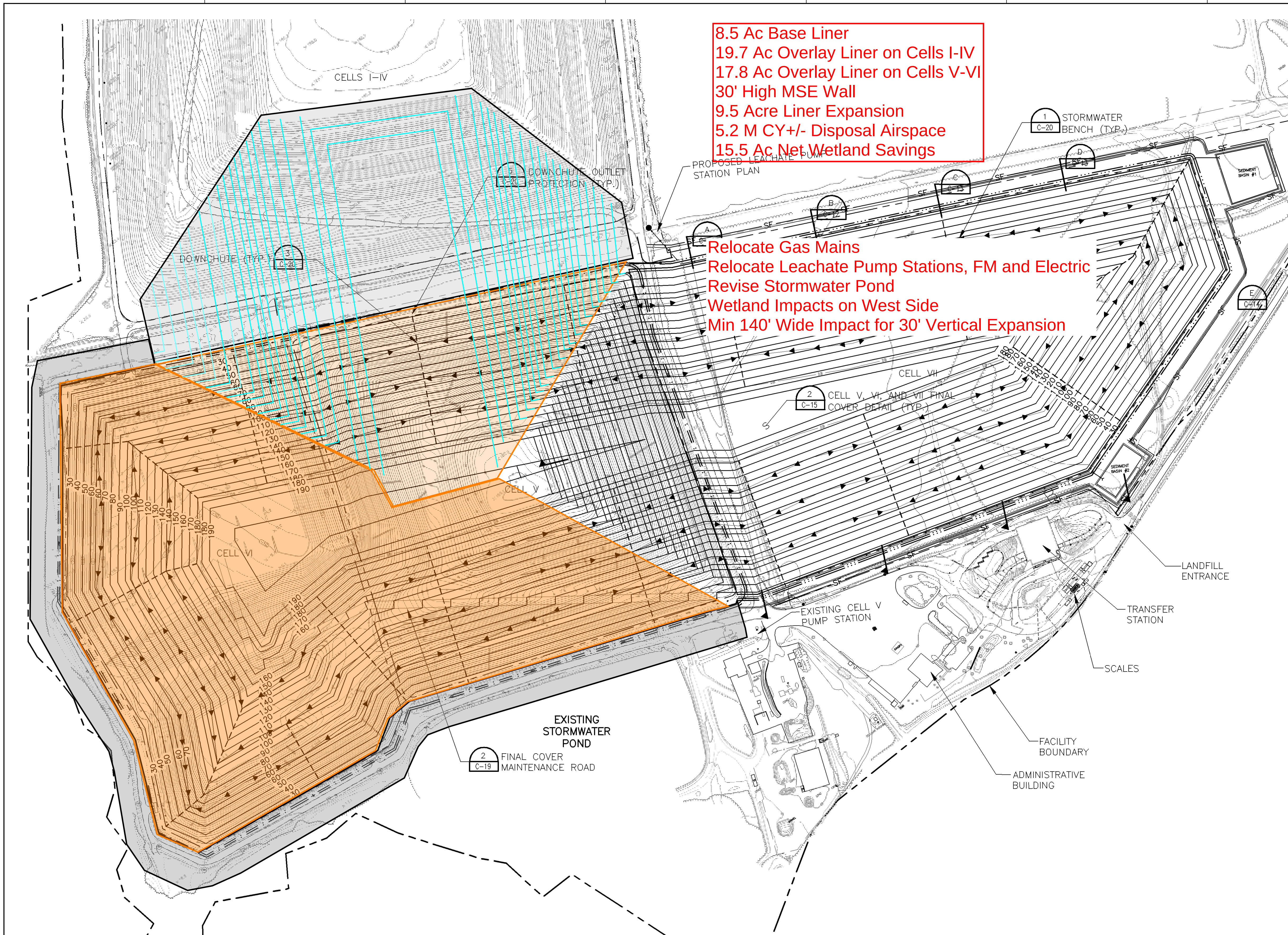


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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

ALTERNATIVE 4
RELOCATE GAS MAIN &
CONSTRUCT 30' MSE WALL

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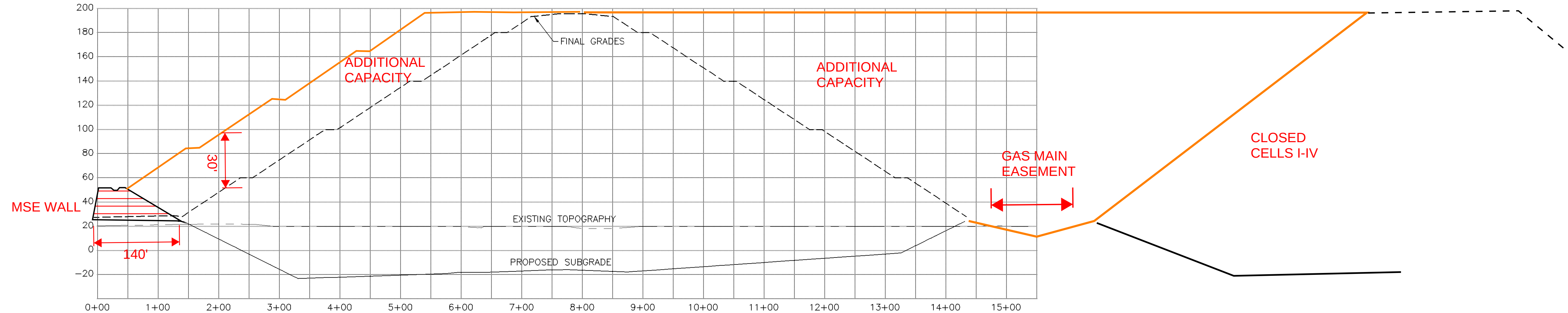


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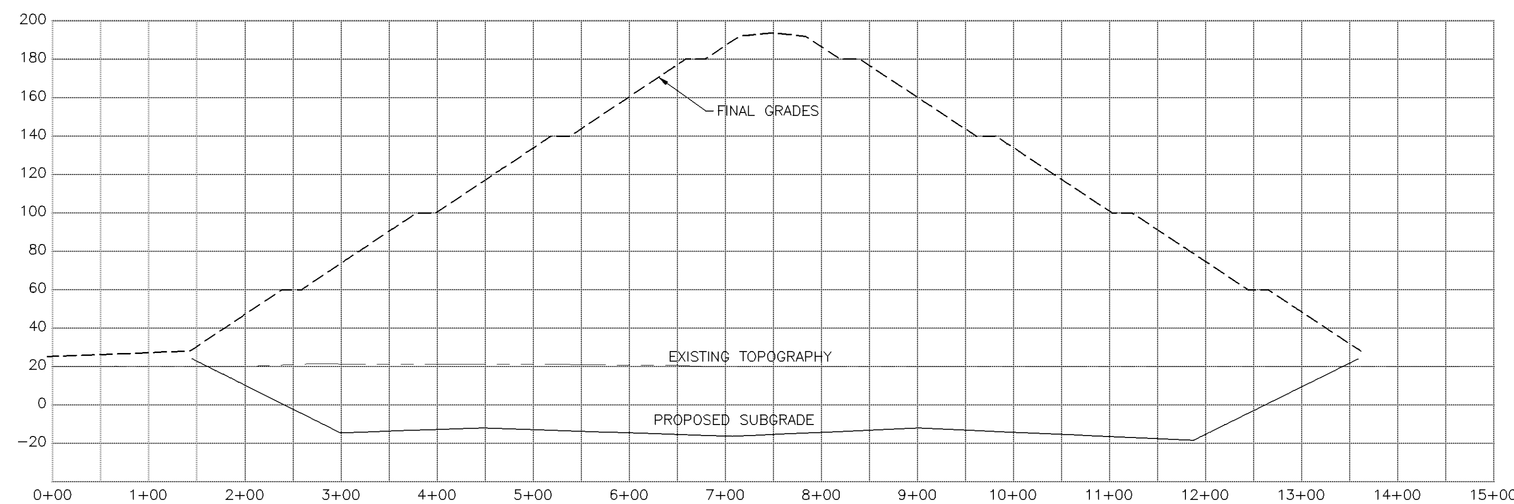


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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

RELOCATE GAS MAIN & CONSTRUCT 30' MSE WALL

0 1" 2"

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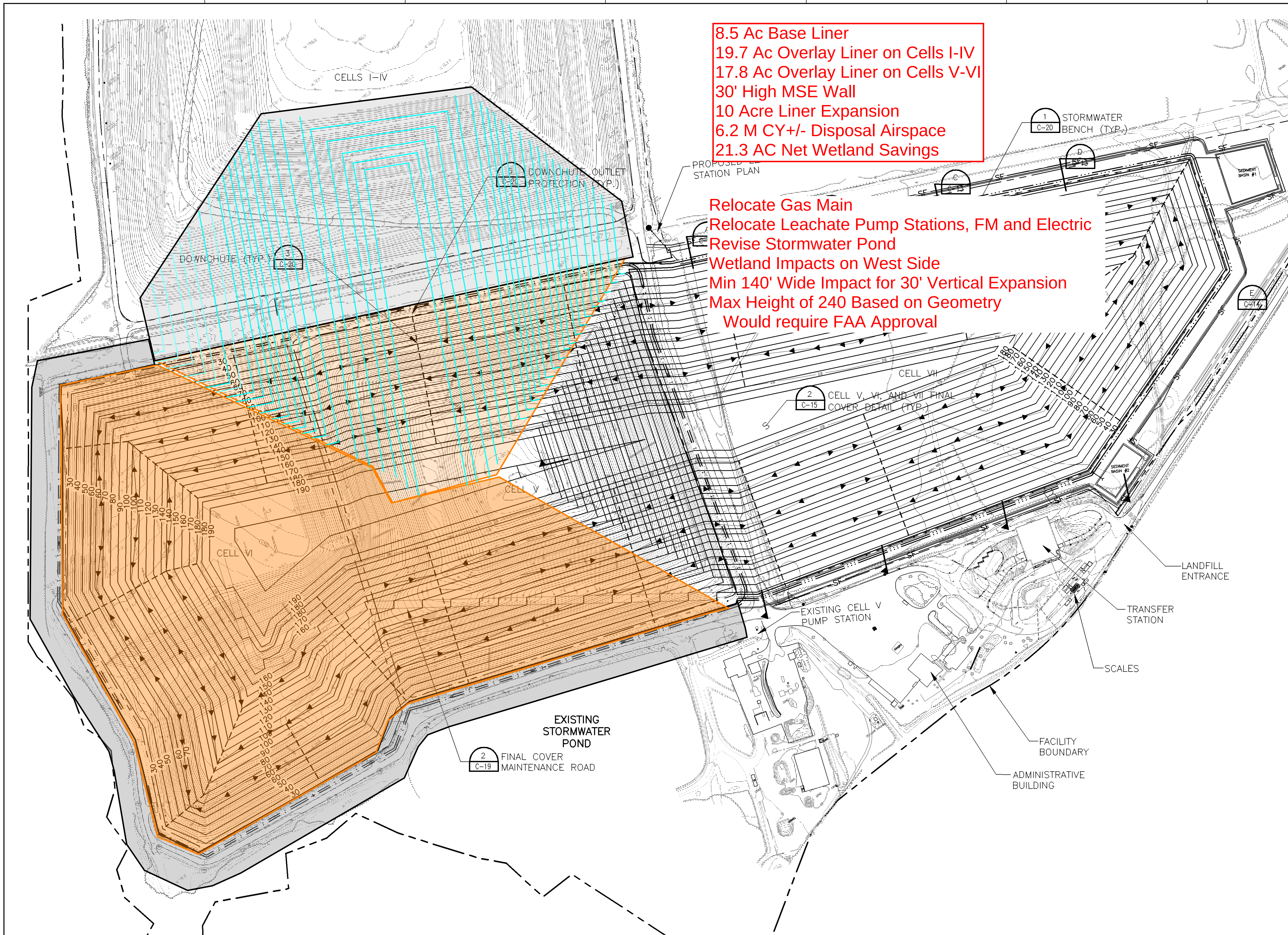


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- FACILITY BOUNDARY
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- SIDESLOPE BENCH
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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

ALTERNATIVE 5
RELOCATE GAS MAIN & CONSTRUCT
30' MSE WALL FILL TO 240'

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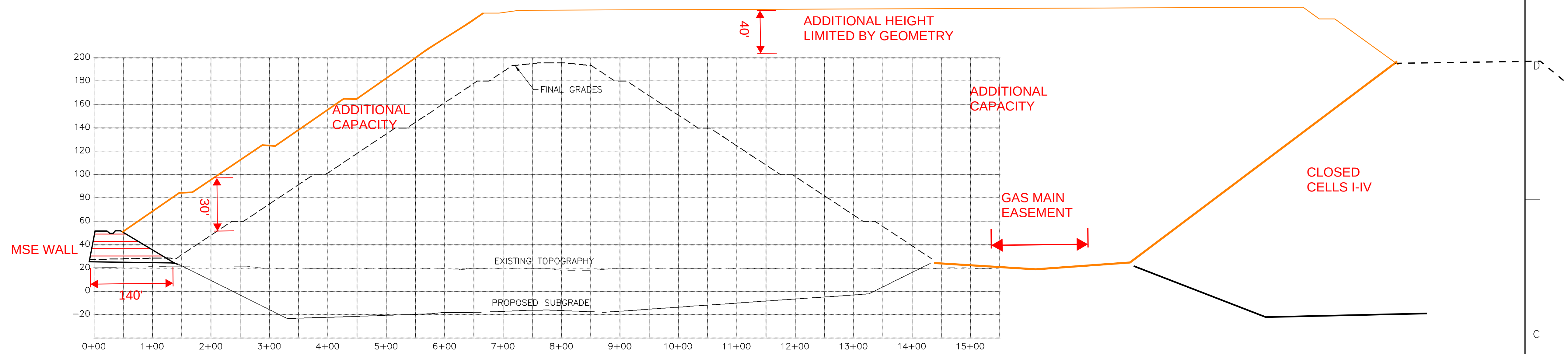


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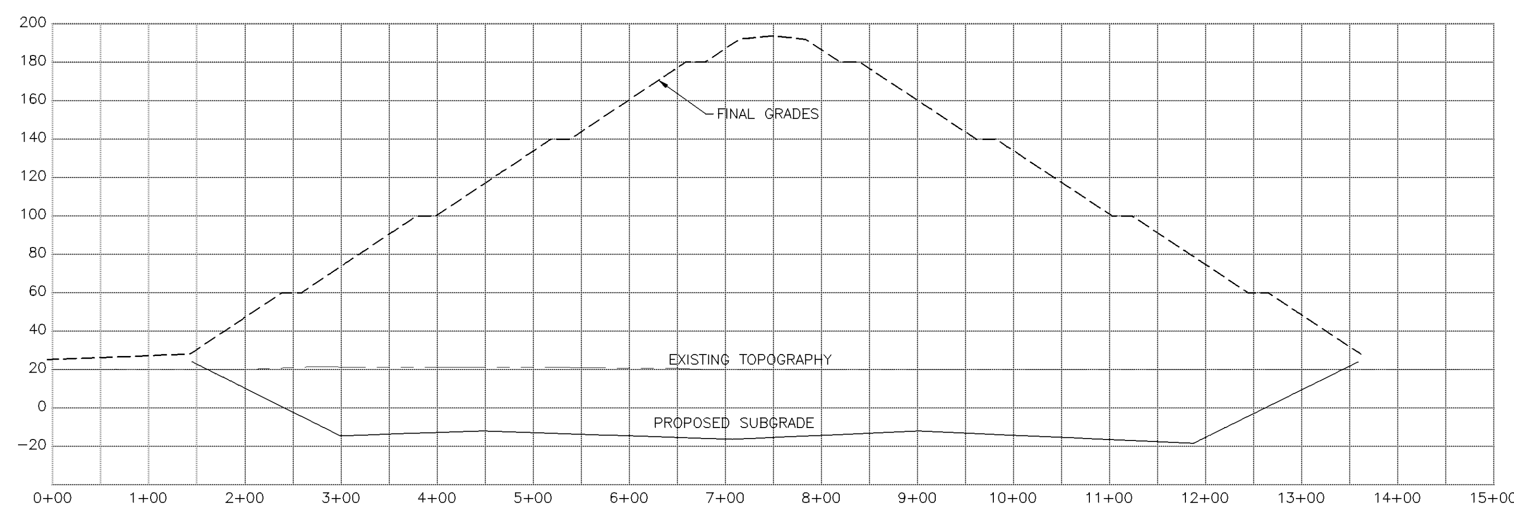


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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

RELOCATE GAS MAIN & CONSTRUCT 30' MSE WALL FILL TO 240'

0 1" 2"

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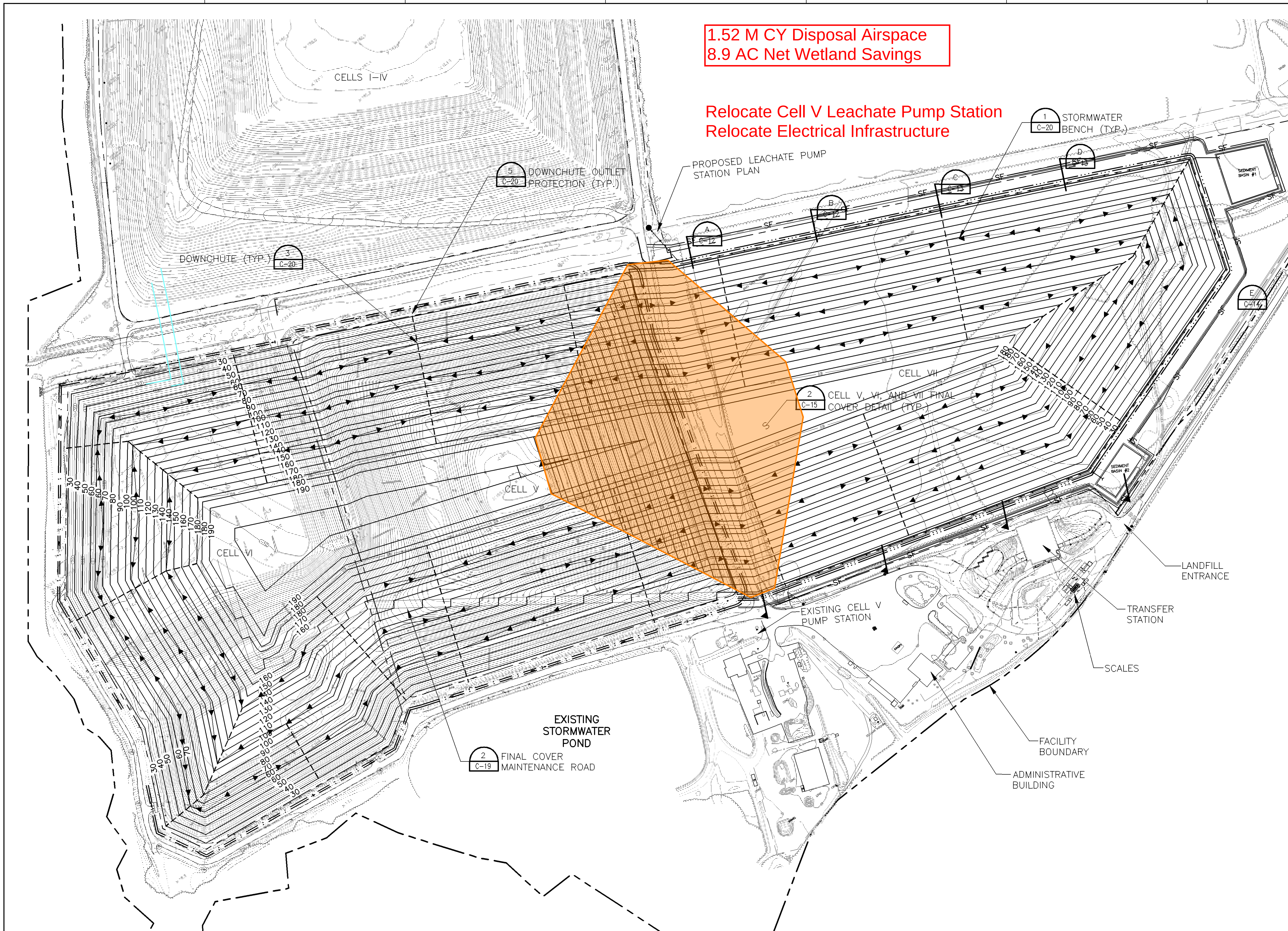


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12. STORMWATER BENCHES ARE SHOWN SCHEMATICALLY. ARROWS SHOW DIRECTION OF FLOW.

## LEGEND

- EXISTING CONTOURS
- FINAL COVER GRADES
- CONSTRUCTION BASELINE
- FACILITY BOUNDARY
- SILT FENCE
- SIDESLOPE BENCH
- DOWNCHUTE
- PROPERTY BOUNDARY
- PERIMETER CHANNEL
- DIVERSION BERM


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Virginia Beach, VA 23462
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3733 National Drive, Suite 207 | Raleigh, NC 27612


| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| B | 02/2009 | REVISED DISPOSAL LIMITS |
| A | 08/2008 | ISSUED FOR APPROVAL |

PROJECT MANAGER: D.T. DECESARE, P.E.; T.M. YANOSCHAK, P.E.; G.M. WILLIAMS, E.I.

PROJECT NUMBER: 00002889.018

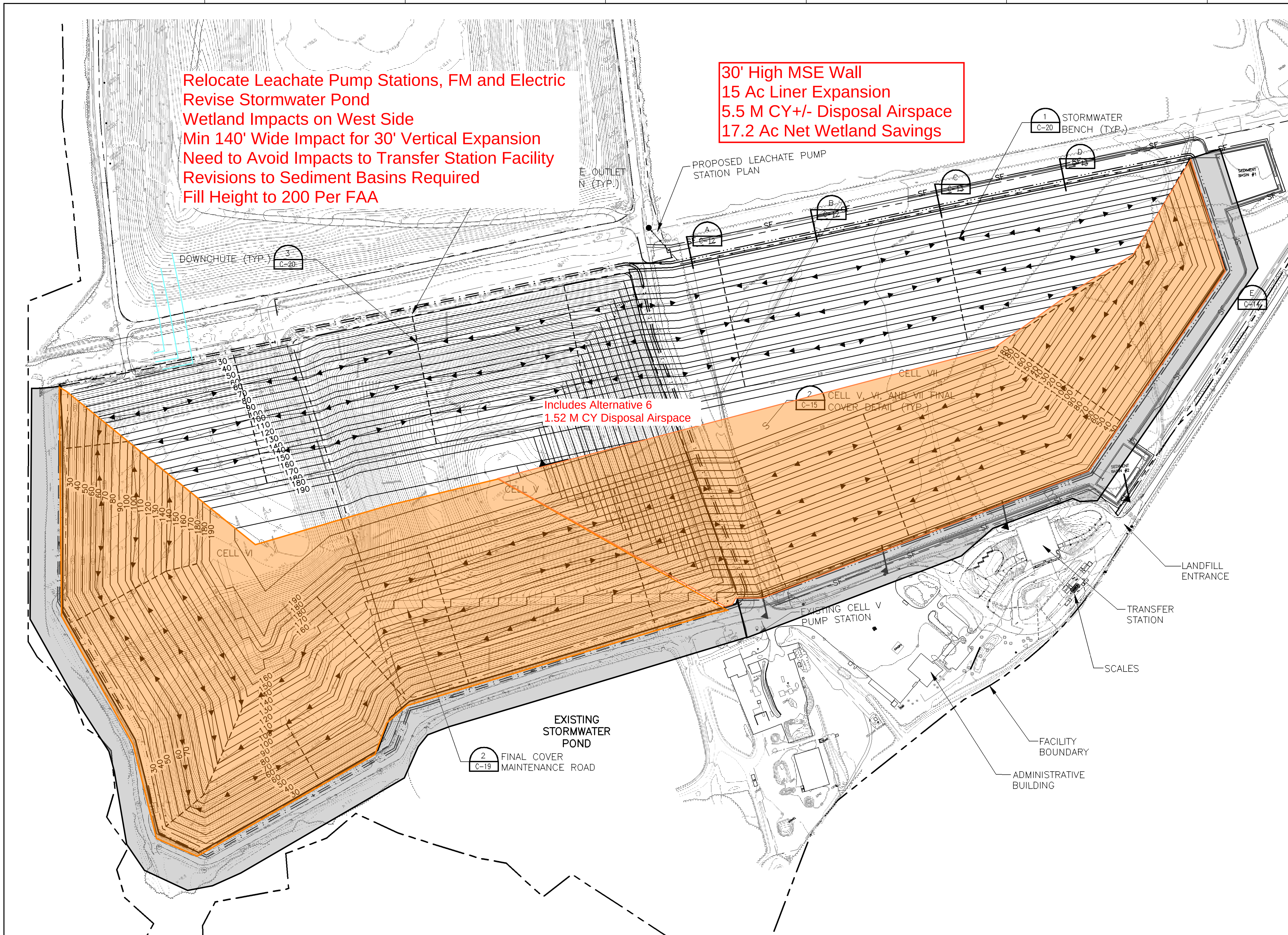
SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

ALTERNATIVE 6
CAPTURE PERMITTED AIRSPACE
WITH OVERLAP ONTO CELL V

FILENAME: 00C–09.dwg
SCALE: 1"=200'
SHEET




## NOTES

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- EXISTING CONTOURS
- FINAL COVER GRADES
- CONSTRUCTION BASELINE
- FACILITY BOUNDARY
- SILT FENCE
- SIDESLOPE BENCH
- DOWNCHUTE
- PROPERTY BOUNDARY
- PERIMETER CHANNEL
- DIVERSION BERM

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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

ALTERNATIVE 7
CONSTRUCT 30' MSE WALL
AROUND CELL V, VI AND VII

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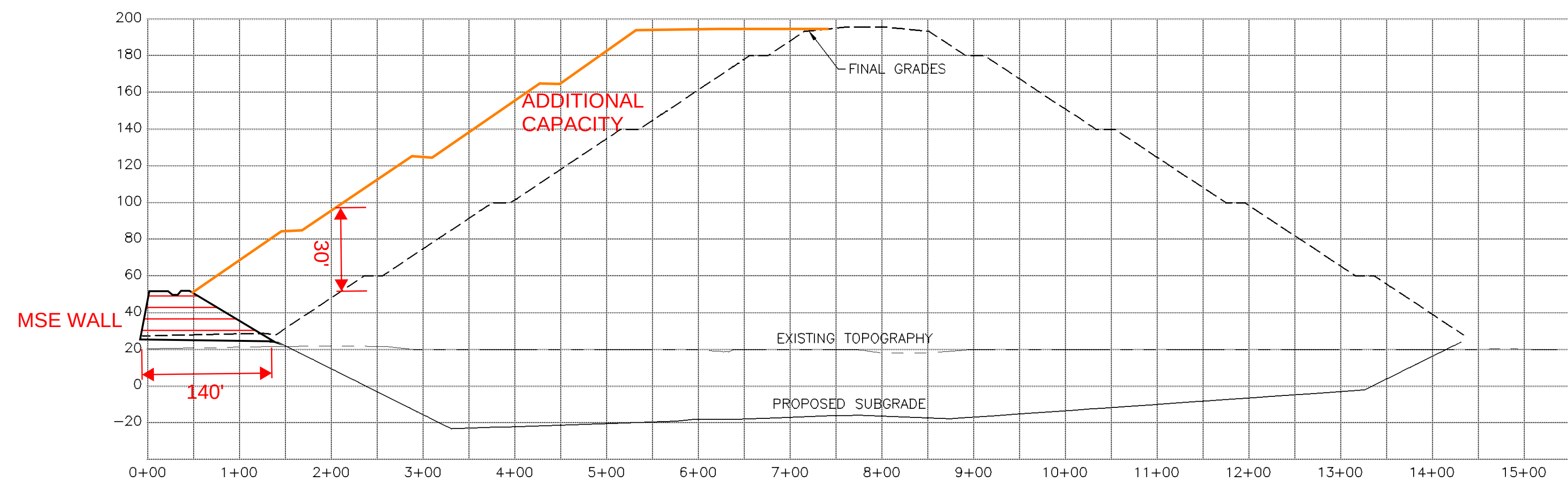
SCALE 1"=200'
SHEET




SECTION A
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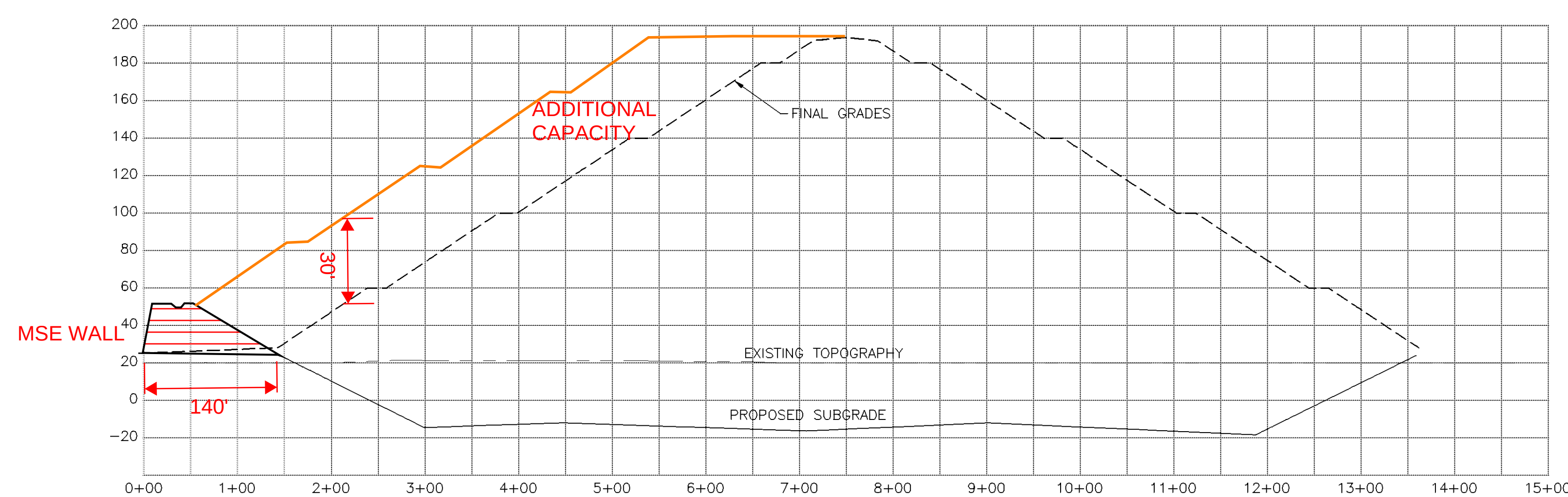
A C-09

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SPSA WASTE SOLUTIONS

**Regional Landfill**
Cells VIII & IX Expansion
On-site Alternatives

**SUFFOLK** **VIRGINIA**

CONSTRUCT 30' MSE WALL AROUND CELL V, VI AND VII

0 1" 2"

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SCALE AS SHOWN
SHEET **C-12**

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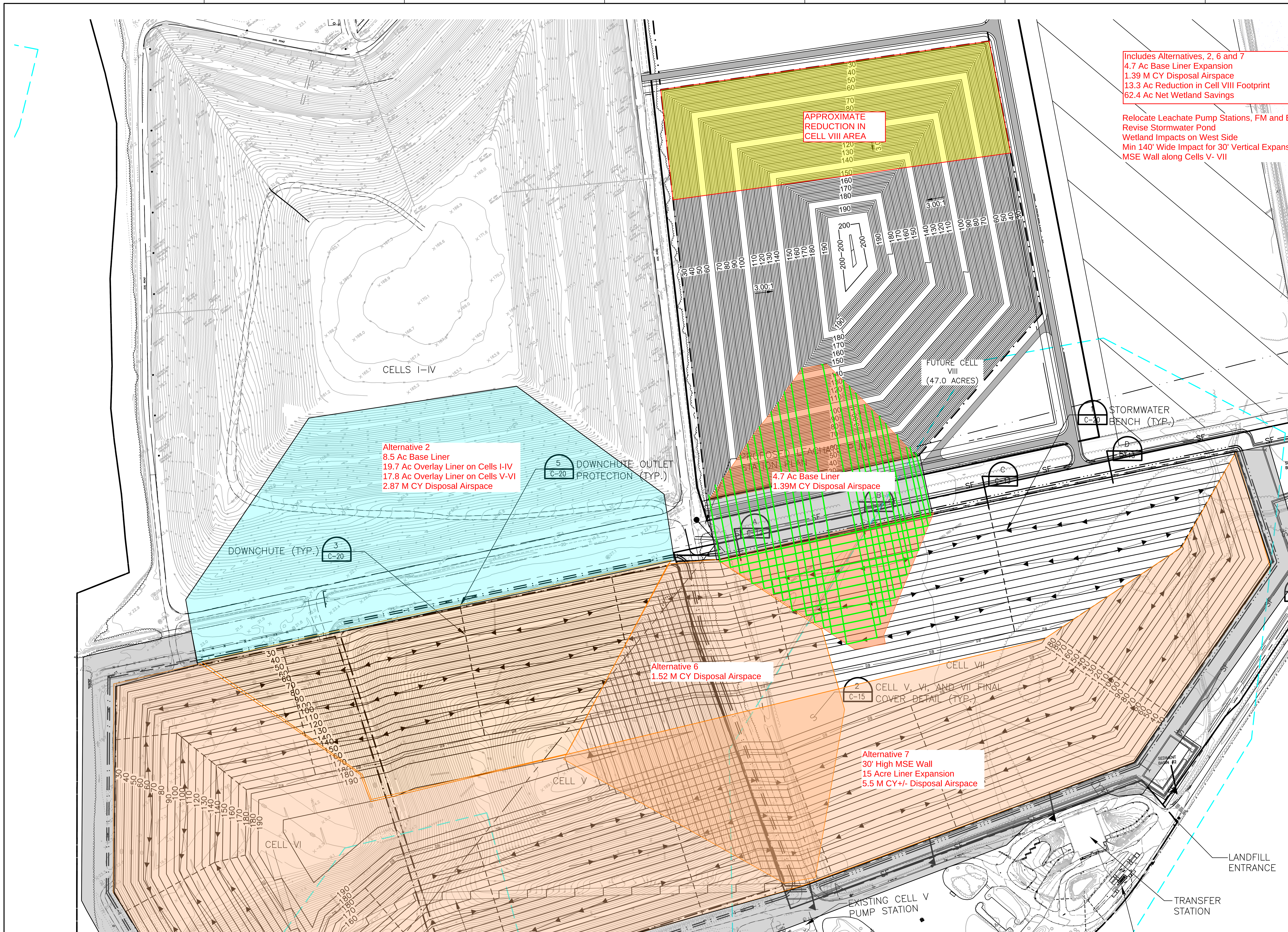


D C B A

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## LEGEND

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- PROPOSED MINOR CONTOURS
- 180 PROPOSED MAJOR CONTOURS
- CONSTRUCTION BASELINE
- FACILITY BOUNDARY
- SILT FENCE
- SIDESLOPE BENCH
- DOWNCHUTE
- PROPERTY BOUNDARY
- PERIMETER CHANNEL
- DIVERSION BERM
- CHESAPEAKE BAY PRESERVATION AREA
- STREAMS
- WETLAND PRESERVATION AREA
- 129–AC BOUNDARY LINE

HDR

| ISSUE | DATE | DESCRIPTION |
|---|---|---|

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| DESIGNED BY | |
| REVIEWED BY | |
| DRAWN BY | |
| PROJECT NUMBER | 10139129 |

SPSA WASTE SOLUTIONS

**Southeastern Public Service Authority**

Cells VIII & IX Expansion
On-site Alternatives

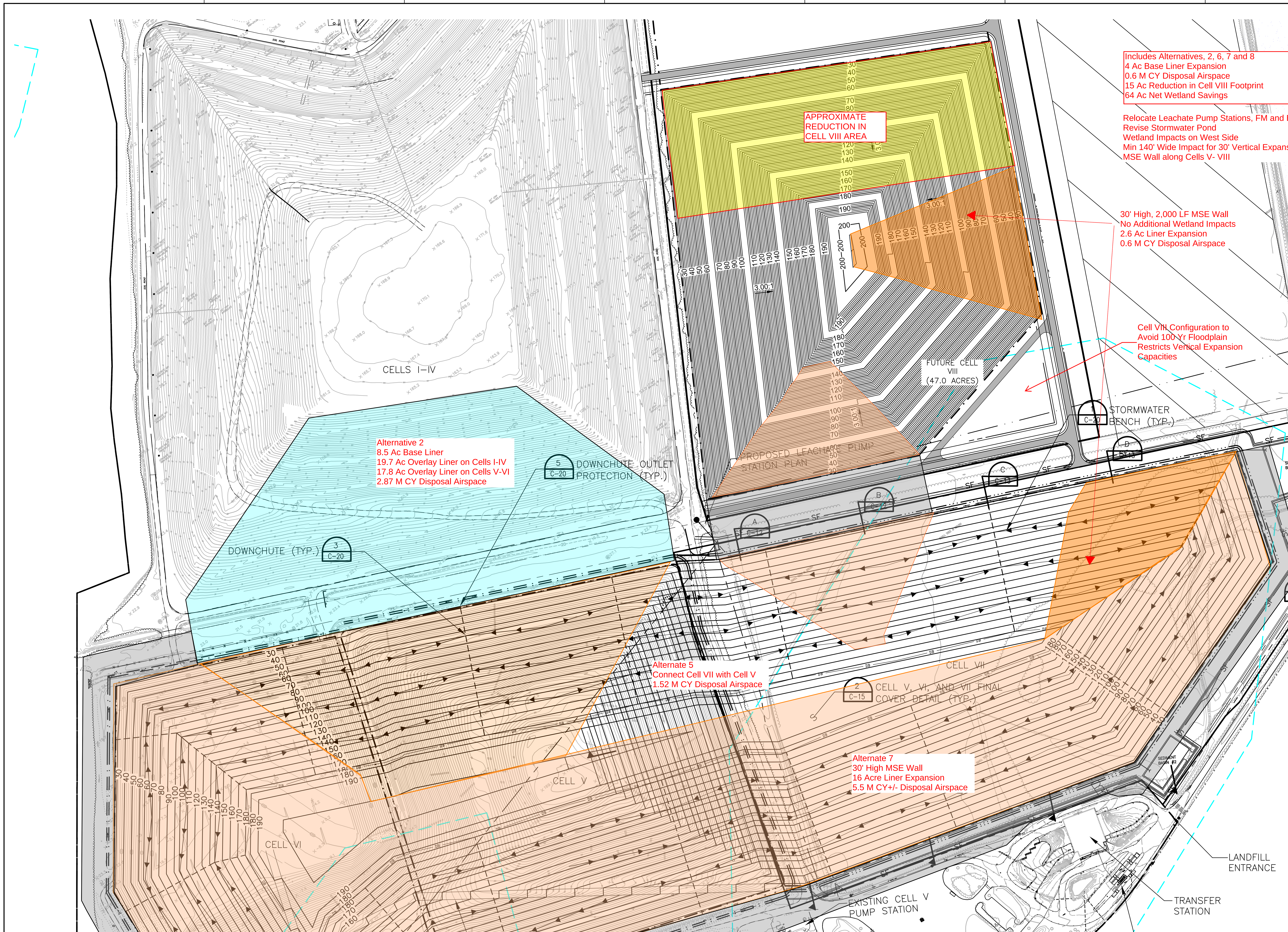
SUFFOLK VIRGINIA

RELOCATE GAS MAIN & CONSTRUCT 4.7 AC BASE LINER AREA IN FORMER EASEMENT

0 1" 2"

SCALE 1"=200'

SHEET 00C-13




## ES

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- WETLAND PRESERVATION AREA
- 129–AC BOUNDARY LINE

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| DESIGNED BY | |
| REVIEWED BY | |
| DRAWN BY | |
| PROJECT NUMBER | 10139129 |

| ISSUE | DATE | DESCRIPTION |
|---|---|---|

HDR

SPSA WASTE SOLUTIONS

**Southeastern Public Service Authority**

Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

RELOCATE GAS MAIN & CONSTRUCT 30' HIGH MSE WALL

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SCALE 1"=200'
SHEET 00C-13

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# B

# Appendix B Wetland Impacts and Avoidance Calculation Summary

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Wetlands Recovery

| # | OPTION | Disposal Volume (CY) | Area (AC)* | Wetland Impact (CY/AC) |
|---|---|---|---|---|
| 1 | Cells VIII and IX Expansion | 573,620 | 3.35 | 171,046 |
| | | *includes eastern berm and roadway | | |

| # | OPTION | Disposal Volume (CY) | Potential Wetland Savings (AC) | Additional Wetlands Impact (AC) | **Net Wetland Savings (AC)** | **Cell VIII & IX Total Area (AC)** | Notes |
|---|---|---|---|---|---|---|---|
| 2 | Relocate Natural Gas Main and Overlap onto Closed Cells I-IV | 2,870,000 | 16.8 | 0 | **16.8** | **76.12** | Cell IX reduced |
| 3 | MSE Wall Around South and West Boundary of Cells V & VI | 2,200,000 | 12.9 | 14.9 | **-2.0** | **80.04** | Cell IX reduced |
| 4 | MSE Wall and Gas Main Relocation and fill to 200’ | 5,200,000 | 30.4 | 14.9 | **15.5** | **62.50** | Cell IX reduced |
| 5 | MSE Wall and Gas Main Relocation and Fill to 240’ | 6,200,000 | 36.2 | 14.9 | **21.3** | **56.65** | Cell IX reduced |
| 6 | Capture Airspace Between Cell V and VII* | 1,520,000 | 8.9 | 0 | **8.9** | **84.01** | Cell IX reduced |
| 7 | MSE Wall Around Cells V, VI and VII | 5,500,000 | 32.2 | 14.9 | **17.3** | **60.74** | Cell IX not constructed, Cell VIII expanded |
| 8 | Construct Cell 8 and Overlap onto Cell VII with Gas Main Relocation | 16,000,000 | 93.5 | 72.1 | **62.4** | **33.72** | Cell IX not constructed, Cell VIII reduced |
| 9 | MSE Wall Around Cells V-VII and Gas Main Relocation and Fill to 200' | 16,000,000 | 93.5 | 74.1 | **64.1** | **32.02** | Cell IX not constructed, Cell VIII reduced |

*Already permitted

# C

## Appendix C Estimated Cost for Each Alternative

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## ALTERNATIVES SUMMARY

| # | Alternatives | Net Wetland Savings (AC) | Cells VIII/IX Total Area (AC) | Total Lined Area (AC) | Captial Cost ($) | Wetland Mitigation Cost ($) | Total Cost ($) | Deviation (%) | Net Cost per Acre of Net Wetland Savings ($/AC) | Reduction Volume of Cells VIII/IX (CY) | Total Cell Expansion Disposal Volume (CY) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cells VIII & IX Expansion | - | 92.9 | 92.9 | $72,659,120 | $7,141,800 | $79,800,920 | | - | - | 16,000,000 | Practicable<br>Conventional Design/Construction/Operation<br>Leachate Pump Depth Managable<br>Coordinates with Cell VII Operations<br>Generates Soil for Operation/Construction<br>Straight Forward Permitting/Above Confining Layer |
| 2 | Relocate Natural Gas Main and Overlap onto Closed Cells I-IV | 16.8 | 76.1 | 122.1 | $110,292,800 | $6,135,052 | $116,427,853 | 46% | $2,182,887 | 2,870,000 | 13,130,000 | Not Practicable<br>Relies on Cooperation of Columbia Gas<br>No Wetland Impact for 16.8 Ac of Savings<br>Significant Impacts to Leachate Collection and Maintenance<br>Impacts to LFG System Operation |
| 3 | MSE Wall Around South and West Boundary of Cells V & VI | -2.0 | 80.0 | 89.1 | $83,707,065 | $7,263,949 | $90,971,014 | 14% | - | 2,200,000 | 13,800,000 | Not Practicable<br>No Net Savings in Wetlands<br>Impacts to Leachate and Stormwater Infrastructure<br>Perimeter Access and Waste Filling Difficult<br>Loss of Operating Soil for MSE Wall Build |
| 4 | MSE Wall and Gas Main Relocation and fill to 200' | 15.5 | 62.5 | 99.7 | $120,746,295 | $6,211,599 | $126,957,895 | 59% | $3,041,729 | 5,200,000 | 10,800,000 | Not Practicable<br>Relies on Cooperation of Columbia Gas<br>Significant Impacts to Leachate and Stormwater Infrastructure<br>Perimeter Access and Waste Filling Difficult<br>Loss of Operating Soil for MSE Wall Build |
| 5 | MSE Wall and Gas Main Relocation and Fill to 240' | 21.3 | 56.7 | 93.9 | $116,173,599 | $5,860,816 | $122,034,415 | 53% | $1,978,175 | 6,200,000 | 9,800,000 | Not Practicable<br>Relies on Cooperation of Columbia Gas and FAA<br>Significant Impacts to Leachate and Stormwater Infrastructure<br>Perimeter Access and Waste Filling Difficult<br>Loss of Operating Soil for MSE Wall Build |
| 6 | Capture Airspace Between Cell V and VII | 8.9 | 84.0 | 89.4 | $70,959,178 | $6,608,610 | $77,567,788 | -3% | -$251,295 | 1,520,000 | 14,480,000 | Practicable<br>Permitted for Construction by DEQ<br>No Wetland Impact for 8.9 Ac of Savings<br>Impacts to Cell V Leachate and LFG |
| 7 | MSE Wall Around Cells V, VI and VII | 17.3 | 60.7 | 81.1 | $81,140,494 | $6,106,364 | $87,246,858 | 9% | $431,467 | 5,500,000 | 10,500,000 | Not Practicable<br>Impacts to Leachate and Stormwater Infrastructure<br>Complicated Permitting/Design and Operation<br>Impacts to Cell V Leachate and LFG<br>Loss of Operating Soil for MSE Wall Build |
| 8 | Construct Cell VIII and Overlap onto Cell VII with Gas Main Relocation | 62.4 | 33.7 | 87.0 | $115,632,709 | $3,396,142 | $119,028,850 | 49% | $628,374 | 9,760,000 | 6,240,000 | Not Practicable<br>Relies on Cooperation of Columbia Gas and FAA<br>Significant Impacts to Leachate and Stormwater Infrastructure<br>Little Overlap Available Due to Floodplain<br>Loss of Operating Soil for MSE Wall Build |
| 9 | MSE Wall Around Cells V-VII and Gas Main Relocation and Fill to 200' | 64.1 | 32.0 | 87.9 | $120,289,033 | $3,294,142 | $123,583,175 | 55% | $682,736 | 10,360,000 | 5,640,000 | Not Practicable<br>Relies on Cooperation of Columbia Gas<br>MSE Wall on Cell VII of Little Value<br>Impacts to Leachate and Stormwater Infrastructure<br>Loss of Operating Soil for MSE Wall Build |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Cell VII - Phase 1

| | | 30.8 Acre Cell | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | | TOTAL PRICE | | TOTAL PRICE/AC | |
| | | | | | | | | | |
| 1 | Mobilization | 4% | of WORK | | | $ | 628,185 | $ | 20,396 |
| 2 | Surveying and Control | 1 | LS | $ | 178,289 | $ | 178,289 | $ | 5,789 |
| 3 | Sedimentation & Erosion Control | 1 | LS | $ | 20,620 | $ | 20,620 | $ | 669 |
| 4 | Soil Excavation* | 945,000 | CY | $ | 4.62 | $ | 4,367,131 | $ | 141,790 |
| 5 | Undercut, Transport, Stockpile, and Backfill Unsuitable Soils | 17,040 | CY | $ | 12.65 | $ | 215,552 | $ | 6,998 |
| 6 | Structural Fill Placement | 19,790 | CY | $ | 6.59 | $ | 130,449 | $ | 4,235 |
| 7 | Geologic Buffer Layer | 49,667 | CY | $ | 10.99 | $ | 545,648 | $ | 17,716 |
| 8 | Geocomposite | 2,697,400 | SF | $ | 1.13 | $ | 3,048,068 | $ | 98,963 |
| 9 | 40-mil HDPE Geomembrane | 1,348,700 | SF | $ | 0.80 | $ | 1,079,524 | $ | 35,049 |
| 10 | 60-mil HDPE Geomembrane | 1,348,700 | SF | $ | 0.94 | $ | 1,397,689 | $ | 45,380 |
| 10 | GCL | 1,348,700 | SF | $ | 1.07 | $ | 1,587,811 | $ | 51,552 |
| 11 | Protective Cover Layer (Off-site) | 74,800 | CY | $ | 47.31 | $ | 3,538,760 | $ | 114,895 |
| 12 | 20-mil LLDPE Rain Cover | 674,350 | SF | $ | 0.71 | $ | 476,260 | $ | 15,463 |
| 13 | Groundwater Collection Trenches | 1 | LS | $ | 675,679 | $ | 675,679 | $ | 21,938 |
| 15 | Leachate Collection System | 1 | LS | $ | 1,798,222 | $ | 1,798,222 | $ | 58,384 |
| 16 | Cell VII Leachate Pump Station | 1 | LS | $ | 381,391 | $ | 381,391 | $ | 12,383 |
| 17 | Gravel Perimeter Road | 1 | LS | $ | 512,321 | $ | 512,321 | $ | 16,634 |
| 18 | Groundwater/Leachate Enclosures | 3 | EA | $ | 152,494 | $ | 457,482 | $ | 14,853 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 3 | EA | $ | 201,770 | $ | 605,309 | $ | 19,653 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 3 | EA | $ | 142,552 | $ | 427,656 | $ | 13,885 |
| 21 | Leachate Tanks | 2 | EA | $ | 1,224,169 | $ | 2,448,339 | $ | 79,492 |
| 22 | Relocate Cell V-2 Pump Station | 1 | LS | $ | 349,987 | $ | 349,987 | $ | 11,363 |
| 23 | Site & Misc. | 1 | LS | $ | 15,427 | $ | 15,427 | $ | 501 |
| | | | | | **TOTAL** | **$** | **24,885,800** | **$** | **807,981** |

*Total excavation quantity remaining for Cell VII is 1.89M CY as of March 2016. We have assumed that 1.5M CY excavation will be funded through the Cell VII construction contracts
Inflation Adjustment 2018 to 2022 is 1.1013 per VDEQ

# Engineering Opinion of Probable Construction Cost

## SPSA Regional Landfill

### Cell VII - Phase 2

| | | 25.3 | Acre Cell | | | |
|---|---|---|---|---|---|---|
| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | TOTAL PRICE | TOTAL PRICE/AC |
| | | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 464,353 | $ 18,354 |
| 2 | Surveying and Control | 1 | LS | $ 138,343 | $ 138,343 | $ 5,468 |
| 3 | Sedimentation & Erosion Control | 1 | LS | $ 7,216 | $ 7,216 | $ 285 |
| 4 | Soil Excavation* | 555,000 | CY | $ 4.68 | $ 2,597,640 | $ 102,674 |
| 5 | Undercut, Transport, Stockpile, and Backfill Unsuitable Soils | 12,960 | CY | $ 12.55 | $ 162,691 | $ 6,430 |
| 6 | Structural Fill Placement | 14,256 | CY | $ 6.55 | $ 93,361 | $ 3,690 |
| 7 | Geologic Buffer Layer | 37,775 | CY | $ 10.89 | $ 411,297 | $ 16,257 |
| 8 | Geocomposite | 2,199,870 | SF | $ 1.15 | $ 2,536,133 | $ 100,242 |
| 9 | 40-mil HDPE Geomembrane | 1,099,935 | SF | $ 0.82 | $ 898,214 | $ 35,503 |
| 10 | 60-mil HDPE Geomembrane | 1,099,935 | SF | $ 0.96 | $ 1,162,904 | $ 45,965 |
| 10 | GCL | 1,099,935 | SF | $ 1.09 | $ 1,320,381 | $ 52,189 |
| 11 | Protective Cover Layer (Off-site) | 61,100 | CY | $ 48.15 | $ 2,941,935 | $ 116,282 |
| 12 | 20-mil LLDPE Rain Cover | 549,968 | SF | $ 0.72 | $ 396,271 | $ 15,663 |
| 13 | Groundwater Collection Trenches | 1 | LS | $ 503,854 | $ 503,854 | $ 19,915 |
| 15 | Leachate Collection System | 1 | LS | $ 1,150,952 | $ 1,150,952 | $ 45,492 |
| 16 | Cell VII Leachate Pump Station | 0 | LS | - | $ - | $ - |
| 17 | Gravel Perimeter Road | 0 | LS | - | $ - | $ - |
| 18 | Groundwater/Leachate Enclosures | 2 | EA | $ 151,455 | $ 302,909 | $ 11,973 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 2 | EA | $ 222,710 | $ 445,421 | $ 17,606 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 2 | EA | $ 200,907 | $ 401,814 | $ 15,882 |
| 21 | Leachate Tanks | 0 | EA | - | $ - | $ - |
| 22 | Relocate Cell V-2 Pump Station | 0 | LS | - | $ - | $ - |
| 23 | Site & Misc. | 0 | LS | - | $ - | $ - |
| | | | | **TOTAL** | **$ 15,935,686** | **$ 629,869** |

*Total excavation quantity remaining for Cell VII is 1.89M CY
as of March 2016. We have assumed that 1.5M CY excavation
will be funded through the Cell VII construction contracts
Inflation Adjustment 2018 to 2022 is 1.1013 per VDEQ

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Cell VII - Average of Phases 1 & 2

| | ITEM DESCRIPTION | UNIT PRICE PHASE 1 | UNIT PRICE PHASE 2 | AVG UNIT PRICE | TOTAL PRICE/AC PHASE 1 | TOTAL PRICE/AC PHASE 2 | AVERAGE TOTAL PRICE/AC - ADJUSTED FOR INFLATION |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | Mobilization | | | | $ 20,396 | $ 18,354 | $ 19,375 |
| 2 | Surveying and Control | $ 178,289 | $ 138,343 | $ 158,316 | $ 5,789 | $ 5,468 | $ 5,628 |
| 3 | Sedimentation & Erosion Control | $ 20,620 | $ 7,216 | $ 13,918 | $ 669 | $ 285 | $ 477 |
| 4 | Soil Excavation* | $ 4.62 | $ 4.68 | $ 4.65 | $ 141,790 | $ 102,674 | $ 122,232 |
| 5 | Undercut, Transport, Stockpile, and Backfill Unsuitable Soils | $ 12.65 | $ 12.55 | $ 12.60 | $ 6,998 | $ 6,430 | $ 6,714 |
| 6 | Structural Fill Placement | $ 6.59 | $ 6.55 | $ 6.57 | $ 4,235 | $ 3,690 | $ 3,963 |
| 7 | Geologic Buffer Layer | $ 10.99 | $ 10.89 | $ 10.94 | $ 17,716 | $ 16,257 | $ 16,986 |
| 8 | Geocomposite | $ 1.13 | $ 1.15 | $ 1.14 | $ 98,963 | $ 100,242 | $ 99,603 |
| 9 | 40-mil HDPE Geomembrane | $ 0.80 | $ 0.82 | $ 0.81 | $ 35,049 | $ 35,503 | $ 35,276 |
| 10 | 60-mil HDPE Geomembrane | $ 0.94 | $ 0.96 | $ 0.95 | $ 45,380 | $ 45,965 | $ 45,672 |
| 10 | GCL | $ 1.07 | $ 1.09 | $ 1.08 | $ 51,552 | $ 52,189 | $ 51,871 |
| 11 | Protective Cover Layer (Off-site) | $ 47.31 | $ 48.15 | $ 47.73 | $ 114,895 | $ 116,282 | $ 115,588 |
| 12 | 20-mil LLDPE Rain Cover | $ 0.71 | $ 0.72 | $ 0.71 | $ 15,463 | $ 15,663 | $ 15,563 |
| 13 | Groundwater Collection Trenches | $ 675,679 | $ 503,854 | $ 589,767 | $ 21,938 | $ 19,915 | $ 20,926 |
| 15 | Leachate Collection System | $ 1,798,222 | $ 1,150,952 | $ 1,474,587 | $ 58,384 | $ 45,492 | $ 51,938 |
| 16 | Cell VII Leachate Pump Station | $ 381,391 | $ - | $ 190,696 | $ 12,383 | $ - | $ 6,191 |
| 17 | Gravel Perimeter Road | $ 512,321 | $ - | $ 256,161 | $ 16,634 | $ - | $ 8,317 |
| 18 | Groundwater/Leachate Enclosures | $ 152,494 | $ 151,455 | $ 151,974 | $ 14,853 | $ 11,973 | $ 13,413 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | $ 201,770 | $ 222,710 | $ 212,240 | $ 19,653 | $ 17,606 | $ 18,629 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | $ 142,552 | $ 200,907 | $ 171,729 | $ 13,885 | $ 15,882 | $ 14,883 |
| 21 | Leachate Tanks | $ 1,224,169 | $ - | $ 612,085 | $ 79,492 | $ - | $ 39,746 |
| 22 | Relocate Cell V-2 Pump Station | $ 349,987 | $ - | $ 174,993 | $ 11,363 | $ - | $ 5,682 |
| 23 | Site & Misc. | $ 15,427 | $ - | $ 7,714 | $ 501 | $ - | $ 250 |
| | | | | | | **TOTAL ($/AC)** | **$ 718,925** |

Inflation Adjustment 2018 to 2022 is 1.1013 per VDEQ

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Cell VIII Construction

| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | TOTAL PRICE |
|---|---|---|---|---|---|
| | | 47.0 | Acre Cell | | |
| 1 | Mobilization | 4% | of WORK | | $ 1,285,336 |
| 2 | Surveying and Control | 47.0 | AC | $ 5,628 | $ 264,533 |
| 3 | Sedimentation & Erosion Control | 47.0 | AC | $ 477 | $ 22,435 |
| 4 | Soil Excavation* | 837,377 | CY | $ 4.65 | $ 3,894,527 |
| 5 | Undercut, Transport, Stockpile, and Backfill Unsuitable Soils | 10,000 | CY | $ 12.60 | $ 126,015 |
| 6 | Structural Fill Placement | 30,000 | CY | $ 6.57 | $ 197,108 |
| 7 | Geologic Buffer Layer | 189,659 | CY | $ 10.94 | $ 2,074,319 |
| 8 | Geocomposite | 4,094,640 | SF | $ 1.14 | $ 4,673,741 |
| 9 | 40-mil HDPE Geomembrane | 2,047,320 | SF | $ 0.81 | $ 1,655,283 |
| 10 | 60-mil HDPE Geomembrane | 2,047,320 | SF | $ 0.95 | $ 1,945,978 |
| 10 | GCL | 2,047,320 | SF | $ 1.08 | $ 2,210,082 |
| 11 | Protective Cover Layer (Off-site) | 113,740 | CY | $ 47.73 | $ 5,428,761 |
| 12 | 20-mil LLDPE Rain Cover | 2,047,320 | SF | $ 0.71 | $ 1,460,543 |
| 13 | Groundwater Collection Trenches | 47.0 | AC | $ 20,926 | $ 983,541 |
| 15 | Leachate Collection System | 47.0 | AC | $ 51,938 | $ 2,441,087 |
| 16 | Leachate Pump Station | 47.0 | AC | $ 6,191 | $ 290,997 |
| 17 | Gravel Perimeter Road | 47.0 | AC | $ 8,317 | $ 390,895 |
| 18 | Groundwater/Leachate Enclosures | 47.0 | AC | $ 13,413 | $ 630,411 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 47.0 | AC | $ 18,629 | $ 875,573 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 47.0 | AC | $ 14,883 | $ 699,522 |
| 21 | Leachate Tanks | 47.0 | AC | $ 39,746 | $ 1,868,051 |
| | *Assumes 50% of total excavation of required is remaining to be completed at the time construction commences. | | | **SUBTOTAL** | **$ 33,418,737** |
| | | | | **10% PERMITTING AND DESIGN CONTINGENCY** | **$ 3,341,874** |
| | | | | **TOTAL** | **$ 36,760,611** |
| | | | | **COST PER ACRE** | **$ 782,141** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alternative 2 - Base Liner

| | | 8.5 Acre | | | | |
|---|---|---|---|---|---|---|
| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | TOTAL PRICE | TOTAL PRICE (w/o Gas Main Relocation) |
| | | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 980,689 | $ 270,894 |
| 2 | Surveying and Control | 8.5 | AC | $ 5,628 | $ 47,841 | $ 47,841 |
| 3 | Sedimentation & Erosion Control | 8.5 | AC | $ 477 | $ 4,057 | $ 4,057 |
| 4 | Soil Excavation | 137,133 | CY | $ 4.65 | $ 637,789 | $ 637,789 |
| 5 | Undercut, Transport, Stockpile, and Backfill Unsuitable Soils | 8.5 | AC | $ 6,714 | $ 57,073 | $ 57,073 |
| 6 | Structural Fill Placement | 8.5 | AC | $ 3,963 | $ 33,683 | $ 33,683 |
| 7 | Geologic Buffer Layer | 8.5 | AC | $ 16,986 | $ 144,384 | $ 144,384 |
| 8 | Geocomposite | 8.5 | AC | $ 99,603 | $ 846,624 | $ 846,624 |
| 9 | 40-mil HDPE Geomembrane | 8.5 | AC | $ 35,276 | $ 299,846 | $ 299,846 |
| 10 | 60-mil HDPE Geomembrane | 8.5 | AC | $ 45,672 | $ 388,212 | $ 388,212 |
| 10 | GCL | 8.5 | AC | $ 51,871 | $ 440,900 | $ 440,900 |
| 11 | Protective Cover Layer (Off-site) | 8.5 | AC | $ 115,588 | $ 982,501 | $ 982,501 |
| 12 | 20-mil LLDPE Rain Cover | 8.5 | AC | $ 15,563 | $ 132,285 | $ 132,285 |
| 13 | Groundwater Collection Trenches | 8.5 | AC | $ 20,926 | $ 177,874 | $ 177,874 |
| 15 | Leachate Collection System | 8.5 | AC | $ 51,938 | $ 441,473 | $ 441,473 |
| 18 | Groundwater/Leachate Enclosures | 1 | EA | $ 151,974 | $ 151,974 | $ 151,974 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 1 | EA | $ 212,240 | $ 212,240 | $ 212,240 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 1 | EA | $ 171,729 | $ 171,729 | $ 171,729 |
| 22 | Relocate Cell V-4 & Cell VI-8 Pump Stations | 2 | EA | $ 349,987 | $ 699,973 | $ 699,973 |
| 22 | Relocate Electrical/Comm Infrastrucutre | 1 | LS | $ 899,769 | $ 899,769 | $ 899,769 |
| 24 | Site & Misc. | 8.5 | AC | $ 250 | $ 2,129 | $ 2,129 |
| 25 | Gas Main Transmission Line Relocation | 1 | LS | $ 17,744,868 | $ 17,744,868 | $ - |
| | | | | **SUBTOTAL** | **$ 25,497,916** | **$ 7,043,253** |
| | **25% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | | | | **$ 6,374,479** | **$ 1,760,813** |
| | | | | **TOTAL** | **$ 31,872,395** | **$ 8,804,066** |
| | | | | **COST PER ACRE** | **$ 3,749,694** | **$ 1,035,773** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alternative 2 - Overlay Liner

| | | 19.7 | Acre | | |
|---|---|---|---|---|---|
| | **ITEM DESCRIPTION** | **QUANTITY** | **UNIT** | **UNIT PRICE** | **TOTAL PRICE** |
| | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 355,608 |
| 2 | Surveying and Control | 19.7 | AC | $ 5,628 | $ 110,879 |
| 3 | Sedimentation & Erosion Control | 1 | LS | $ 50,000 | $ 50,000 |
| 4 | Soil Excavation | 63,565 | CY | $ 4.65 | $ 295,634 |
| 8 | Geocomposite | 858,132 | SF | $ 1.14 | $ 979,497 |
| 10 | 60-mil HDPE Geomembrane | 858,132 | SF | $ 0.95 | $ 815,654 |
| 10 | GCL | 858,132 | SF | $ 1.08 | $ 926,353 |
| 11 | Protective Cover Layer (Off-site) | 47,674 | CY | $ 47.73 | $ 2,275,459 |
| 12 | 20-mil LLDPE Rain Cover | 858,132 | SF | $ 0.71 | $ 612,185 |
| 15 | Leachate Collection System | 19.7 | AC | $ 51,938 | $ 1,023,179 |
| 18 | Groundwater/Leachate Enclosures | 2 | EA | $ 151,974 | $ 303,949 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 2 | EA | $ 212,240 | $ 424,480 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 2 | EA | $ 171,729 | $ 343,459 |
| 21 | Leachate Tanks | 1 | EA | $ 306,042 | $ 306,042 |
| 24 | Landfill Gas Modification | 1 | LS | $ 423,421 | $ 423,421 |
| | | | | **SUBTOTAL** | **$ 9,245,799** |
| | **25% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | | | | **$ 2,311,450** |
| | | | | **TOTAL** | **$ 11,557,249** |
| | | | | **COST PER ACRE** | **$ 586,662** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alternative 2 - Overlay Liner on V and VI

| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | TOTAL PRICE |
|---|---|---|---|---|---|
| | | 17.8 | Acre | | |
| 1 | Mobilization | 4% | of WORK | | $ 252,767 |
| 2 | Surveying and Control | 17.8 | AC | $ 5,628 | $ 100,185 |
| 3 | Sedimentation & Erosion Control | 1 | LS | $ 50,000 | $ 50,000 |
| 4 | Soil Excavation | 0 | CY | $ 4.65 | $ - |
| 8 | Geocomposite | 775,368 | SF | $ 1.14 | $ 885,028 |
| 10 | 60-mil HDPE Geomembrane | 775,368 | SF | $ 0.95 | $ 736,987 |
| 10 | GCL | 775,368 | SF | $ 1.08 | $ 837,010 |
| 11 | Protective Cover Layer (Off-site) | 43,076 | CY | $ 47.73 | $ 2,055,999 |
| 12 | 20-mil LLDPE Rain Cover | 0 | SF | $ 0.71 | $ - |
| 15 | Leachate Collection System | 17.8 | AC | $ 51,938 | $ 924,497 |
| 18 | Groundwater/Leachate Enclosures | 0 | EA | $ 151,974 | $ - |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 0 | EA | $ 212,240 | $ - |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 0 | EA | $ 171,729 | $ - |
| 21 | Leachate Tanks | 1 | EA | $ 306,042 | $ 306,042 |
| 24 | Landfill Gas Modification | 1 | LS | $ 423,421 | $ 423,421 |
| | | | | **SUBTOTAL** | **$ 6,571,935** |
| | | | | **25% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | **$ 1,642,984** |
| | | | | **TOTAL** | **$ 8,214,918** |
| | | | | **COST PER ACRE** | **$ 461,512** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alernative 3 - MSE Wall Southern and Western Berm

| | | 9.0 | Acre | | |
|---|---|---|---|---|---|
| | **ITEM DESCRIPTION** | **QUANTITY** | **UNIT** | **UNIT PRICE** | **TOTAL PRICE** |
| | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 624,493 |
| 2 | Surveying and Control | 9.0 | AC | $ 5,628 | $ 50,737 |
| 3 | Sedimentation & Erosion Control | 1 | LS | $ 200,000 | $ 200,000 |
| 7 | Geologic Buffer Layer | 14,543 | CY | $ 10.94 | $ 159,062 |
| 10 | 60-mil HDPE Geomembrane | 392,670 | SF | $ 0.95 | $ 373,233 |
| 10 | GCL | 392,670 | SF | $ 1.08 | $ 423,887 |
| 11 | Protective Cover Layer (Off-site) | 21,815 | CY | $ 47.73 | $ 1,041,220 |
| 12 | 20-mil LLDPE Rain Cover | 392,670 | SF | $ 0.71 | $ 280,128 |
| 15 | Leachate Collection System | 9.0 | AC | $ 51,938 | $ 468,193 |
| 18 | Groundwater/Leachate Enclosures | 5 | EA | $ 151,974 | $ 759,872 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 5 | EA | $ 212,240 | $ 1,061,200 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 5 | EA | $ 171,729 | $ 858,647 |
| 22 | Relocate Electical/Comm Infrastructure | 1 | LS | $ 1,058,552 | $ 1,058,552 |
| 24 | MSE Wall Materials (per SF of wall face) | 130,890 | SF | $ 21.17 | $ 2,771,077 |
| 25 | MSE Wall Labor | 130,890 | SF | $ 21.17 | $ 2,771,077 |
| 26 | MSE Wall Structural Fill | 445,996 | CY | $ 6.35 | $ 2,832,657 |
| 27 | MSE Wall Access Road | 9,696 | SY | $ 11.52 | $ 111,664 |
| 28 | MSE Wall Guard Rail | 4,363 | LF | $ 47.32 | $ 206,445 |
| 29 | MSE Wall Seeding | 3.00 | AC | $ 1,694 | $ 5,089 |
| 30 | MSE Wall Catch Basin | 5 | EA | $ 17,373 | $ 86,865 |
| 31 | MSE Wall Drainage Pipe | 400 | LF | $ 232 | $ 92,729 |
| | | | | **SUBTOTAL** | **$ 16,236,829** |
| | **30% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | | | | **$ 4,871,049** |
| | | | | **TOTAL** | **$ 21,107,877** |
| | | | | **COST PER ACRE** | **$ 2,341,557** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alternative 7 - MSE Wall Cells V-VII

| | | 15.0 | Acre | | |
|---|---|---|---|---|---|
| | ITEM DESCRIPTION | QUANTITY | UNIT | UNIT PRICE | TOTAL PRICE |
| | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 839,664 |
| 2 | Surveying and Control | 15.0 | AC | $ 5,628.36 | $ 84,565 |
| 3 | Sedimentation & Erosion Control | 15.0 | AC | $ 477.34 | $ 7,172 |
| 7 | Geologic Buffer Layer | 24,240 | CY | $ 10.94 | $ 265,115 |
| 10 | 60-mil HDPE Geomembrane | 654,480 | SF | $ 0.95 | $ 622,083 |
| 10 | GCL | 654,480 | SF | $ 1.08 | $ 706,511 |
| 11 | Protective Cover Layer (Off-site) | 36,360 | CY | $ 47.73 | $ 1,735,447 |
| 12 | 20-mil LLDPE Rain Cover | 654,480 | SF | $ 0.71 | $ 466,901 |
| 15 | Leachate Collection System | 15.0 | AC | $ 51,938.01 | $ 780,358 |
| 18 | Groundwater/Leachate Enclosures | 5 | EA | $ 151,974.35 | $ 759,872 |
| 19 | Groundwater/Leachate Pumps & Controls/SCADA | 5 | EA | $ 212,239.97 | $ 1,061,200 |
| 20 | Groundwater/Leachate Enclosure Electrical Controls | 5 | EA | $ 171,729.38 | $ 858,647 |
| 22 | Relocate Electical/Comm Infrastructure | 1 | LS | $ 1,058,552.00 | $ 1,058,552 |
| 24 | MSE Wall Materials (per SF of wall face) | 218,160 | SF | $ 16.05 | $ 3,500,955 |
| 25 | MSE Wall Labor | 218,160 | SF | $ 16.05 | $ 3,500,955 |
| 26 | MSE Wall Structural Fill | 743,360 | CY | $ 6.35 | $ 4,721,311 |
| 27 | MSE Wall Access Road | 16,160 | SY | $ 11.52 | $ 186,115 |
| 28 | MSE Wall Guard Rail | 7,272 | LF | $ 47.32 | $ 344,091 |
| 29 | MSE Wall Seeding | 5.01 | AC | $ 1,693.68 | $ 8,482 |
| 30 | MSE Wall Catch Basin | 9 | EA | $ 17,372.96 | $ 156,357 |
| 31 | MSE Wall Drainage Pipe | 720 | LF | $ 231.82 | $ 166,912 |
| | | | | **SUBTOTAL** | **$ 21,831,267** |
| | | | | **30% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | **$ 6,549,380** |
| | | | | **TOTAL** | **$ 28,380,647** |
| | | | | **COST PER ACRE** | **$ 1,888,921** |

# Engineering Opinion of Probable Construction Cost
## SPSA Regional Landfill
### Alternative 9 - MSE Wall Cell VIII

| | | 2.6 | Acre | | |
|---|---|---|---|---|---|
| | **ITEM DESCRIPTION** | **QUANTITY** | **UNIT** | **UNIT PRICE** | **TOTAL PRICE** |
| | | | | | |
| 1 | Mobilization | 4% | of WORK | | $ 177,100 |
| 2 | Surveying and Control | 2.6 | AC | $ 5,628 | $ 14,652 |
| 3 | Sedimentation & Erosion Control | 2.6 | AC | $ 477 | $ 1,243 |
| 7 | Geologic Buffer Layer | 4,200 | CY | $ 10.94 | $ 45,936 |
| 10 | 60-mil HDPE Geomembrane | 113,400 | SF | $ 0.95 | $ 107,787 |
| 10 | GCL | 113,400 | SF | $ 1.08 | $ 122,415 |
| 11 | Protective Cover Layer (Off-site) | 6,300 | CY | $ 47.73 | $ 300,696 |
| 12 | 20-mil LLDPE Rain Cover | 113,400 | SF | $ 0.71 | $ 80,899 |
| 15 | Leachate Collection System | 2.6 | AC | $ 51,938 | $ 135,211 |
| 24 | MSE Wall Materials (per SF of wall face) | 60,000 | SF | $ 16.05 | $ 962,859 |
| 25 | MSE Wall Labor | 60,000 | SF | $ 16.05 | $ 962,859 |
| 26 | MSE Wall Structural Fill | 231,911 | CY | $ 6.35 | $ 1,472,940 |
| 27 | MSE Wall Access Road | 4,444 | SY | $ 11.52 | $ 51,187 |
| 28 | MSE Wall Guard Rail | 2,000 | LF | $ 47.32 | $ 94,635 |
| 29 | MSE Wall Seeding | 1.38 | AC | $ 1,694 | $ 2,333 |
| 30 | MSE Wall Catch Basin | 2 | EA | $ 17,373 | $ 34,746 |
| 31 | MSE Wall Drainage Pipe | 160 | LF | $ 232 | $ 37,092 |
| | | | | **SUBTOTAL** | **$ 4,604,587** |
| | | | | **30% ENGINEERING & PROJECT CONSTRUCTION CONTINGENCY** | **$ 1,381,376** |
| | | | | **TOTAL** | **$ 5,985,964** |
| | | | | **COST PER ACRE** | **$ 2,299,370** |

## ALTERNATIVE 1 - Cells VIII & IX Expansion

| | Components | Lined Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 92.9 | $782,141 | $72,659,120 | | $4.54 |
| | Wetland Mitigation | 238.1 | $30,000 | $7,141,800 | | $0.45 |
| | **TOTAL** | | | **$79,800,920** | **16,000,000** | **$4.99** |

Total Wetland Impact Assumed 119.03 AC
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio

## ALTERNATIVE 2 - Relocate Natural Gas Main and Overlap onto Closed Cells I-IV

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 76.1 | $782,141 | $59,535,482 | 13,130,000 | $4.53 |
| Alt. 2 | Gas Main Relocation | | | $22,181,085 | | $7.73 |
| Alt. 2 | Base Liner | 8.5 | $1,035,773 | $8,804,066 | | |
| Alt. 2 | Overlay Liner I - IV | 19.7 | $586,662 | $11,557,249 | 2,870,000 | $9.96 |
| Alt. 2 | Overlay Liner V - VI | 17.8 | $461,512 | $8,214,918 | | |
| | *Total Lined Acres* | *122.1* | | | | |
| | Wetland Mitigation | 204.5 | $30,000 | $6,135,052 | | $0.38 |
| | **TOTAL** | | | **$116,427,853** | **16,000,000** | **$7.28** |

**Assumptions:**

8.5 AC Base Liner
19.7 AC Overlay Liner on Cells I - IV
17.8 AC Overlay Liner on Cells V - VI
2.87 MCY Disposal Airspace
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio
Relocate Gas Main
Relocate Leachate Pump Stations and Electrical/Comm (covered in Base Liner cost est.)
Relocate LFG Infrastructure (Covered in Overlay Cost est)

## ALTERNATIVE 3 - MSE Wall Around S and W Boundary of Cells V & VI

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 80.0 | $782,141 | $62,599,188 | 13,800,000 | $4.54 |
| Alt. 3 | MSE Wall - S&W | 9.0 | $2,341,557 | $21,107,877 | 2,200,000 | $9.59 |
| | *Total Lined Acres* | *89.1* | | | | |
| | Wetland Mitigation | 242.1 | $30,000 | $7,263,949 | | $0.45 |
| | **TOTAL** | | | **$90,971,014** | **16,000,000** | **$5.69** |

**Assumptions:**
30' High MSE Wall
9.0 AC Liner Expansion
2.2 MCY Disposal Airspace
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio
Relocate Leachate Pump Stations, FM and Electric (covered in MSE Wall)
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion

**ALTERNATIVE 4 - MSE Wall and Gas Main Relocation and fill to 200’**

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 62.5 | $782,141 | $48,881,100 | 10,800,000 | $4.53 |
| Alt. 2 | Gas Main Relocation | | | $22,181,085 | | $7.73 |
| Alt. 2 | Base Liner | 8.5 | $1,035,773 | $8,804,066 | | |
| Alt. 2 | Overlay Liner I - IV | 19.7 | $586,662 | $11,557,249 | 2,870,000 | $9.96 |
| Alt. 2 | Overlay Liner V - VI | 17.8 | $461,512 | $8,214,918 | | |
| Alt. 3 | MSE Wall - S&W | 9.0 | $2,341,557 | $21,107,877 | 2,330,000 | $9.06 |
| | *Total Lined Acres* | *117.5* | | | | |
| | Wetland Mitigation | 207.1 | $30,000 | $6,211,599 | | $0.39 |
| | **TOTAL** | | | **$126,957,895** | **16,000,000** | **$7.93** |

**Assumptions:**
8.5 AC Base Liner
19.7 AC Overlay Liner on Cells I - IV
17.8 AC Overlay Liner on Cells V - VI
30' High MSE Wall
9.0 AC Liner Expansion
5.2 M CY Total Disposal Capacity Provided
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio

Relocate Gas Main
Relocate Leachate Pump Stations, FM and Electric (covered in MSE Wall)
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion

**ALTERNATIVE 5 - MSE Wall and Gas Main Relocation and Fill to 240'**

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 56.7 | $782,141 | $44,308,403 | 9,800,000 | $4.52 |
| Alt. 2 | Gas Main Relocation | | | $22,181,085 | | $7.73 |
| Alt. 2 | Base Liner | 8.5 | $1,035,773 | $8,804,066 | | |
| Alt. 2 | Overlay Liner I - IV | 19.7 | $586,662 | $11,557,249 | 2,870,000 | $9.96 |
| Alt. 2 | Overlay Liner V - VI | 17.8 | $461,512 | $8,214,918 | | |
| Alt. 3 | MSE Wall - S&W | 9.0 | $2,341,557 | $21,107,877 | 3,330,000 | $6.34 |
| | *Total Lined Acres* | *111.7* | | | | |
| | Wetland Mitigation | 195.4 | $30,000 | $5,860,816 | | $0.37 |
| | **TOTAL** | | | **$122,034,415** | **16,000,000** | **$7.63** |

**Assumptions:**
8.5 AC Base Liner
19.7 AC Overlay Liner on Cells I - IV
17.8 AC Overlay Liner on Cells V - VI
30' High MSE Wall
9.0 AC Liner Expansion
6.2 MCY Disposal Airspace Provided
Requires FAA Approval
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio

Relocate Gas Main
Relocate Leachate Pump Stations, FM and Electric (covered in MSE Wall)
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion
Max. Height of 240' Based on Geometry (would require FAA approval)

## ALTERNATIVE 6 - Capture Airspace Between Cell V and VII

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 84.0 | $782,141 | $65,708,622 | 14,480,000 | $4.54 |
| Alt. 6 | Base Liner | 5.35 | $800,516 | $ 4,282,762 | | |
| Alt. 6 | Relocate Infrastructure | | | $650,000 | 1,520,000 | $3.45 |
| Alt. 6 | Relocate Pump Station V-2 | | | $317,794 | | |
| | *Total Lined Acres* | *89.4* | | | | |
| | Wetland Mitigation | 220.3 | $30,000 | $6,608,610 | | $0.41 |
| | **TOTAL** | | | **$ 77,567,788** | **16,000,000** | **$4.85** |

**Assumptions:**

1.52 M CY Disposal Airspace Provided
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio
Base Liner Costs from Alternative 2 without LFG or pump station relocation
Relocate Cell V Leachate Pump Station
Relocate Electrical Infrastructure

**ALTERNATIVE 7 - MSE Wall Around Cells V, VI and VII**

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cells VIII & IX Construction | 60.7 | $782,141 | $47,509,291 | 10,500,000 | $4.52 |
| Alt. 6 | Base Liner | 5.35 | $800,516 | $4,282,762 | | |
| Alt. 6 | Relocate Electrical Infrastructure | | | $650,000 | 1,520,000 | $3.45 |
| Alt. 6 | Relocate Pump Station V-2 | | | $317,794 | | |
| Alt. 7 | MSE Wall - Cells V-VII | 15.0 | $1,888,921 | $28,380,647 | 3,980,000 | $7.13 |
| | *Total Lined Acres* | *81.1* | | | | |
| | Wetland Mitigation | 203.5 | $30,000 | $6,106,364 | | $0.38 |
| | **TOTAL** | | | **$ 87,246,858** | **16,000,000** | **$5.45** |

**Assumptions:**
Includes Alt 6
30' High MSE Wall
15 AC Liner Expansion
5.5 M CY Total Disposal Airspace Provided
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio

Relocate Leachate Pump Stations, FM and Electric
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion
Will Need to Avoid Impacts to Transfer Station Facility
Revisions to Sediment Basins Required
Fill Height to 200' per FAA

**ALTERNATIVE 8 - RELOCATE GAS MAIN & CONSTRUCT 4.7 AC BASE LINER IN AREA IN FORMER EASEMENT**

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cell VIII Construction | 33.7 | $782,141 | $26,376,056 | 6,240,000 | $4.23 |
| Alt. 2 | Gas Main Relocation | | | $22,181,085 | | $7.73 |
| Alt. 2 | Base Liner | 8.5 | $1,035,773 | $8,804,066 | | |
| Alt. 2 | Overlay Liner I - IV | 19.7 | $586,662 | $11,557,249 | 2,870,000 | $9.96 |
| Alt. 2 | Overlay Liner V - VI | 17.8 | $461,512 | $8,214,918 | | |
| Alt. 6 | Base Liner | 5.35 | $800,516 | $4,282,762 | 1,520,000 | $3.25 |
| Alt. 6 | Relocate Infrastructure | | | $650,000 | | |
| Alt. 6 | Relocate Pump Station V-2 | | | $317,794 | | |
| Alt. 7 | MSE Wall - Cells V-VII | 15.0 | $1,888,921 | $28,380,647 | 3,980,000 | $7.13 |
| Alt. 8 | Base Liner | 4.7 | $1,035,773 | $4,868,131 | 1,390,000 | $3.50 |
| | *Total Lined Acres* | *104.8* | | | | |
| | Wetland Mitigation | 113.2 | $30,000 | $3,396,142 | | $0.21 |
| | **TOTAL** | | | **$119,028,850** | **16,000,000** | **$7.44** |

**Assumptions:**
Includes Alternative Scenarios 2, 6, and 7
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio

Relocate Leachate Pump Stations, FM and Electric
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion
Will Need to Avoid Impacts to Transfer Station Facility
Revisions to Sediment Basins Required

## ALTERNATIVE 9 - RELOCATE GAS MAIN & CONSTRUCT 30' HIGH MSE WALL

| | Components | Acreage (AC) | Cost per Acre ($/AC) | Total Cost ($) | Disposal Volume (CY) | Cost per CY ($/CY) |
|---|---|---|---|---|---|---|
| Alt. 1 | Cell VIII Construction | 32.0 | $782,141 | $25,046,417 | 5,640,000 | $4.44 |
| Alt. 2 | Gas Main Relocation | | | $22,181,085 | | $7.73 |
| Alt. 2 | Base Liner | 8.5 | $1,035,773 | $8,804,066 | | |
| Alt. 2 | Overlay Liner I - IV | 19.7 | $586,662 | $11,557,249 | 2,870,000 | $9.96 |
| Alt. 2 | Overlay Liner V - VI | 17.8 | $461,512 | $8,214,918 | | |
| Alt. 6 | Base Liner | 5.35 | $800,516 | $4,282,762 | | |
| Alt. 6 | Relocate Infrastructure | | | $650,000 | 1,520,000 | $3.45 |
| Alt. 6 | Relocate Pump Station V-2 | | | $317,794 | | |
| Alt. 7 | MSE Wall - Cells V-VII | 15.0 | $1,888,921 | $28,380,647 | 3,980,000 | $7.13 |
| Alt. 8 | Base Liner | 4.7 | $1,035,773 | $4,868,131 | 1,390,000 | $3.50 |
| Alt. 9 | MSE Wall - Cells VII & VIII | 2.6 | $2,299,370 | $5,985,964 | 600,000 | $9.98 |
| | *Total Lined Acres* | *105.7* | | | | |
| | Wetland Mitigation | 109.8 | | $3,294,142 | | $0.21 |
| | **TOTAL** | | | **$123,583,175** | **16,000,000** | **$7.72** |

**Assumptions:**
Includes Alternative Scenarios 2, 6, 7, and 8.
Cost Estimate Based on Cell VII BOE
Mitigation Assumed 2:1 Ratio
MSE Wall Only Provides 0.6 M CY Due to Geoemetries

Relocate Leachate Pump Stations, FM and Electric
Revise Stormwater Pond
Wetland Impacts on West Side
Min. 140' Wide Impact for 30' Vertical Expansion
Will Need to Avoid Impacts to Transfer Station Facility
Revisions to Sediment Basins Required
Fill Height to 200' per FAA

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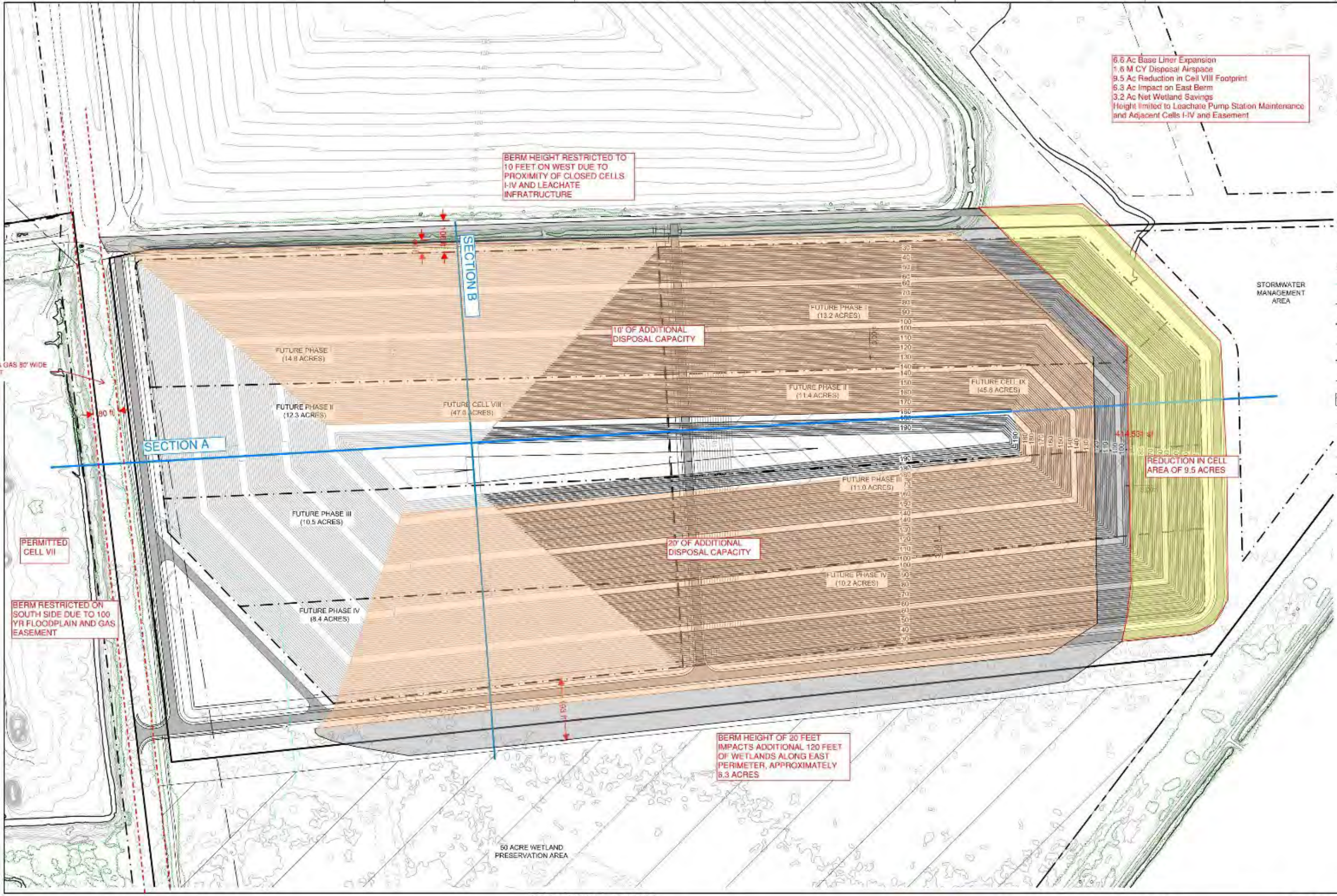
The following slides provide additional information on Alternative 10 that was not previously included in Appendix B.

# 10. CONSTRUCT 10’ TO 20’ HIGH SOIL BERM AROUND PERIMETER OF CELLS VIII AND IX, WHERE APPLICABLE

- Soil Berm Constrained on South and West
  - Gas Easement
  - Proximity of Cells I – IV and Leachate Infrastructure
- Requirements
  - Install 20’ High Berm on East and North (193’ Wide at Base)
    - Wall height limited due to Preserved Wetlands and Leachate Maintenance
      - 260’+ long side riser
    - 6.6 Acre Additional Base Liner on Slopes
- 3.2 Ac of Net Wetland Savings
- Pros
  - Slight Reduction of LF Footprint
- Cons
  - Challenging Leachate System Maintenance
  - Limited Capacity Due to Floodplain, Existing Cells, Easement and Preserved Wetlands
  - Requires Wetland Impact to Construct East Berm




NOTES:

1. EXISTING TOPOGRAPHY WITHIN TAX MAP# 27*28A SUPPLIED BY HOGGARD-EURE ASSOCIATES BASED ON AERIAL PHOTOGRAPHY DATED MARCH 22, 2016. BASE PLAN AND TOPOGRAPHY OF AREAS OUTSIDE TAX MAP# 27*28A COMPILED FROM AERIAL AND FIELD SURVEYS FROM 2005 - 2015. TEMPORARY SHOWN OUTSIDE PROPERTY BOUNDARY OBTAINED FROM GIS.
2. ELEVATIONS REFER TO NGS MEAN SEA LEVEL HORIZONTAL CONTROL BASED UPON VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NAD 1983.
3. PROPERTY LINE BOUNDARY FROM VANASSE HANGEN BRUSTLIN DATED FEBRUARY 29, 2000.

LEGEND:

- CHESAPEAKE BAY PRESERVATION AREA
- STREAMS
- PROPERTY LINE
- INTERNAL PROPERTY LINE
- FACILITY BOUNDARY (APPROXIMATE)
- EASEMENT
- WETLAND PRESERVATION AREA
- EXISTING MINOR CONTOURS
- EXISTING MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- -20- PROPOSED MAJOR CONTOURS

HDR

| ISSUE | DATE | DESCRIPTION |
|---|---|---|

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| DESIGNED BY | |
| REVIEWED BY | |
| DRAWN BY | L. MCCAUL |
| PROJECT NUMBER | 10139129 |

SPSA WASTE SOLUTIONS

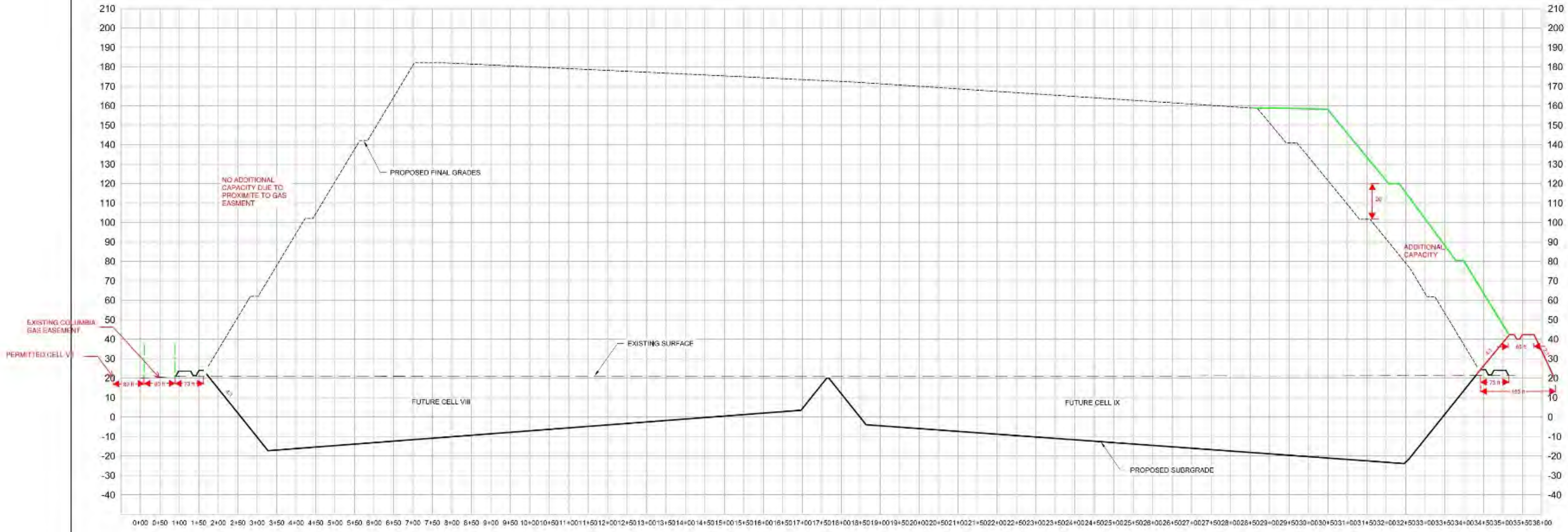
**Southeastern Public Service Authority**

Cells VIII & IX Expansion
On-site Alternatives

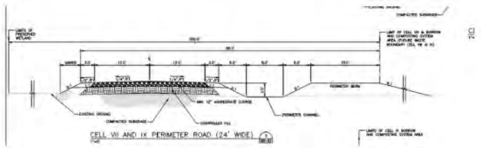
SUFFOLK VIRGINIA

ALTERNATIVE 10
CONSTRUCT 10' - 20' HIGH
PERIMETER BERM

FILENAME 00C-04.dwg
SCALE 1"=150'
SHEET




A SECTION A
H: 1"=125' ; V: 1"=25'



CELL VII AND IX PERIMETER ROAD (24' WIDE)

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| DESIGNED BY | |
| REVIEWED BY | |
| DRAWN BY | T. PREDDY, E.I. |
| PROJECT NUMBER | 10139129 |

ISSUE DATE DESCRIPTION

SPSA WASTE SOLUTIONS

**Southeastern Public Service Authority**

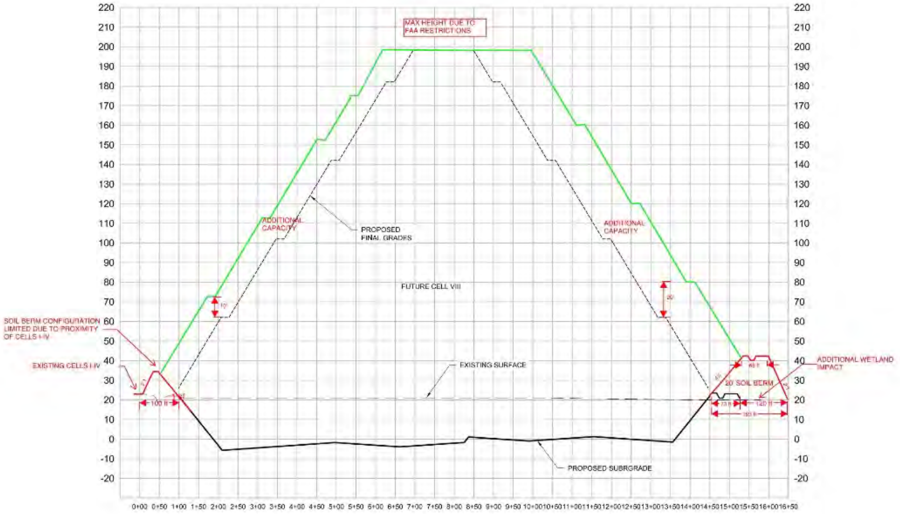
Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

**ALTERNATIVE 10 - SECTIONS (1 OF 2)**

FILENAME 00C-05.dwg
SCALE AS SHOWN

SHEET **00C-05**




SECTION B
H: 1"=125' ; V: 1"=25'

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| DESIGNED BY | |
| REVIEWED BY | |
| DRAWN BY | T. PREDDY, E.I. |
| PROJECT NUMBER | 10139129 |

ISSUE DATE DESCRIPTION

HDR

SPSA WASTE SOLUTIONS

**Southeastern Public Service Authority**

Cells VIII & IX Expansion
On-site Alternatives

SUFFOLK VIRGINIA

**ALTERNATIVE 10 - SECTIONS (2 OF 2)**

FILENAME 00C-06.dwg
SCALE AS SHOWN

SHEET 00C-06

# Appendix C: Analysis of Potential Hauling and Landfill Operations Greenhouse Gas (GHG) Impacts for the SPSA Regional Landfill and Alternative Landfill Sites

April 15, 2024
File No. 02220102.00

MEMORANDUM

TO: Kimberly Blossom, Neville Reynolds, VHB

FROM: Bob Gardner, PE, BCEE
Ray Huff, REPA
Keith Matteson, PE

SUBJECT: Analysis of Potential Hauling and Landfill Operations Greenhous Gas (GHG) Impacts for the SPSA Regional Landfill and Alternative Landfill Sites

SCS Engineers (SCS) prepared high-level conceptual analyses of the potential greenhouse gas (GHG) impacts associated with alternatives to the proposed expansion of SPSA's Regional Landfill. The expansion involves developing what is referred to as Cells VIII and IX with a total expansion waste disposal capacity of approximately 16 million cubic yards. The analysis uses SPSA's reported Federal GHG Reporting Program (GHGRP) data and budgeted truck/trailer census for its Fleet Maintenance and Transportation departments as the basis for the GHG impact evaluations.

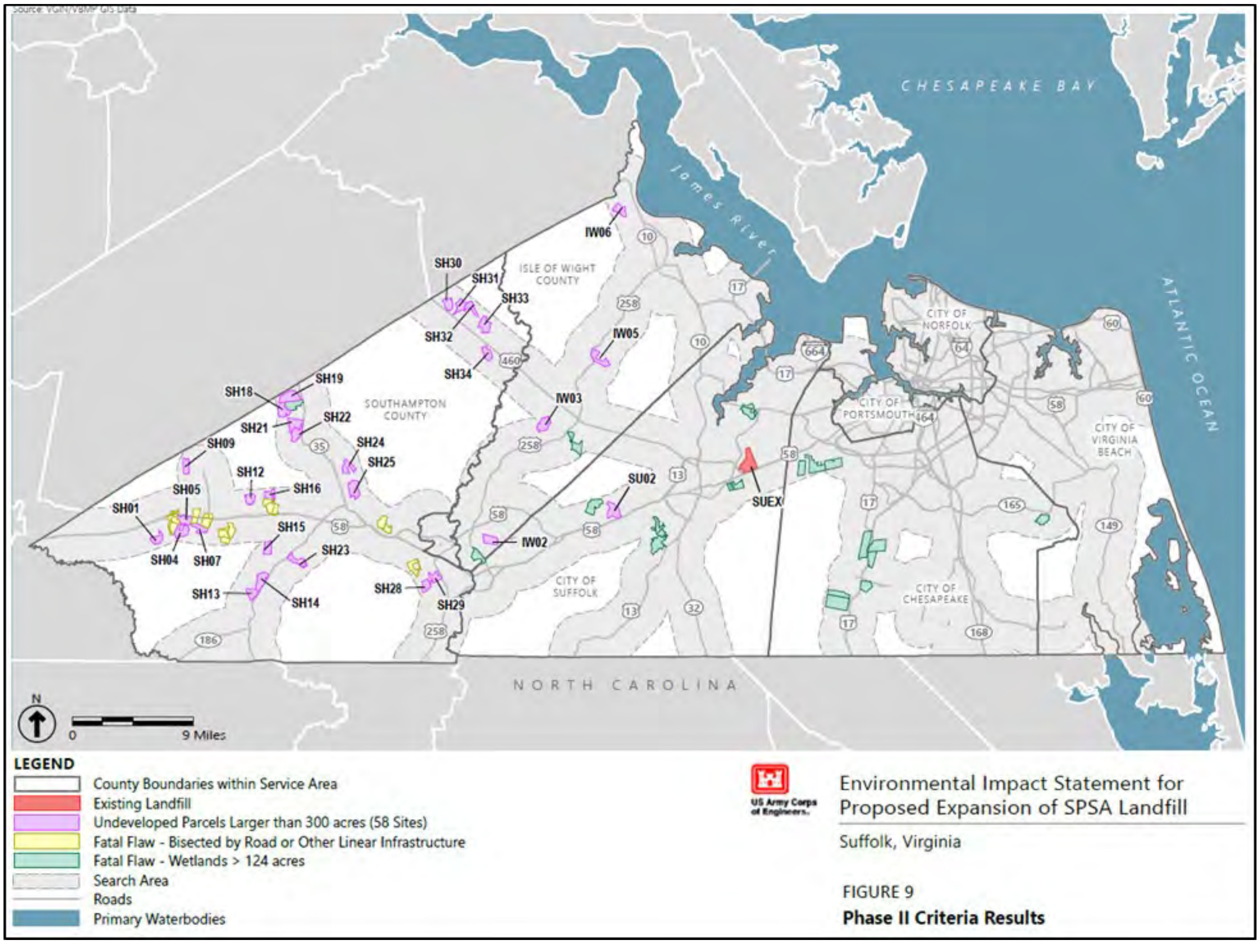
This analysis has been performed as part of the Environmental Impact Statement (EIS) currently being developed by the US Army Corps of Engineers (USACE) associated with mitigation of wetlands that will be disturbed due the proposed Regional Landfill expansion. The waste hauling GHG impact analysis includes all the alternative landfill sites considered in the EIS while the landfill operations GHG impact analysis compares impacts of five alternative waste disposal scenarios.

## WASTE HAULING GHG IMPACT ANALYSIS

The additional equipment resources that would be needed to support waste hauling operations for each alternative waste disposal scenario were estimated and added to existing resources to evaluate the total conceptual hauling GHG impacts associated with each alternative. Total mileage was estimated and GHG impacts calculated for each alternative based on the estimated gallons of diesel fuel consumed. The primary purpose of the analysis is to provide estimated conceptual GHG impacts related to waste hauling to support the screening evaluation of the alternatives.

The hauling analysis assumes that all the municipal waste from SPSA member communities (cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, and counties of Southampton and Isle of Wight) would be collected at and transferred from SPSA's existing network of transfer stations and/or, in the case of Portsmouth, the refuse derived fuel (RDF) tipping floor at the WIN Waste Innovations facility, and then transferred for final disposal.

Figure 1. SPSA's Transfer Station Network and Alternative Landfill Site Locations




The waste distribution from each of the member communities to each of the transfer station facilities was estimated, and, for this analysis, it was assumed that all the municipally collected waste would be hauled per one of the alternatives being evaluated.

The locations of the majority of potential alternative sites being considered in this analysis are shown in **Figure 1.** Site SUEX is an on-site alternative (Regional Landfill expansion Cells VIII/IX) included for comparison to off-site alternative locations. Four existing off-site alternative disposal facility locations (private landfills) were also included in the analysis, again for comparison to off-site alternative locations. **Table 1** provides one-way distance from each SPSA transfer station to the off-site alternative landfill locations.

The estimated annual (transfer) hauling mileage and GHG impacts for each off-site alternative landfill location are presented in **Table 2.**

Table 1. One-Way Travel Distance from Transfer Stations to Alternative Landfill Site Locations

| Alternative Landfill Location Parcels | Transfer Station/Distances, One-Way Miles | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CTS | FTS | IWTS | LTS | NTS | OTS | STS | To RDF |
| SH01 | 72.4 mi. | 23.7 mi. | 48.0 mi. | 79.4 mi. | 69.8 mi. | 81.7 mi. | 53.4 mi. | 66.4 mi. |
| SH04 | 69.3 mi. | 20.6 mi. | 44.9 mi. | 76.3 mi. | 66.8 mi. | 78.6 mi. | 50.4 mi. | 63.3 mi. |
| SH05 | 68.5 mi. | 19.9 mi. | 44.1 mi. | 75.5 mi. | 66.0 mi. | 77.8 mi. | 49.6 mi. | 62.6 mi. |
| SH09 | 71.4 mi. | 22.7 mi. | 47.0 mi. | 78.4 mi. | 68.9 mi. | 80.7 mi. | 52.5 mi. | 65.4 mi. |
| SH07 | 67.7 mi. | 19.0 mi. | 43.3 mi. | 74.7 mi. | 65.1 mi. | 76.9 mi. | 48.7 mi. | 61.7 mi. |
| SH13 | 65.4 mi. | 13.6 mi. | 41.0 mi. | 72.4 mi. | 62.8 mi. | 74.6 mi. | 46.4 mi. | 59.4 mi. |
| SH14 | 64.5 mi. | 14.1 mi. | 40.1 mi. | 71.5 mi. | 61.9 mi. | 73.7 mi. | 45.5 mi. | 58.5 mi. |
| SH15 | 63.9 mi. | 15.2 mi. | 38.5 mi. | 70.9 mi. | 61.3 mi. | 73.1 mi. | 44.9 mi. | 57.9 mi. |
| SH18 | 66.9 mi. | 18.2 mi. | 35.4 mi. | 73.9 mi. | 64.3 mi. | 76.1 mi. | 47.9 mi. | 60.9 mi. |
| SH19 | 67.8 mi. | 19.2 mi. | 36.4 mi. | 74.8 mi. | 65.3 mi. | 77.1 mi. | 48.9 mi. | 61.8 mi. |
| SH23 | 60.9 mi. | 10.8 mi. | 36.5 mi. | 67.9 mi. | 58.3 mi. | 70.2 mi. | 41.9 mi. | 54.9 mi. |
| SH24 | 54.9 mi. | 12.3 mi. | 27.6 mi. | 61.9 mi. | 52.3 mi. | 64.1 mi. | 35.9 mi. | 48.9 mi. |
| SH25 | 58.5 mi. | 9.9 mi. | 29.5 mi. | 65.5 mi. | 56.0 mi. | 67.8 mi. | 39.6 mi. | 52.6 mi. |
| SH28 | 51.6 mi. | 3.2 mi. | 35.1 mi. | 58.6 mi. | 49.1 mi. | 60.9 mi. | 32.7 mi. | 43.5 mi. |
| SH29 | 49.4 mi. | 3.4 mi. | 32.9 mi. | 56.4 mi. | 46.9 mi. | 58.7 mi. | 30.5 mi. | 45.7 mi. |
| SH30 | 47.9 mi. | 23.7 mi. | 16.0 mi. | 55.1 mi. | 45.1 mi. | 57.0 mi. | 28.5 mi. | 42.4 mi. |
| SH32 | 47.2 mi. | 25.1 mi. | 15.0 mi. | 54.2 mi. | 44.6 mi. | 56.4 mi. | 28.2 mi. | 41.2 mi. |
| SH33 | 45.6 mi. | 23.7 mi. | 12.7 mi. | 52.6 mi. | 43.1 mi. | 54.9 mi. | 26.7 mi. | 39.6 mi. |
| IW02 | 46.6 mi. | 7.3 mi. | 30.1 mi. | 53.5 mi. | 44.0 mi. | 55.8 mi. | 27.6 mi. | 40.6 mi. |
| IW05 | 40.0 mi. | 24.1 mi. | 9.9 mi. | 47.0 mi. | 37.4 mi. | 49.3 mi. | 21.0 mi. | 34.0 mi. |
| SU02 | 33.5 mi. | 17.6 mi. | 27.0 mi. | 40.5 mi. | 30.9 mi. | 42.8 mi. | 14.5 mi. | 27.5 mi. |
| SU03 | 35.0 mi. | 22.3 mi. | 28.8 mi. | 42.0 mi. | 32.5 mi. | 44.3 mi. | 16.1 mi. | 29.0 mi. |
| SUEX | 22.7 mi. | 31.5 mi. | 24.1 mi. | 29.7 mi. | 20.1 mi. | 31.9 mi. | 0.4 mi. | 16.7 mi. |
| WM Atl Waste | 65.0 mi. | 42.0 mi. | 34.0 mi. | 73.0 mi. | 63.0 mi. | 74.0 mi. | 46.0 mi. | 59.0 mi. |
| WM Bethel LF | 32.0 mi. | 60.0 mi. | 23.0 mi. | 34.0 mi. | 23.0 mi. | 34.0 mi. | 29.0 mi. | 31.0 mi. |
| WM Brunswick LF | 100.0 mi. | 53.0 mi. | 76.0 mi. | 107.0 mi. | 98.0 mi. | 109.0 mi. | 81.0 mi. | 94.0 mi. |
| Shoesmouth LF | 97.0 mi. | 67.0 mi. | 65.0 mi. | 104.0 mi. | 94.0 mi. | 106.0 mi. | 77.0 mi. | 90.0 mi. |

See Figure 1 for Transfer Station Key.

Table 2. Analysis Summary of Annual Hauling Mileage and GHG Impacts

| Alternative Landfill Location Parcels | Alternative Label | Estimated Total Annual Mileage | Estimated Total Transfer Mileage[1] | GHG Emissions Estimate (MT CO2)[2] |
|---|---|---|---|---|
| SH01 | D | 3,161,860 mi | 77,149,384 mi | 195,000 MT CO2 |
| SH04 | D | 3,020,870 mi | 73,709,228 mi | 188,000 MT CO2 |
| SH05 | D | 2,984,610 mi | 72,824,484 mi | 185,000 MT CO2 |
| SH09 | D | 3,117,470 mi | 76,066,268 mi | 193,000 MT CO2 |
| SH07 | D | 2,945,360 mi | 71,866,784 mi | 183,000 MT CO2 |
| SH13 | D | 2,835,220 mi | 69,179,368 mi | 176,000 MT CO2 |
| SH14 | D | 2,795,780 mi | 68,217,032 mi | 173,000 MT CO2 |
| SH15 | D | 2,768,860 mi | 67,560,184 mi | 171,000 MT CO2 |
| SH18 | D | 2,896,490 mi | 70,674,356 mi | 181,000 MT CO2 |
| SH19 | D | 2,940,110 mi | 71,738,684 mi | 183,000 MT CO2 |
| SH23 | D | 2,630,900 mi | 64,193,960 mi | 163,000 MT CO2 |
| SH24 | D | 2,360,170 mi | 57,588,148 mi | 146,000 MT CO2 |
| SH25 | D | 2,516,790 mi | 61,409,676 mi | 156,000 MT CO2 |
| SH28 | D | 2,212,120 mi | 53,975,728 mi | 137,000 MT CO2 |
| SH29 | D | 2,131,880 mi | 52,017,872 mi | 132,000 MT CO2 |
| SH32 | D | 2,026,340 mi | 49,442,696 mi | 127,000 MT CO2 |
| SH33 | D | 1,953,740 mi | 47,671,256 mi | 122,000 MT CO2 |
| IW02 | D | 2,000,290 mi | 48,807,076 mi | 124,000 MT CO2 |
| IW05 | D | 1,707,690 mi | 41,667,636 mi | 105,000 MT CO2 |
| SU02 | D | 1,448,810 mi | 35,350,964 mi | 90,000 MT CO2 |
| SU03 | D | 1,524,410 mi | 37,195,604 mi | 95,000 MT CO2 |
| SUEX | B-C | 980,580 mi | 23,926,152 mi | 61,000 MT CO2 |
| SH30 | D | 2,055,550 mi | 50,155,420 mi | 127,000 MT CO2 |
| WM Atl Waste Disp | A | 2,862,100 mi | 69,835,240 mi | 178,000 MT CO2 |
| WM Bethel | A | 1,409,000 mi | 34,379,600 mi | 88,000 MT CO2 |
| RSI Brunswick | A | 4,439,800 mi | 108,331,120 mi | 276,000 MT CO2 |
| Hybrid E-50 WM Atl Waste Disp | Hybrid-50 | Varies | 49,138,520 mi | 125,000 MT CO2 |
| Hybrid E-25 WM Atl Waste Disp | Hybrid-25 | Varies | 38,790,160 mi | 99,000 MT CO2 |
| Hybrid E-50 WM Bethel LF | Hybrid-50 | Varies | 29,666,980 mi | 76,000 MT CO2 |
| Hybrid E-25 WM Bethel LF | Hybrid-25 | Varies | 27,310,670 mi | 70,000 MT CO2 |
| Hybrid E-50 RSI Brunswick LF | Hybrid-50 | Varies | 70,279,700 mi | 179,000 MT CO2 |
| Hybrid E-25 RSI Brunswick LF | Hybrid-25 | Varies | 51,253,990 mi | 130,000 MT CO2 |
| Hybrid-50 Average | | Varies | 49,695,067 mi | 127,000 MT CO2 |
| Hybrid-25 Average | | Varies | 39,118,273 mi | 100,000 MT CO2 |

[1]Based on total of 24.4 years
[2]GHG Conversion factor = 0.01018 MT CO2/gal of diesel

## LANDFILL OPERATIONS GHG IMPACT ANALYSIS

SCS evaluated landfill operations GHG impacts associated with the following alternatives:

- **Alternative A – No Action Alternative/Divert Waste to an Existing Off-Site Landfill.** Under this scenario, SPSA would re-route waste to another existing (private) landfill following reaching permitted capacity in Cell VII in 2037.
- **Alternative B – Full Expansion.** Under this scenario, SPSA would expand its landfill operations into a 134-acre expansion area, which would accommodate two additional landfill cells, designated Cells VIII/IX. Under this scenario, approximately 117 acres of forested wetlands would be impacted.
- **Alternative C – Partial Expansion.** Under this scenario, construction of Cells VIII/IX would still occur, but the footprint of Cell IX would be smaller than proposed under Alternative B. Under this scenario, approximately 109 acres of forested wetlands would be impacted.
- **Alternative D – Closure and Conversion to Just a Transfer Station Operation Only with New Off-Site Landfill.** Under this scenario, the Regional Landfill would stop accepting waste in 2037, and all waste would be diverted to a new SPSA landfill site (SH30).
- **Alternative E – Hybrid Alternative Scenarios.** Under this alternative, either 25 % or 50% of the waste that would otherwise be disposed in the expansion area would be diverted to private landfills (three assumed), resulting in a smaller landfill footprint and fewer wetland impacts.

Alternate C is SPSA's preferred alternative because it impacts fewer wetlands than Alternative B. A summary and the results of each scenario analysis are presented in the sections below.

Key components of the GHG impact analysis for the alternative scenarios are landfill GHG emissions. Hauling/transportation costs and associated GHG impacts were addressed in the Hauling Analysis Section.

## Alternative A - No Action Alternative/Divert Waste to an Existing Off-Site Landfill Emissions Estimate

In this scenario, once the Regional Landfill reaches capacity, waste will be re-routed to one of four existing private landfills (see **Table 3**):

Table 3. Potential Receiver Facilities in the No-Action Alternative

| Facility | Location |
|---|---|
| Atlantic Waste Disposal | Waverly, VA |
| Bethel Landfill | Hampton, VA |
| Brunswick Waste Management Facility | Lawrenceville, VA |
| Shoosmith Sanitary Landfill | Chester, VA |

Each of the alternative landfills listed in **Table 3** are known to have a landfill gas (LFG) collection and control system (GCCS), capable of collecting landfill gas generated from the waste disposed at each facility.

The Shoosmith Landfill was active and was pursuing an expansion permit when SCS's work began on this analysis. While working on another project recently, SCS learned that public opposition resulted in Shoosmith Landfill not pursuing its expansion permit, and the landfill stopped receiving waste; therefore, the Shoosmith Landfill was removed from the analysis.

## Landfill GHG Emissions

In order to calculate the GHG emissions impact SCS developed a first-order decay GHG landfill emissions estimation model using the estimated waste capacity volume for the proposed project (approximately 16 million cubic yards).

Assuming a waste density of 1,400 lbs per cubic yard, 16 million cubic yards equates to 11.2 million tons of waste to be disposed. Using an anticipated waste acceptance rate of 460,000 tons per year, this results in a lifespan of 24.4 years in order to place 11.2 million tons of waste in any of the five landfills (SPSA and the four alternative sites). Therefore, SCS developed a GHG model with a 24.4-year lifespan, for comparative purposes.

Using rainfall information from the SPSA GHGRP as a regional input for each landfill, SCS developed a first-order decay model based on the GHGRP, Equation HH-1[1] to develop methane generation estimates for the proposed waste mass for the four sites (all values are the same for each landfill). The results of the first-order decay model are presented in **Table 4**.

Table 4. Landfill Gas Generation Estimate

| Year Following SPSA Closure | Annual Waste Input (tons) | Waste in Place (tons) | Methane Generation ($MTCH_4$/yr) | Methane Generation Adjusted for 10% Oxidation ($MTCH_4$/yr) | Total LFG Production[1] (scf/yr) |
|---|---|---|---|---|---|
| Year 1 | 460,000 | 460,000 | 0 | 0 | 0 |
| Year 2 | 460,000 | 920,000 | 1,541 | 1,387 | 317 |
| Year 3 | 460,000 | 1,380,000 | 2,997 | 2,697 | 616 |
| Year 4 | 460,000 | 1,840,000 | 4,373 | 3,935 | 898 |
| Year 5 | 460,000 | 2,300,000 | 5,672 | 5,104 | 1,165 |
| Year 6 | 460,000 | 2,760,000 | 6,899 | 6,209 | 1,417 |
| Year 7 | 460,000 | 3,220,000 | 8,058 | 1,813 | 1,655 |
| Year 8 | 460,000 | 3,680,000 | 9,153 | 2,059 | 1,880 |
| Year 9 | 460,000 | 4,140,000 | 10,187 | 2,292 | 2,092 |

[1] 40 CFR 98.343(a)(1), https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-HH#p-98.343(a)(1).

Table 4. Landfill Gas Generation Estimate

| Year Following SPSA Closure | Annual Waste Input (tons) | Waste in Place (tons) | Methane Generation ($MTCH_4/yr$) | Methane Generation Adjusted for 10% Oxidation ($MTCH_4/yr$) | Total LFG Production[1] (scf/yr) |
|---|---|---|---|---|---|
| Year 10 | 460,000 | 4,600,000 | 11,164 | 2,512 | 2,293 |
| Year 11 | 460,000 | 5,060,000 | 12,087 | 2,719 | 2,482 |
| Year 12 | 460,000 | 5,520,000 | 12,959 | 2,915 | 2,661 |
| Year 13 | 460,000 | 5,980,000 | 13,782 | 3,101 | 2,830 |
| Year 14 | 460,000 | 6,440,000 | 14,560 | 3,276 | 2,990 |
| Year 15 | 460,000 | 6,900,000 | 15,295 | 3,441 | 3,141 |
| Year 16 | 460,000 | 7,360,000 | 15,989 | 3,597 | 3,283 |
| Year 17 | 460,000 | 7,820,000 | 16,644 | 3,745 | 3,418 |
| Year 18 | 460,000 | 8,280,000 | 17,264 | 3,884 | 3,545 |
| Year 19 | 460,000 | 8,740,000 | 17,848 | 4,015 | 3,665 |
| Year 20 | 460,000 | 9,200,000 | 18,401 | 4,140 | 3,779 |
| Year 21 | 460,000 | 9,660,000 | 18,923 | 4,257 | 3,886 |
| Year 22 | 460,000 | 10,120,000 | 19,416 | 4,368 | 3,987 |
| Year 23 | 460,000 | 10,580,000 | 19,881 | 4,473 | 4,083 |
| Year 24 | 460,000 | 11,040,000 | 20,321 | 4,572 | 4,173 |
| Year 25 | 160,000 | 11,200,000 | 20,737 | 4,666 | 4,258 |
| | **Totals** | **11,200,000** | **314,154** | **85,185** | **64,513** |

[1]Total LFG Production is based on methane generation estimate, without Oxidation.

It is assumed that the Methane Generation Adjusted for Oxidation[2] value would be what is emitted to the atmosphere from a municipal solid waste landfill over the approximate 25-year duration of the project.

[2] As methane migrates through the landfill it undergoes some oxidation in the cover of the landfill. The default EPA value used in the GHGRP is 10%.

Table 5. 2021 Reported GHGRP GCCS Information

| Landfill Name | Status | GCCS? | Control Device(s) | GCCS Collection Efficiency (CE) (%) |
|---|---|---|---|---|
| SPSA Regional Landfill | Open | Yes | Flares – 1<br>LFGTE[1] - 1 | 83% |
| Atlantic Waste Disposal | Open | Yes | Flares - 6 | 76% |
| Bethel Landfill | Open | Yes | Flares – 2<br>LFGTE - 5 | 83% |
| Brunswick Waste Management Facility | Open | Yes | Flares – 2<br>LFGTE - 1 | 80% |

[1]LFGTE – Landfill Gas to Energy (electricity, renewable natural gas, etc.)

However, the SPSA Regional Landfill, as well as the other three alternative landfills, are known to have GCCSs installed (oxidation is assumed to occur both with and without a GCCS). A summary of the key factors of the existing GCCS at each facility are presented in **Table 5.** Using this information, SCS applied the GCCS Collection Efficiency value to the methane generation estimates from **Table 4** by reducing the generation amount by the Collection Efficiency value. SCS then applied a 10 percent methane oxidation factor to the remaining value to provide an estimate of the comparative landfill only emissions over the project lifespan. This summary is provided in **Table 6** which provides the results of this analysis.

Table 6. Project Lifespan Landfill Emissions Estimate

| Comparative Item | SPSA Regional Landfill | Atlantic Waste Disposal | Bethel Landfill | Brunswick Waste Management Facility |
|---|---|---|---|---|
| **Methane Generation ($MTCH_4$) (from Table 4)** | 314,154 | | | |
| **Collection Efficiency (%)** | 83 | 76 | 83 | 80 |
| **Uncontrolled Methane ($MTCH_4$)** | 53,406 | 75,397 | 53,406 | 62,831 |
| **Uncontrolled Methane Adjusted for 10% OX ($MTCH_4$)** | 48,066 | 67,857 | 48,066 | 56,548 |
| **Net GHG Impacts ($MTCO_2e$)** | 1,201,638 | 1,696,430 | 1,201,638 | 1,413,693 |

As shown in **Table 6**, using the global warming potential for methane of 25x, the resulting carbon dioxide equivalent ($MTCO_2e$) emissions for this alternative range from 1,201,638 (SPSA Regional Landfill and Bethel Landfill) to 1,696,430 (Atlantic Waste Disposal) $MTCO_2e$. Since this alternative involves waste transport to more than one alternate landfill, the GHG impacts from the alternative can be presented as a range. Combining the ranges of GHG emissions presented in **Table 6**, provides the total alternative emissions, which are presented in **Table 7.** As shown in **Table 7**, the alternative has a net GHG impact that ranges from 1,201,638 to 1,696,430 $MTCO_2e$ over the lifespan of the project. Summing the averages of the landfill emissions from the three landfill options considered under Alternative A results in an average Alternative A GHG impact of 1,437,254 $MTCO_2e$.

Table 7. Alternative A – GHG Impacts Summary in $MTCO_2e$

| Landfill Destination | Landfill GHG Impact ($MTCO_2e$) |
|---|---|
| Atlantic Waste Disposal | 1,696,430 |
| Bethel Landfill | 1,201,638 |
| Brunswick Waste Management Facility | 1,413,693 |
| **Average** | **1,437,254** |

## Alternative B – Full Expansion Alternative Emissions Estimate

In the "full expansion" alternative, SPSA would expand its landfill operations into a 134-acre expansion area, which would accommodate two additional landfill cells, designated Cells VIII and IX. Under this scenario, 117 acres of forested wetlands would be impacted. No off-site landfills are considered under Alternative B. However, as Alternative B involves the disturbance of approximately 117 acres of wetlands, the GHG impacts from the sequestration of carbon in the wetlands are considered as a component of the GHG impact analysis.

Since this analysis is a high-level conceptual evaluation, a full GHG sequestration analysis was not performed. As an alternative, SCS researched several recent Forestry Sequestration carbon credit projects on-file with the American Carbon Registry, for a site in the regional area. Based on a review of four projects in nearby states (OH, NY, PA, and MA), the carbon sequestered per year, per acre ranged from 1.69 to 21.20 $MTCO_2e$/acre, with an average value of 11.58 $MTCO_2e$/acre of forested land.[3]

Using the average value from sites researched, SCS multiplied the average per acre $MTCO_2e$ for forestry project by the 117-acre footprint of the area to be impacted by Alternative B development. This value was then multiplied by the project lifespan of 24.4 years, assuming that once the landfill was closed, it could be developed with trees and grasses that would allow for future carbon sequestration. The results of these calculations are presented in **Table 8**.

[3] Sequestered carbon per acre calculated from reported information from the following four American Carbon Registry (ACR) projects and reporting years (in parentheses): ACR586 (2021), ACR424 (RY 2020-2021), ACR375 (2020-2021), and ACR376 (2019-2020).

Table 8. Alternative B – Carbon Not Sequestered

| Impacted Acreage | Average $CO_2$ Emissions per Acre | Project Lifespan | $CO_2$ Not Sequestered |
|---|---|---|---|
| 117 | 11.58 $MTCO_2e$ | 24.4 years | 33,058 $MTCO_2e$ |

As shown in **Table 8**, Alternative B has a net GHG impact of 33,058 $MTCO_2e$ in carbon not sequestered from the eradication of 117 acres of wetland forest. When added to the GHG Impacts from just placing waste in the proposed expansion area of the Regional Landfill (see **Table 6**) the Net GHG Impacts of this Alternative is **1,234,696** MTCO2e.

## Alternative C – Partial Expansion Alternative Emissions Estimate

In the "partial expansion" alternative, construction of Cells VIII and IX would still occur (see Alternative B), but the footprint of Cell IX would be smaller than proposed under Alternative B. Under this scenario, approximately 109 acres of forested wetlands would be impacted. Similar to Alternative B, no off-site landfills are considered under Alternative C. In addition, since there is no off-site alternative, there are no hauling GHG impacts to evaluate under Alternative C.

Since Alternative C involves impact to the wetland forested area, SCS calculated the avoided sequestration of 109 acres of development, using the same methodology outlined in the previous section. **Table 9** contains the results of the additional analysis for Alternative C.

Table 9. Alternative C – Carbon Not Sequestered

| Impacted Acreage | Average $CO_2$ Emissions per Acre | Project Lifespan | $CO_2$ Not Sequestered |
|---|---|---|---|
| 109 | 11.58 $MTCO_2e$ | 24.4 years | 30,798 $MTCO_2e$ |

As shown in **Table 9**, Alternative C has a net GHG impact of 30,798 $MTCO_2e$ in carbon not sequestered from the eradication of 109 acres of wetland forest. When added to the GHG Impacts from just placing waste in the proposed expansion area of the Regional Landfill (see **Table 6**) the Net GHG Impacts of this Alternative is **1,232,436** MTCO2e (assumes that approximately the same amount of waste will be disposed of as in Alternative B even though the landfill expansion footprint would be slightly smaller).

## Alternative D – Closure and Conversion of Landfill to Just a Transfer Station Operation – Hauling to a New Landfill

In the "closure and conversion" alternative, the Regional Landfill would stop accepting waste in 2037, and all waste would be diverted to a new SPSA landfill site (SH30). The SH30 site is approximately 28.5 miles away from the SPSA Regional Landfill.

Since SH30 would be a new landfill, under federal New Source Performance Standards (NSPS) regulation, the new landfill would have a minimum of six years prior to being required to install a GCCS. In evaluating the potential emissions from an uncontrolled landfill for the first six years, SCS assumed the same waste placement, but with no GCCS installation. Thereafter, SCS assumed a

75% Collection Efficiency with no LFGTE, as this is the minimum required under NSPS. The results of these calculations are presented in **Table 10.**

Table 10. GHG Emission Estimate for SH30

| Year Following SPSA Closure | Annual Waste Input (tons) | Methane Generation ($MTCH_4$/yr) | LFG Collection Efficiency (%) | Uncontrolled Methane ($MTCH_4$) | Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Total LFG Production[1] (scfm) |
|---|---|---|---|---|---|---|
| Year 1 | 460,000 | 0.00 | 0 | - | - | 0.00 |
| Year 2 | 460,000 | 1,541 | 0 | 1,541 | 1,387 | 317 |
| Year 3 | 460,000 | 2,997 | 0 | 2,997 | 2,698 | 616 |
| Year 4 | 460,000 | 4,373 | 0 | 4,373 | 3,936 | 898 |
| Year 5 | 460,000 | 5,672 | 0 | 5,672 | 5,105 | 1,165 |
| Year 6 | 460,000 | 6,899 | 0 | 6,899 | 6,209 | 1,417 |
| Year 7 | 460,000 | 8,058 | 75 | 2,015 | 1,813 | 1,655 |
| Year 8 | 460,000 | 9,153 | 75 | 2,288 | 2,060 | 1,880 |
| Year 9 | 460,000 | 10,187 | 75 | 2,547 | 2,292 | 2,092 |
| Year 10 | 460,000 | 11,164 | 75 | 2,791 | 2,512 | 2,293 |
| Year 11 | 460,000 | 12,087 | 75 | 3,022 | 2,720 | 2,482 |
| Year 12 | 460,000 | 12,959 | 75 | 3,240 | 2,916 | 2,661 |
| Year 13 | 460,000 | 13,782 | 75 | 3,447 | 3,101 | 2,830 |
| Year 14 | 460,000 | 14,560 | 75 | 3,640 | 3,276 | 2,990 |
| Year 15 | 460,000 | 15,295 | 75 | 3,824 | 3,441 | 3,141 |
| Year 16 | 460,000 | 15,989 | 75 | 3,997 | 3,598 | 3,283 |
| Year 17 | 460,000 | 16,644 | 75 | 4,161 | 3,745 | 3,418 |
| Year 18 | 460,000 | 17,264 | 75 | 4,316 | 3,884 | 3,545 |
| Year 19 | 460,000 | 17,849 | 75 | 4,462 | 4,016 | 3,665 |
| Year 20 | 460,000 | 18,401 | 75 | 4,600 | 4,140 | 3,779 |
| Year 21 | 460,000 | 18,923 | 75 | 4,731 | 4,258 | 3,886 |
| Year 22 | 460,000 | 19,416 | 75 | 4,854 | 4,369 | 3,987 |
| Year 23 | 460,000 | 19,882 | 75 | 4,970 | 4,473 | 4,083 |
| Year 24 | 460,000 | 20,321 | 75 | 5,080 | 4,572 | 4,173 |
| Year 25 | 160,000 | 20,737 | 75 | 5,184 | 4,666 | 4,258 |
| | **Totals** | **314,154** | | **94,650** | **85,185** | **64,513** |

[1]Total LFG Production is based on methane generation estimate, without Oxidation.

In addition, for the development of SH30, SCS assumed 60 acres of forested woodlands would need to be cleared. Using the same factors from Alternatives B and C (see **Tables 8 and 9**), the non-sequestered carbon that would result from removal of 60 acres of forested area is presented in **Table 11** below.

Table 11. Alternative D – Carbon Not Sequestered

| Impacted Acreage | Average $CO_2$ Emissions per Acre | Project Lifespan | Total $CO_2$ Not Sequestered |
|---|---|---|---|
| 60 | 11.58 $MTCO_2e$ | 24.4 years | 16,953 $MTCO_2e$ |

Similar to the Alternative A analysis, SCS used the Collection Efficiency- and oxidation-adjusted methane values as potential methane emissions to the atmosphere. Using information from **Tables 10 and 11**, the results of the analysis for Alternative D are shown in **Table 12**.

Table 12. Alternative D - Project Lifespan Landfill Emissions Estimate

| Comparative Item | Landfill at SH30 |
|---|---|
| **Methane Generation ($MTCH_4$) (from Table 10)** | 314,154 |
| **Collection Efficiency (%)** | 75 |
| **Uncontrolled Methane ($MTCH_4$)** | 78,538 |
| **Uncontrolled Methane Adjusted for 10% OX ($MTCH_4$)** | 70,685 |
| **Total GHG Impacts from Landfill Operations ($MTCO_2e$) (70,685 x 25)** | 1,767,116 |
| **Carbon Not Sequestered ($MTCO_2e$) (Table 11)** | 16,953 |
| **Net GHG Impacts ($MTCO_2e$)** | **1,784,069** |

As shown in **Table 12**, using the global warming potential for methane of 25x, the resulting carbon dioxide equivalent ($MTCO_2e$) emissions for Alternative D is 1,784,069 $MTCO_2e$.

In addition, under Alternative D, the SH30 landfill will not be required to utilize the collected LFG for beneficial purposes (like LFGTE), as is the case with the existing SPSA Regional Landfill. Considering that the SPSA Regional Landfill and the majority of the Alternative A landfills have beneficial use of LFG integrated, the impacts of non-beneficial reuse of LFG are relevant. As shown in **Table 10**, the potential methane production for SH30 over the project lifespan is 314,154 $MTCH_4$. The portion collected and controlled by a GCCS is approximately 219,504 $MTCH_4$ (314,154 - 94,650 $MTCH_4$ from **Table 10**) which will <u>not</u> be put to beneficial reuse (electricity generation, renewable natural gas, etc.) and displacement of the burning of fossil fuels. Over the lifespan of the proposed project, this results in an excess of GHG impacts equivalent to more than 33,000 railcars of coal burned, more than 600 million gallons of gasoline consumed, or 5,487,600 $MTCO_2e$ (25x the amount of methane collected).

## Alternative E – Hybrid Alternative Scenarios

- **Hybrid 50% (E-50) Diversion and Partial Expansion.** Under this alternative, 50% of the waste that would otherwise be disposed in the expansion area would be diverted to private landfills, with WM Atlantic Waste, Bethel Landfill, and Brunswick Waste Management Facility being the assumed disposal locations for the diverted waste, resulting in a smaller landfill footprint and fewer wetland impacts.

- **Hybrid 25% (E-25) Diversion and Partial Expansion.** Under this alternative, 25% of the waste that would otherwise be disposed in the expansion area would be diverted to private landfills, with WM Atlantic Waste, Bethel Landfill, and Brunswick Waste Management Facility being the assumed disposal locations for the diverted waste, resulting in a smaller landfill footprint and fewer wetland impacts.

The 16 MCY disposal capacity associated with the full expansion of Cells VII and IX (Alternative B) was used as the basis for the analysis. The Hybrid Alternative would divert 25 percent and 50 percent of the design capacity of preferred expansion Alternative C.

SCS prepared a high-level conceptual analysis of the estimated footprint required to provide the disposal capacity for the hybrid diversion alternative. Detailed designs were not prepared for the Hybrid Alternatives.

The Hybrid 50% scenario for expanding into Cells VIII and IX is estimated to have a landfill footprint of 54 acres and impact a total of 72 acres of wetlands assuming approximately 18 acres of supporting roads, drainage, and other infrastructure. The Hybrid 25% scenario for expanding into Cells VIII and IX is estimated to have a landfill footprint of 73 acres and impact a total of 97 acres of wetlands assuming approximately 24 acres of supporting roads, drainage, and other infrastructure.

For the 50% (E-50) diversion scenario, using the methane generation estimated calculated in **Table 10** (assumes that methane generation for the Regional Landfill expansion would be the same as for a new landfill in this case SH30), 50% of the generated methane was assigned to the expansion of SPSA Regional Landfill, which has a collection efficiency (CE) of 83%, with the remaining 50% assigned to WM Atlantic Waste, Bethel Landfill, and Brunswick Waste Management Facility, which have CEs of 76%, 83% and 80% respectively (refer to **Table 5**). The resultant combined methane emissions from all three of the landfills under this scenario is provided in **Table 13**.

Table 13. Alternative E – Hybrid 50% Scenario Methane Emission Estimate

| Year Following SPSA Closure | Reg. LF Expansion Methane Generation ($MTCH_4$/yr) | Private Landfill Methane Generation ($MTCH_4$/yr) | Atlantic Waste LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Bethel LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Brunswick LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) |
|---|---|---|---|---|---|
| Year 1 | - | - | - | - | - |
| Year 2 | 1,541 | - | 236 | 236 | 236 |
| Year 3 | 2,997 | - | 459 | 459 | 459 |
| Year 4 | 4,373 | - | 669 | 669 | 669 |
| Year 5 | 5,672 | - | 868 | 868 | 868 |
| Year 6 | 6,899 | - | 1,056 | 1,056 | 1,056 |
| Year 7 | 8,058 | - | 1,233 | 1,233 | 1,233 |
| Year 8 | 9,153 | - | 1,400 | 1,400 | 1,400 |
| Year 9 | 10,187 | - | 1,559 | 1,559 | 1,559 |
| Year 10 | 11,164 | - | 1,708 | 1,708 | 1,708 |
| Year 11 | 12,087 | - | 1,849 | 1,849 | 1,849 |

| Year Following SPSA Closure | Reg. LF Expansion Methane Generation ($MTCH_4$/yr) | Private Landfill Methane Generation ($MTCH_4$/yr) | Atlantic Waste LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Bethel LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Brunswick LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) |
|---|---|---|---|---|---|
| Year 12 | - | 12,959 | 2,799 | 1,983 | 2,332 |
| Year 13 | - | 13,782 | 2,977 | 2,109 | 2,480 |
| Year 14 | - | 14,560 | 3,145 | 2,228 | 2,620 |
| Year 15 | - | 15,295 | 3,304 | 2,340 | 2,753 |
| Year 16 | - | 15,989 | 3,454 | 2,446 | 2,877 |
| Year 17 | - | 16,644 | 3,595 | 2,547 | 2,996 |
| Year 18 | - | 17,264 | 3,729 | 2,641 | 3,107 |
| Year 19 | - | 17,848 | 3,855 | 2,731 | 3,213 |
| Year 20 | - | 18,401 | 3,975 | 2,815 | 3,312 |
| Year 21 | - | 18,923 | 4,087 | 2,895 | 3,406 |
| Year 22 | - | 19,416 | 4,194 | 2,971 | 3,495 |
| Year 23 | - | 19,881 | 4,294 | 3,042 | 3,579 |
| Year 24 | - | 20,321 | 4,389 | 3,109 | 3,658 |
| Year 25 | - | 20,737 | 4,479 | 3,173 | 3,733 |
| **Totals** | **72,133** | **242,021** | **63,313** | **48,066** | **54,600** |

As shown in **Table 13**, the 50% Hybrid scenario has net methane emissions that ranges from 48,066 to 63,313 $MTCH_4$/yr. Summing the yearly methane emissions of the three landfills considered results in an average of 55,326 $MTCH_4$ and a resulting GHG impact of 1,383,153 $MTCO_2e$. When sequestration avoided (22,322 $MTCO_2e$) the total GHG impact is **1,405,475 $MTCO_2e$.**

For the 25% (E-25) diversion scenario, using the same **Table 10** information, 75% of the generated methane was assigned to the SPSA Regional Landfill expansion, with the remaining 25% assigned to Atlantic Landfill. The resultant combined emissions from both of the landfills under this scenario is provided in **Table 14.**

Table 14. Alternative E – Hybrid 25% Scenario Methane Emission Estimate

| Year Following SPSA Closure | Reg. LF Expansion Methane Generation ($MTCH_4$/yr) | Private Landfill Methane Generation ($MTCH_4$/yr) | Atlantic Waste LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Bethel LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Brunswick LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) |
|---|---|---|---|---|---|
| Year 1 | - | - | - | - | - |
| Year 2 | 1,541 | - | 236 | 236 | 236 |
| Year 3 | 2,997 | - | 459 | 459 | 459 |
| Year 4 | 4,373 | - | 669 | 669 | 669 |

| Year Following SPSA Closure | Reg. LF Expansion Methane Generation ($MTCH_4$/yr) | Private Landfill Methane Generation ($MTCH_4$/yr) | Atlantic Waste LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Bethel LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) | Brunswick LF Total Methane Emissions Adjusted for 10% Oxidation ($MTCH_4$/yr) |
|---|---|---|---|---|---|
| Year 5 | 5,672 | - | 868 | 868 | 868 |
| Year 6 | 6,899 | - | 1,056 | 1,056 | 1,056 |
| Year 7 | 8,058 | - | 1,233 | 1,233 | 1,233 |
| Year 8 | 9,153 | - | 1,400 | 1,400 | 1,400 |
| Year 9 | 10,187 | - | 1,559 | 1,559 | 1,559 |
| Year 10 | 11,164 | - | 1,708 | 1,708 | 1,708 |
| Year 11 | 12,087 | - | 1,849 | 1,849 | 1,849 |
| Year 12 | 12,959 | - | 1,983 | 1,983 | 1,983 |
| Year 13 | 13,782 | - | 2,109 | 2,109 | 2,109 |
| Year 14 | 14,560 | - | 2,228 | 2,228 | 2,228 |
| Year 15 | 15,295 | - | 2,340 | 2,340 | 2,340 |
| Year 16 | 15,989 | - | 2,446 | 2,446 | 2,446 |
| Year 17 | 8,322 | 8,322 | 3,071 | 2,547 | 2,771 |
| Year 18 | - | 17,264 | 3,729 | 2,641 | 3,107 |
| Year 19 | - | 17,848 | 3,855 | 2,731 | 3,213 |
| Year 20 | - | 18,401 | 3,975 | 2,815 | 3,312 |
| Year 21 | - | 18,923 | 4,087 | 2,895 | 3,406 |
| Year 22 | - | 19,416 | 4,194 | 2,971 | 3,495 |
| Year 23 | - | 19,881 | 4,294 | 3,042 | 3,579 |
| Year 24 | - | 20,321 | 4,389 | 3,109 | 3,658 |
| Year 25 | - | 20,737 | 4,479 | 3,173 | 3,733 |
| **Totals** | **153,040** | **161,114** | **58,216** | **48,066** | **52,416** |

As shown in **Table 14**, the 25% Hybrid scenario has net methane emissions that ranges from 48,066 to 58,216 $MTCH_4$/yr. Summing the yearly methane emissions of the three landfills considered results in an average of 52,899 $MTCH_4$ and a resulting GHG impact of 1,322,473 $MTCO_2e$. When sequestration avoided (27,973 $MTCO_2e$) the total GHG impact is **1,350,446 $MTCO_2e$.**

Since Alternative E involves impact to the wetland forested area, SCS calculated the avoided sequestration of 79 and 99-acres of development, using the same methodology outlined in previous sections. **Tables 15 and 16** contain the results of the additional analysis for Alternative E.

Table 15. Alternative E (Hybrid 50%) – Carbon Not Sequestered

| Impacted Acreage | Average $CO_2$ Emissions per Acre | Project Lifespan | $CO_2$ Not Sequestered |
|---|---|---|---|
| 79 | 11.58 $MTCO_2e$ | 24.4 years | 22,322 $MTCO_2e$ |

Table 16. Alternative E (Hybrid 25%) – Carbon Not Sequestered

| Impacted Acreage | Average $CO_2$ Emissions per Acre | Project Lifespan | $CO_2$ Not Sequestered |
|---|---|---|---|
| 99 | 11.58 $MTCO_2e$ | 24.4 years | 27,973 $MTCO_2e$ |

As shown in **Tables 15 and 16**, Alternative E has a respective GHG impact of 22,322 and 27,973 $MTCO_2e$ in carbon not sequestered from the eradication of 79 and 99 acres of wetland forest.

Similar to the Alternative A analysis, SCS used the CE and oxidation-adjusted methane values as potential methane emissions to the atmosphere. Using information from **Tables 13** through **16**, the results of the analysis for Alternative E are shown in **Table 17.**

Table 17. Alternative E – Hybrid Alternative

| Comparative Item | 50% Scenario | 25% Scenario |
|---|---|---|
| **Uncontrolled Methane Adjusted for 10% OX ($MTCH_4$)** | 55,326 | 52,899 |
| **Total GHG Impacts from Landfill Operations ($MTCO_2e$)** | 1,383,153 | 1,322,473 |
| **Carbon Not Sequestered ($MTCO_2e$)** | 22,322 | 27,973 |
| **Net GHG Impacts ($MTCO_2e$)** | 1,405,475 | 1,350,446 |

As shown in **Table 17**, using the global warming potential for methane of 25x, the resulting carbon dioxide equivalent ($MTCO_2e$) emissions for Alternative E is 1,341,722 $MTCO_2e$ under the 50% diversion scenario and 1,429,825 $MTCO_2e$ under the 25% diversion scenario.

## SUMMARY AND CONCLUSIONS

A summary of the hauling and landfill operational GHG impacts from the various alternatives evaluated is presented in **Table 18.**

Table 18. Alternative GHG Impacts Summary – Landfill Operational and Hauling Analysis

| Project Alternative | Operational GHG Impacts ($MTCO_2e$) | Hauling GHG Impacts ($MTCO_2$) | Total GHG Impacts ($MTCO_2e$) |
|---|---|---|---|
| **Alternative A** - No Action Alternative/Transfer Waste to a Private Landfill Emissions Estimate (Baseline) | 1,437,254 | 181,000 | 1,618,254 |
| **Alternative B** – Full Expansion Alternative Emissions Estimate | 1,234,696 | 61,000 | 1,295,696 |
| **Alternative C** – Partial Expansion Alternative Emissions Estimate | 1,232,436 | 61,000 | 1,293,436 |
| **Alternative D** – Closure and Conversion of Landfill to a Transfer Station – Hauling to a New Landfill (SH30) | 1,784,069 | 127,000 | 1,911,069 |
| **Alternative E** – Hybrid Alternative 50% Diversion and Partial Expansion | 1,405,475 | 127,000 | 1,532,475 |
| **Alternative E** – Hybrid Alternative 25% Diversion and Partial Expansion | 1,350,446 | 100,000 | 1,450,446 |

As can be seen in **Table 18**, Alternative D (building a new landfill at SH30) would have the greatest total GHG impact of all the scenarios (292,815 $MTCO_2e$ greater, or the equivalent of over 30 million gallons of gasoline consumed, than the next lowest Alternative). Alternatives B and C have the lowest GHG impacts. Also, the current SPSA Regional Landfill has an RNG facility, which provides additional GHG benefits (credits) equivalent to an estimated 5,487,585 $MTCO_2e$. This benefit could also accrue for the private landfill alternatives that have landfill gas to energy or renewable natural gas facilities.

## Other Considerations

### Carbon Sequestration

There is a net zero difference in the amount of carbon sequestered from landfilling operations under all the Alternatives. Within a landfill, Carbon Sequestration is represented as the fraction of organic carbon in the waste stream that is not converted to methane or carbon dioxide via methanogensis. This sequestered carbon is stored in the landfill. SCS calculated carbon sequestration for the project lifespan waste (11.2 million tons) following the USEPA calculation methodologies for carbon storage calculations and used a carbon storage factor (CSF) value specific to a given waste type and presented in metric tons carbon equivalent (MTCE) which is then multiplied by the number of short tons of waste received within a given waste category.

SCS utilized USEPA default waste composition values in order to get the waste-specific composition for the 11.2 million tons of MSW. The resulting USEPA-aligned waste composition percentages were then multiplied by the total project waste volume to obtain a tonnage distribution of the waste accepted. The result of the distribution is presented in **Table 19.**

Table 19. Alternative A – Carbon Sequestration

| Waste Type | Percentage in MSW Stream | Carbon storage Factor (MTCE/ton) | Sequestered Carbon (MTCE) |
|---|---|---|---|
| Newspapers | 2.17% | 0.395 | 96,068 |
| Office Paper | 1.92% | 0.047 | 10,115 |
| Mixed Paper | 3.65% | 0.226 | 92,198 |
| Magazines/Catalogs | 0.76% | 0.254 | 21,634 |
| Cardboard/Kraft Paper | 6.61% | 0.247 | 182,773 |
| Remainder/Comp Paper | 5.57% | 0.235 | 146,545 |
| Textiles | 6.29% | 0.009 | 6,336 |
| Wood | 8.88% | 0.304 | 302,418 |
| Food Waste | 18.59% | 0.024 | 49,959 |
| Yard Trimmings | 6.96% | 0.136 | 105,968 |
| Misc. Organics | 5.28% | 0.135 | 79,800 |
| Other waste | 33.33% | - | - |
| **Total** | **100%** | | **1,093,812** |
| | | **Conversion Factor ($MTCO_2e$/MTCE)** | **3.67** |
| | | **Total Sequestered Carbon ($MTCO_2e$)[1]** | **4,014,290** |

[1]Conversion factor for sequestered carbon equivalents to sequestered carbon dioxide equivalents by using relative molecular weight ratio of carbon dioxide to carbon (44/12 = 3.67 $MTCO_2E$)/MTCE.

# Appendix D: Analysis of Potential Hauling and Landfill Capital and Operational Cost Impacts for Alternative Landfill Sites to Support SPSA’s Environmental Impact Statement

April 22, 2024
File No. 022220102.00

MEMORANDUM

TO: Kimberly Blossom, Neville Reynolds, VHB

FROM: Bob Gardner, PE, BCEE
Keith Matteson, PE

SUBJECT: Analysis of Potential Hauling and Landfill Capital and Operational Cost Impacts for Alternative Landfill Sites to Support Southeastern Public Service Authority's (SPSA) Environmental Impact Statement

The purpose of this memorandum is to present the analysis of the operational and capital cost impacts of the site alternatives (scenarios) evaluated as part of the subject Environmental Impact Statement (EIS). This memorandum supersedes all previous drafts regarding the cost analysis prepared by SCS Engineers (SCS) and includes a new Hybrid Alternative that was added subsequent to the submission of the Draft EIS (DEIS, dated June 2023). The Hybrid Alternative, which is described in more detail below, involves further reducing the size of the expansion area and wetland impacts by diverting 25 percent or 50 percent of the expansion area disposal volume to a private landfill.

## ALTERNATIVES EVALUATED

SCS evaluated the capital and operational costs, landfill footprint, and wetland impacts for following alternatives:

- **Alternative A – No Action Alternative/Transfer Waste to Private Landfill.** Under this alternative, SPSA would re-route waste to a private landfill following reaching permitted capacity in 2037.
- **Alternative B – Full Expansion.** Under this alternative, SPSA would expand its landfill operations into the expansion area, which would accommodate two additional landfill cells, designated Cells VII and IX. Under this alternative, 117.36 acres of forested wetlands would be impacted.
- **Alternative C – Partial Expansion.** Under this alternative, construction of Cells VII and IX would still occur, but the footprint of Cell IX would be smaller than proposed under Alternative B. Under this alternative, 109.64 acres of forested wetlands would be impacted.

- **Alternative D – Closure and Conversion to Just a Transfer Station Operation with New Off-Site Landfill.** Under this alternative, the landfill would close in 2037, and all waste would be diverted to a new SPSA landfill site (SH30).

- **Alternative E - Hybrid Alternative Scenarios**

  – **Hybrid 50% (E-50) Diversion and Partial Expansion.** Under this alternative, 50% of the waste that would otherwise be disposed in the expansion area would be diverted to either the WM Atlantic Waste Disposal Landfill, the WM Bethel Landfill, or the Republic Services Brunswick Landfill, resulting in a smaller landfill footprint and fewer wetland impacts.

  – **Hybrid 25% (E-25) Diversion and Partial Expansion.** Under this alternative, 25% of the waste that would otherwise be disposed in the expansion area would be diverted to a either the WM Atlantic Waste Disposal Landfill, the WM Bethel Landfill, or the Republic Services Brunswick Landfill, resulting in a smaller landfill footprint and fewer wetland impacts.

The locations of the majority of potential alternative sites being considered in this analysis are shown in Figure 1. Under Alternative A, the hauling and disposal costs for three private regional landfills was evaluated. Alternative C is SPSA's preferred alternative because it impacts fewer wetlands than Alternative B.

The Shoosmith Landfill was active and was pursuing a expansion permit when our work began on this analysis While working on another project recently, SCS learned that public opposition resulted in Shoosmith Landfill not pursuing its expansion permit, and the landfill stopped receiving waste; therefore, the Shoosmith Landfill was removed from the analysis.

## HYBRID ALTERNATIVES

Following cooperating and other supporting agency review and comment on the Draft EIS, SCS was requested to evaluate the Hybrid Alternative described above. The Hybrid Alternative involves diverting a portion of the waste stream to one of three private landfills resulting in a smaller landfill expansion than the SPSA preferred alternative, thus impacting fewer wetlands. The 16 million cubic yards (MCY) of disposal capacity associated with the full expansion of Cells VII and IX (Alternative B) was used as the basis for the analysis. The Hybrid Alternative considered two scenarios, one diverting 25 percent and the other 50 percent of the design capacity of preferred expansion Alternative C.

SCS prepared a high-level conceptual analysis of the estimated footprint required to provide the disposal capacity for the hybrid diversion alternative for the 25 and 50 percent scenarios (see Table 1). Detailed designs were not prepared for the Hybrid Alternative scenarios and further analysis and engineering design could be performed to refine and optimize the estimated footprint and wetland impact areas. Landfill geometry is an important factor in landfill design, including the length and width of the development area, access road configuration and grades, excavation depth, landfill slopes, and maximum permitted height. These factors were taken into consideration in developing the conceptual designs used for the hybrid analysis. SPSA's preferred alternative for expanding into Cells VIII and IX (Alternative C) is estimated to have a landfill footprint of 84.28 acres and impact a total of 109.64 acres of wetlands assuming 25.36 acres of supporting roads, drainage, and other infrastructure. For the Hybrid Alternative scenarios, the supporting wetlands impacted infrastructure area was reduced proportionally to the estimated reduced landfill footprint. In other words, as an example, if the Hybrid Alternative scenario landfill footprint was reduced by 6% compared to Alternative C, the supporting infrastructure wetlands impacted area was reduced by 6%.

Figure 1. SPSA's Transfer Station Network and Alternative Landfill Site Locations

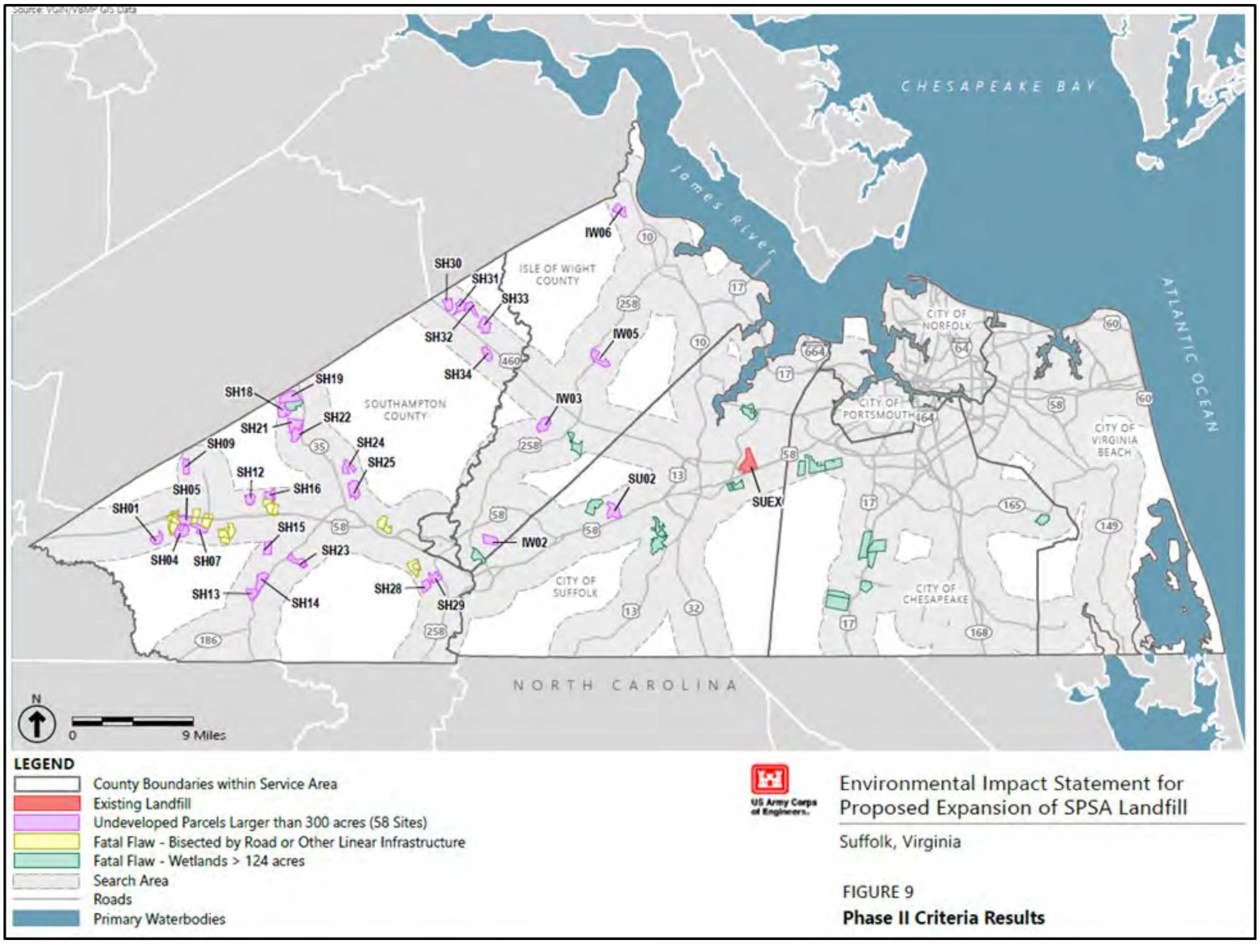


Table 1. Conceptual Analysis of Landfill Height Versus Disposal Capacity, SPSA Regional Landfill Hybrid Analysis

| Landfill[1] Height | Footprint | Total Volume | LF Footprint Area | Support Area | Total Impacts | Hybrid Landfill Footprint Est. Hybrid-50[2] | Hybrid-25[2] |
|---|---|---|---|---|---|---|---|
| 50 ft | 13.70 ac | 1,082,317 cy | 13.71 ac | 4.00 ac | 17.71 ac | | |
| 60 ft | 20.21 ac | 1,879,822 cy | 20.21 ac | 6.00 ac | 26.21 ac | 0.00 ac | 0.00 ac |
| 70 ft | 26.71 ac | 2,769,947 cy | 26.71 ac | 8.00 ac | 34.71 ac | 0.00 ac | 0.00 ac |
| 80 ft | 33.21 ac | 3,740,903 cy | 33.21 ac | 10.00 ac | 43.21 ac | 0.00 ac | 0.00 ac |
| 90 ft | 39.71 ac | 4,784,272 cy | 39.72 ac | 12.00 ac | 51.72 ac | 0.00 ac | 0.00 ac |
| 100 ft | 46.21 ac | 5,889,107 cy | 46.22 ac | 14.00 ac | 60.22 ac | 0.00 ac | 0.00 ac |
| 110 ft | 52.72 ac | 7,046,987 cy | 52.72 ac | 16.00 ac | 68.72 ac | 0.00 ac | 0.00 ac |
| 120 ft | 59.22 ac | 8,246,968 cy | 59.22 ac | 18.00 ac | 77.22 ac | 53.76 ac | 0.00 ac |
| 130 ft | 65.72 ac | 9,480,629 cy | 65.73 ac | 20.00 ac | 85.73 ac | 0.00 ac | 0.00 ac |
| 140 ft | 72.22 ac | 10,737,865 cy | 72.23 ac | 22.00 ac | 94.23 ac | 0.00 ac | 0.00 ac |
| 150 ft | 78.72 ac | 12,007,732 cy | 78.73 ac | 24.00 ac | 102.73 ac | 0.00 ac | 72.85 ac |
| 170 ft | 84.00 ac | 14,480,000 cy | 84.00 ac | 25.36 ac | 109.36 ac | 0.00 ac | 0.00 ac |
| | | Target Hybrid Capacity | | | | 7,240,000 cy | 10,860,000 cy |
| | | | | Footprint | | 53.76 ac | 72.85 ac |
| | | | | Support | | 18.00 ac | 24.00 ac |
| | | Total Wetland Impact, Hybrid Alternative | | | | 71.76 ac | 96.85 ac |
| | | Total Wetland Impacts, Alternative C | | | | 109.64 ac | 109.64 ac |
| | | Hybrid Wetlands Reduction | | | | 37.88 ac | 12.79 ac |
| | | | | Est. LF Life | | 11.0 | 16.5 |
| | | | | Hauling | | 13.4 yrs | 7.9 yrs |

[1]Final height above grade.
[2]Landfill footprint extrapolated; support infrastructure wetland area calculated based on ratio of landfill footprint for Alternative C and the Hybrid landfill footprint area.

## KEY ASSUMPTIONS

Other key assumptions for the financial analysis are as follows:

- **In-place waste density:** 1,400 pounds per cubic yard
- **Annual disposal rate:** 460,000 tons per year
- **Tip fee for disposal at a private landfill:** The Environmental Research and Education Foundation (EREF) conducts periodic surveys of landfill tip fees throughout the United States, and presents the results on a national, regional, and state-by-state basis. The most recent EREF tip fee survey report was completed for 2022. The average tip fee rate for Virginia in 2022 was $59.89 (± $18.40). The average inflation rate for the solid waste industry between 2022 and 2024 according to the Bureau of Labor and Statistics was 5.26%/year or a 1.11 multiplication factor. Using the 1.11 inflation factor, the tip fee rate for Virginia in 2024 dollars would $66.36 ±$20.39/ton. To reflect potential market conditions if SPSA were to close its Regional Landfill and

contract for disposal, we assumed a tip fee rate of $45.97/ton (first standard deviation below the average) to estimate contract disposal rates.

- **Capacity of future landfill expansion**: 16,000,000 cubic yards and provides approximately 24.4 years of disposal capacity, based on the assumed annual disposal rate. The preferred Alternative C has a landfill footprint of 84.28 acres and 25.36 acres, for a total wetland impact of approximately 109.64 acres. Figure 2 shows the configuration of Alternative C, which includes approximately 14,480,000 cubic yards in the Cells VIII and IX expansion area and 1,520,000 cubic yards in the valley area between Cells V and VII.

- **Cell development costs**: $719,500/acre

- **Closure costs**: When a landfill reaches capacity, it must be "closed". The primary capital cost of closure is construction of the final cover system and other environmental controls that may be needed. SPSA estimates closure costs $206,800/acre for the Regional Landfill (SPSA 2022 Closure/Post-Closure Care estimate).

- **Post-closure care (Cells I-VII):** SPSA has a 30-year obligation to maintain the site after closure for 30 years. This is referred to as the post-closure care period. SPSA estimates its post-closure care liability for the Regional Landfill is $7.944 million. We assume this cost will be applied to all the alternatives, but for Alternative D, which involves constructing a new regional landfill at SH30, we assume an additional annual accrual of $318,000/year ($7.944 million/25) is included in the yearly operational costs to cover this liability for a new landfill site.

- **Wetland mitigation credit costs**: $40,000/acre, 2 to 1 ratio

- **Inflation**: Not considered in this analysis.

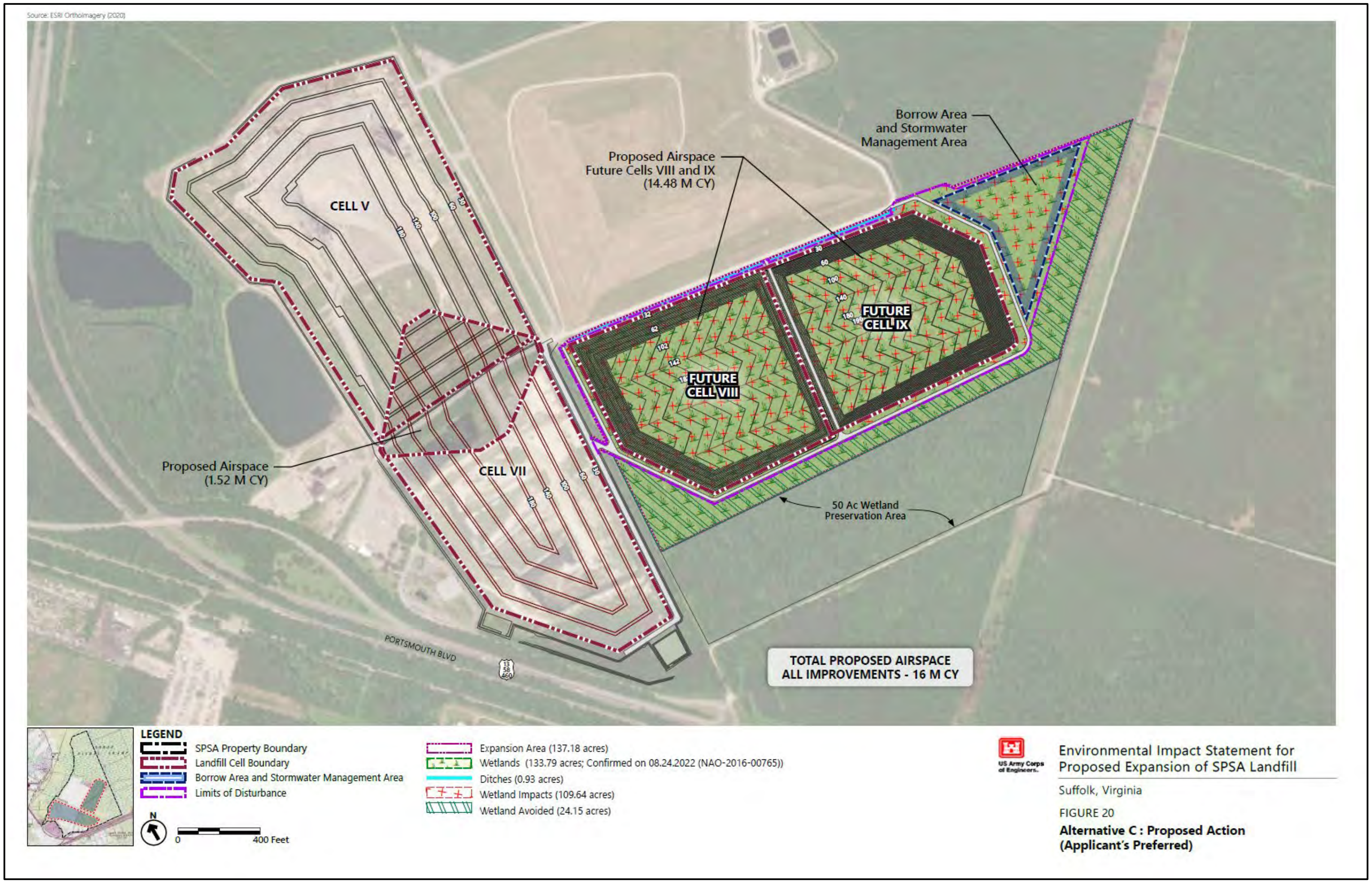
- **Diesel fuel costs**: $5/gallon, fuel efficiency of 4 miles/gallons.

- **Equipment costs** (7-year replacement schedule):
  - Trucks: $129,500
  - Trailers: $85,000

## WETLANDS IMPACTS AND MITIGATION COSTS

- Alternatives B, C, D, and E have varying projected impacts to forested wetlands. SPSA estimates a $40,000/acre cost per credit for wetlands mitigation. The cost of wetland credits is market driven and shifts when buyers begin negotiating with bankers. However, we believe the $40,000/acre is a reasonable estimate for cost comparison purposes. Table 2 summarizes the projected wetlands impact impacts and mitigation costs for each alternative.

Figure 2. Alternative C Proposed Action (SPSA's Preferred)




Source: VHB, Southeastern Public Service Authority of Virginia (SPSA) Landfill Expansion, Draft Environmental Impact Statement, September 2022, p. 69.

Table 2. Summary of Wetland Impacts for Alternatives

| Alternative | Description | Est. Wetlands Impact | Assumed Mitigation Ratio | Total Credits Needed | Wetlands Credit $/ac | Estimated Wetlands Mitigation Costs |
|---|---|---|---|---|---|---|
| A | Hauling and Diposal at Private LF | 0.00 ac | | | | $0 |
| B | Regional Landfill Expansion | 117.36 ac | 2:1 | 234.72 ac | $40,000 /ac | $9,388,800 |
| C | Regional Landfill Expansion | 109.64 ac | 2:1 | 219.28 ac | $40,000 /ac | $8,771,200 |
| D | SH30 | 8.00 ac | 2:1 | 16.00 ac | $40,000 /ac | $640,000 |
| E-50 | Hybrid 50% Diversion | 71.76 ac | 2:1 | 143.52 ac | $40,000 /ac | $5,740,800 |
| E-25 | Hybrid 25% Diversion | 96.85 ac | 2:1 | 193.70 ac | $40,000 /ac | $7,748,000 |

## CAPITAL COSTS

The following capital costs were considered in the analysis:

- **Landfill cell development and closure costs** for either expansion into Cells VIII and IX or siting, constructing, and closing a new regional landfill. SCS used the estimates prepared by HDR for Cell VIII and IX, and estimates prepared by SCS for siting, constructing, and closing a new regional landfill.

- **Transfer equipment purchase/replacement costs** for trucks and trailers needed to transfer waste from SPSA's transfer stations to the selected disposal alternative. SPSA has an existing fleet to support its ongoing operations. Hauling to any of the other landfills than the Regional Landfill will require additional trucks, trailers, and drivers. The purchase and replacement costs for the existing fleet and new trucks and trailers is included.

- **Land acquisition costs for Alternative D (SH30).** The assumed land acquisition costs for SH30 is based on the Virginia Mass Appraisal Network estimate of $582,000 (rounded to a thousand dollars) for the property which is zoned A-1. Southampton County indicated that the assessed value is based on the fair market value of the property.

Capital and operational cost estimates have been updated since the DEIS was issued. The DEIS also added current dollars for landfill capital costs and net present value dollars for the fleet transfer capital costs (i.e., equipment replacement) to arrive at the total capital costs. Net present value costs discount future costs based on an assumed discount factor and timing of the costs. To be internally consistent, all costs are now in current dollars versus mixing net present value and current dollar costs.

## OPERATIONAL COSTS

The operational costs include the individual department costs for SPSA's system as shown in Table 3. Some of the department costs will change, be eliminated, or stay the same depending on the alternative selected. Table 3 also provides a matrix of the logic used to allocate costs for each alternative, and our estimate of the annual operating costs for each. For example, in the case of

Alternative A (transferring to a private landfill and ceasing the Regional Landfill operations), there would be significant added costs for transfer fleet operations (additional trucks, personnel, fuel, maintenance, and replacement costs), contract disposal costs, and post-closure care.

The operational costs presented in this memorandum are SPSA's full-system costs as shown in Table 3. The "Transportation" costs shown in the table under the "Private" column is for the WM Atlantic Disposal Landfill scenario. The "Transportation" cost item varies depending on private landfill selected (i.e., WM Bethel or Republic Brunswick). In addition, for the Hybrid Alternative scenarios, the transfer and fleet capital and operational costs were calculated based on the pro-rated costs estimated for Alternative A and C. For example, if the landfill is projected to operate for 11 years (the 50% Diversion Alternative), and the projected life of Alternative C is 24.4 years, the landfill operational costs would be allocated for 11 years and transfer and fleet hauling costs from the No Action Alternatives would be allocated for 24.4 – 11 = 13.4 years.

Table 3. Southeastern Public Service Authority (SPSA), Summary of Projected Operational Costs by Cost Center for EIS Alternatives

| | | | EIS Alternatives Cost Allocation | | | | | EIS Alternatives | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | B-C | D | E-50 | E-25 | A | B-C | D |
| Cost Center | Description | FY 2023 Budget | Private | Expand | New RLF | Hybrid-50 | Hybrid-25 | Private | Expand | New RLF |
| 110 | Accounting Department | $262,393 | Same | Same | Same | Same | Same | $262,393 | $262,393 | $262,393 |
| 120 | Executive Offices | $913,780 | Same | Same | Same | Same | Same | $913,780 | $913,780 | $913,780 |
| 130 | Human Resources | $133,508 | Same | Same | Same | Same | Same | $133,508 | $133,508 | $133,508 |
| 140 | Purchasing Department | $0 | Same | Same | Same | Same | Same | $0 | $0 | $0 |
| 150 | Regional Office Building | $120,207 | Same | Same | Same | Same | Same | $120,207 | $120,207 | $120,207 |
| 160 | Information Technology | $451,423 | Same | Same | Same | Same | Same | $451,423 | $451,423 | $451,423 |
| 200 | Environmental Management | $559,327 | Same | Same | Same | Same | Same | $559,327 | $559,327 | $559,327 |
| 210 | Household Hazardous Waste Program | $0 | Same | Same | Same | Same | Same | $0 | $0 | $0 |
| 300 | Operations Center | $118,800 | Same | Same | Same | Same | Same | $118,800 | $118,800 | $118,800 |
| 310 | Safety | $213,257 | Same | Same | Same | Same | Same | $213,257 | $213,257 | $213,257 |
| 320 | Regional Landfill | $3,162,554 | Eliminate | Same | Same | Same | Same | $0 | $3,162,554 | $3,162,554 |
| 330 | Tire Shredder | $311,795 | Same | Same | Same | Same | Same | $311,795 | $311,795 | $311,795 |
| 340 | Fleet Maintenance - Operations Center | $1,017,076 | Change | Same | Same | Same | Same | $1,708,688 | $1,017,076 | $1,017,076 |
| 341 | Fleet Maintenance - Regional Landfill Shop | $430,353 | Eliminate | Same | Same | Same | Same | $0 | $430,353 | $430,353 |
| 350 | Transportation | $3,799,643 | Change | Same | Change | Same | Same | $9,138,000 | $5,075,000 | $7,005,000 |
| 361 | Boykins Transfer Station | $25,150 | Same | Same | Same | Same | Same | $25,150 | $25,150 | $25,150 |
| 362 | Chesapeake Transfer Station | $719,761 | Same | Same | Same | Same | Same | $719,761 | $719,761 | $719,761 |
| 363 | Franklin Transfer Station | $322,583 | Same | Same | Same | Same | Same | $322,583 | $322,583 | $322,583 |
| 364 | Isle of Wight Transfer Station | $322,358 | Same | Same | Same | Same | Same | $322,358 | $322,358 | $322,358 |
| 365 | Ivor Convenience Center | $22,306 | Same | Same | Same | Same | Same | $22,306 | $22,306 | $22,306 |
| 366 | Landstown Transfer Station | $1,176,472 | Same | Same | Same | Same | Same | $1,176,472 | $1,176,472 | $1,176,472 |
| 367 | Norfolk Transfer Station | $911,853 | Same | Same | Same | Same | Same | $911,853 | $911,853 | $911,853 |
| 368 | Oceana Transfer Station | $586,242 | Same | Same | Same | Same | Same | $586,242 | $586,242 | $586,242 |
| 369 | Suffolk Transfer Station | $481,935 | Same | Same | Same | Same | Same | $481,935 | $481,935 | $481,935 |
| 370 | Scalehouse Operations | $776,272 | Same | Same | Same | Same | Same | $776,272 | $776,272 | $776,272 |
| 900 | Contracted Waste Disposal | $23,905,192 | | | | | | | | |
| | Va. Beach Ash & Residue Agreement | $0 | Eliminate | Eliminate | Eliminate | Eliminate | Eliminate | $0 | $0 | $0 |
| | Waste Disposal & Services Agreement | $15,445,192 | Eliminate | Eliminate | Eliminate | Eliminate | Eliminate | $0 | $0 | $0 |
| | Waste Hauling & Disposal Agreement | $8,460,000 | Eliminate | Eliminate | Eliminate | Eliminate | Eliminate | $0 | $0 | $0 |
| | Waste Disposal Atlantic | $0 | Eliminate | Eliminate | Eliminate | Eliminate | Eliminate | $0 | $0 | $0 |
| | New Hauling Contract (EIS) | | Change | Eliminate | Eliminate | Eliminate | Eliminate | $21,146,000 | $0 | $0 |
| 900 | Capital Improvement / Equipment Replacement | $3,500,000 | Eliminate | Same | Same | Same | Same | $0 | $3,500,000 | $3,500,000 |
| 900 | Debt Service | $0 | Same | Same | Same | Same | Same | $0 | $0 | $0 |
| 900 | Suffolk Environmental Trust Fund | $5,000 | Same | Same | Same | Same | Same | $5,000 | $5,000 | $5,000 |
| 900 | Reserves for Landfill Closure/Expansion | $8,000,000 | Eliminate | Eliminate | Eliminate | Eliminate | Eliminate | 0 | 0 | 0 |
| 900 | Tip Fee Stabilization Credit to Localities | $0 | | | | | | | | |
| | Accrual for Post-Closure Care (added line item) | | | | | | | | | $318,000 |
| | **Total Expenses** | **$52,249,241** | | | | | | **$40,427,110** | **$21,619,406** | **$23,867,406** |

Notes:
1. PCC = Post closure care
2. "New RLF" refers to site SH30, "Expand" refers to expansion of the existing regional landfill (i.e., SUEX), and "Private" refers to transferring waste for disposal at a private landfill
3. "Alternatives" A, B, C, D, E-50 and E-25 are defined above. Alternative B and C are grouped together and labeled "B-C" because operational costs would be the same; the only difference being the number of wetlands impacted. Alternatives E-50 and E-25 represent combinations of Alternatives A and C as described above.

If a new landfill were to be constructed (SH30), we assumed that the existing Regional Landfill in Suffolk would close (although waste transfer operations would continue), and post-closure costs would begin. We use the post-closure care costs presented in SPSA's annual financial assurance documentation. Divided by life of the landfill to estimate the annual post-closure care cost accrual that would result. We eliminated the capital cost reserve line item for the alternatives evaluated because we account for the capital costs separately for the purpose of this analysis.

The fleet operations include the transfer trucks and trailers and drivers, and maintenance tasks that support the transfer fleet. The fleet operations cost estimates were prepared for the alternatives. The analysis is based on a time and motion calculations considering the quantities of municipal solid waste that would be transferred from each transfer station in the SPSA network (see Table 4) to the final disposal location (see Figure 1 and Table 5). We assume a 20-ton per load for each transfer trailer in calculating the total number of loads and the roundtrip mileage that would result from transferring the 460,000 tons per year of municipal solid waste to each of the alternative disposal locations. The costs are based on SPSA's current fleet operations budgets and modified to increase hauling costs based on estimated labor, fuel, and maintenance costs. All costs are presented in 2023 dollars.

## FINDINGS AND CONCLUSIONS

1. **Disposal Capacity, Estimated Landfill Life, and Hauling Periods.** We estimate SPSA's preferred expansion alternative (Alternative C) would provide 24.4 years of disposal capacity assuming a disposal rate of 460,000 tons per year and an in-place density of 1,400 pounds per cubic yard. The 50% and 25% diversion Hybrid Alternative would provide 11 to 16.5 years of disposal capacity, respectively, after which the landfill would be closed and all waste diverted to a private landfill through year 24.4 (i.e., estimated service life of Alternatives B and C).

2. **Total System Costs.**

    – SCS evaluated the projected SPSA system operational and capital costs for each of the EIS site alternatives. Operational and capital costs vary for each alternative. For example, with the expansion of the existing Regional Landfill and the siting of a new regional landfill having cell development and other associated capital and operational costs, while transferring waste to a private landfill would include hauling and disposal costs, plus continued SPSA administrative and environmental activities associated with the closed Regional Landfill. Total System Costs were calculated over the 24.4-year period (estimated life of the preferred alternative). Total System Costs are the sum of the projected capital costs and yearly operational costs over the 24.4-year period. A summary of the total estimated system costs for each alternative is summarized in Table 6. Table 7 and Figure 3 present more detail on the capital and operational cost calculations and comparison of the alternatives. We also calculated the average costs for transporting and disposing at the Alternative A private landfill disposal sites, as well as the Hybrid-50 and Hybrid 25 Alternative scenarios.

    – The no-action alternative (Alternative A), which would close the landfill and haul all waste to one of the three private landfills identified in this analysis, is estimated to be 38% to 64% more costly than Alternative C. The 25% and 50% diversion Hybrid Alternative scenarios are estimated to be 13% to 36% more costly compared to

SPSA's Alternative C, although the lower range of the potential cost increases is associated with the WM Bethel Landfill disposal scenario, which is unlikely for the reasons stated above. For illustrative purpose, Figure 4 was prepared to demonstrate the cost relationship between Alternative C (SPSA's preferred alternative), Alternative A (no-action alternative), and Alternative E-50 and E-25 (the Hybrid Alternative scenarios) as a function of the percent diversion assuming the diverted waste would be transported and disposed at the WM Atlantic Waste Disposal Landfill. As can be seen, the relationship between % diversion and Total System Cost is generally linear.

3. **Wetland Impacts:** Alternative C (SPSA's preferred alternative) is estimated to impact approximately 109.64 acres of wetlands, while the Hybrid Alternatives could reduce the total wetland impacts by 11.43 to 30.52 acres to 98.21 acres (Hybrid-25) and 79.12 acres (Hybrid-50).

Table 4. Assumed Waste Transfer Quantities by Transfer Station and SPSA Community Members

| | Transfer Station Waste Quanties (Tons Per Year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Customer | CTS FY 2018 | FTS FY 2018 | IWTS FY 2018 | LTS FY 2018 | NTS FY 2018 | OTS FY 2018 | STS FY 2018 | TOTALS FY 2018 | RDF FY 2018 | Grand Total |
| CHESAPEAKE | 87,000 | 0 | 0 | 0 | 3,000 | 0 | 11,000 | 101,000 | 2,000 | 103,000 |
| FRANKLIN | 0 | 3,000 | 0 | 0 | 0 | 0 | 0 | 3,000 | 0 | 3,000 |
| ISLE OF WIGHT | 0 | 2,000 | 16,000 | 0 | 0 | 0 | 0 | 18,000 | 0 | 18,000 |
| NORFOLK | 0 | 0 | 0 | 0 | 89,000 | 0 | 0 | 89,000 | 0 | 89,000 |
| PORTSMOUTH | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 | 1,000 | 38,000 | 39,000 |
| SOUTHAMPTON | 0 | 9,000 | 1,000 | 0 | 0 | 0 | 0 | 10,000 | 0 | 10,000 |
| SUFFOLK | 0 | 0 | 0 | 0 | 0 | 0 | 46,000 | 46,000 | 0 | 46,000 |
| VIRGINIA BEACH | 5,000 | 0 | 0 | 106,000 | 11,000 | 30,000 | 0 | 152,000 | 0 | 152,000 |
| OTHER | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL MUNICIPAL** | **92,000** | **14,000** | **17,000** | **106,000** | **103,000** | **30,000** | **58,000** | **420,000** | **40,000** | **460,000** |

Table 5. Transfer Distances from SPSA Transfer Stations to Various Disposal Locations

| Alternative Landfill Location Parcels | Transfer Station/Distances, One-Way Miles | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Boykins | CTS | FTS | IWTS | Ivor | LTS | NTS | OTS | STS | To RDF |
| SH30 | 31 | 47.9 | 23.7 | 16 | 4.2 | 55.1 | 45.1 | 57 | 28.5 | 42.4 |
| SUEX | 44.9 | 20.5 | 32 | 24.6 | 25.6 | 28.3 | 18.3 | 32.4 | 0.9 | 15.1 |
| WM Atl Waste, Sussex Co. | 45 | 65 | 42 | 34 | 73 | 73 | 63 | 74 | 46 | 59 |
| WM Bethel LF, Hampton | 73 | 32 | 60 | 23 | 34 | 34 | 23 | 34 | 29 | 31 |
| Shoosmouth LF | 71 | 97 | 67 | 65 | 104 | 104 | 94 | 106 | 77 | 90 |
| Republic Brunswick LF | 51 | 99 | 52 | 75 | 107 | 107 | 97 | 109 | 63 | 93 |

Notes:
SUEX = SPSA Regional LF
SH30 = Alternative SPSA landfill site in Southampton County
CTS = Chesapeake Transfer Station
FST = Franklin Transfer Station
IWTS = Isle of Wight Transfer Station
LTS = Landstown Transfer Station (Virginia Beach)
NTS = Norfolk Transfer Station
OTS = Oceana Transfer Station (Virginia Beach)
STS = Suffolk Transfer Station
RDF = Refuse Derived Fuel Facility (Portsmouth)

Table 6. Total System Cost Alternatives Summary

| Alternative | Description | Total 25-year System Costs ($million) | Estimated Wetlands Impacts (acres) |
|---|---|---|---|
| Alternative A | Close Regional Landfill and transfer waste to a private landfill | $948 to $1,125 (depending on disposal site, but disposal at WM Bethel Landfill is unlikely due to restrictive local agreements) Average: $1,047 | 0.00acres |
| Alternative B | Expansion into Cells VII and IX at the existing Regional Landfill, wetland impacts of 117.36 acres | $687 | 117.36 acres |
| Alternative C | Expansion into Cells VIII and IX at the existing Regional Landfill, wetlands impact of 109.64 acres. | $686 | 109.64 acres |
| Alternative D | Develop new regional Landfill at SH30 | $775 | 8.00 acres |
| Alternative E-50 | Divert 50% of the expansion area disposal capacity | $837 - 932<br>Average: $932 | 71.76 acres |
| Alternative E-25 | Divert 25% of the expansion area disposal capacity. | $775 - $831<br>Average: $806 | 96.85 acres |

Table 7. Summary of Capital and Operational Cost Impacts for SPSA Disposal Alternatives Supporting the EIS

| Summary Item | Scenarios | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| Disposal Location | SUEX | SUEX | SH30 | WM Atl Waste Disp | WM Bethel | RSI Brunswick | Shoosmith | Hybrid-50 | Hybrid-25 | Hybrid-50 | Hybrid-25 | Hybrid-50 | Hybrid-25 |
| EIS Alternative Label | B-C | B-C | D | A | A | A | A | E-50 | E-25 | E-50 | E-25 | E-50 | E-25 |
| Impacted Wetlands Area | 117.36 ac | 109.64 ac | 8.00 ac | | | | | 71.76 ac | 96.85 ac | 71.76 ac | 96.85 ac | 71.76 ac | 96.85 ac |
| Estimated Wetlands Credits Needed | 234.72 ac | 219.28 ac | 16.00 ac | | | | | 143.52 ac | 193.70 ac | 143.52 ac | 193.70 ac | 143.52 ac | 193.70 ac |
| Hybrid Disposal Location Post SPSA | | | | | | | | WM Atl Waste Disposal | WM Atl Waste Disposal | WM Bethel | WM Bethel | RSI Brunswick | RSI Brunswick |
| Tons Hauled | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr | 460,000 tons/yr |
| **Estimated LF Life, Regional LF Preferred Alternative (Scenario 2** | 2 | | | | | | | | | | | | |

Figure 3. Summary Total System Cost Analysis by Alternative

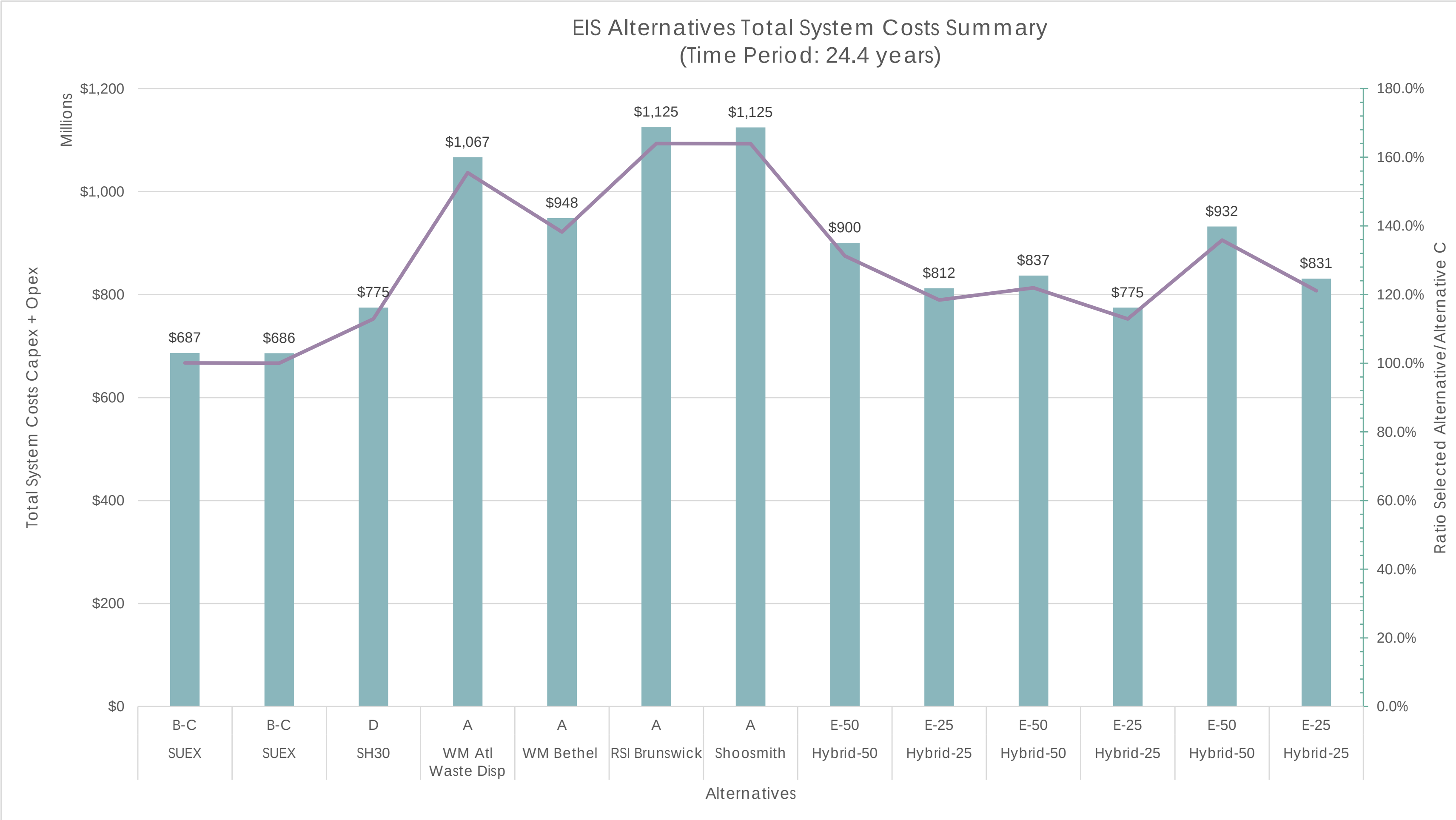
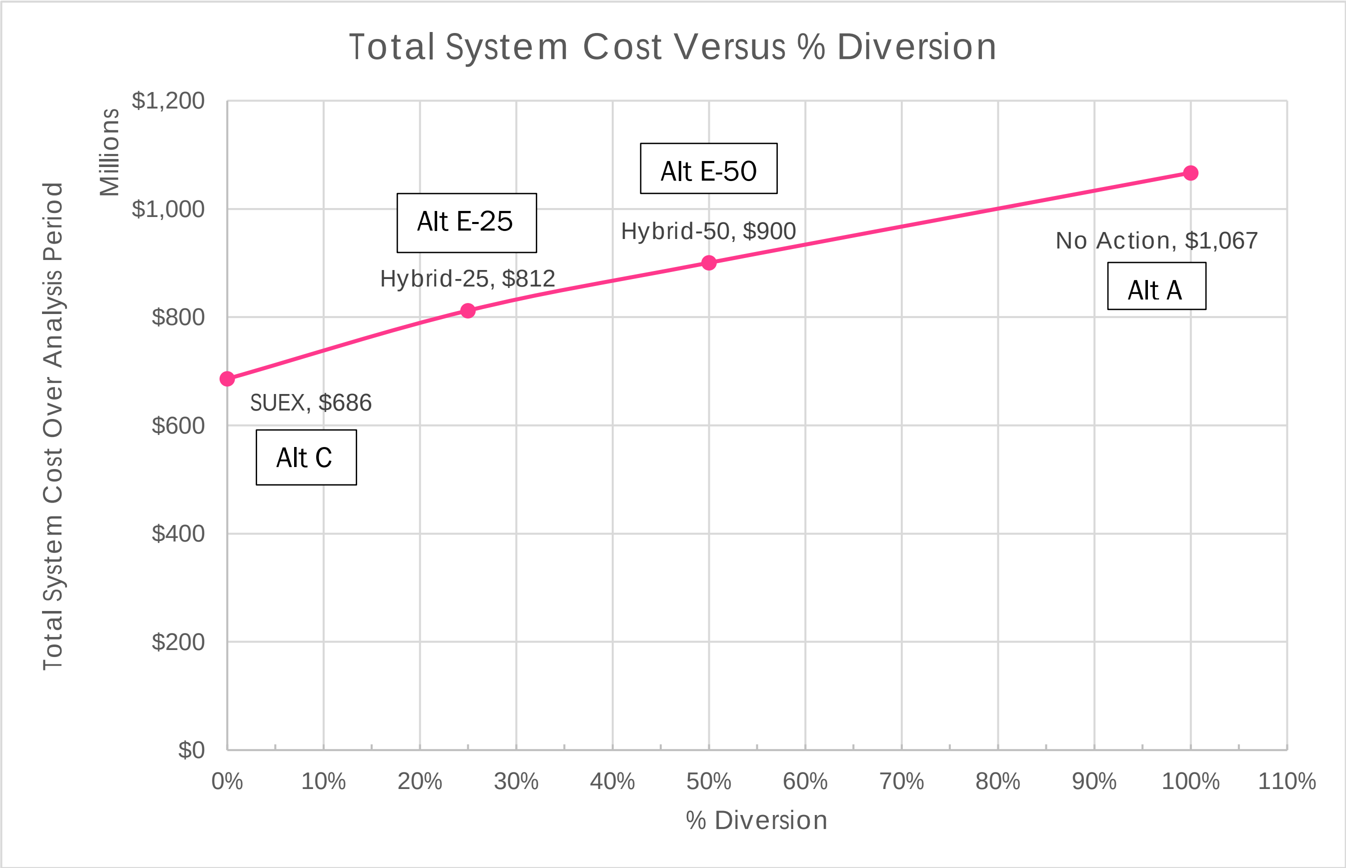


Figure 4. Total System Cost Estimate Versus % Diversion, Alternatives A, C, and E




Note: The Alternative A and Hybrid Scenarios (E-50 and E-25) represent hauling to WM Atlantic Disposal Landfill for illustrative purposes.

# Appendix E: HRPDC Regional Solid Waste Management Plan; Amended December 2023

# Regional Solid Waste Management Plan for Southeastern Virginia
# 2020 - 2025

Prepared on behalf of the:

**SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA**

This amended RSWMP is based on
a plan originally prepared by:

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Last Amended: December 2023

Approved by HRPDC October 19, 2023,

Approved by SPSA December 13, 2023

Accepted by VADEQ July 3, 2024

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## Appendices

# EXECUTIVE SUMMARY

The **Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides an overview and analysis of solid waste management in the Cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, the Counties of Isle of Wight and Southampton, and the Towns of Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield and Windsor. As required by the state regulations, the RSWMP presents background information on population and development patterns in southeastern Virginia, providing the context in which solid waste management occurs in the region. It also provides an inventory and projection of current solid waste management programs and current and future solid waste quantities generated in the region and the characteristics of those wastes. Finally, it discusses and presents available options for meeting the long-term solid waste management needs of the region in the form of a series of goals and objectives and an implementation plan.

The structure of the RSWMP is as follows:

**Chapter 1.0 - Introduction.** This chapter provides a history of solid waste management planning in Southeastern Virginia and a description of the planning area. Information is included on the regional transportation system, land use patterns, economic development and markets for recycling.

**Chapter 2.0 - Existing Solid Waste Management System.** This chapter presents regional solid waste generation quantities and disposal statistics, and the various solid waste processing, recycling, and disposal facilities in the planning area. In addition, a synopsis of solid waste handling practices is provided for each of the cities and counties in the planning area. This chapter also addresses the pending cessation of operation of the WIN Waste (formerly known as Wheelabrator Portsmouth) facility at the end of June 2024 and decommissioning and demolition of the power generating facility and RDF facility.

**Chapter 3.0 - Special Wastes.** This chapter addresses the management of additional waste streams generated in the Region such as medical waste and construction and demolition debris.

**Chapter 4.0 - Waste Management Summary.** This chapter provides a summary of the existing waste management system in the region and an overview of the future of solid waste management based on the proposed closure of the WIN Waste facility.

**Chapter 5.0 - Future Solid Waste Management Needs.** This chapter presents projections and characterization of the future solid waste stream for the planning area. National trends are presented and solid waste generation is provided by locality. Existing landfill and transfer station capacity is analyzed in light of the projections and the need for additional landfill disposal capacity is presented.

**Chapter 6.0 - Recycling Rate.** This chapter summarizes the mandatory state recycling rate and a historic overview of regional recycling performance.

**Chapter 7.0 - Litter Control.** This chapter summarizes existing litter control programs in the Region.

**Chapter 8.0 - Solid Waste Needs Assessment.** This chapter discusses the waste management hierarchy as it relates to regional solid waste management practices. The hierarchy includes source reduction, reuse, recycling, resource recovery, incineration and land filling. This chapter includes a summary of current conditions and an overview of potential actions for consideration.

**Chapter 9.0 - Implementation Plan.** This chapter presents an implementation plan for options selected during the planning process. This Chapter also includes a discussion of public/private partnerships and financing.

**Chapter 10.0 - Public Participation.** This chapter discusses opportunities for public participation at SPSA board meetings, various public education programs and media events.

**Chapter 11.0 - RSWMP Amendment Procedures.** This chapter provides an overview of the procedures to amend the RSWMP.

# 1.0 INTRODUCTION

The **Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides a guide for the short and long-term management of the solid waste system within the planning area. This Plan documents the existing solid waste management programs and facilities, describes the opportunities for improvement to the existing system, evaluates alternatives and recommends programs and facilities which will achieve the region's goals, and describes the strategy for implementing the recommended programs. This Plan's 20-year planning period is through 2040.

The format of this Plan is as follows:

- Section 1: Introduction and Background of the Planning Area
- Section 2: Existing Solid Waste Management System
- Section 3: Special Waste
- Section 4: Waste Management Summary
- Section 5: Future Municipal Solid Waste Management Needs
- Section 6: Recycling Rate
- Section 7: Litter Control
- Section 8: Solid Waste Needs Assessment
- Section 9: Implementation Plan
- Section 10: Public Participation
- Section 11: Plan Amendment Procedures

As required by the regulations, this Plan presents background information on population and development patterns in southeastern Virginia, while providing the context in which solid waste management occurs in the region. It also provides an inventory and projection of current solid waste management programs and current and future solid waste quantities generated in the region and the characteristics of those wastes. Finally, it discusses and presents available options for meeting the long-term solid waste management needs of the region in the form of a series of goals and objectives and an implementation plan.

## 1.1 SOLID WASTE MANAGEMENT PLANNING IN SOUTHEASTERN VIRGINIA

### 1.1.1 Historical Perspective

Southeastern Virginia has a long history of cooperation and innovation in solid waste management. Beginning in the early 1970s, the Region's eight cities and counties recognized the need to develop alternative solid waste management approaches. A regional study process was instituted under the auspices of the Southeastern Virginia Planning District Commission (SVPDC) to examine technological and institutional approaches to management of the region's solid waste. This effort culminated in the identification of a regional waste-to-energy project as a viable solution to this issue and the establishment of the Southeastern Public Service Authority (SPSA) of Virginia as the entity to implement the proposed regional system. Startup of the regional system occurred in 1985 with development of the Regional Landfill. The Refuse Derived Fuel and Waste to Energy Facility (RDF WTE Facility) began operation in 1988 as part of SPSA's waste-to-energy system. The search for additional management options preceded the startup date and is continuing.

Concurrent with the creation of a regional solid waste management system, the two regional agencies and the member local governments examined other aspects of the regional solid waste management issue and developed approaches to dealing with its various aspects. Studies have been undertaken and regional programs implemented in the areas of hazardous waste management and recycling. The local governments have instituted innovations in the collection system (e.g. automated collection), have undertaken components of the regional recycling program, and have implemented measures to better control environmental contaminants, such as landfill gas and leachate, at their own disposal facilities.

In 1989, the Virginia General Assembly enacted legislation requiring that localities, or regional agencies on behalf of the localities, prepare solid waste management plans. These plans were to focus on how the locality or region would achieve recycling goals. Regulations to implement this legislation and to outline common procedures for preparation of these plans were developed by the Virginia Department of Waste Management (VDWM). They were promulgated and became effective on May 15, 1990.

The SVPDC and SPSA acted jointly in March 1990, in accordance with these regulations, to recommend that the boundaries of the Southeastern Virginia Planning District should be designated as the solid waste planning region; that the SVPDC should be responsible for developing the solid waste management plan; and that SPSA should be designated as the Regional Solid Waste Management Agency and charged with implementation of the regional solid waste management plan. The VDWM formally concurred with these recommendations on February 20, 1991. Following the creation of the Hampton Roads Planning District Commission (HRPDC) by the merger of the Southeastern Virginia and Peninsula Planning District Commissions, the HRPDC became the agency responsible for preparing the solid waste management plan. In addition, the VDWM no longer exists and the authority for administering the solid waste management regulations now rests with the Virginia Department of Environmental Quality (VDEQ).

In 1991, the HRPDC, in cooperation with SPSA and its member local governments completed the RSWMP for Southeastern Virginia, which was approved by the VDWM. On August 1, 2001, the regulations were amended to require that solid waste management plans be developed or amended to conform to new plan requirements. To comply with the amended regulations, the RSWMP was revised and adopted by the HRPDC and SPSA in 2005. At that time, it is understood that SPSA accepted responsibility for making future updates to the RSWMP as needed. However, in March 2010, the local governments designated the HRPDC as the regional solid waste planning agency while SPSA remains the regional solid waste management agency. This revised solid waste management plan has been prepared by the HRPDC in cooperation with SPSA and the member local governments to meet the requirements of the Virginia "Solid Waste Planning and Recycling Regulations" (9 VAC § 20-130-10 et seq.). It builds upon the previous solid waste management planning efforts in southeastern Virginia and establishes a framework by which this region can meet the state-mandated planning requirements and recycling goals as well as the long-term waste management needs of this region.

### 1.1.2 SPSA Goals and Objectives

The SPSA Board of Directors and staff annually adopt a Strategic Operating Plan to address the future of solid waste management functions performed by SPSA in the Region for its member communities and define guiding principles for the organization.

The Strategic Operating Plan includes SPSA's:

- **Mission:** To provide an efficient and responsible waste management system for its member communities.
- **Purpose:** Management of safe and environmentally sound disposal of regional waste.
- **Vision:** To be the gold standard leader in innovative waste management and landfill operations.
- **Values:** Community Stewardship, Convenience, Dependability, Environmental Stewardship, Fiscal Responsibility, Pride.
- **Core Business.** Create, manage, and maintain an infrastructure for the disposal of regional waste, including through the operation and management of the regional landfill and all transfer stations and other delivery points, and provide for the transportation of waste.
- **Guiding Principles:** The Strategic Operating Plan, including a detailed statement of SPSA's guiding principles, are available at https://www.spsa.com/about-spsa/reports-publications.

## 1.2 SOLID WASTE MANAGEMENT PLAN REQUIREMENTS

The laws of Virginia mandate the development and adoption of a solid waste management plan by all local governments in the Commonwealth. To facilitate regional coordination of solid waste services, rather than develop an individual plan for each locality, the law allows local governments within a designated region to develop one plan for the region. HRPDC and SPSA are coordinating the development of the solid waste management plan for the local governments in southeastern Virginia.

Under state solid waste planning regulations, no permit for a new sanitary landfill, incinerator, or waste-to-energy facility or for an expansion of an existing sanitary landfill, incinerator, or waste-to-energy facility will be issued until the solid waste planning unit within which the facility is located has developed a solid waste management plan that has been approved by the Virginia

Department of Environmental Quality (VDEQ). Regulations governing the development and submittal of solid waste management plans are provided in 9 VAC 20-130-10 et seq.

In addition, the solid waste management plan must be considered in the permitting process in three ways. First, VDEQ must review a proposed solid waste management facility for its consistency with the solid waste management plan. Second, permit applicants must certify that sufficient disposal capacity will be available to allow local governments in the region to comply with the solid waste management plan. Finally, VDEQ may impose permit conditions to allow local governments to contract and reserve disposal capacity in the new facility in accordance with the solid waste management plan.

The solid waste management plan must address six policy areas specified in state law. These six policy areas include:

1. Source Reduction
2. Reuse
3. Recycling
4. Resource Recovery (Waste to Energy)
5. Incineration
6. Landfilling

The plan must give preference to lower numbered policy areas over higher numbered policy areas. These policy areas are based upon the widely accepted waste management hierarchy, originally conceived by the U.S. Environmental Protection Agency and embodied in the Virginia Solid Waste Management Regulations. The hierarchy encourages communities to develop policies that rank the most environmentally sound strategies for management of solid waste (see Figure 1):

- First, Reduce and Reuse – Efforts to prevent the creation of waste should precede other waste management options that deal with the waste after it is generated, as in recycling. The underlying thought is that solid waste that is not produced does not require management.

- Second, Recycle and Compost – This level includes recycling and composting. These techniques have the potential to divert large amounts of waste from disposal and turn them into valuable products. Through these techniques, waste materials can potentially go through several cycles of use, conserving raw materials and energy in the process.

- Third, Recover Energy – This level of the hierarchy also uses waste as a resource, but essentially the material can only be used once. The highest use becomes energy production.

- Finally, Dispose – After the first levels of the hierarchy are maximized, there may be residual solid waste left to manage. This material must be disposed of in an environmentally safe manner, through incineration or landfilling at a permitted facility.

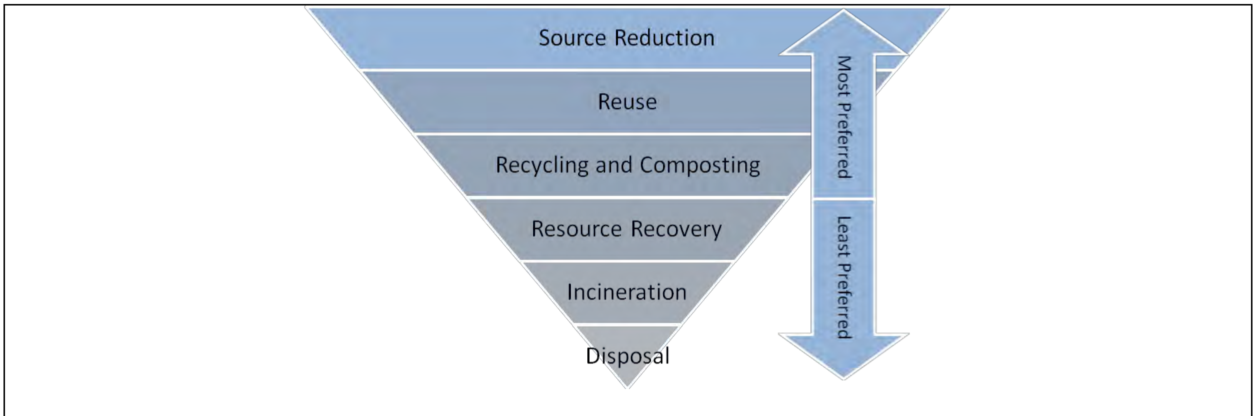



**Figure 1. Waste Management Hierarchy**

In addition to addressing these policy areas, the plan must provide an integrated waste management strategy with objectives and an implementation plan. The plan must also address achieving the established minimum recycling rate, funding, strategies for public education and public involvement, and public-private partnerships.

The strategies of the solid waste management plan must be supported by descriptions and analysis of urban development, population, transportation system condition, and waste generation estimates in the planning area. Further, the plan must develop future estimates of waste generation and present how the region anticipates meeting future solid waste needs. This plan addresses all of the regulatory requirements and serves as the solid waste management plan for the communities of southeastern Virginia.

## 1.3 DESCRIPTION OF PLANNING AREA

SPSA is the regional solid waste management organization for eight southeastern Virginia communities with a total land area of nearly 2,000 square miles and a population of 1,205,287(Weldon Cooper, 2022). The SPSA member localities are the cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the Counties of Isle of Wight and Southampton. Additional localities covered by this plan are the towns within Isle of Wight and Southampton Counties, including the following: Smithfield and Windsor in Isle of Wight County and Branchville, Boykins, Capron, Courtland, Ivor, and Newsoms in Southampton County. With the exception of Franklin and Southampton County, the SPSA communities are a part of the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area. Figure 2 illustrates the SPSA service area.

The SPSA area is bordered to the north by the James River and the Chesapeake Bay, with the Atlantic Ocean to the east. To the south is the North Carolina state line, while the Virginia Counties of Greensville, Sussex, and Surry border the region to the west.

The SPSA service area is located in the coastal plain of Virginia. The region is blessed with numerous waterways and wetlands, including the Elizabeth, Lynnhaven, Nansemond, Pagan, North Landing, Blackwater, Nottoway, and Meherrin Rivers, the Great Dismal Swamp, Back Bay, and the Intracoastal Waterway.

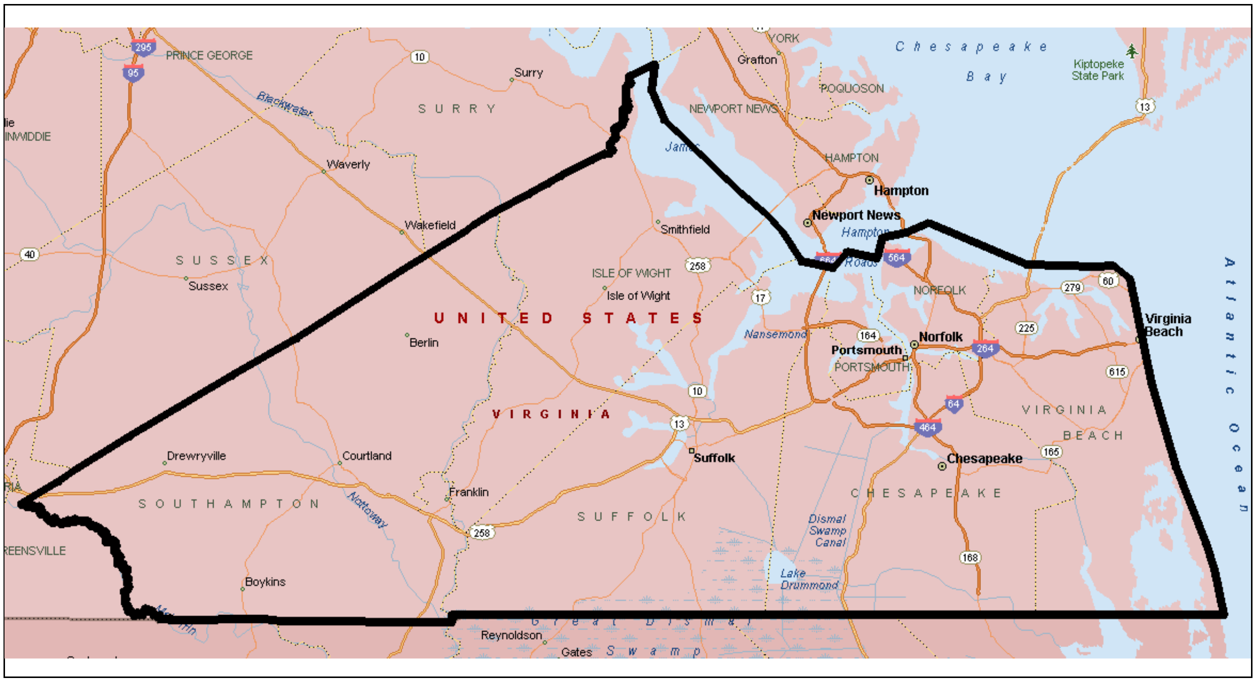



**Figure 2. SPSA Service Area**

### 1.3.1 Transportation

The location and topography of the SPSA planning area makes its transportation system unique. Due to the vast number of waterways in the planning area, bridges and tunnels are vital components of the surface transportation system. Four major bridges and tunnels serve major geographic areas of the region: the Hampton Roads Bridge-Tunnel, the Monitor-Merrimac Memorial Bridge Tunnel, the Downtown Tunnel, and the Midtown Tunnel. Other major bridges in the area include the Berkley Bridge, the High Rise Bridge, and the James River Bridge. These bridges and tunnels are significant traffic congestion points. The major interstates in the area consist of I-64 and I-664, which collectively serve as the beltway for the region; I-264 connecting Chesapeake, Portsmouth, Norfolk and Virginia Beach from west to east; and I-464 connecting the cities of Chesapeake and Norfolk. Significant U.S. Routes in the area include U.S. 13, 17, 58, and 460.

Transportation congestion is a major issue in the Region. The collection, transfer, and disposal of solid waste make extensive use of the road transportation network. Transportation to and from the Region is controlled in large part by the various tunnels and bridges that connect to the West and North. The HRPDC has focused much effort over the last several years to facilitate approaches to solving the Region's most vexing transportation problems, and these problems are not easy to solve. According to studies conducted by the HRPDC, travel growth has outpaced roadway capacity improvements in the Region. The Hampton Roads Bridge Tunnel (HRBT), the Monitor-Merrimac Memorial Bridge Tunnel (MMMBT), the Downtown Tunnel, the Midtown Tunnel and the "Highrise" Bridge are major system constraints, and congestion is routinely evident on all the Region's interstates, affecting the movement of people, goods and services. The constraints imposed by the Region's roadway network affect the planning, siting, implementation, and operation of the Region's solid waste system in the following ways.

- **Collection Efficiency.** Solid waste is collected by public and private operations in the Region. Traffic congestion affects the efficiency of these collection operations. Travel time from collection routes to transfer stations, the Regional Landfill, or the RDF WTE facility are extended during congestion periods, which means that the per day collection rate of each collection vehicle is reduced, more collection vehicles are needed to service collection routes, and overall operational costs are increased.

- **Collection and Transfer Scheduling.** Collection routes and transfer station operations are routinely scheduled to avoid peak congestion periods; however, this is not always practical, and these operations are negatively affected during congestion periods.

- **Location of Facilities.** The Region's current solid waste system is transportation intensive. The Region's transfer station, landfill, and RDF WTE facilities are the primary delivery points for solid waste disposal involving a significant number of collection and transfer vehicles. The capacity of the road networks to and from these facilities and any future facilities is an important consideration.

All solid waste in the Region is collected and transferred by public or private collection vehicles and equipment. Currently, no solid waste is transported to or from the Region by rail or barge, although previous proposals for barging in out-of-state waste have been considered, but ultimately rejected for various political reasons.

### 1.3.2 Urban Concentration

Within the Region, urban development is primarily concentrated within the beltway formed by the loop of I-64 and I-664 and to the area east of the beltway. Thus, the majority of urban development is concentrated in the cities of Norfolk and Portsmouth and in northern Virginia Beach and Chesapeake. This area contains more than three-quarters of the planning area's population and also the vast majority of the area's employment.

Waste transfer stations in the Region are located to serve existing areas of urban development. Five of the nine existing transfer stations are located in the area within the beltway and northern Virginia Beach and Chesapeake. The location of future transfer stations will need to take into account forecasted growth within the region. Further discussion of future needs can be found in Chapter 5.0, Hierarchy and Implementation.

### 1.3.3 Economic Growth and Development

Economic forecasts by the HRPDC indicate expected future economic growth and development for the SPSA planning area. In 2022, the member jurisdictions of SPSA had an estimated total population of 1,205,287. The largest city in the Region is Virginia Beach, followed by Chesapeake and Norfolk.

Population change since 2010 is shown in Table 1. Overall, the Region has experienced growth from 2010 to 2021. However, some jurisdictions experienced a decline in population during this period.

From 2020 to 2045, the Region is expected to grow nearly 8 percent to 1,302,086 people. This equates to an average annual growth rate of 0.33% or approximately 3,926 people per year. Suffolk and Isle of Wight are projected to experience the greatest increase in total population (on a percentage basis). The population growth rate is significant for planning purposes since the amount of waste generated increases as population increases.

Projections about population growth, regional employment, and number of households can help define what kinds and amounts of waste the Region will generate. A brief summary of projections for other key planning variables is presented here:

- **Employment:** Employment is expected to increase at an average annual rate of about 0.88 percent through 2040, resulting in an overall increase of over 19 percent from 2020 (Table 3). Employment is projected to increase in each locality. Isle of Wight County is projected to experience the greatest percentage growth in employment followed by Southampton County and Suffolk. Employment is an important forecasting variable because growth reflects an increase in economic activity, which in turn leads to increased consumption and waste generation.

- **Households:** The number of households in the region is expected to increase by about 18 percent from 2020 to 2040 at an average annual rate of 0.84 percent. The largest percentage expansion in population and households is forecasted for the City of Suffolk and Isle of Wight County. Generally, each home, regardless of the number of residents, contributes a certain amount of waste such as junk mail and yard waste.

**Table 1. SPSA Population 2011 - 2021**

| | 2011 | 2017 | 2018 | 2019 | 2020 | 2021 | Growth (2011-2021) |
|---|---|---|---|---|---|---|---|
| Chesapeake | 225,361 | 242,655 | 243,868 | 245,745 | 249,422 | 250,256 | 11% |
| Franklin | 8,445 | 8,474 | 8,308 | 8,261 | 8,180 | 8,064 | -5% |
| Norfolk | 243,655 | 246,256 | 245,741 | 245,054 | 238,005 | 238,102 | -2% |
| Portsmouth | 95,748 | 95,440 | 94,953 | 94,581 | 97,915 | 97,883 | 2% |
| Suffolk | 84,750 | 92,533 | 92,714 | 93,825 | 94,324 | 96,130 | 13% |
| Virginia Beach | 442,583 | 454,448 | 453,410 | 452,643 | 459,470 | 458,028 | 3% |
| Isle of Wight | 35,296 | 37,333 | 37,492 | 37,649 | 38,606 | 38,944 | 10% |
| Southampton | 18,638 | 18,119 | 17,851 | 17,855 | 17,996 | 17,880 | -4% |
| Total | 1,145,548 | 1,195,258 | 1,194,337 | 1,195,613 | 1,203,918 | 1,205,287 | 4% |

Sources: 2021 Census - U.S. Census Bureau and Population Estimates from the Weldon Cooper Center for Public Service

## Table 2. SPSA Estimated Population Growth by Community

| | 2010 Census | 2020 Population Projection | 2030 Population Projection | 2040 Population Projection | Average Annual Growth Rate (2020-2040) |
|---|---|---|---|---|---|
| Chesapeake | 222,209 | 249,513 | 280,173 | 314,600 | 1.17% |
| Franklin | 8,582 | 9,265 | 10,003 | 10,800 | 0.77% |
| Norfolk | 242,803 | 246,220 | 249,686 | 253,200 | 0.14% |
| Portsmouth | 95,535 | 96,415 | 97,304 | 98,200 | 0.09% |
| Suffolk | 84,585 | 109,339 | 141,337 | 182,700 | 2.60% |
| Virginia Beach | 437,994 | 456,993 | 476,817 | 497,500 | 0.43% |
| Isle of Wight | 35,270 | 42,749 | 51,813 | 62,800 | 1.94% |
| Southampton | 18,570 | 20,641 | 22,942 | 25,500 | 1.06% |
| Total | 1,145,548 | 1,237,832 | 1,330,075 | 1,445,300 | 0.78% |

Sources: 2020-2040 Population Projection - HRPDC

## Table 3. SPSA Employment Projections, 2020 - 2040

| | 2010 Census | 2020 Projection | 2030 Projection | 2040 Projection | Average Annual Change (2020 – 2040) |
|---|---|---|---|---|---|
| Chesapeake | 122,265 | 135,656 | 150,515 | 167,000 | 1.04% |
| Franklin | 6,182 | 6,874 | 7,644 | 8,500 | 1.07% |
| Norfolk | 210,037 | 217,801 | 225,852 | 234,200 | 0.36% |
| Portsmouth | 57,414 | 61,452 | 65,774 | 70,400 | 0.68% |
| Suffolk | 33,914 | 41,668 | 51,195 | 62,900 | 2.08% |
| Virginia Beach | 240,070 | 261,901 | 285,718 | 311,700 | 0.87% |
| Isle of Wight | 15,347 | 19,400 | 24,523 | 31,000 | 2.37% |
| Southampton | 5,454 | 6828 | 8,547 | 10,700 | 2.27% |
| Total | 690,683 | 751,580 | 819,768 | 896,400 | 0.88% |

Sources: 2020-2040 Projection - HRPDC

## SPSA Household Projections, 2020 - 2040

| | 2010 Census | 2020 Projection | 2030 Projection | 2040 Projection | Average Annual Change (2020 – 2040) |
|---|---|---|---|---|---|
| Chesapeake | 79,574 | 89,783 | 101,303 | 114,300 | 1.21% |
| Franklin | 3,530 | 3,828 | 4,150 | 4,500 | 0.81% |
| Norfolk | 86,485 | 88,125 | 89,797 | 91,500 | 0.19% |
| Portsmouth | 37,324 | 37,777 | 38,236 | 38,700 | 0.12% |
| Suffolk | 30,868 | 40,125 | 52,158 | 67,800 | 2.66% |
| Virginia Beach | 165,089 | 172,764 | 180,795 | 189,200 | 0.46% |
| Isle of Wight | 13,718 | 16,689 | 20,303 | 24,700 | 1.98% |
| Southampton | 6,719 | 7,541 | 8,464 | 9,500 | 1.16% |
| Total | 423,307 | 456,632 | 495,206 | 540,200 | 0.84% |

Sources: 2020-2040 Projection - HRPDC

# 2.0 EXISTING SOLID WASTE MANAGEMENT SYSTEM

Solid waste generated in the planning area is managed through a combination of services and service providers. Generally, municipal solid waste is collected by local governments and private haulers and is taken to either a SPSA transfer station or to WIN Waste Portsmouth facility (formerly known as Wheelabrator's RDF WTE Facility) located in Portsmouth. The collection of MSW from single-family homes has remained the responsibility of the local governments. Each locality handles its collection systems differently, although almost all are on a weekly/automated system. Some localities also serve multi-family residences and small commercial businesses. WIN Waste Portsmouth has notified SPSA that it will continue to operate through June 2024, and following, it will close the facility and proceed with decommissioning and demolition of the power generating facility and RDF facility.

All localities in the region provide recycling services. SPSA continues to operate regional programs for white goods recycling (including Freon extraction), household hazardous waste, tire processing, used oil collection, and battery recycling.

## 2.1 RECYCLING PROGRAMS

### 2.1.1 Municipal Recycling Programs

Recycling in the region consists primarily of curbside recycling and drop-off locations:

- Chesapeake had contracted for its curbside recycling services. The service provided on an every-other week schedule using a 96-gallon container. With the implementation of curbside collection, the City eliminated use of drop-off facilities. Beginning on June 30, 2022 the curbside collection of recyclable materials by the City was ended and it has transitioned to a subscription based recycling program where residents can contract directly with private recycling providers for curb side collection and processing. On July 1, 2022 the City re-established residential drop off recycling sites. The sites will accept metal cans (aluminum, tin and steel), plastics #1 -7, mixed paper (newspaper, office paper, magazines, catalogs, mail) boxboard (e.g., cereal boxes, paper towel rolls) and corrugated cardboard (shipping box only).

- Curbside recycling in Franklin is provided through a contract with a private firm (All Virginia Environmental Solutions). The service provider uses an automated, single-stream system using 95-gallon carts. Items that are recyclable are, aluminum cans, cardboard, paper (office, newspaper, junk mail, catalogs, glass (clear, green and brown), metal cans, newspaper, office paper and plastics #1 through #7.

- Isle of Wight operates eight, single-stream drop-off recycling facilities at the County convenience centers (Camptown, Carroll Bridge, Carrsville, Crocker's, Jones Creek, Stave Mill, Walters and Wrenn's Mill). Materials accepted at the centers include paper (newspaper, office, magazines and telephone books, junk mail), cardboard, paperboard (cereal boxes, shoe boxes), milk and juice cartons, plastic bottles and containers (#1 through #7), glass, tin and steel cans, aluminum (cans, foil, pie plates).

Additional containers are available for plastic bags, electronics, scrap metal, appliances, cooking oil, motor oil, yard waste. Residents of Smithfield receive monthly curbside collection of recyclable materials through a private contractor.

- Norfolk provides curbside collection of recyclable goods on a bi-weekly basis to 58,200 single-family homes. Each residence is provided a 90-gallon recycling container for participation in the curbside program. Citizens also have two drop-off facilities located in the City for recycling; a third site is scheduled to open soon. Office paper and cardboard are collected from Norfolk schools and other City buildings.

- The City of Portsmouth discontinued its curbside recycling program and provides residents the opportunity to recycle at seven local drop-off sites located throughout the City. The bins accept comingled materials.

- Southampton County offers recycling services through drop-off facilities as well as single-stream curbside collection (in some areas of the County) through a contract with a private firm (All Virginia Environmental Solutions). The County is in the process of providing containers for recycling at 11 convenience centers and transfer stations. Recyclables collected include paper, cans (aluminum, steel, tin), glass, plastic bottles and tubs, cardboard, and paperboard.

- Suffolk currently offers recycling services through 13 drop-off locations. Materials accepted include aluminum cans, plastic bottles (#1 and #2), cardboard, mixed papers, steel/tin cans and glass bottles. Suffolk currently has a franchise agreement for a private hauler for curbside collection but must have 2,500 homeowners sign up for service for it to become effective. The cost for this service is $12 per month.

- Virginia Beach contracts for its own recycling program through Tidewater Fibre Corporation and provides containers to all residents who receive curbside waste collection from the City. Automated recycling pickup, using large 95-gallon containers, is provided on an every-other-week basis. In addition, four drop-off facilities are also located throughout the City.

Some of the programs offered by SPSA include the following:

- **Ferrous Metal Processing Plant.** Metal collected at the RDF WTE Facility and at the drop-off facilities is brought to this Plant for processing. (Propane tanks are collected as well and handled through a contract with a local distributor.) Ferrous metals, such as steel food and paint cans, scrap metal, and compressed gas tanks are processed into small nuggets at the Bi-Metals Recycling Facility at the Regional Landfill. These nuggets are then sold to steel mills and processed into new steel.

- **White Goods Recycling Facilities.** Refrigerators, washing machines, air conditioning units, and other large household appliances are collected from residents free of charge at the Regional Landfill. Local contractors prepare the appliances for recycling by removing and collecting the freon for proper disposal. The scrap metal from the appliances is then recycled.

- **Tire Shredder** . Tires are shredded at the Tire Processing Facility located at the Regional Landfill. The shredded tires are used for drainage projects, pipe bedding and alternate daily cover ADC). SPSA reports that approximately 400,000 tires are shredded per year.

- **Used Oil Collection Sites.** Most SPSA facilities have containers to collect motor oil from residents free of charge. Used oil is cleaned of particles and processed into new oil and fuels. The oil collected by SPSA is recycled through a contract with a private vendor.

A summary of recycling opportunities for various materials is provided in Table 5.

### 2.1.2 Recycling Quantities

A summary of recyclable materials collected in the region is provided in Table 5. Over the past several years, the region has annually collected around 500,000 tons of waste to be recycled.

**Table 5. Local Recycling Programs**

| | Curbside Recycling | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Cardboard & Paper | Plastic Bottles & Jugs | Glass Bottles & Jars | Metal Cans | Cartons | Plastic Tubs (Wide Mouth) | Rigid Plastics (Small) | Rigid Plastics (Large) |
| Chesapeake | x | x | x | x | x | | | |
| Franklin | x | x | x | x | | | | |
| Isle of Wight | No curbside recycling service | | | | | | | |
| Norfolk | x | x | x | x | x | | | |
| Portsmouth | x | x | x | x | x | x | | |
| Southampton | x | x | x | x | | x | | |
| Suffolk | x | x | x | x | x | | | |
| Virginia Beach | x | x | x | x | x | | | |
| | | | | | | | | |
| | Drop-Off Recycling | | | | | | | |
| | Cardboard & Paper | Plastic Bottles & Jugs | Glass Bottles & Jars | Metal Cans | Cartons | Plastic Tubs (Wide Mouth) | Rigid Plastics (Small) | Rigid Plastics (Large) |
| Chesapeake | x | x | x | x | x | | | |
| Franklin | No drop-off recycling service | | | | | | | |
| Isle of Wight | x | x | x | x | x | x | | |
| Norfolk | x | x | x | x | x | | | |
| Portsmouth | x | x | x | x | x | x | | |
| Southampton | x | x | x | x | | x | | |
| Suffolk | x | x | x | x | x | | | |
| Virginia Beach | x | x | x | x | x | | | |

**Table 6. Principle Recyclable Materials (Tons)**

| | CY2015 | CY2016 | CY2017 | CY2018 | CY2019 | CY2020 | CY2021 |
|---|---|---|---|---|---|---|---|
| Paper | 84,225 | 64,497 | 56,383 | 56,245 | 48,332 | 34,136 | 15,819 |
| Metal | 102,885 | 169,296 | 263,566 | 274,103 | 270,094 | 265,694 | 228,960 |
| Plastic | 2091 | 12,223 | 1,869 | 680 | 1,546 | 114 | 579 |
| Glass | 1,797 | 3,830 | 5,556 | 2,721 | 4,929 | 49 | 0 |
| Commingled | 102,885 | 151,953 | 90,759 | 88,020 | 71,024 | 110,492 | 99,516 |
| Yard Waste | 67,807 | 20,195 | 45,330 | 17,294 | 11,837 | 16,390 | 24,433 |
| Waste Wood | 36,834 | 3,992 | 8,208 | 39,578 | 16,906 | 7,109 | 13,966 |
| Textiles | 1,483 | 3,433 | 128 | 4 | 4,260 | 4,557 | 4,500 |
| Waste Tires | 6,057 | 2,924 | 4,915 | 7,852 | 7,575 | 1,344 | 571 |
| Used Oil | 3,017 | 4,294 | 3,999 | 3,182 | 1,242 | 8,018 | 461 |
| Used Oil Filters | 54 | 389 | 209 | 161 | 24 | 176 | 12 |
| Used Antifreeze | 94 | 102 | 108 | 155 | 41 | 144 | 41 |
| Batteries | 3,222 | 2,863 | 2,877 | 3,772 | 1,164 | 3,190 | 3,327 |
| Electronics | 262 | 764 | 986 | 288 | 216 | 111 | 214 |
| Inoperative Motor Vehicles | N/A | N/A | N/A | N/A | 44,818 | 34,136 | 82,500 |
| Food Waste | N/A | 36,371 | 2,316 | 74 | 2,857 | N/A | N/A |
| Toner Cartridges | N/A | 15 | 14 | 16 | 10 | N/A | N/A |
| Cardboard[1] | N/A | N/A | 19,806 | N/A | N/A | N/A | N/A |
| Cooking Oil | N/A | N/A | 99 | 17 | N/A | N/A | N/A |
| Wood Pallets | N/A | N/A | 10,891 | 8,803 | 314 | N/A | N/A |
| Sludge (composted) | N/A | N/A | N/A | N/A | 909 | N/A | N/A |
| **Total** | **463,628** | **477,141** | **518,019** | **502,965** | **488,098** | **485,660** | **474,899** |

Source: HRPDC, as annually reported to DEQ via the "Locality Recycling Rate Report"
1) In most years, cardboard is classified under the PRM paper.

### 2.1.3 Recycling Education

HRPDC and the individual localities continue to bring awareness of its programs to the public that are both local and regional in scope. Educational initiatives to encourage recycling are currently underway both at the local and regional level. These educational initiatives will be continued and expanded, based on need and availability of funding and staff resources, to ensure that the citizens and businesses in the SPSA localities are aware of available recycling programs and the benefits of recycling.

- **HR CLEAN: HR CLEAN** promotes litter prevention, recycling, community beautification and environmental awareness in the cities and counties that make up the Hampton Roads Region. The program is managed by the HRPDC and closely coordinates with other regional environmental education programs. The program's website (www.hrclean.org) contains information on residential recycling, business recycling and buying recycled goods.

- **Chesapeake:** The city has recycling information, including how to contact subscription based recycling providers and where drop-off sites will be located on its website (https://www.cityofchesapeake.net/government/City-Departments/Departments/Public-Works-Department/wastemanagement-recycling.htm) The City has implemented "Recycling Perks," a program that rewards residents for participation in the recycling program. The City's website states that "Recycling Perks are designed to help residents save money and provide discounts on entertainment or leisure activities. Rewards are offered by local businesses to reward residents for recycling."

- **Franklin:** Recycling information is included in the city's newsletter *City Clips,* which is available online at: http://www.franklinva.com.

- **Isle of Wight:** The county has a webpage devoted to environmental issues, including recycling, that is entitled *Isle be Green* (http://islebegreen.com).

- **Norfolk:** The Norfolk Environmental Commission http://www.norfolkbeautiful.org/). This website contains information for Norfolk residents regarding household hazardous waste, recycling, and adopt a spot. Additional recycling information is available on the city's website (http://www.norfolk.gov/curbside_recycling).

- **Portsmouth:** Information regarding recycling drop off facilities is available on the city's website at http://www.portsmouthva.gov/publicworks/recycle.aspx.

- **Suffolk:** Recycling information is provided on the City's website at http://www.suffolk.va.us/pub_wks/recycling.html.

- **Virginia Beach:** Recycling information is available on the city's public works webpage, which is available through http://www.vbgov.com. The Waste Management division also uses social media to disseminate updated recycling information. Virginia Beach recently acquired an official recycling mascot to attend local events. The mascot represents the city's "Catch the Wave--Recycle" logo.

Both the municipalities and the HRPDC provide information to the public on waste disposal issues, including litter control, recycling, household hazardous waste, and waste minimization. In addition, through askHRgreen, information is provided to the public on a variety of other environmental issues. This information is provided in the form of media coverage, advertising, fact sheets, brochures, educational materials, and "give-aways."

Several askHRgreen campaigns address issues such as single-use plastics campaign, straw-free Earth Day, and grants to schools regarding measures to reduce plastic use. In addition, through the HRDPC Recycling and Beautification Committee, askHRgreen conducted a waste reduction media campaign in FY2019 called Choose to Refuse. The campaign included paid media, outreach materials, public relations, and social media efforts to raise awareness about waste reduction. The Committee's message to the region's residents was that we should all choose to reduce our waste production first before focusing on what can or cannot be recycled.

### 2.1.4 Private Recycling Programs

Private businesses provide additional recycling opportunities in the Region for residents and businesses. Many examples are provided below.[1] Although most recycling businesses accept one or two materials, many accept a range of common recyclable materials. In addition to the opportunities listed here, many large businesses, such as Walmart, have branches in the Region likely have their own recycling programs to back-haul their recyclables to central locations.

The quantities of materials recycled through private recyclers is typically not tracked in a comprehensive fashion by the Region. Quantities of recycling by firms are tracked.

#### 2.1.4.1 Commercial Recycling Collection

TFC, Bay Disposal, and RDS offer fee-based recycling opportunities to commercial businesses located in the Region. Collection programs generally are offered for paper, corrugated cardboard, plastic containers, aluminum cans, steel/tin cans, and glass. Butler Paper Recycling and Atlantic Paper Stock provide office and institutional recycling for paper commodities.

#### 2.1.4.2 Private Material-specific Drop-off Locations

Several businesses in the Region specialize in recycling a few material types as described below.

##### 2.1.4.2.1 Electronics

[1] Discussion of specific recycling programs in this section should not be construed as a recommendation or endorsement by the Hampton Roads Planning District Commission. The recycling programs discussed here may not represent all programs available in the region as some businesses may have reduced or expanded the types of materials they accept.

Collection of computers, monitors, laptops, and televisions, telephones, game consoles, and small appliances is provided by Goodwill, Best Buy, and electronics retailers. Generally, electronics recycling, with the exception of monitors, is free; however, some retailers will provide incentives for users of their electronics recycling programs.

#### 2.1.4.2.2 Household battery, ink cartridge, and cell phone collection

Several locations within the Region collect ink cartridges, cell phones and household batteries. Some retailers, such as Target, collect all three. Only cell phones are collected at most wireless retailers. Retailers that accept NiCad/rechargeable batteries include Home Depot, Best Buy, and Batteries Plus. Ink cartridges are accepted at recycling programs operated by OfficeMax and Best Buy.

#### 2.1.4.2.3 Metal Recycling

Several metal recyclers are located in the Region that will accept both ferrous and nonferrous metals, including aluminum, brass, and copper. These recyclers include Sims Metal Management Dubin metals, Guterman Iron and Metal, Surplus Recycling, U-Cycle Recycling, Virginia Beach Salvage Exchange, and Wise Recycling. Some will pay a fee for certain metals.

#### 2.1.4.2.4 Car Batteries and Used Motor Oil

Car batteries and used motor oil are accepted at Jiffy Lube, Advanced Auto Parts, Firestone, Treadquarters, Pep Boys, and Interstate.

#### 2.1.4.2.5 Compact Fluorescent Lights

Used compact fluorescent lights (CFL) are accepted by Home Depot and Lowes stores.

#### 2.1.4.2.6 Plastic Bags

Plastic bags (#2 and #4 plastics) are accepted at a variety of grocery stores and retailers including Farm Fresh, Sam's Club, Lowe's, JCPenny, Walmart, and Target.

#### 2.1.4.2.7 Asphalt, Concrete, and Brick

These three materials are accepted by Waterway. Concrete is accepted by Vulcan materials.

#### 2.1.4.2.8 Waste Cooking Oil

Virginia Beach SPCA accepts used vegetable oil to fuel its Neuter Scooter mobile clinic.

#### 2.1.4.2.9 Textiles

Goodwill stores generally recycle textiles that are not of high enough quality to be sold in the stores.

### 2.1.4.3 Reuse Opportunities

Various organizations offer reuse opportunities for clothing and household items including Goodwill, Salvation Army, and Habitat for Humanity (reusable building materials).

### 2.1.5 Material Recovery Facilities

Table 7 lists the known active MRFs in the Tidewater area.

**Table 7. Material Recovery Facilities in Southeastern Virginia**

| Facility Name | Location |
|---|---|
| Active Permitted Facilities | |
| Bay Disposal LLC (PBR598) | Norfolk |
| Bay Disposal LLC (PBR620) | Smithfield |
| Clearfield MMG Inc - Suffolk (PBR155) | Suffolk |
| Clearfield MMG Inc - Chesapeake (PBR622) | Chesapeake |
| Military Highway Recycling Center MRF (PBR596) | Chesapeake |
| Recycling and Disposal Solutions of Virginia (RDS) (PBR558) | Portsmouth |
| Select Recycling Waste Services Inc (PBR619) | Chesapeake |
| SPSA – Tire Processing Facility (PBR072) | Suffolk |
| TFC Recycling - Chesapeake (PBR568) | Chesapeake |
| United Disposal Incorporated (PBR522) | Norfolk |
| US Navy - Norfolk Naval Shipyard (PBR135) | Portsmouth |
| Waste Industries LLC (PBR077) | Chesapeake |
| WIN Waste Portsmouth Inc (PBR 500) | Portsmouth |

Source: Virginia DEQ 2021 Annual Solid Waste Report for CY2020

### 2.1.6 Markets for Recycling and Reuse

Currently, all of the municipalities rely on the private sector for processing and marketing of collected recyclables. Collected materials are sold to a variety of end markets; the municipalities have no control over marketing decisions or prices paid. The municipalities can affect recycling markets, however, by:

- Using economic development mechanisms to attract business that manufacture recycled products or assist current businesses with methods to use recycled materials. By doing this, the region will help close the loop for recycling and can create markets for their collected materials.

- Creating viable, long-term markets for recovered materials. Generally, markets for recyclables are driven by demand for the end-products manufactured from recovered materials. The region can encourage procurement of products made with recycled content.

### 2.1.7 Summary

Currently there is only one significant facility in the Region that is capable of processing materials collected from various recycling programs. At the time the 2005 SWMP was written, SPSA was the primary provider of recycling collection services in the Region, with the exception of Virginia Beach. As an alternative, SPSA considered the construction and operation of a competing MRF. However, SPSA has discontinued recycling services and the member communities have taken over the responsibility for collection of recyclables. Processing of recyclables is currently a private sector function (see Figure 3).

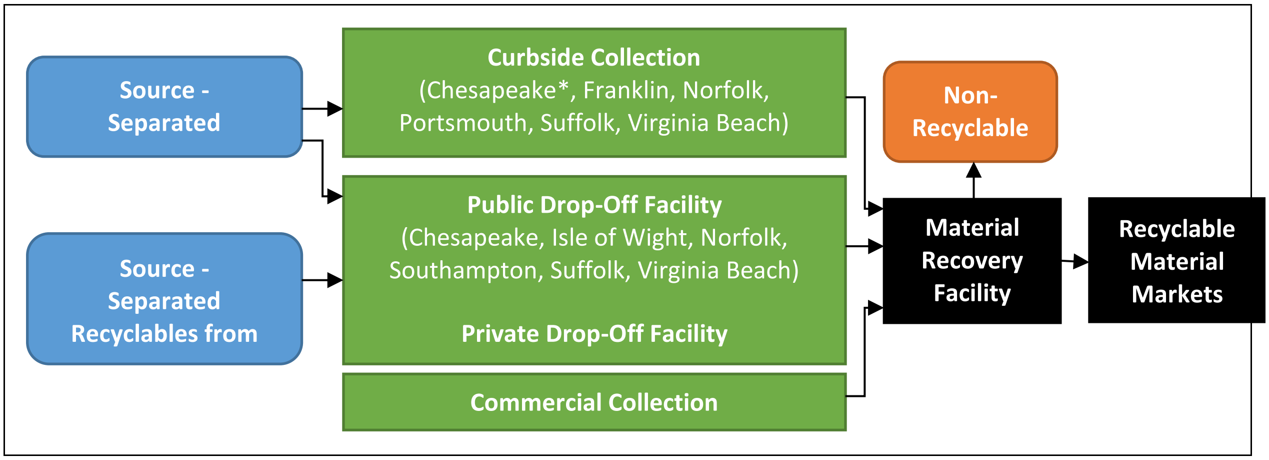



**Figure 3. Management of Recyclables**

*Effective July 1, 2022 Chesapeake has implemented subscription-based collection

## 2.2 YARD WASTE MANAGEMENT

Household chores such as raking leaves, mowing grass and trimming trees and shrubs generate the majority of yard waste, which has accounted for approximately 20 percent of solid waste collected in the Region (from SPSA Yard Waste Recycling flyer). The following is a summary of current yard waste collection/handling activities.

### 2.2.1 Municipal Collection

The majority of yard waste generated in the Region is currently collected by the SPSA member communities:

- **City of Chesapeake.** Leaves, trimmings and grass clippings are picked up with regular collections when placed at curbside. The City requires yard waste, leaves and grass clippings to be placed in clear plastic bags. The material currently is delivered to Waterway Materials or the Holland Landfill.

- **City of Franklin.** Each customer is provided a green 90-gallon cart for yard waste collection. Collected yard waste is delivered to a city-owned farm where it is processed.

- **Isle of Wight County.** Approximately 600 tons of yard waste is delivered to the convenience centers, which is transported to a composting facility in Waverly, Virginia.

- **City of Norfolk.** The City collects yard wastes, in amounts up to 20 clear plastic bags (up to 3 cubic yards if scheduled). The City disposes of some yard waste along with bulk items with a private vendor but the majority of yard waste is transported to a composting facility in Waverly, Virginia.

- **City of Portsmouth.** The City provides yard waste collection services; material is taken to the City of Portsmouth's landfill at Craney Island.

- **Southampton County.** The County does not offer curb side yard waste collection. Yard waste is delivered by citizens to the mini-transfer stations operated by the County. Woody debris is grinded by a private vendor.

- **City of Suffolk.** The City collects yard waste from single-family homes. Collected material is sent directly to the Regional Landfill or the Suffolk Transfer Station.

- **City of Virginia Beach.** The City collects yard waste from residences on a weekly schedule. Most yard waste collected is currently transported to a private composting facility in Waverly for beneficial reuse. Some yard waste is mulched at the City's Landfill No. 2 and used to landscape city properties.

### 2.2.2 Previous SPSA Yard Waste Management Initiatives

SPSA has operated facilities where yard waste collected by member communities was handled, mulched and composed. The end product of this activity had been a source of revenue for the Authority through the sales of mulch and compost (marketed as Nature's Blend). In 2005, operations conducted at the Regional Landfill and Landfill No. 2 were consolidated on a section of Landfill No. 2 known as Phases 2B and 3. However, this facility was closed in 2007 to address Landfill No. 2 neighbor complaints of excess odors from the facility. No new regional initiatives have been implemented since the Virginia Beach Landfill No. 2 facility was closed.

### 2.2.3 Private Sector Yard Waste Management

Waterways Recycling, LLC is located in Chesapeake and operates out of Waterway Marine Terminal. Though the facility is capable of processing and recycling the full range of construction, demolition and debris (CDD) materials, the facility is slightly more geared to convert woodbased debris into processed wood. A significant portion of their recycled product customer base pre-orders and utilizes its wood chips.

### 2.2.4 Yard Waste Management Summary

As stated previously, the Region does not currently have a facility dedicated to the handling and processing of yard waste, although several member communities are in the process of implementing programs to beneficially reuse the yard waste that they collect.

# 2.3 SOLID WASTE COLLECTION

## 2.3.1 Municipal Collection

Below is a summary of each member's MSW collection services to its citizens. Table 8 provides the relative contributions of the SPSA member localities to the total collected waste within the region. Municipal quantities have generally decreased over the past several years.

### 2.3.1.1 City of Chesapeake

Chesapeake's Department of Public Works, Division of Waste Management collects residential solid waste once per week from over 65,000 households using automated vehicles. Collected waste is primarily delivered to either the RDF WTE Facility or the SPSA Chesapeake Transfer Station located just off Greenbrier Parkway. The City supplies the residents with standard 96-gallon solid waste containers. Also available upon request is a smaller, 64-gallon container or 35-gallon container.

Chesapeake residents are able to dispose of waste at the Chesapeake Transfer Station or any other SPSA facility at no charge. Yard waste (clear bags or bundles) and bulk waste are collected weekly from residents as well. No requests are necessary for pickup of yard waste, but the City does require that requests to schedule bulk waste collection be received one week prior to the day of collection. Yard waste is delivered to Waterway Materials or the Holland Landfill, bulk waste is delivered to SPSA or to the Holland Landfill.

Residents are responsible for properly disposing of their own building debris and are directed to SPSA transfer stations and the Regional Landfill in Suffolk.

Chesapeake also collects waste from a limited number of small commercial establishments that are able to deposit all waste into two or three cans. The City does not intend to expand this service to additional establishments.

### 2.3.1.2 City of Franklin

The City of Franklin's Department of Public Works offers collection for 3,000 residential and small commercial generators, with weekly solid waste and yard waste collection. Special collections of bulk waste are offered upon request once a month. Each of the customers is given a black 90-gallon solid waste receptacle and a green 90-gallon cart for yard waste. Bulk yard waste is also collected upon request. Yard waste collected is delivered to a city-owned farm where it is processed. All other wastes are taken to the SPSA Franklin transfer station.

### 2.3.1.3 Isle of Wight County

The County operates eight convenience centers to handle solid waste, most of which are open seven days a week. A SPSA transfer station within the County is also available for waste disposal.

If requested, curbside collection is provided to Isle of Wight County residents for a fee by a franchised commercial hauler. The Towns of Smithfield and Windsor also each provide curbside pickup for residents through an agreement with a private hauler. Smithfield provides twice-weekly pickup of both residential refuse and yard debris. The hauler provides containers for a monthly fee. No municipal refuse collection is provided for Town businesses.

#### 2.3.1.4 City of Norfolk

The Waste Management Division of the Department of Public Works collects approximately 95,000 tons of refuse, bulk waste, and yard waste annually from 61,000 households and businesses within the City. The City issues 90-gallon containers to residents of single-family homes, and curbside collection is provided once weekly by automated collection vehicles. Collection of bulk wastes is handled on the same designated day, when requested at least 24 hours in advance. In addition, yard wastes, in amounts up to 20 clear plastic bags (up to 3 cubic yards if scheduled), can also be collected at this time for recycling.

Waste collection in Norfolk's central business district takes place each Monday, Wednesday, and Friday evening. In addition, the City collects recyclables such as paper and cardboard each Tuesday and Thursday evening. Businesses outside the central business district receive waste collection weekly.

#### 2.3.1.5 City of Portsmouth

The City of Portsmouth's Department of Public Works collects MSW from approximately 33,000 households each week using 95-gallon containers. The collected waste is delivered to the WIN Waste RDF WTE Facility. Bulk waste and yard waste collection services also are provided; material is taken to the City of Portsmouth's landfill at Craney Island.

#### 2.3.1.6 Southampton County

In addition to the Franklin Transfer Station, SPSA operates two other stations within Southampton County at Ivor and Boykins. The County offers to the residents of Southampton County fourteen mini-transfer stations. The waste collected from these mini-transfer stations is then delivered to the larger sites, where it is collected by SPSA. Southampton County residents may dispose of waste at any other SPSA facility free of charge.

#### 2.3.1.7 City of Suffolk

The City of Suffolk Department of Public Works provides weekly residential refuse collection for all single-family homes within the City (approximately 32,000) using 90 gallon containers and automated collection vehicles. The City also provides collection services to approximately 200 businesses. Bulk and yard waste are also collected by the City. The City delivers collected waste directly to the Regional Landfill or the Suffolk Transfer Station.

#### 2.3.1.8 City of Virginia Beach

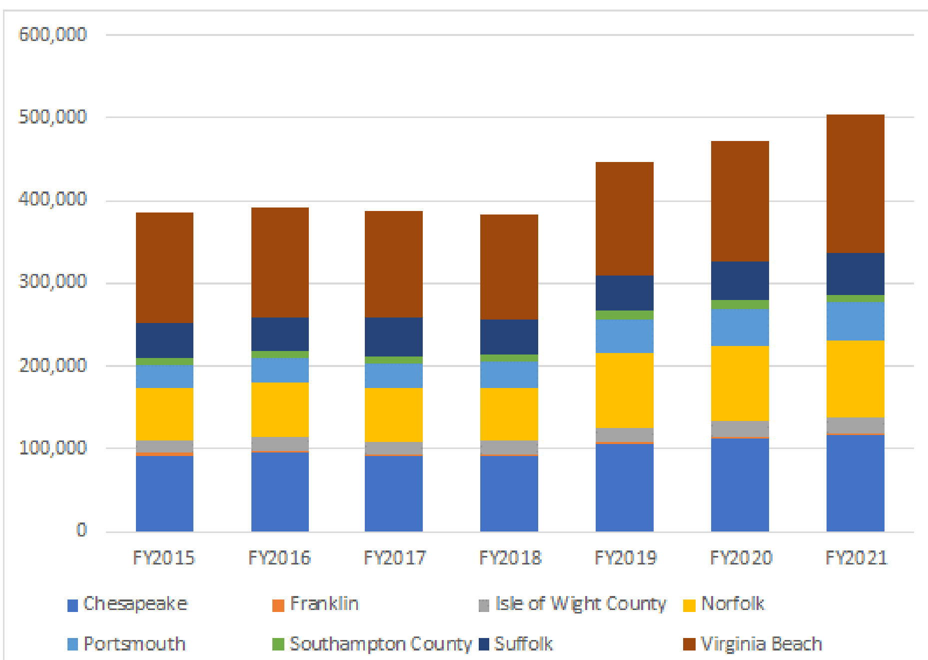
Virginia Beach provides 95-gallon solid waste containers and weekly, automated curbside collection for approximately 150,000 households within the City. Curbside bulk pickup is available to households by special request. Each request must be received 24 hours prior to the regularly scheduled collection day. Yard waste is also collected from residences on the collection day. Bulk waste is delivered to the SPSA transfer stations and the majority of yard waste is transported to a private handling facility near Waverly, Virginia. Some yard waste is transported to the City's Landfill No. 2 where it is mulched for use on city properties.

The Virginia Beach Landfill No. 2 is a 300-acre facility located in the Kempsville area of the City. Waste generated within the City by Virginia Beach residents can be delivered in privately owned vehicles to Landfill No. 2 free of charge. However, most of the waste received at the Landfill was ash from the WIN Waste RDF WTE Facility.

**Table 8. Breakdown of Municipally Collected Waste by Locality**

| Locality | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 | FY 21 Percent of Total |
|---|---|---|---|---|---|---|---|---|
| Chesapeake | 92,072 | 94,981 | 90,926 | 90,896 | 105,353 | 112,154 | 115,566 | 22.9% |
| Franklin | 2,524 | 2,592 | 2,690 | 2,698 | 2,955 | 3,276 | 3,543 | 0.7% |
| Isle of Wight County | 16,070 | 16,513 | 15,180 | 16,883 | 17,265 | 17,102 | 17,948 | 3.6% |
| Norfolk | 62,296 | 66,240 | 64,575 | 62,587 | 90,129 | 92,423 | 93,632 | 18.6% |
| Portsmouth | 28,439 | 29,089 | 30,023 | 32,769 | 40,222 | 43,829 | 45,977 | 9.1% |
| Southampton County | 8,107 | 8,385 | 8,593 | 8,910 | 10,675 | 9,881 | 9,775 | 1.941% |
| Suffolk | 43,337 | 40,770 | 45,645 | 40,847 | 42,325 | 46,614 | 49,482 | 9.8% |
| Virginia Beach | 133,304 | 134,285 | 130,645 | 127,483 | 138,823 | 147,250 | 167,748 | 33.3% |
| Total | 386,149 | 392,855 | 388,277 | 383,073 | 447,747 | 472,529 | 503,671 | 100% |

Source: SPSA FY2023 Operating and Capital Budgets




Source: SPSA FY2023 Operating and Capital Budgets

**Figure 4. MSW Collected by Locality(Tons)**

## Table 9. Solid Waste Services

| Service | Chesapeake | Franklin | Norfolk | Portsmouth |
|---|---|---|---|---|
| Solid Waste Residential Collection | The city provides weekly, automated collection using 96-gallon containers. | The city provides weekly collection using 90-gallon containers. | The city provides weekly, automated service using 90-gallon containers. | The city provides weekly collection services. |
| Solid Waste Commercial Collection | Not provided. | The city provides collection services for small commercial generators. | The city provides collection services for businesses located in the Central Business District (CBD) every other day. Businesses located outside the CBD receive one weekly collection. | Not provided. |
| Yard Waste Collection | City provides separate collection of yard waste using clear plastic bags on a weekly basis. | City provides collection services using a green 90-gallon cart on a weekly basis. | Yard waste is collected weekly by the City. Residents may use either a 30-gallon container or clear plastic bags. | Yard waste is collected by the City in clear plastic bags from the curb (placed next to MSW). |
| Recyclables Collection | Effective July 1, 2022 transitioned to subscription-based curbside collection and public drop-off facilities | Franklin offers automated recycling using a 95-gallon cart. | The city collects recyclables twice a week from businesses located in the CBD. Curbside collection of recyclables is provided by the City every other week using a 95-gallon cart. | The City operates recycling drop off locations for the city. |

**Table 9 (Continued)**

| Service | Suffolk | Virginia Beach | Isle of Wight | Southampton |
|---|---|---|---|---|
| Solid Waste Residential Collection | The city provides weekly automated and manual collection from single-family homes. | The city provides weekly automated collection from single-family homes using 90-gallon containers. Townhouse areas may use 32-gallon containers or plastic bags. | The county provides weekly collection through a franchised hauler (for a fee) for those residents requesting the service. As an alternative, the county operates eight full-service manned convenience centers for self-hauled waste. | The county operates 14 sites for residents to self haul waste. |
| Solid Waste Commercial Collection | Not provided. | Not provided. | Not provided. | Not provided. |
| Yard Waste Collection | The City offers curb-side yard waste collection upon request (limited to residential dwellings). | The City provides weekly collection of yard waste either stacked or in clear plastic bags. The City also offers a yard waste container rental program for larger quantities of yard waste. | The County does not provide curb-side collection of yard waste, but does provide containers for residents to dispose of yard waste at each of its eight convenience centers. | The County does not offer curb-side yard waste collection. Yard waste is accepted at the County's 16 refuse collection sites. |
| Recyclables Collection | The city offers drop-off only recycling for its residents. Drop-off facilities are located throughout the city. | Virginia Beach provides residents with automated curbside collection (non-SPSA) using 95-gallon carts on an every-other-week basis. | Drop-off only recycling sites for the county that are located at the convenience centers and the transfer station. The town of Smithfield offers bi-weekly curbside recycling to all single-family homes, duplexes, and townhouses. | The county provides 18-gallon bin recycling for residents of Courtland, Newsoms, and Boykins. Drop-off facilities are located at six of the county's mini-transfer stations. |

### 2.3.2 Private Collection

Private firms perform a significant function in the Region with regard to waste collection and disposal. While the SPSA member communities are the primary collectors of MSW from single-family residents (with the exception of the more rural areas in Southampton and Isle of Wight Counties), private firms are the primary collectors of MSW from multi-family, commercial, and industrial establishments. Commercially collected MSW is delivered by the private firms to either the WIN Waste RDF WTE Facility, a SPSA Transfer Station or an out of Region disposal facility. Of the waste that is delivered to the Transfer Stations, processible waste is delivered to the RDF WTE Facility by SPSA for a fee. Non-processible waste is loaded onto WIN Waste trailers for eventual disposal at Waste Management's Bethel or Atlantic Waste Landfills. WIN Waste maintains contracts with the private haulers. Firms that play a significant role in the collection of MSW in the Region include Waste Management, Waste Industries (now GFL), Republic Services, and Bay Disposal.

#### 2.3.2.1 Commercial Waste Receipts

During FY 2021, SPSA's commercial customers delivered 181,284 tons of waste into the system. This amount includes 26,176 tons of Navy waste and 92,113 tons of other waste. Historically, quantities of commercial waste have been decreasing due to expiration of contracts, an increase in tipping fees for CDD waste, and a decision to cease accepting out of region waste in late 2008.

Table 10. SPSA Commercial Waste Receipts

| | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 |
|---|---|---|---|---|---|---|---|
| Commercial | 471,812 | 403,461 | 411,630 | 286,898 | 183,715 | 170,987 | 181,284 |
| Navy | 25,357 | 24,869 | 24,500 | 26,668 | 26,265 | 24,975 | 26,176 |
| Other Waste | 118,935 | 181,187 | 69,938 | 65,567 | 86,195 | 184,030 | 92,113 |
| Total | 616,104 | 609,517 | 506,068 | 379,133 | 296,175 | 379,992 | 299,576 |

Source: SPSA FY2023 Operating and Capital Budgets

#### 2.3.2.2 Flow Control

When SPSA was formed, its organization and facilities were sized and began operations under the assumption that all MSW generated in its service area would be delivered to SPSA facilities. Since SPSA's formation, the Commonwealth of Virginia has allowed several large landfills to be constructed in largely rural areas of eastern Virginia.

With the adoption by the U.S. Supreme Court of the Carbone decision in 1994, neither states nor localities could effectively control the flow of waste across political boundaries. In order to internalize cash flows, the operators of the large private landfills began hauling waste generated from within the SPSA service area to their own landfills, sometimes as much as 100 miles away. Because the SPSA system was developed and sized to accept all of the region's waste, the loss of a significant portion of the waste stream has had a significant negative financial impact on SPSA and its member communities. The Use and Support Contracts which called for member communities to deliver all or substantially all of their solid waste to SPSA were effectively amended by this decision to include only that waste which is collected by the member communities or controlled by them through contracts. The SPSA system was built under the assumption that SPSA members could control the flow of both residential and commercial solid waste generated within their borders and that adequate waste flows would create sufficient revenues to finance construction and maintenance of the system. In 1994, the U.S. Supreme Court ruled (Carbone case) that flow control was unconstitutional. After this decision, SPSA's commercial waste flows significantly decreased. In an attempt to regain lost waste flows, SPSA negotiated contracts with private haulers, both in and outside of the Region, which included a reduced tipping fee.

In 2007, the Court clarified its decision (United Haulers case) to allow localities to direct waste to a publicly-owned facility. As a result, the cities of Norfolk, Chesapeake, Portsmouth, and Franklin, and Isle of Wight and Southampton counties passed ordinances requiring delivery of waste generated within their jurisdictions to SPSA facilities beginning in January 2009; however, the Cities of Virginia Beach and Suffolk did not. The decline in commercial waste deliveries, and the resulting negative revenue impact to SPSA led to a financial crisis culminating in the sale of the RDF WTE Facility to Wheelabrator (now WIN Waste) in April 2010. This has significantly reduced SPSA's debt service, stabilized its financial condition, and reduced tipping fees.

## 2.4 SOLID WASTE TRANSFER

### 2.4.1 SPSA Transfer Stations

SPSA currently operates seven transfer stations and two convenience centers. The facilities received 705,563[2] tons of waste in FY2021. Figure 5 shows the location of each facility. In 2021, the Landstown Transfer Station accepted the greatest percentage of waste followed by the Norfolk Transfer Station. A summary of each transfer station throughput is provided in Table 11. The 2017 SPSA Annual Survey Report prepared by CH2M describes the current condition of the SPSA transfer stations as well as recommended maintenance activities.

- *Boykins Convenience Center*: The station opened in 1985 and consists of an elevated area where customers can deposit waste into a stationary compactor or two open-top roll-off containers. The station is permitted to accept 50 tons per day and is manned by Southampton County and serviced by SPSA.

- *Chesapeake Transfer Station*: This transfer station was built in 1984 and utilizes a bi-level, non-compacted, direct-dump design consisting of one refuse hopper, a tipping area on the upper level, and a "load out" area on the lower level. The facility has a maximum capacity of 500 tons per day with a storage capacity of up to 150 tons at any given time. The station utilizes a drop-and-hook system, which allows waste on the floor to be removed and placed in staged trailers for hauling at a later time.

[2] The Boykins and Ivor Convenience centers receive approximately 650 tons per year. This figure also include waste from Portsmouth and Chesapeake delivered directly to the WIN Waste RDF facility.

- *Franklin Transfer Station*: This station was opened in 1985 and consists of an open tipping floor area screened with a fabric chain link fence and a prefabricated office building. Waste is dumped into the single hopper directly into open-top transfer trailers and is hauled to the Regional Landfill by SPSA. The facility is permitted for 150 tons per day and capable of storing 50 tons at any one time. The station utilizes a drop-and-hook system, which allows waste on the floor to be removed and placed in staged trailers for hauling at a later time.

- *Isle of Wight Transfer Station*: This station was opened in 1985 and consists of a push-wall transfer station with a three-sided metal building superstructure. Transfer trailers travel on a loading lane situated at a lower grade than the tipping floor so that the side of the trailers are approximately four feet above the tipping floor, and a front-end loader lifts waste into the transfer trailers which are then hauled to the Regional Landfill by SPSA. The station is permitted for 150 tons per day and capable of storing 50 tons at any one time. The station utilizes a drop-and-hook system, which allows waste on the floor to be removed and placed in staged trailers for hauling at a later time.

- *Ivor Convenience Center*: This station was opened in 1985 and consists of an elevated area where customers can deposit waste into a stationary compactor or two open-top roll-off containers. The station is permitted to accept 30 tons per day and is manned by Southampton County and serviced by SPSA.

- *Landstown Transfer Station*: This station opened in 1993 and consists of an enclosed tipping floor with three hoppers for loading. The station is permitted to accept 1,500 tons per day.

- *Norfolk Transfer Station*: This station opened in 1985 and consists of an enclosed tipping floor with three hoppers for loading. The station is permitted to accept 1,300 tons per day.

- *Oceana Transfer Station*: This station was built by the City of Virginia Beach in 1982. In 1987, SPSA bought the facility. The station has a design capacity of 500 tons per day, with the capability of storing 450 at any one time. The station utilizes a drop-and-hook system, which allows waste on the floor to be removed and placed in staged trailers for hauling at a later time.

- *Suffolk Transfer Station*: This station, built in 2005, is located near the entrance to the Regional Landfill and consists of an enclosed tipping floor with two hoppers for loading. The station is permitted to accept 1,300 tons per day. The station utilizes a drop-and-hook system, which allows waste on the floor to be removed and placed in staged trailers for hauling at a later time.

### 2.4.2 Private Transfer Stations

There are no known proposed or permitted privately owned transfer stations in the Region.

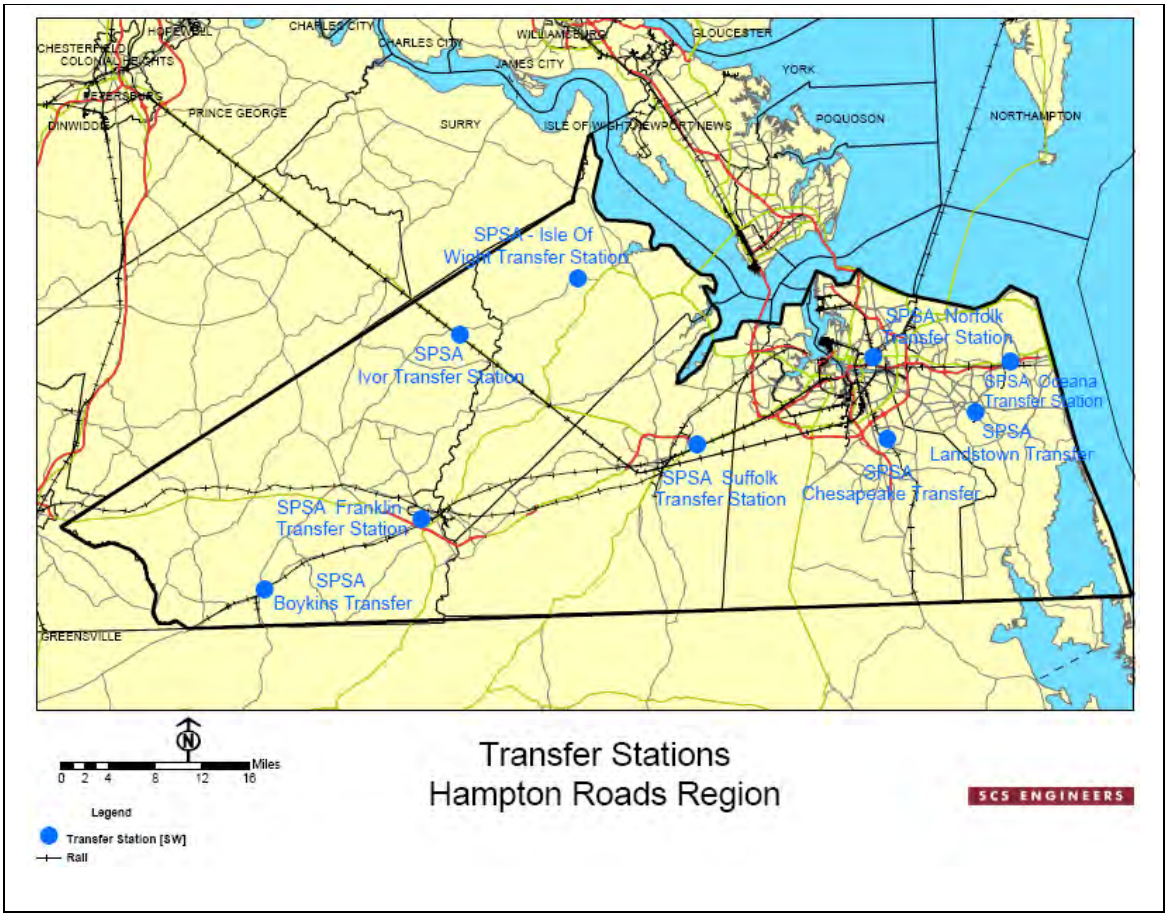
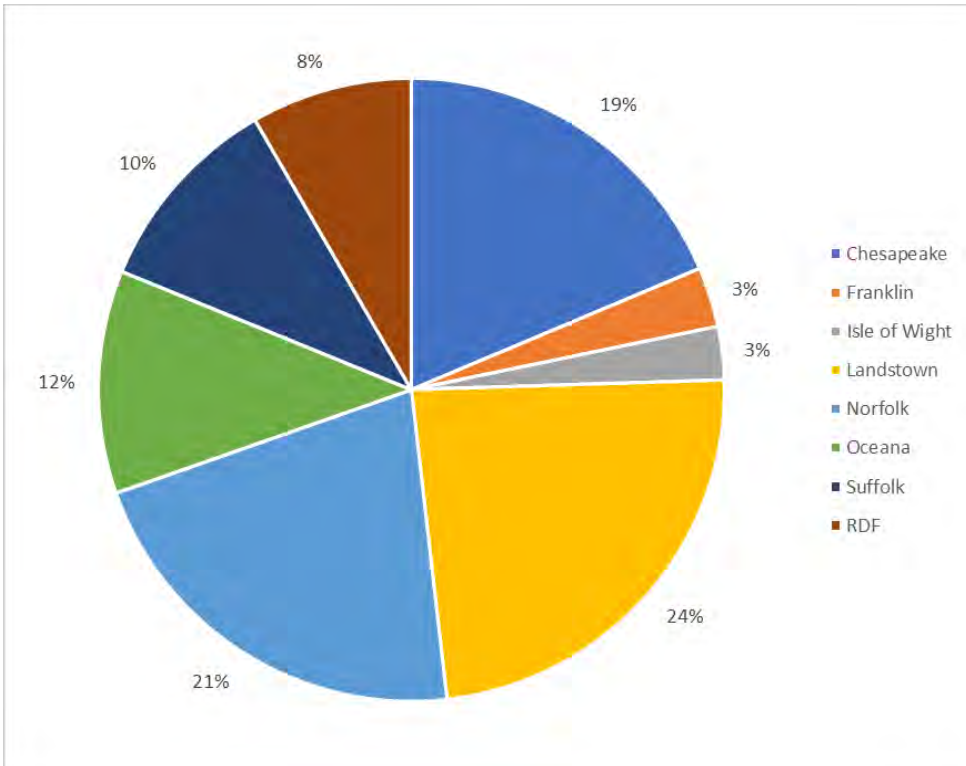



**Figure 5. SPSA Transfer Station Location Map**




*Ivor and Boykins Stations Transfer < 1% of Waste
Source: SPSA FY2023 Operating and Capital Budgets

**Figure 6. Relative Proportion of Waste Transferred – Fiscal Year 2021**

**Table 11. Transfer Station Solid Waste Totals**

| Transfer Station | Design Capcity (Tons/Day) | Tons Received | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 |
| Boykins[1] | 50 | 650 | 650 | 650 | 650 | 650 | 650 | 650 |
| Chesapeake | 500 | 141,030 | 135,637 | 137,053 | 122,729 | 130,282 | 124,492 | 131,243 |
| Franklin | 150 | 22,674 | 21,760 | 21,817 | 20,966 | 22,162 | 21,755 | 21,839 |
| Isle of Wight | 150 | 22,230 | 23,930 | 20,247 | 20,326 | 19,056 | 18,703 | 19,452 |
| Ivor[1] | 50 | 650 | 650 | 650 | 650 | 650 | 650 | 650 |
| Landstown | 1,300 | 169,468 | 176,966 | 163,360 | 147,696 | 142,522 | 147,816 | 166,798 |
| Norfolk | 1,300 | 218,208 | 195,975 | 196,339 | 162,697 | 155,733 | 155,473 | 150,971 |
| Oceana | 500 | 83,961 | 74,736 | 76,298 | 70,037 | 73,650 | 72,280 | 81,533 |
| Suffolk | 500 | 65,075 | 65,101 | 70,607 | 66,767 | 64,084 | 68,542 | 73,772 |
| RDF Facility[2] | N/A | 151,300 | 142,343 | 141,794 | 93,326 | 49,135 | 57,454 | 58,655 |
| Total | 5,500 | 875,246 | 837,748 | 828,815 | 705,844 | 657,924 | 667,815 | 705,563 |

Source: SPSA FY2023 Operating and Capital Budgets 1) Boykins and Ivor facilities average 650 tons/year. 2) The RDF facility is not a SPSA transfer station, but waste from Portsmouth and some waste from Chesapeake are delivered directly to the RDF facility.

# 2.5 SOLID WASTE DISPOSAL

Described in the following section are the solid waste disposal assets located in the planning area including the SPSA Regional Landfill, the Virginia Beach Landfill No. 2, the WIN Waste RDF WTE Facility, and other private disposal facilities.

## 2.5.1 Regional Facilities

### 2.5.1.1 RDF WTE Facility

#### 2.5.1.1.1 Operations

The RDF WTE Facility, located in Portsmouth, Virginia opened in June 1987. The facility processes municipal and commercial solid waste into fuel, shredding the wastes and removing metals. The fuel is burned in lieu of coal at the adjacent Power Plant to produce steam and electricity. The steam is sold to the US Navy and the 60 megawatts of electricity is sold to the local power utility.

Solid waste is delivered to the RDF WTE Facility and dumped onto the enclosed tipping floor, which is roughly four acres in size. Front-end loaders push the waste toward the initial conveyor belts, while pulling out non-processible materials such as mattresses, lumber, tires and other bulky items. Hazardous wastes are also pulled out of the waste to be processed. Those items that are not processed are sent to a landfill for recycling and/or landfilling.

The waste placed on the conveyors is taken through a series of shredders, trommels, and sorting machines. The waste is broken down into smaller pieces that pass through magnetic separators in order to remove ferrous metals. Stations are positioned along the conveyor for teams of pickers who pull out large sticks or other non-processible objects prior to the waste being transported to the Power Plant. The result is small particles of solid waste that are in a more acceptable fuel form. These are sent by conveyor to the adjacent Power Plant that fuels the Norfolk Naval Shipyard.

The RDF WTE Facility was designed to process 2,000 tons of waste per day and was projected to divert just over 450,000 tons of material per year from the Regional Landfill. Ferrous metals are removed from the combustor ash produced from the RDF WTE facility.

WIN Waste has committed to operating the RDF WTE facility through June 2024, after which time it will close and begin the process of decommissioning and demolishing the power generating and RDF facility.

#### 2.5.1.1.2 Ownership and Contractual Arrangements

In late 2007, SPSA advertised that it would entertain proposals from qualified interested parties for the sale of the RDF WTE Facility. In 2010, SPSA sold the facility to Wheelabrator Technologies (now WIN Waste). Under the terms of the sale and subsequent agreements, WIN Waste was contracted to accept and processes SPSA member community solid waste at the RDF WTE Facility through June 2027. Under the current agreement with WIN Waste, all MSW received at the Chesapeake, Landstown, Oceana, and Norfolk transfer stations are delivered to the RDF plant. WIN Waste then delivers ash to the SPSA Regional Landfill. Waste that can't be processed at the RDF plant is delivered to private landfills. Waste from the Suffolk, Isle of Wight, Ivor, Franklin, and Boykins transfer stations can be delivered directly to the SPSA Regional Landfill. Waste from these transfer stations is currently being delivered directly to the SPSA Regional Landfill. Figure 7 depicts the current flow of waste in the region.

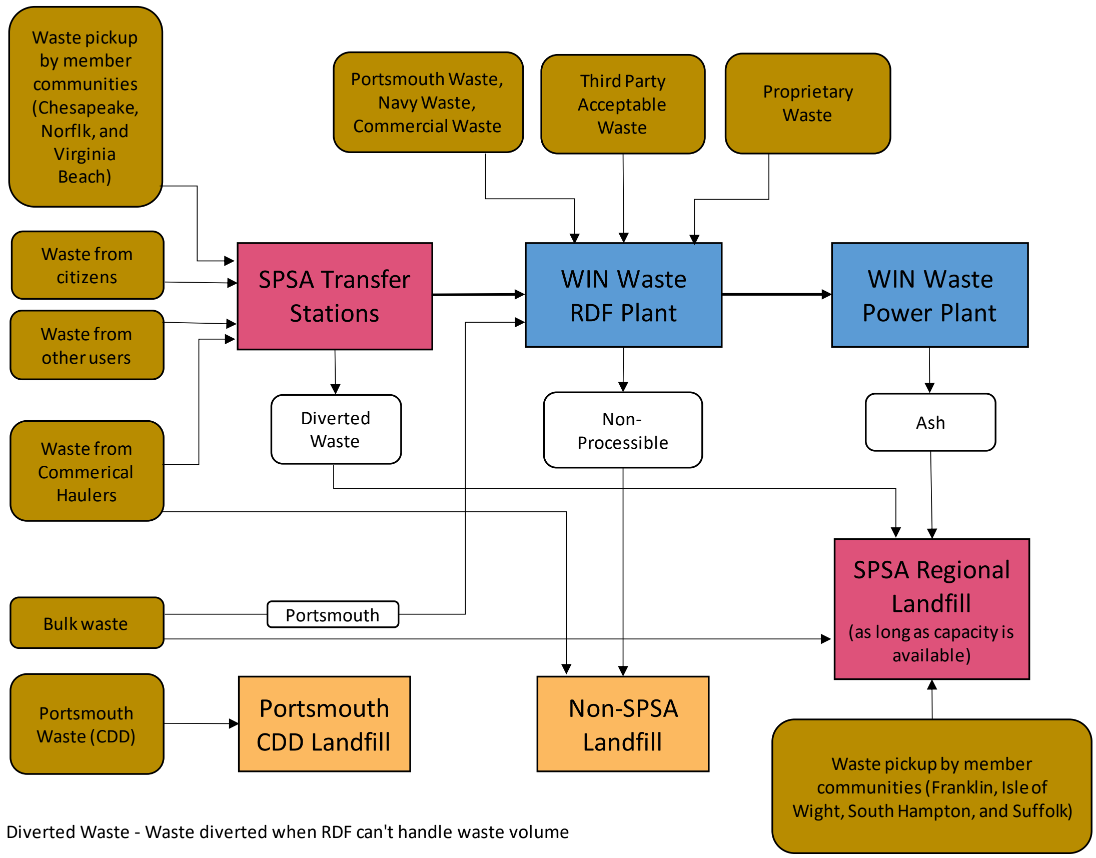



**Figure 7. Flow of Municipal Solid Waste**

In 2021, SPSA was notified by WIN Waste that the US Navy would not be extending its contract for the purchase of steam beyond June 30, 2024. In order for WIN Waste to continue to accept and process SPSA waste after this date, adjustments would be required to the contract terms and costs. SPSA has notified WIN Waste that it will cease delivery of waste to them after June 30, 2024. SPSA intends to dispose of the solid waste currently delivered to WIN Waste at the Regional Landfill beginning on July 1, 2024. WIN Waste has stated that it intends to close the RDF and power generating facility in July 1, 2024 and begin the decommissioning and demolition process of each facility that may require up to four years to complete. Solid waste collected by the City of Portsmouth will require operation of a transfer station to consolidate and transport solid waste to the Regional Landfill. Figures 8 depict the flow of waste in the SPSA system after June 30, 2024. SPSA may divert some waste from western communities based on transportation and disposal costs and conservation of disposal airspace, as necessary.

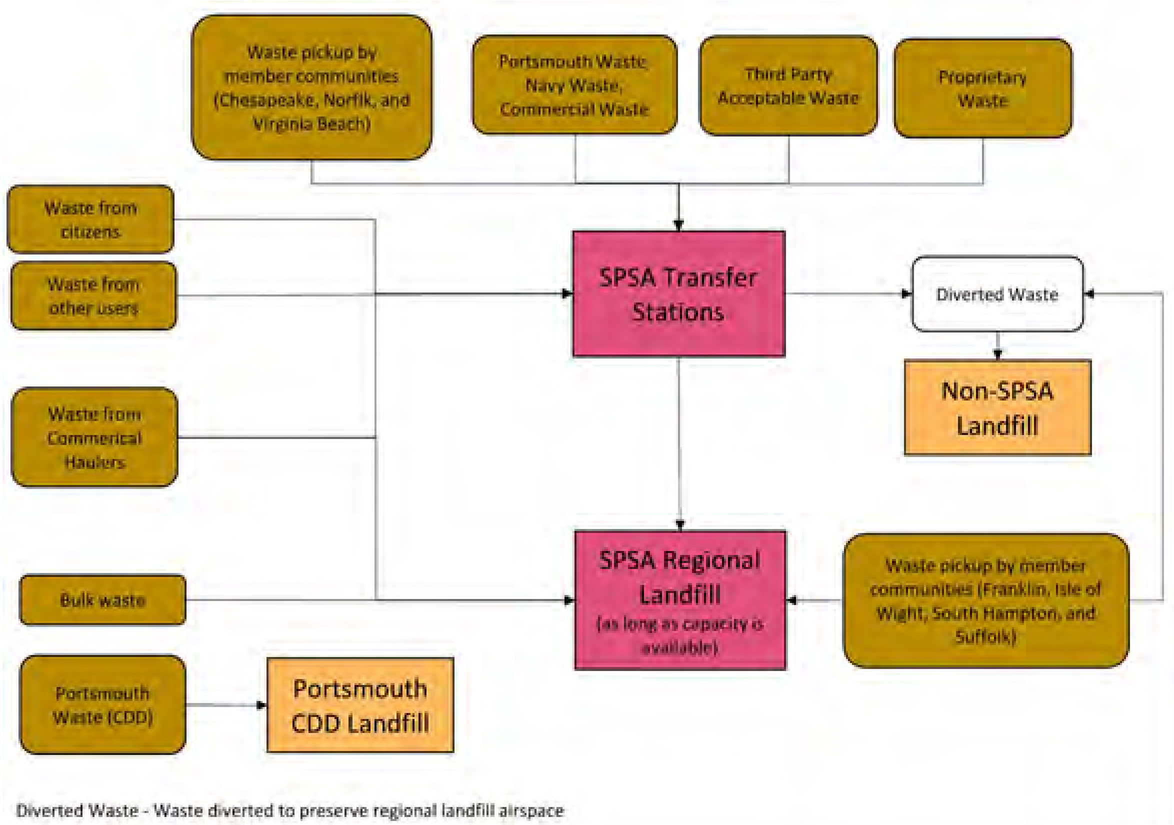



**Figure 8. Flow of Municipal Solid Waste after June 2024**

### 2.5.1.2 Regional Landfill (SWP 417)

#### 2.5.1.2.1 Estimated Site Life

The SPSA Regional Landfill is located on 833 acres within the City of Suffolk near the intersection of US Route 13/58/460 and the US Route 58/460 Bypass. SPSA began disposing of waste in the Landfill in January 1985. Of the 833 acres, 188 acres are currently permitted and constructed landfill area (Cells I through VI). Cell VII was permitted in 2011. The landfill is currently open to the public six days a week.

Since 2015, the SPSA Regional Landfill has been utilized for disposal of around 300,000 tons per year and 350,000 CY per year of disposal airspace. Solid waste disposed of at the landfill consists of MSW, construction and demolition debris, ash and other wastes as well as clean fill. HRSD handles the treatment of leachate through their network of treatment facilities. Currently, the largest waste streams being received by the landfill is MSW from member communities to the west of the facility and ash from the WIN Waste Portsmouth facility that processes the remainder of the SPSA member communities MSW.

Beginning on July 1, 2024, SPSA will no longer be delivering municipal solid waste to WIN Waste and all member community residential MSW will be transferred to the SPSA regional landfill for disposal. SPSA estimates that in July 2024 the Regional Landfill annual waste receipt will increase to 491,000 tons of MSW and other wastes. At an assumed density of 1,400lbs/CY waste disposal could consume over 700,000 cubic yards of disposal airspace per year, which is twice the consumption rate that has been experienced in recent years.

On an annual basis SPSA measures the volume of material already placed in the Regional Landfill by a topographic survey. HDR Engineering was hired by SPSA to perform airspace calculations utilizing information from the topographic survey. In the January 2022 Airspace Management Report, HDR Engineers, presented information concerning when the currently constructed landfill cells could possibly reach capacity depending on the quantity of waste disposed annually and the density achieved in waste being placed for disposal. In the report, assuming current conditions continue, HDR Engineers estimated that as of December of 2021 the Regional Landfill had less than 3.2 million cubic yards of permitted airspace available in Cells V and VI, of which just 2.6 million cubic yards of disposal airspace was readily recoverable. The recoverable airspace include filling in areas within existing operating area and not recovering airspace available on lower slopes due to settlement of waste. The 2022 report assessed the impacts associated with the shift in waste disposal away from WIN Waste in July 2024 and estimated that Cells V and VI would reach capacity as early as **January 2027**, if the waste placement approached 1,400 lb/CY.

The capacity of the permitted but not yet constructed Cell VII is estimated to be 10,800,000 cubic yards. The construction of Cell VII is anticipated to commence in 2024 and be ready for receipt of waste by April 2026, according to SPSA. At a density of 1,400 lb/CY and a waste acceptance rate of approximately 500,000 tons per year, Cell VII would provide approximately 15 years of additional life or through 2042. However, the Cell VII capacity relies on overlap onto existing Cell V filled areas and the abandonment of the main landfill access road and relocation of critical infrastructure in that corridor including leachate forcemains, underground electric, fiber optic SCADA communication lines and stormwater drain lines. SPSA has stated that it intends to modify the Cell VII permit to include a separate phase of construction to delay the connection of Cell VII to Cell V and the relocation of this infrastructure. This adjustment to the phasing would reportedly truncate the effective capacity to between 8.6 million and 9.3 million cubic yards and reduce the effective life of Cell VII to 12 to 13 years.

The actual rate of landfill airspace consumption will depend on the rate of waste intake over time and the ability of the landfill operators to maintain the outside side slopes at the design elevations as the landfill settles. Per the Solid Waste Information and Assessment (SWIA) Report for CY 2020, the SPSA Regional Landfill had a reported 12,008,065 cubic yards of permitted capacity remaining and an expected remaining permitted life of 22 years. The SWIA report however did not yet contemplate the changes in waste volume and density associated with the closure of the WIN Waste facility in 2024.

#### 2.5.1.2.2 Expansion Potential

The Landfill was originally designed to contain four disposal cells comprising 106 acres (Cells I through IV), which have now undergone the closure process. The permitted capacity of Cells I through IV is 12,200,000 cubic yards. In 1998, Cell V (43.8 acres) opened and provided the Landfill with additional capacity, extending the life of the Landfill through 2005. With the addition of Cell V, a final height of 205 feet above mean sea level can be achieved. A sixth landfill cell, Cell VI, was permitted and opened in May 2006 west of Cell V with an area of 41.3 acres. The permitted capacity of Cells V and VI is 15,000,000 cubic yards.

In addition to Cells V and VI, the SPSA Regional Landfill includes a 56-acre lateral expansion known as Cell VII. Cell VII was approved by the Virginia Department of Environmental Quality on June 8, 2011. The capacity of Cell VII is approximately 10,800,000 cubic yards of operating airspace, as permitted, increasing the total permitted capacity of the Regional Landfill to 38,000,000 cubic yards.

As stated above, the SPSA Regional Landfill may only provide disposal capacity through 2037. In accordance with the Use and Support Agreements with the member communities, SPSA is required to satisfy the waste disposal needs for at least the next 20 years. The remaining capacity of the Regional Landfill is well short of this obligation.

In 2016, SPSA submitted an application to the City of Suffolk for a conditional use permit for the operation of Cell VII and construction and operation of a borrow area and vegetative waste composting in future Cells VIII and IX. As part of the City's permitting process, SPSA prepared a Master Plan to identify future areas of landfill expansion and borrow areas within the 525 acres remaining for expansion. SPSA's Master Plan includes 262.2 Acres of landfill waste boundary (Cells VII – XII), 54.1 acres of borrow area and stormwater management, and 16.3 acres of leachate management. The remaining 192.4 acres of the 525-acre parcel consist of the 98 acres dedicated to wetland mitigation as part of the Cell VII permits, property line and wetland buffers, gas pipeline easement, and access roadways and stormwater conveyance systems (see Figure 9).

According to SPSA, Cells VIII and IX would provide an additional 16 million cubic yards of waste disposal capacity and extend the life of the Regional Landfill through at least 2060 under current waste receipt of approximately 500,000 tons per year and waste density of 1,400 lbs/CY. The expansion would require increasing the solid waste boundary at the site by 129 acres and disturbance of approximately 110 acres of forested wetlands. SPSA has initiated preparation the Draft Environmental Impact Statement with the U.S. Army Corps of Engineers (USACE) for the proposed impacts in anticipation of filing a Joint Permit Application (JPA) to Virginia Marine Resources Commission (VMRC) who will distribute to the USACE and Virginia DEQ for consideration of Individual Permits under the Clean Water Act Section 404 and 401, respectively.

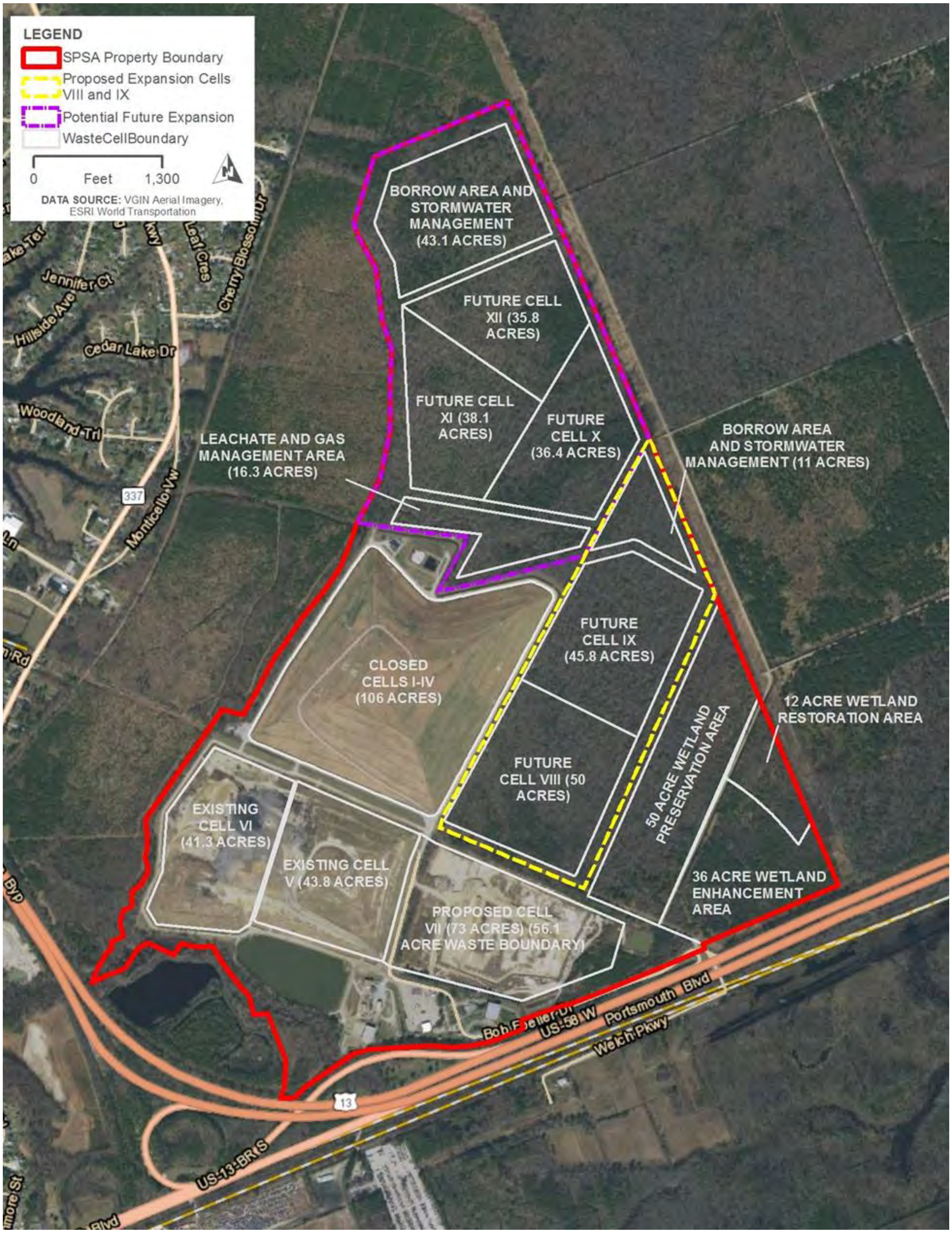



Figure 9. SPSA Regional Landfill Master Plan

#### 2.5.1.3 Virginia Beach Landfill (SWP 398)

The Virginia Beach Landfill No. 2 is a 300-acre facility in the western portion of the City. The current landfill area footprint is 104 acres. Waste generated within the City by Virginia Beach can be delivered in privately owned vehicles to the landfill free of charge. Ash from the RDF WTE facility is no longer delivered to Virginia Beach Landfill No. 2.

##### 2.5.1.3.1 Capacity

The Virginia Beach Landfill has a permitted capacity of 15,331,000 cubic yards. In 2020, 21,051 tons were landfilled leaving a remaining capacity of 1,725,000 tons (DEQ CY2020 SWIA Report for Virginia Beach City – Landfill No. 2.)

##### 2.5.1.3.2 Estimated Site Life

The Virginia Beach Landfill has an expected remaining permitted life of 71 years (DEQ CY2020 SWIA Report for Virginia Beach City – Landfill No. 2.)

##### 2.5.1.3.2 Expansion Potential

There are no plans to expand the landfill at this time.

#### 2.5.1.4 Portsmouth CDD Landfill (SWP 041)

Portsmouth owns and operates a permitted construction, demolition, and debris (CDD) landfill located in the northern portion of the City known as the Craney Island Landfill. The facility only accepts CDD generated within the City.

##### 2.5.1.4.1 Capacity

The Portsmouth CDD Landfill has a remaining permitted capacity of 1,871,809.80 ton after landfilling 8,237 tons in 2020 (DEQ CY2020 SWIA Report for Portsmouth City – Craney Island Landfill)

##### 2.5.1.4.2 Estimated Site Life

The Portsmouth CDD Landfill has an expected remaining permitted life of 129 years (DEQ CY2020 SWIA Report for Portsmouth City – Craney Island Landfill)

##### 2.5.1.4.2 Expansion Potential

There are no plans to expand the landfill at this time.

### 2.5.2 Private Landfill Capacity

There are several privately-owned disposal facilities that have the potential for accepting the Region's solid waste. All of these facilities are outside the Region. A large majority of the

Region's waste that does not go to the RDF WTE Facility is currently being disposed in Waste Management's Bethel and Atlantic Waste Disposal Landfills.

#### 2.5.2.1 Location and Status

Figure 10 shows the locations of most of the private disposal facilities with the approximate distance from the approximate center of the South Hampton Roads Region (intersection of I-264 and I-64).

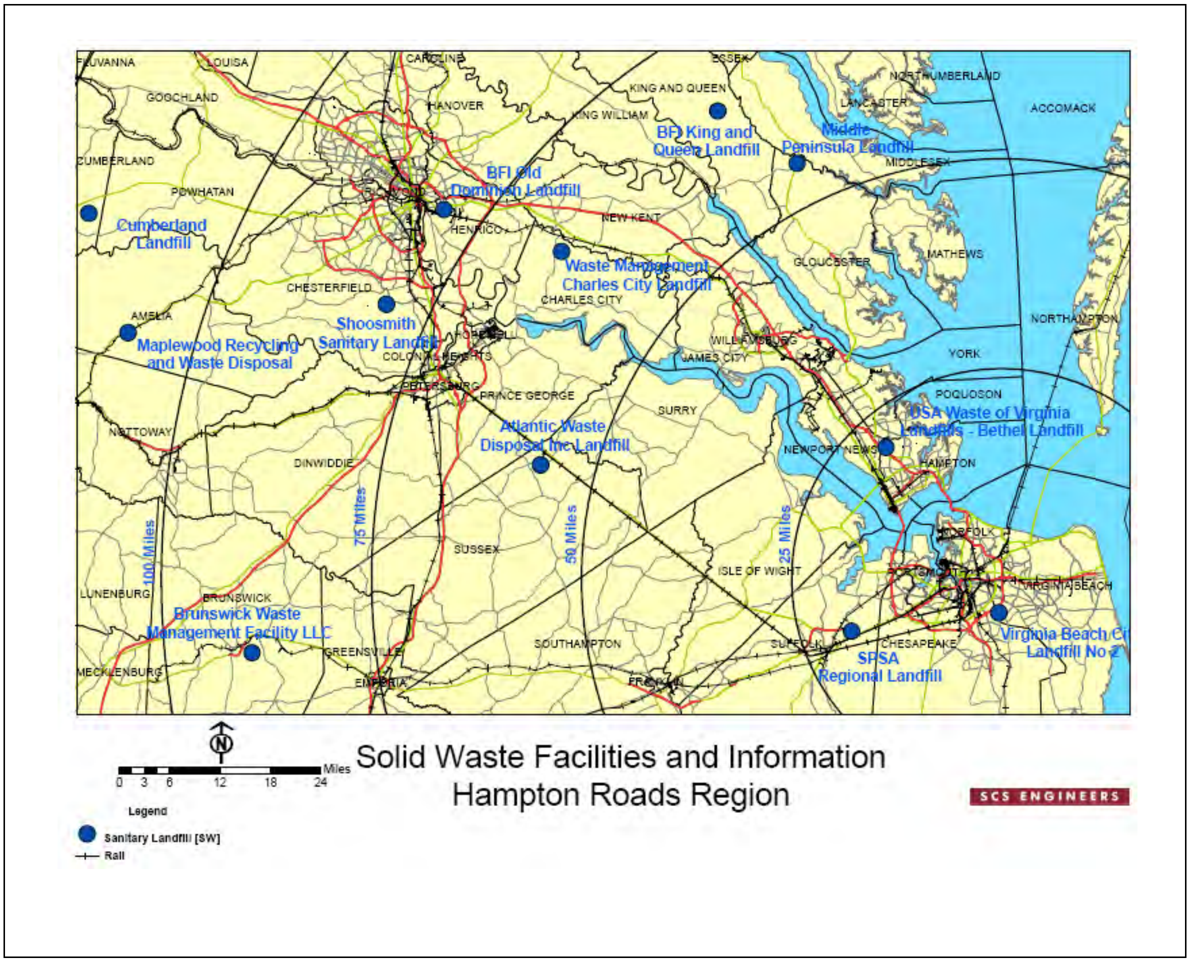



**Figure 10. Private Landfill Facilities in Eastern Virginia**

#### 2.5.2.2 Capacity

As shown in Table 12, most of the private disposal facilities in eastern Virginia have sufficient capacity needed to accommodate the Region's waste flow through the planning period, should the proposed permitting of the expansion to the SPSA Regional Landfill not be successful.

The table summarizes the reported estimated total remaining permitted capacity, remaining reported permitted life, total projected remaining capacity and total projected life of each facility. As indicated, the total remaining permitted capacity and life of each facility were obtained from

VDEQ's published annual report on solid waste management in Virginia (for calendar year 2020).

#### 2.5.2.3 Haul Distance

Table 13 shows the hauling distance from each transfer station in the SPSA network to each private waste disposal facility in eastern Virginia. It is anticipated that with the cessation of operations of the WIN Waste facility in 2024, that the existing RDF facility could potentially be used to transfer waste from the City of Portsmouth. In addition to hauling distance, it is recognized that traffic congestion would play a significant role in the costs to transport waste to private disposal facilities out of the SPSA service area.

#### 2.5.2.4 Rail Access

Several of the out-of-region landfills listed in Table 12 and Table 13 have rail access and transfer capabilities for servicing New York, Maryland, and other out-of-state communities (Atlantic Waste, King George, Brunswick).

### 2.5.3 Survey of Solid Waste Disposal Sites

The Virginia Regulations for Solid Waste Management require that all known solid waste disposal sites (closed, inactive, and active) in the planning region be documented and recorded. Appendix B lists all solid waste management facilities in the Southeastern Virginia Region.

### Table 12. Out of Region Landfill Facilities

| Landfill | Total Remaining Permitted Capacity (Tons) | 2020 Waste Disposed (Tons) | Remaining Reported Permitted Life (Years) |
|---|---|---|---|
| Atlantic Waste Disposal - Sussex Co. (Waste Management) | 43,943,186 | 1,191,495 | 54 |
| BFI King and Queen Landfill (Republic) | 9,355,269 | 664,318 | 32.2 |
| BFI Old Dominion Landfill (Republic) | 6,606,501 | 494,130 | 19 |
| Brunswick Waste Management Facility | 9,569,031 | 326,016 | 40 |
| King George Sanitary Landfill (Waste Management) | 15,520,811 | 1,549,909 | 20 |
| Maplewood Recycling and Disposal (Waste Management) | 15,416,986 | 963,719 | 125.8 |
| Middle Peninsula (Waste Management) | 13,227,433 | 535,825 | 48 |
| Bethel Landfill (Waste Management) | 21,816,740 | 771,358 | 65 |
| Charles City Landfill (Waste Management) | 12,026,818 | 653,005 | 33 |
| Shoosmith Sanitary Landfill | 19,085,000 | 923,347 | 28 |

* Source: Virginia DEQ 2021 Annual Solid Waste Report for CY 2020

## Table 13. Potential Out-of-Region Long Haul Transportation Distance (From Current SPSA Transfer Stations)

| | Distance, Miles (One Way) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Transfer Station** | **SPSA Regional Landfill** | **ATL Waste Disposal, Sussex County** | **WM Charles City County Landfill** | **Cumberland Landfill** | **WM Maplewood Landfill** | **WM Middle Peninsula Landfill** | **WM King George Landfill** | **BFI King & Queen Landfill** | **BFI Old Dominion Landfill** | **Brunswick Waste Management Facility** | **WM Bethel Landfill** | **Shoosmith Sanitary Landfill** |
| Landstown | 27 | 73 | 89 | 155 | 139 | 70 | 144 | 82 | 99 | 107 | 34 | 104 |
| Oceana | 29 | 68 | 89 | 143 | 137 | 70 | 144 | 82 | 100 | 109 | 28 | 106 |
| Norfolk | 17 | 63 | 78 | 145 | 129 | 59 | 133 | 71 | 88 | 98 | 23 | 94 |
| Franklin | 30 | 42 | 72 | 118 | 104 | 96 | 146 | 109 | 77 | 53 | 60 | 67 |
| Isle of Wight | 25 | 34 | 64 | 116 | 101 | 58 | 140 | 71 | 72 | 76 | 23 | 65 |
| Suffolk | 0 | 46 | 85 | 128 | 117 | 65 | 152 | 78 | 95 | 81 | 29 | 77 |
| Boykins | 44 | 45 | 76 | 120 | 107 | 109 | 153 | 117 | 83 | 52 | 73 | 71 |
| Ivor | 25 | 21 | 52 | 102 | 89 | 72 | 127 | 85 | 60 | 64 | 36 | 53 |
| Chesapeake | 20 | 65 | 88 | 148 | 132 | 68 | 142 | 81 | 98 | 100 | 32 | 97 |
| RDF Transfer - Portsmouth | 13 | 59 | 87 | 141 | 125 | 68 | 142 | 80 | 98 | 94 | 31 | 90 |

# 3.0 SPECIAL WASTE

This section includes discussions of various waste types generated in the region that are categorized, processed, handled, or otherwise addressed separately or differently than the wastes that are addressed in the other sections of this plan. The following information describes in more detail the most prevalent types of special wastes handled throughout the region.

### 3.1.1 Household Hazardous Waste

Household cleaners, pesticides and fertilizers, fuels, paints, batteries, and pool chemicals that would otherwise go into the Regional Landfill are diverted from the waste stream through the SPSA Household Hazardous Waste (HHW) collection program. SPSA operates five HHW collection facilities. Virginia Beach has assumed responsibility for the HHW facility operation at the City's Landfill No. 2. The City of Norfolk also operates a household hazardous waste facility. The table below provides a breakdown of the materials collected at the SPSA facilities.

**Table 14. Household Hazardous Waste Disposal Quantities**

| Waste Profile | Units | Quantity | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 |
| Paint Related Materials | Gallons | 880 | 660 | 990 | 550 | 1,210 | 1,182 | 770 |
| High Btu (Waste fuel/solvents) | Gallons | 1,650 | 1,650 | 1,485 | 1,100 | 1,925 | 2,715 | 2,970 |
| Detergents/Cleaners | Gallons | 1,320 | 385 | 440 | 380 | 440 | 673 | 660 |
| Oxidizers | Gallons | 3,850 | 3,150 | 4,400 | 3,500 | 4,000 | 3,075 | 3,850 |
| Pesticide Liquid | Gallons | 2,420 | 2,035 | 1,705 | 1,650 | 2,035 | 2,852 | 3,410 |
| Pesticide Solid | Pounds | 8,800 | 6,750 | 9,900 | 6,750 | 4,500 | 4,700 | 2,400 |
| Acids (Inorganic) | Gallons | 385 | 275 | 220 | 220 | 385 | 343 | 385 |
| Antifreeze | Gallons | 2,298 | 1,460 | 1,285 | 746 | 825 | 847 | 2,090 |
| Oil | Gallons | 11,580 | 7,064 | 10,381 | 8,703 | 6,900 | 8,800 | 12,200 |
| Base Liquids | Gallons | 385 | 220 | 110 | 236 | 55 | 154 | 220 |
| Base Solids | Pounds | 110 | 55 | 0 | 0 | 0 | 55 | 110 |
| *Wet Cell Batteries | Each | 390 | 307 | 731 | 687 | 1,070 | 398 | 505 |
| **Dry Cell Batteries | Pounds | 1,100 | 700 | 700 | 1,050 | 1,400 | 1,200 | 800 |
| *Propane Cylinders | Each | 568 | 576 | 730 | 776 | 776 | 524 | 776 |
| *Other Cylinders | Each | 700 | 1,125 | 416 | 1,619 | 2,650 | 2,446 | 2,164 |
| Aerosol Cans | Pounds | 600 | 6 | 2,400 | 2,000 | 1,200 | 1,850 | 2,750 |
| Mercury | Pounds | 456 | 584 | 30 | 75 | 30 | 15 | 25 |
| Reactive (Calcium Carbide) | Pounds | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| Cooking oil | Gallons | 980 | 555 | 600 | 800 | 550 | 600 | 500 |
| **Total Liquid** | Gallons | 21,898 | 14,304 | 17,216 | 14,385 | 14,325 | 18,166 | 23,205 |
| **Total Solid** | Pounds | 14,916 | 11,246 | 17,430 | 13,375 | 11,130 | 10,897 | 9,935 |

Source: SPSA | NR = not reported | *Totals do not include waste measured as "each", **dry cell battery weight is based on approximately 700 pounds per 55 gallon drum

### 3.1.2 Medical Waste

Virginia's medical waste management regulations have established standards for the storage, transportation and treatment of medical waste. Regulated medical waste may be stored, steam sterilized, incinerated or treated by an acceptable alternative mechanism in a permitted facility. The private sector is the primary supplier of Regulated Medical Waste (RMW) collection, treatment and disposal in the Region. There are two active RMW stream sterilizers in the Region. There are currently no permitted RMW incinerators or transfer stations in the Region. Table 15 lists the active and proposed RMW facilities in the Tidewater Region.

The purpose of medical waste regulations is to establish standards and procedures in order to protect public health and safety, and to protect the environment and natural resources. Under current permitting requirements, those facilities that handle and process wastes on site, (such as hospitals and college labs) and do not accept wastes from other institutions or businesses, are not required to obtain a permit or report quantities. They are however, required to maintain proper handling procedures and standards for the protection of public safety and health, and the environment.

**Table 15. Regulated Medical Waste Facilities in the Tidewater Region**

| Facility Name | Location | Type | Operator |
|---|---|---|---|
| Old Dominion University | Norfolk | Steam Sterilizer (Unit 1) | ODU |
| Old Dominion University | Norfolk | Steam Sterilizer (Unit 2) | ODU |
| Curtis Bay Waste Services | Norfolk | Transfer and Storage Facility | Curtis Bay Waste Services |

### 3.1.3 Construction and Demolition Debris

CDD consists of waste generated during construction, renovation, and demolition projects. The often bulky, heavy materials that make up CDD include wood, concrete, steel, brick, asphalt, gypsum, and plastic. CDD also includes salvaged building components such as doors, windows, and plumbing fixtures. Every time a building, road, or bridge is constructed, remodeled, or demolished, these materials are generated.

In addition, large volumes of CDD waste materials are generated during major storm events such as tropical storms and hurricanes. Historically, the region has experienced such storm events and has been forced to manage the resulting debris. The Region must plan and prepare for the management of large influxes of CDD in addition to the volumes of CDD waste that are generated as a result of normal construction and demolition activities within the area.

The EPA has estimated that the per capita generation of building-related CDD materials is 3.2 pounds per person per day.[3] This estimate was based on a series of calculations to estimate

[3] US EPA: Estimating 2003 Building-Related Construction and Demolition Materials Amounts

residential construction debris, nonresidential construction debris, residential demolition debris, nonresidential demolition debris, and renovation/remodeling debris. The EPA in continuing to study methods for estimating CDD generation.

Regional CDD generation may also be estimated using historical data from CDD waste disposed at landfills in the region. From 2015 to 2018, per DEQ Annual Solid Waste Reports, an average of 359,234 tons of CDD waste was disposed at four landfills in the region. These include the three landfills listed in Table 15 and the SPSA Regional Landfill. Using these disposal figures, the Region's residents generate an estimated 1.6 pounds of CDD waste per day. While some CDD waste is recycled, it is likely that the rate of CDD generation in the Region is closer to 1.6 lbs/person/day than 3.2 lbs/person/day.

### Table 16. CDD Generation (Tons/Year)

| | 2020 | 2030 | 2040 |
|---|---|---|---|
| **Regional CDD Generation (Rate of 3.2 lbs/person/day)** | 718,983 | 776,764 | 844,055 |
| **Regional CDD Generation (Rate of 1.6 lbs/person/day)** | 359,234 | 388,104 | 421,725 |

The majority of CDD handled and disposed of in the Region is collected by the private sector. There are three active CDD-only disposal facilities in the Region. However, the City of Portsmouth's landfill is currently intended for disposal of city produced CDD material only. The Centerville Turnpike CDD Landfill has a reported capacity of 3,083,011 tons. The Higgerson-Buchanan Landfill has a permitted capacity of 1,376,917 tons. The Elbow Road CDD landfill on Centerville Turnpike in Chesapeake was closed in 2012.

### Table 17. Active CDD and Industrial Landfills

| Landfill | Facility Type | Total Remaining Permitted Capacity (Tons) | Waste Disposed (Tons) | Remaining Reported Permitted Life (Years) |
|---|---|---|---|---|
| City of Portsmouth Craney Island Landfill | CDD | 1,871,809 | 8,237 | 129 |
| Recycled Properties LLC | CDD | 1,258,161 | 53,666 | 17 |
| Centerville Turnpike CDD Landfill | CDD | 3,083,011 | 278,176 | 10.8 |
| International Paper LF No. 2 – Isle of Wight | Industrial | 1,658,555 | 27,230 | 65 |
| John C. Holland Enterprises Inc | Industrial | 797,379 | 20,688 | 46.3 |

Source: Virginia DEQ 2021 Annual Solid Waste Report for CY 2020

Landfills that are permitted for other types of waste (either MSW or Industrial) may also accept CDD, although a CDD only disposal facility would most likely have a lower tipping fee, and therefore disposal of CDD in a MSW or Industrial landfill may not be considered cost effective since CDD waste would be replacing MSW or Industrial waste air space. Non-CDD only permitted landfills that may accept CDD waste include the SPSA Regional Landfill (MSW) and the Holland Landfill (Industrial). Additionally, several of the MRFs listed in Table 7 recycle CDD waste.

The region has the total capacity to manage CDD waste over the planning period, however, CDD disposal capacity is limited. The region will need to explore options for managing CDD waste such as increased recycling, accommodating more CDD waste at the SPSA Regional Landfill, expanding the catchment area of the Portsmouth CDD landfill, or adding private CDD landfill capacity at existing or new landfills.

### 3.1.4 Industrial Sludge

Industrial Sludge is generated by a variety of businesses and industries in south Hampton Roads. The following major producers have, in the past, reported the volumes of sludge produced and the disposal methods.

- Smithfield Foods reported that it produced 62 wet tons of wet solids per day, 4 to 5 days per week. The waste was reportedly sent to the BFI landfill in Lawrenceville.
- City of Norfolk water treatment process generates sludge that is disposed of in the SPSA Regional Landfill.
- City of Norfolk 37th Street Water Treatment Plant sludge was piped directly to the solids handling section at HRSD's VIP wastewater treatment plant behind ODU.

The SPSA Regional Landfill typically receives 5,000 to 6,000 tons of sludge per year. Several private companies in Southeastern Virginia also collect, handle, and dispose of industrial sludge. The region does not have comprehensive information on the generation of industrial sludge.

### 3.1.5 Agricultural Waste

Agricultural wastes are by-products of farming and ranching that include crop harvesting waste and manure. According to the 2017 Census of Agriculture, the amount of land used for farming in the region is decreasing in some localities and increasing in others:

- **Chesapeake.** Land in farms is down 18 percent from 2012 to 36,796 acres. Approximately 88 percent is cropland and 7 percent is woodland.
- **Isle of Wight.** Land in farms is up seven percent from 2012 to 80,672 acres. Approximately 64 percent is cropland and 24 percent is woodland.
- **Southampton.** Land in farms is down eight percent from 2012 to 141,942 acres. Approximately 69 percent is cropland and 26 percent is woodland.
- **Suffolk.** Land in farms is up 14 percent from 2012 to 79,035 acres. Approximately 73 percent is cropland and 17 percent is woodland.

- **Virginia Beach.** Land in farms is down 11 percent from 2012 to 23,350 acres. Approximately 80 percent is cropland and 10 percent is woodland.

A rural waste characterization study conducted for Washington State Department of Ecology attempted to quantify and characterize the types of waste disposed, recycled, or reused for four agricultural groups (field crops, orchards, vegetables, and livestock). The study found that less than 1% of the waste generated by these agricultural groups was landfilled. The primary means of handling waste generated by agriculture was through beneficial use, such as replenishment of soil nutrients.

# 4.0 WASTE MANAGEMENT SUMMARY

This section of the plan provides a summary of the waste management system that exists in the region.

## 4.1 RECYCLABLES

Portsmouth is the only locality in the Region that conducts curbside recycling itself. The other communities in the region have all contracted with private firms or are negotiating private contracts for curbside and/or drop-off facility services.

Other public and private programs exist within the region for the recycling of non-curbside collected materials: used oil, batteries, appliances, electronics, and tires.

## 4.2 YARD WASTE

Yard waste in the region is managed through a variety of mechanisms:

- Some residents recycle yard debris in their own yards (grasscycling and/or composting)
- Several municipalities collect grass, clippings, and leaves at the curb. Collected material is either sent for composting at a private facility or disposal within the SPSA system.

However, no regionally-owned composting option is available.

## 4.3 MUNICIPAL SOLID WASTE

With the transfer of the RDF WTE Facility to Wheelabrator (now WIN Waste in 2010, the flow of waste in the system changed since the last solid waste management plan was written. A chart of municipal solid waste flow prior to 2016 is provided in Figure 11. In 2016 ash and municipal solid waste from Virginia Beach were no longer disposed of at the Virginia Beach Landfill No. 2. A chart of municipal solid waste flow after 2016 and up until the closure of the WIN Waste facility in June 2024 is include as Figure 12. The anticipated flow of waste after June 2024 is depicted in Figure 13.

## 4.4 CONSTRUCTION AND DEMOLITION DEBRIS (CDD)

Currently, most CDD generated in the Region is sent directly to CDD landfills, both in and outside the Region. The private CDD landfills accept material from a wide area, including out-of-state sources. Privately owned collection firms operating in the Region provide CDD collection services. Construction firms are responsible for procuring CDD collection containers (e.g., dumpsters) and services at their building sites. Most companies collect CDD from the construction sites for transport directly to a CDD disposal facility. CDD generated by the City of Portsmouth is sent to the Portsmouth Landfill (Craney Island) for disposal.

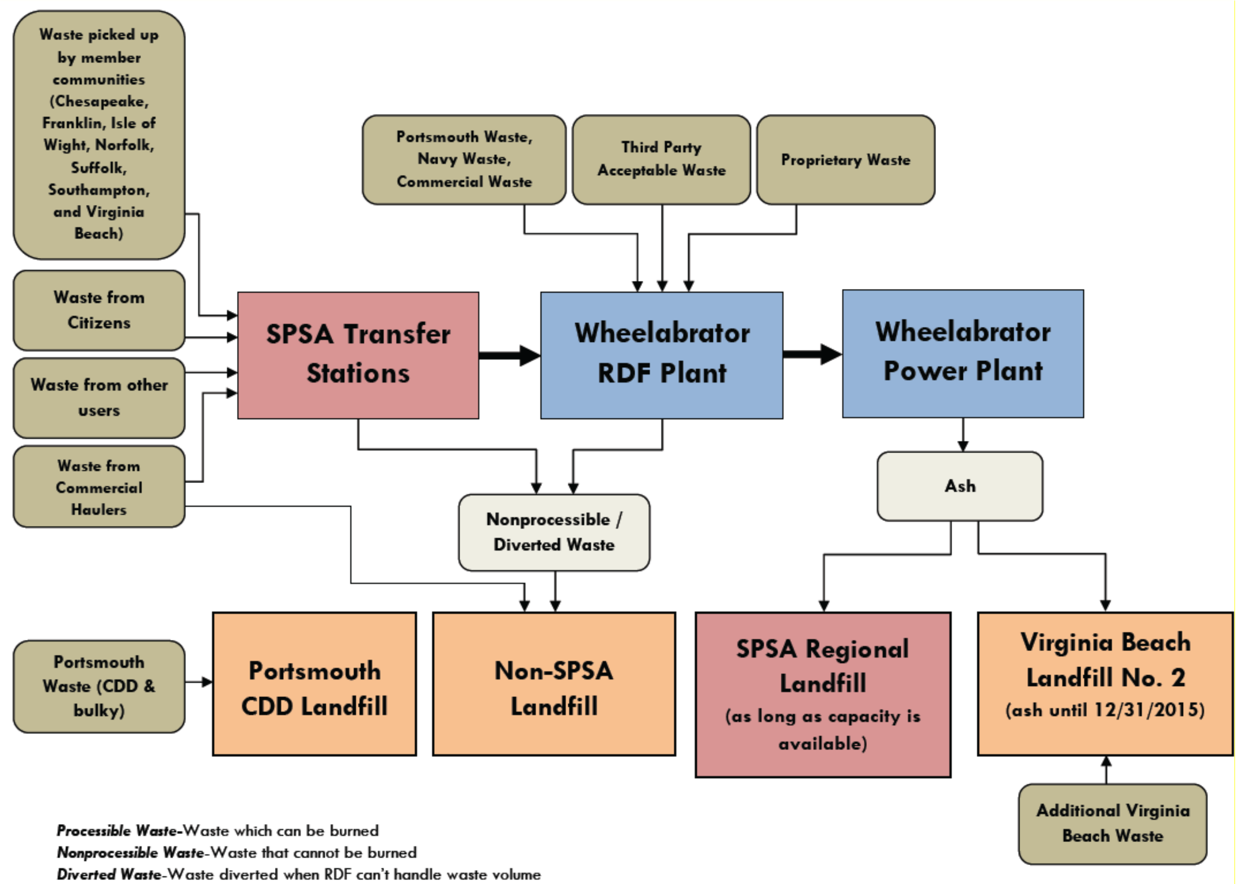



**Figure 11. Flow of Municipal Solid Waste Prior to 2016**

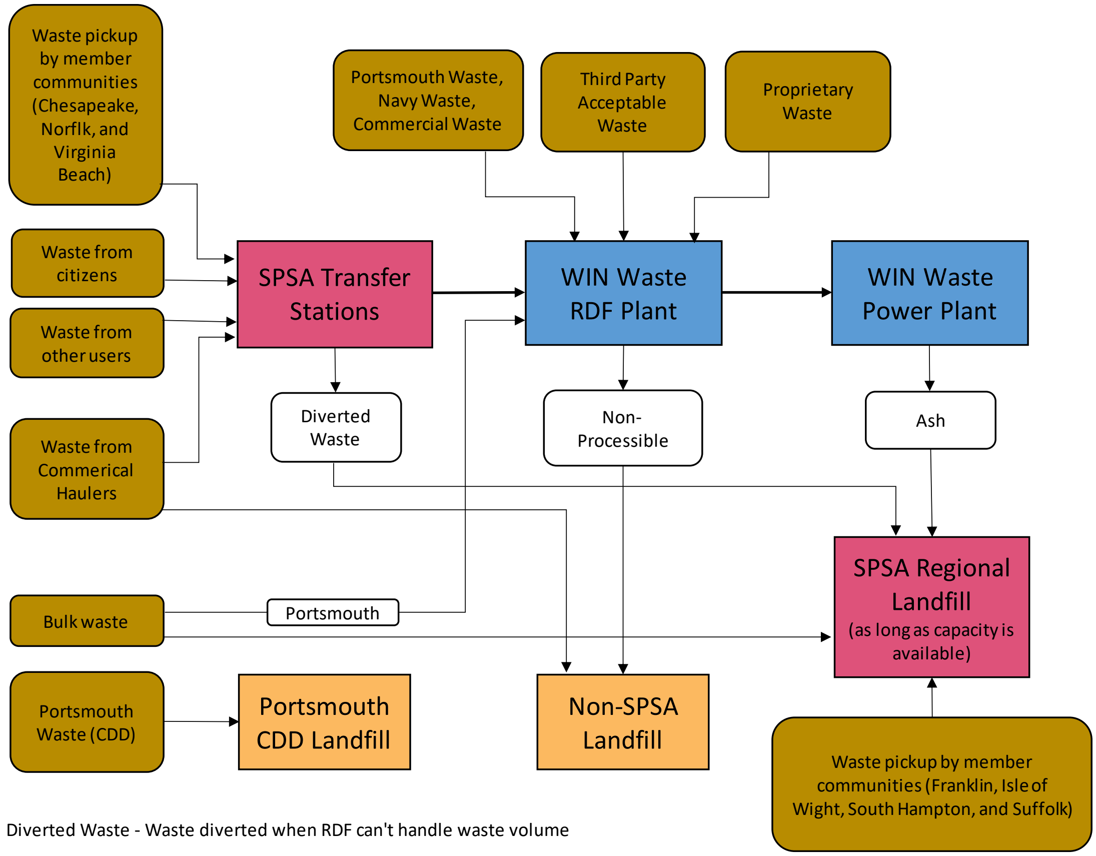



**Figure 12. Flow of Municipal Solid Waste through June 2024**

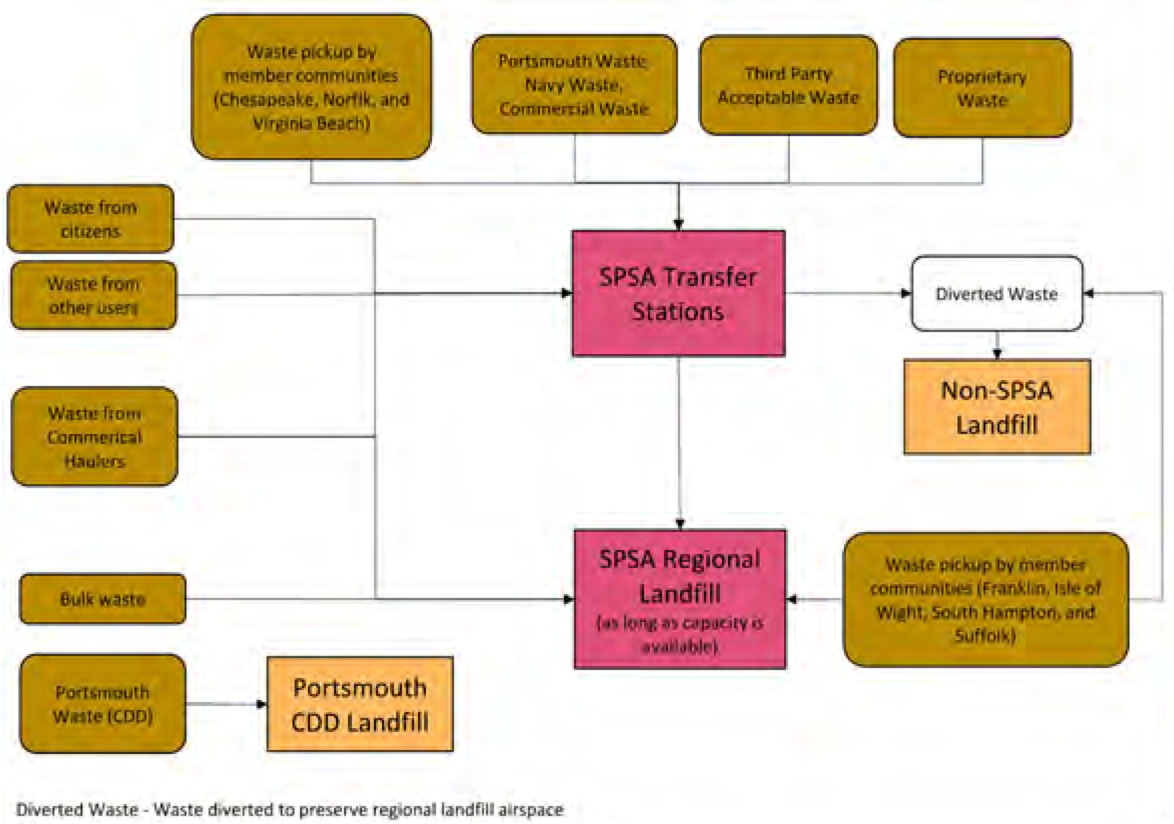



**Figure 13. Flow of Municipal Solid Waste after June 2024**

# 5.0 FUTURE MUNICIPAL SOLID WASTE MANAGEMENT NEEDS

## 5.1 INTRODUCTION

While the Region has programs in place and facilities are available for management of the current waste stream, the quantity of waste generated in the Region will change with time. This means that the Region's programs will be required to change in response. To provide the Region with an understanding of these projected changes, it was necessary to document current waste generation and project future waste generation.

## 5.2 MUNICIPAL SOLID WASTE

Projections of municipal solid waste generation were calculated by applying an EPA per capita waste generation rate to regional population projections. As part of its Sustainable Materials Management program, the EPA periodically develops per capita MSW generation rates, measured in pounds per person per day. The EPA's *Advancing Sustainable Materials Management: 2018 Factsheet* provides per capita generation rates developed every five years from 1960 to 2018. The rate was as low as 2.68 lbs/person/day in 1960 and peaked at 4.90 lbs/person/day in 2018. The rates from 2010 to 2017 were around 4.5 lbs/person/day. EPA has indicated that the generation rate jumped in 2018 due to their enhancement in its food measurement methodology. To make projections for regional MSW generation, the per capita generation rate of 4.90 lbs/person/day was applied to regional population projections developed by the HRPDC for the years 2020, 2030, and 2040.

**Table 18. MSW Generation Projections for Southeastern Virginia (Tons/Year)**

| | 2020 | 2030 | 2040 |
|---|---|---|---|
| **Chesapeake** | 223,127 | 250,545 | 281,331 |
| **Franklin** | 8,285 | 8,945 | 9,658 |
| **Isle of Wight County** | 38,228 | 46,334 | 56,159 |
| **Norfolk** | 220,182 | 223,282 | 226,424 |
| **Portsmouth** | 86,219 | 87,014 | 87,815 |
| **Southampton County** | 97,776 | 126,391 | 163,379 |
| **Suffolk** | 18,458 | 20,516 | 22,803 |
| **Virginia Beach** | 408,666 | 426,394 | 444,889 |
| **Total** | **1,100,942** | **1,189,420** | **1,292,460** |

# 6.0 RECYCLING RATE

The following provides an overview of the Virginia recycling requirements and the recycling rates achieved by the Region's recycling programs.

## 6.1 VIRGINIA REQUIREMENTS FOR SOLID WASTE MANAGEMENT PLANNING, RECYCLING, AND ANNUAL REPORTING

In 1989, the Virginia General Assembly adopted legislation that laid the foundation for solid waste management planning, requiring that solid waste management plans be developed at the local or regional level. After July 1, 2007 no permit for a new sanitary landfill, incinerator, or waste-to-energy facility or for an expansion of an existing sanitary landfill, incinerator, or waste-to-energy facility will be issued until the solid waste planning unit within which the facility is located has an approved solid waste management plan. Regulations governing the development and submittal of solid waste management plans are provided in 9VAC20-130-10 et seq.

This legislation also established recycling rates for communities. The established rates were: 10 percent by 1991, 15 percent by 1993, and 25 percent by 1995. Each county, city, town, or regional authority was required by the legislation to establish recycling programs that would meet these goals.

Legislation introduced in 2006 provided for a two-tiered recycling mandate: 15 percent or 25 percent. The recycling rate that must be achieved by a community is dependent upon two factors: population density and unemployment rates. Localities or regions (called Solid Waste Planning Units or SWPUs) with population densities less than 100 persons per square mile or with an unemployment rate 50 percent higher than the statewide average are required to meet the 15 percent mandated recycling level, all others are required to continue to meet the 25 percent recycling mandated level.

The regulations for solid waste management plans require that the plan describe how the mandated recycling rate will be met or exceeded. Additionally, Section 9VAC 20-130-165 D requires that every city, county, town, or SWPU submit the data and calculations to document the recycling rate for the preceding calendar year to the Department of Environmental Quality.

Virginia uses the following formula for calculating the recycling rate:

**Recycling Rate = (PRMs + Credits) ÷ (PRMs + Credits + MSW Disposed)**

Where:

- **"Principal recyclable materials (PRMs)"** means paper, metal, plastic, glass, commingled yard waste, wood, textiles, tires, used oil, used oil filters, used antifreeze, batteries, electronics, or material as may be approved by the director.

- **"Municipal solid waste (MSW)"** means waste that is normally composed of residential, commercial, and institutional solid waste and residues derived from the combustion of these wastes. MSW generated equals the sum of PRMs recycled and MSW disposed. (MSW disposed equals the amount of MSW delivered to landfills, transfer stations, incineration and waste-to-energy facilities).

  - "Residential waste" means any waste material, including garbage, trash and refuse, derived from households. Households include single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day-use recreation areas. Residential wastes do not include sanitary waste in septic tanks (septage) that is regulated by other state agencies.

  - "Commercial waste" means all solid waste generated by establishments engaged in business operations other than manufacturing or construction. This category includes, but is not limited to, solid waste resulting from the operation of stores, markets, office buildings, restaurants and shopping centers.

  - "Institutional waste" means all solid waste emanating from institutions such as hospitals, nursing homes, orphanages, and public or private schools. It can include regulated medical waste from health care facilities and research facilities that must be managed as a regulated medical waste.

- **Credits** may be added to the recycling formula, provided that the aggregate of the credits does not exceed five percentage points of the annual municipal solid waste recycling rate achieved for each solid waste planning unit:

  - A credit of one ton for each ton of any non-municipal solid waste material that is recycled (e.g., industrial waste, construction and demolition debris).

  - A credit of one ton for each ton of any solid waste material that is reused.

  - A credit of one ton for each ton of recycling residue disposed in a landfill. "Recycling residue" means the (i) nonmetallic substances, including but not limited to plastic, rubber, and insulation, which remain after a shredder has separated for purposes of recycling the ferrous and nonferrous metal from a motor vehicle, appliance, or other discarded metallic item, and (ii) organic waste remaining after removal of metals, glass, plastics and paper which are to be recycled as part of a resource recovery process for municipal solid waste resulting in the production of a refuse derived fuel.

  - A credit of two percentage points of the minimum recycling rate mandated for the solid waste planning unit for a source reduction program that is implemented within the solid waste planning unit. "Source reduction" means any action that reduces or eliminates the generation of waste at the source, usually within a process. Source reduction measures include process modifications, feedstock substitutions, improvements in feedstock purity, improvements in housekeeping and management practices, increases in the efficiency of machinery, and recycling within a process. Source reduction minimizes the material that must be managed by waste disposal or nondisposal options by creating less waste. "Source reduction" is also called "waste prevention," "waste minimization," or "waste reduction."

- A credit of one ton for each inoperable vehicle for which a locality receives reimbursement from the Virginia Department of Motor Vehicles under §46.2-1407 of the Code of Virginia.

If the SWPU's annual recycling rate falls below the minimum rate, the SWPU is required to submit a recycling action plan (RAP), or its approved solid waste management plan may be revoked. The RAP must identify specific elements of the recycling program that will be changed or improved in order for the SWPU to reach its recycling rate. The RAP requires both a commitment by the SWPU to provide resources necessary to improve its program, as well as a timeline for achieving the program elements. The RAP must be adopted by the administrative governmental board(s) for all localities covered by the Solid Waste Management Plan, and then approved by DEQ. Regular reporting on the progress made on the RAP elements is required.

## 6.2 HISTORIC RECYCLING RATES

Beginning with calendar year 2001, Virginia required that all SWPUs submit annual recycling rate reports. The state uses these reports to establish a statewide recycling rate. The table below provides recycling rates for all SWPUs that reported generating more than 300,000 tons of MSW in 2018. South Hampton Roads has consistently exceeded the state's requirement of 25 percent. The region's recycling rate for CY 2020 was 45.5%.

**Table 19. Regional Recycling Rates (%), 2014 -2020**

| Region | CY2014 | CY2015 | CY2016 | CY2017 | CY2018 | CY2019 | CY2020 |
|---|---|---|---|---|---|---|---|
| Central Virginia Waste Management Authority SWPU (Richmond Area) | 57.7 | 58.8 | 58.9 | 59.0 | 58.7 | 59.1 | 58.1 |
| Fairfax County SWPU | 48.3 | 49.6 | 50.0 | 48.8 | 49.5 | 47.0 | 49.6 |
| Loudon County SWPU | 38.5 | 44.5 | 40.0 | 37.1 | 34.1 | 33.0 | 32.2 |
| Newport News SWPU | 39.6 | 40.7 | 38.2 | 44.4 | 57.0 | 52.8 | 53.3 |
| Northern Shenandoah Valley Regional Commission SWPU | 41.4 | 49.7 | 45.9 | 56.6 | 49.4 | 44.1 | 37.0 |
| Prince William County SWPU | 38.7 | 33.7 | 36.8 | 34.6 | 35.3 | 38.2 | 33.5 |
| Region 2000 SWPU (Lynchburg Area) | 41.5 | 39.1 | 35.7 | 40.1 | 38.0 | 43.6 | 47.6 |
| Southeastern Public Service Authority SWPU (South Hampton Roads) | 30.8 | 31.7 | 34.7 | 36.7 | 49.9 | 35.9 | 35.8 |
| Virginia Peninsulas Public Service Authority SWPU (Virginia and Middle Peninsulas) | 27.7 | 36.5 | 34.6 | 26.4 | 29.3 | 30.8 | 27.9 |
| **Statewide** | **42.5** | **44.2** | **42.6** | **42.8** | **46.1** | **43.2** | **45.5** |

Source: Virginia DEQ Annual Recycling Summary Report for calendar years 2014 through 2020.

# 7.0 LITTER CONTROL

The Region's localities all participate in the Clean Community Program of the Commonwealth. They utilize state grants, when available, together with local funding, other grants and private initiatives in operating their local litter control and related educational programs. The Virginia Beach Clean Community Commission is now a City Council appointed commission with administrative support from Public Works, Waste Management Division. Programs and events include; adopt a spot, storm drain marker, Clean the Bay Day and support for Earth Day. The eight cities and counties that are members of SPSA also participate with SPSA, the Virginia Peninsulas Public Service Authority and their local government counterparts on the Peninsula in HR CLEAN, which is the regional litter control and recycling education program. It operates through the HRPDC. Among the initiatives undertaken by HR CLEAN is an effort to develop an educational program for members of the law enforcement community and judicial system about littering, its control, and the need for more stringent enforcement of anti-littering statutes.

The Cities of Chesapeake, Norfolk, Portsmouth, and Suffolk are member affiliates of the Keep America Beautiful (KAB) program. Each affiliate provides opportunities to the public in areas of education, beautification, and litter control programs. To be an affiliate of KAB, minimum standards and reporting are required. One of the programs being offered to volunteers is the Great American Clean-up where citizens participate in litter clean-ups in their neighborhoods and public areas. The Great American Cleanup takes place annually from March through May.

In addition to the KAB programs, the localities in Southeastern Virginia support and participate in clean-up activities supported by private organizations, such as the Chesapeake Bay Foundation, Lynnhaven River Now, Riverkeepers and other private foundations. They also support and participate in the various "Adopt" programs, which operate under the auspices of the Virginia Departments of Conservation and Recreation and Transportation. They also participate in the various Stewardship programs, which are sponsored by the Governor and the Secretary of Natural Resources.

Examples of these cooperative programs include:

- The Chesapeake Bay Foundation (CBF) promotes volunteer opportunities throughout the region. Along with local coordinators, CBF organizes clean up events not only on the Bay, but at nearby rivers, waterways, under bridges, and the oceanfront.

- Each locality has the opportunity to participate in the annual "Clean The Bay Day," which takes place the second Saturday of June in Norfolk, Chesapeake, Gloucester, Newport News, Poquoson, Portsmouth, Suffolk, and Virginia Beach. Most of the waste collected is put into the waste stream while a small percent might be recycled.

- Similar "Adopt" programs operate under a state umbrella but are administered locally. The Adopt-A-Highway Program, the first of such "adoption" efforts, is an anti-litter and roadside enhancement campaign intended to promote pride and local ownership in our beautiful state. It allows individuals and organized groups of citizens and/or businesses to work in partnership with the Commonwealth by "adopting" a section of state highway and agreeing to help take care of it. This program offers organizations a way to contribute to their community and state, as well as generate publicity for their efforts. A number of localities and private organizations also participate in the Adopt-A-Waterway Program, which is facilitated by the Department of Conservation and Recreation. Due to the overwhelming success of these efforts, HR CLEAN promotes Adopt Hampton Roads as a way to encourage involvement in Adopt-A-Spot and Adopt-A-Waterway programs. These efforts have flourished region wide.

- In several instances, the Sheriffs in Hampton Roads localities utilize inmate labor to clean up areas of highways throughout the region.

Additionally, in an effort to curb litter and non-point source pollution, each locality requires citizens to secure waste set out for collection.

# 8.0 SOLID WASTE NEEDS ASSESSMENT

## 8.1 EVALUATION OF SOLID WASTE MANAGEMENT

SPSA periodically employs a consultant to conduct a comprehensive survey and report. The report evaluates SPSA's fiscal and operational health. The report summarizes current and recent solid waste collection data for each of SPSA's facilities, including the Regional Landfill, the RDF WTE Facility, and transfer stations. The report also describes the current and projected future condition and capacities of these facilities.

Regarding solid waste received at each transfer station, the individual local governments decide on solid waste collection routes. In deciding these routes, the local governments will bring solid waste from different areas within their jurisdiction to the most appropriate transfer station. In addition, private solid waste collection companies make similar decisions. These decisions in turn will affect the amount of solid waste any transfer station receives. SPSA itself has no direct control over the decisions of these entities but works with these entities to plan and identify needed new improvements and facilities.

SPSA will continue to rely on conducting this type of evaluation and assessment of its solid waste management system to improve its ability to meet the solid waste management needs of the region.

## 8.2 NEEDS ASSESSMENT

The existing solid waste management system was reviewed within the context of the solid waste management hierarchy to identify needs to be addressed during the development of this plan and its future implementation. This assessment is presented according to the solid waste management hierarchy. Identified needs that fall outside of the hierarchy, such as solid waste transfer, are presented at the end of the section.

### 8.2.1 Source Reduction and Reuse

#### 8.2.1.1 Current Conditions

There are four basic methods for waste reduction:

- Reduce consumption by using product alternatives that generate less waste.
- Reuse products for their original or compatible purposes.
- Increase the durability or lifetime of products.
- Decrease the amount of material used to produce each product or reduce product packaging.

Waste reduction is generally not as well documented or understood as recycling and requires extensive education. Additionally, some waste reduction tactics, especially those involving product and packaging waste, are controlled by economic, political, and educational forces beyond city and county control.

Waste reduction is supported in the region through various programs and offerings. Many promotional materials and outreach programs exist to spread awareness of waste reduction and recycling. Through askHRgreen, the HRPDC runs several environmental education programs focused on source reduction. These include a single-use plastics campaign, straw-free Earth Day campaign, and grants to schools regarding measures to reduce plastic use. In addition, through the HRDPC Recycling and Beautification Committee, askHRgreen conducted a waste reduction media campaign in FY2019 called Choose to Refuse. The campaign included paid media, outreach materials, public relations, and social media efforts to raise awareness about waste reduction. The Committee's message to the region's residents was that we should all choose to reduce our waste production first before focusing on what can or cannot be recycled.

Oher material donation and reuse opportunities currently available include:

- Numerous private and non-profit businesses operate secondhand material outlets throughout the county.
- Websites such as www.craigslist.org provide an internet-based forum to buy, sell, and exchange secondhand products locally.
- The cities and counties sponsor public surplus sales of materials and equipment no longer needed by those agencies but still usable.
- Some of the member jurisdictions have developed internal goals for buildings that meet Leadership in Environmental Engineering Design (LEED) standards. Some of the jurisdictions have LEED certified buildings.

#### 8.2.1.2 Needs

Waste reduction could be further encouraged by addressing the following needs:

- Residents and businesses are not exposed to education and promotion programs focusing on alternatives to toxics and proper disposal of household hazardous waste.
- According to the most recent EPA estimates, yard waste accounts for 13 percent of the waste stream; food scraps accounts for an additional 13 percent. The cost of home composting bins or mulching mowers may be a deterrent to residents.
- Businesses do not have access to technical assistance and outreach addressing waste reduction opportunities.
- Agencies could adopt procurement policies that encourage the purchase of products made from recycled-content materials.

#### 8.2.1.2.1 Waste/Material Exchange

Materials or waste exchanges are not new. The concept began in Europe and spread to North America in the late 1970s. A waste exchange acts as a liaison between waste generators and potential users. Some exchanges are operated by states or local governments, others are wholly private, for-profit businesses. The exchanges vary in terms of area of service and the types of commodities exchanged. In general, waste exchanges tend to handle hazardous materials and industrial process waste while materials exchanges handle nonhazardous items. Information on several waste exchanges are provided in Table 20.

Increasingly, waste exchanges are making use of the internet to create online databases and eliminate printed catalogs. Private exchanges frequently share information with one another.

Waste/material exchanges operate much like “classified ads.” Businesses, offices, schools, and individuals "advertise" their surplus/unwanted materials, or materials they want to get, by completing an electronic listing form. Once the form has been completed and submitted, the listing is posted on the website. Users can look for and find materials by browsing or searching the materials categories. Users interested in trading posted materials then contact each other directly.

In many instances, sites offer school donation programs. These programs provide the opportunity for businesses to list materials specifically available to schools. Since schools are working with limited resources.

Web-based materials exchange opportunities are limited in the Region. HRPDC could consider establishing a regionally-based waste or material exchange for businesses or residents.

## Table 20. Waste/Material Exchanges

### State Waste Exchanges

**Alaska Materials Exchange (AME)** http://www.greenstarinc.org/ame/ameindex.php

The AME was developed in 1994 as a partnership among the Alaska Department of Environmental Conservation, ARCO-Alaska, BP Exploration, Alyeska Pipeline Services, the Anchorage Chamber of Commerce, and the U.S. EPA. From 1994 until 2003, the AME was a quarterly printed catalog mailed to users across the State. In 2003, the AME was transferred to Green Star and updated to an interactive web-based system.

**California Materials Exchange (CalMAX)** http://www.ciwmb.ca.gov/calmax

CalMAX, maintained by the California Integrated Waste Management Board, is a free service designed to help businesses find markets for materials they have traditionally discarded. CalMAX published quarterly catalogs from 1992-2005; however, in an effort to reduce the use of paper and streamline the administrative process, CalMAX made the decision to publish the last catalog in the summer of 2005 and now operates exclusively as an online exchange service. The CalMAX database categorizes materials into 15 separate classifications and is accessible 24 hours a day through the CalMAX Web site.

**Ohio's Materials Exchange (OMEx)** http://www.myomex.com/

OMEx publishes no-cost materials wanted and available ads for the purpose of facilitating exchanges for users who then work out the details of payment, transportation and storage. Ads are placed, and updated, by the listing entities. OMEx began in 1998. It is administered by the Association of Ohio Recyclers and funded through the Ohio Department of Development's Ohio Energy Office. Waste Alternatives, Inc., of Mount Vernon, OH, services and maintains the listing program while The Internet Professional administers the website.

**Indiana Waste Exchange (IMX)** http://www.in.gov/idem/imx/index.html

The IMX is maintained by the Indiana Department of Environmental Management, Office of Pollution Prevention and Technical Assistance. The IMX is an electronic bulletin board that aids in the dissemination of information on surplus and waste materials either available from or wanted by industrial and commercial entities. IMX operates through the IMX Listserv. Through this listserv, users receive e-mail information about new listings on a regular basis. Listed materials are organized into 17 individual categories.

**Iowa Waste Exchange (IWE)** http://www.iowadnr.gov/waste/iwe/index.html

The mission of the IWE is to provide Iowa industries with smart waste management. The IWE is a free, confidential program that actively promotes the reuse and recycling of Iowa business and industry by-products and wastes. The program operates out of six regions with a coordinator assigned to each region. The IWE is part of and funded by the Iowa Department of Natural Resources. Since 1990 the IWE has matched over 2.6 million tons of materials.

**Minnesota Materials Exchange** http://www.mnexchange.org/

The Minnesota Materials Exchange program is coordinated by the Minnesota Technical Assistance Program (MnTAP). The program focuses on items that are commonly used in a business or organizational setting, rather than a household. Most things are available free or at a low cost. Users are sent emails (2 per month) identifying the newest available and wanted items. MnTAP, a nonregulatory program that helps businesses reduce waste, is funded primarily by a pass-through grant from the Minnesota Pollution Control Agency's Prevention and Assistance Division to the University of Minnesota, School of Public Health, Division of Environmental Health Sciences.

**Montana Material Exchange** http://www.montana.edu/mme/

The Montana Material Exchange (MME) maintains and distributes listings of materials available and materials wanted from individuals and local and international companies. The site is maintained by the Montana State University Extension Service, Pollution Prevention Program, in partnership with the Montana Chamber of Commerce.

**Nebraska Materials Exchange Program** http://www.knb.org/exchange.html

Keep Nebraska Beautiful offers this program. Since its inception in the Fall of 1994, the number of materials listed and exchanged has grown tremendously.

**Ohio's Materials Exchange (OMEx)** http://www.myomex.com/

**Table 20. Waste/Material Exchanges**

OMEx publishes no-cost materials wanted and available ads for the purpose of facilitating exchanges for users who then work out the details of payment, transportation and storage. Ads are placed, and updated, by the listing entities. Information provided through OMEx is supplied by the listing party. OMEx began in 1998. It is administered by the Association of Ohio Recyclers and funded through the Ohio Department of Development's Ohio Energy Office. Waste Alternatives, Inc., of Mount Vernon, OH, services and maintains the listing program while The Internet Professional administers the website.

**Tennessee Materials Exchange (TME)** http://www.cis.tennessee.edu/environmental/recycle/TME.shtml

The Tennessee Materials Exchange (TME) is a free service, operated by the University of Tennessee Center for Industrial Services (CIS), that helps Tennessee industries and businesses find markets for industrial by-products, surplus materials and wastes. TME listings are updated monthly.

**Vermont Business Materials Exchange (VBMX)** http://www.vbmex.org

VBMX is a free service whose goal is to minimize waste by fostering the exchange of reusable resources. VBMX keeps a database of available and wanted materials, and publicizes the listings through this web site, the VBMX Listserve, other specialized listserves, the quarterly catalog, and Vermont Business Magazine.

**West Virginia Materials Exchange** http://www.state.wv.us/swmb/exchange/Index.htm

Created in 1998 by the West Virginia Solid Waste Management Board, the exchange works with business, industry, government agencies and others to facilitate the exchange, reuse and recycling of surplus materials, overstocks, and manufacturing by-products.

**Business Material Exchange of Wisconsin (BMEx)** http://www.bmex.org/

The BMEx is regional material exchange that has been operating since 1996. The BMEx is open to any resident, business, organization, institution, agricultural operation or other entity located in Wisconsin.

**Regional Exchanges**

**2Good2Toss** http://www.2good2toss.com/

2good2toss is Washington's online exchange for reusable building materials and household items. Washington's Department of Ecology funded the start-up costs to get the site off the ground, and each participating municipality paid the web site developer a one-time set-up fee for their exchange on the site and then pays an annual subscription fee to have the site maintained. While anyone can view posted items, users must reside in participating Washington state counties or cities to be eligible to post items. 2good2toss.com is in keeping with Ecology's mission, as set forth in chapter 70.95 RCW, to reduce the volume of solid waste placed in the state's landfills and waste to energy facilities through waste reduction, source separation, recycling, and diversion.

**Resource Exchange Network for Eliminating Waste (RENEW)** http://www.zerowastenetwork.org/renewdev/

RENEW is a materials exchange network originally established by the Texas Legislature in 1987 to promote the reuse or recycling of industrial wastes. In 2007, the Zero Waste Network expanded RENEW to encompass the Environmental Protection Agency's Region 6. RENEW is a marketing channel for industries, businesses, and governmental units that want to sell surplus materials, by-products, and wastes to users who will reclaim or reuse them.

**Southern Waste Information eXchange** http://www.wastexchange.org/

The Southern Waste Information Exchange is a free service designed to help businesses, industries and other organizations. Registered users can post both wanted and available listings, similar to a classified ad section. Businesses, industries and other organizations can list their available materials by type, quantity, frequency of availability, geographic location, and date listed. They may also include photos of the materials. Users can post detailed wanted listings, specifying the type(s) of material they need and the frequency. The WasteXchange is funded by the Florida Department of Environmental Protection.

**Table 20. Waste/Material Exchanges**

| | |
|---|---|
| **Industrial Materials Exchange** | http://www.metrokc.gov/hazwaste/imex/ |
| IMEX, the Industrial Materials Exchange, is a free service designed to match businesses that produce wastes, industrial by-products, or surplus materials with businesses that need them. IMEX is a free listing service. Businesses, offices, schools, and individuals "advertise" their surplus/unwanted materials, or materials that they are seeking, by submitting an electronic IMEX listing form. The listings are then posted on the IMEX web site, where they are viewed by interested waste generators and waste recyclers. IMEX will only accept listings from the Pacific Northwest. Specifically, this means that listings will be accepted only from Alaska, Idaho, Oregon, and Washington (EPA Region 10). | |
| **National Waste/Material Exhange** | |
| **Freecycle Network** | http://faq.freecycle.org/ |
| The Freecycle Network is a private, nonprofit organization incorporated in the State of Arizona. Users join local groups and post items on local Freecycle group sites. Currently, the Freecycle Network is made up of 4,934 groups with 8,338,153 members around the world. | |
| **Locally-Sponsored Waste/Material Exchanges** | |
| **The Los Angeles County Materials Exchange Program (LACoMAX)** | http://dpw.lacounty.gov/epd/lacomax/ |
| LACoMAX is a free service provided by the County of Los Angeles Department of Public Works, Environmental Programs Division. Users of this on-line materials exchange service can browse or post listings of a wide variety of available and wanted materials. Listings are categorized by 15 material classifications and 6 regions and include common items such as wood pallets, out-of-fashion textiles, and chemicals as well as more uncommon items. All exchanges are coordinated between the two interested parties. | |
| **Marin County (Marin Max)** | http://marinmax.org/ |
| MarinMax is designed for use by businesses, non-profits and individuals within Marin County. | |
| **New York City, Department of Sanitation** | http://www.wastematch.org/ |
| NYC Wastematch is a free service, created and funded by the NYC Department of Sanitation, which facilitates the exchange of used and surplus goods and equipment from organizations that no longer need them to other entities that do. | |
| **Twin Cities Free Market** | http://www.twincitiesfreemarket.org/index.cfm |
| The Twin Cities Free Market is a reuse program of Eureka Recycling, a nonprofit organization. The Free Market is an interactive, internet-based program that targets residential exchanges. Residents of Carver, Hennepin, Ramsey, and Washington County may use the Free Market. The Free Market is funded in part by the City of Saint Paul, Carver County, Hennepin County, Ramsey County, Washington County, and the State of Minnesota SCORE Fund. | |

### 8.2.2 Recycling and Composting

#### 8.2.2.1 Current Recycling Conditions

As discussed earlier, the cities and counties currently provide curbside collection services or drop-off facilities for collection of recyclables.

#### 8.2.2.2 Recycling Needs

##### 8.2.2.2.1 Business Recycling

There is a continued need to provide information to businesses to encourage recycling as their actions contribute to the overall recycling rate in the region.

- Recruit and provide technical assistance to large businesses in the region to increase recycling. The purpose of providing technical assistance is to set up new recycling programs in larger businesses and work with the haulers or recyclers to efficiently implement these new programs. After a business is recruited, it would receive a waste audit and at least one on-site visit. During the on-site visit, the program staff person would develop waste reduction and recycling recommendations.

- Develop a business recognition program for recycling, composting, and waste reduction for exemplary waste reduction, composting, and recycling activities.

##### 8.2.2.2.2 Evaluation and Monitoring

The cities and counties have taken over from SPSA implementation of curbside and drop-off programs. There needs to be a coordinated effort to evaluate the status of individual recycling programs. The evaluation should address the following:

- Evaluation of what is and isn't marketable and identify opportunities to develop markets for recycled materials.

- Progress toward recycling goals.

- Assessment of public outreach and education programs.

- Assessment of recycling collection and marketing programs.

- Establish an accurate assessment of the region's recycling rate.

- Identify gaps and needs in recycling programs.

### 8.2.2.2.3 E-Waste

There has been swift growth in the manufacture and sale of consumer electronic products. Advances in technology have led to better, smaller, cheaper products. Industry analysts give every indication that the trend toward rapid introduction of new electronic products will continue.

As the production and use of electronic products continues to grow, the challenge of recovery and disposal is becoming significant. Computer monitors and older TV picture tubes contain an average of four pounds of lead and require special handling at the end of their lives. In addition to lead, electronics can contain chromium, cadmium, mercury, beryllium, nickel, zinc, and brominated flame retardants (USEPA). Another serious concern associated with end-of-life management is the export of electronic scrap to developing countries that may lack adequate worker safety and environmental standards.

While end-of-life electronics (end-of-life electronic products are either obsolete for their intended purpose or no longer useful by the current user and lacks any significant market value as an operational unit. Definition used by the Institute of Scrap Recycling Industries, Inc.) currently comprise only a small amount of the municipal waste stream, that percentage is expected to grow dramatically in the next few years (estimated to be 1.2% of waste generated in 2006 per USEPA, 2006). The average life span of a personal computer is currently about 2-3 years. Electronics that break often are not repaired due to the relatively low price of replacement equipment. When the equipment breaks or becomes obsolete, it is commonly discarded.

SPSA accepts cell phones for recycling through its Household Hazardous Waste Collection facilities. SPSA does not have an established program for the collection and recycling/disposal of computers and other electronics at this time and relies on other programs and vendors to provide this service. Electronics recycling services should be provided to the Region through its solid waste management system.

### 8.2.2.2.4 Recycling Data Collection

Accurate recycling rate reporting is dependent on the cooperation of recycling entities in the region. In the past, a letter and survey were mailed to a limited number of commercial establishments. The following represent possible improvements to the data collection effort:

- Virginia DEQ also has developed a template for gathering recycling information that HRPDC may find useful.

- HRPDC should create a system that is easy to use for commercial establishments to report recyclables. Montgomery County, Maryland, for example, has a reporting module on their website. This reporting system self-populates their recycling database and makes compilation of the data easier. Businesses can also report recycling quantities through the mail or fax via a form that can be downloaded from their website.

- HRPDC should target businesses that are likely to generate recycling quantities that are NOT collected through a licensed (reporting) waste collector. For example, Montgomery County develops a list of SIC codes to target each year. Each year, a different business sector is targeted to establish contact: bookstores for book/paper recycling, HVAC contractors for scrap metal, grocery stores for baled cardboard, restaurants for composted food waste, etc. Each year there are several businesses identified that generate significant quantities of recyclables that are not captured through facility or waste collector reporting. Businesses that typically produce large quantities of recyclables include:

  - Landscaping and Tree Service Companies

  - Auto dealerships

  - Large grocery chains (Food Lion, Farm Fresh, Harris Teeter)

  - Property management companies (generally, they establish recycling programs at large office buildings/complexes with multiple tenants)

  - Large retail establishments (Kohls, Wal-Mart, Target). Please note that Virginia DEQ placed recycling information for Walmart on its website.

- HRPDC should maintain enough staff to process submitted recycling information. Montgomery County, Maryland has multiple people on staff that process recycling information submitted by the commercial sector. In addition to verifying their understanding of submitted information, they track the generator of recyclable material, the collector of each recyclable material type, and the ultimate disposal location of the recyclable material. This helps to ensure they do not double count materials.

- Lastly, HRPDC should be prepared to contact non-responsive establishments. As a last resort, most of the municipalities have enacted recycling reporting ordinances that have penalties for non-compliance.

#### 8.2.2.3 Current Composting Conditions

Most of the yard waste in the Region currently is being landfilled, although some communities have at least some portion of the yard waste they collect transported to a composting facility near Waverly, Virginia (McGill Environmental Systems Inc.). Collection systems are in place throughout most of the Region to collect yard waste separately. It can be readily processed and recycled for beneficial use either as compost, wood chips, soil amendment, or other beneficial uses.

#### 8.2.2.4 Composting Needs

The Region has had difficulty with its yard waste management program. A comprehensive regional processing facility was constructed by SPSA in 2005 at Virginia Beach's Landfill No. 2, but was closed in 2007 following opposition from surrounding residents and the City of Virginia

Beach after persistent nuisance complaints and public health concerns. A regional facility may be appropriate for the urban areas within the Region (Chesapeake, Norfolk, Suffolk, Portsmouth, and Virginia Beach), but an alternative approach may be appropriate for the more rural areas (City of Franklin and Isle of Wight and Southampton Counties).

### 8.2.3 Resource Recovery (Waste-to-Energy)

#### 8.2.3.1 Current Conditions

In late 2007, SPSA advertised that it would entertain proposals from qualified interested parties for the sale of the RDF WTE Facility. In 2010, SPSA sold the facility to WIN Waste Technologies. Under the terms of the sale and subsequent agreements, WIN Waste was contracted to accept and processes SPSA member community solid waste at the RDF WTE Facility through June 2027. Based on the circumstances with WIN Waste's contract with the US Navy for purchase of steam terminating at the end of June 2024, the WIN Waste facility will not be able to satisfy its contractual obligations to accept SPSA waste at the current disposal costs beginning on July 1, 2024. WIN Waste has indicated that it intends to close the facilities and commence with decommissioning and demolition of the power generating and RDF facility after closure.

#### 8.2.3.2 Needs

The RDF WTE Facility was a key component of the Region's waste management infrastructure. The facility had the capacity to process of a significant portion of the Region's municipal, commercial, and industrial solid waste. SPSA has indicated that it intends to dispose of the residential solid waste from its member communities at the Regional Landfill or transfer to other locations that is in its best interest. It is uncertain at this time where the private haulers that are contracted to collect the commercial and industrial waste generated in the region will dispose of their solid waste, but likely will rely on private landfill facilities in proximity to the region.

Under the current market conditions, it is very unlikely that another waste to energy facility would be sited and constructed in the region in the near future. In accordance with SPSA's Strategic Operating Plan, the SPSA Board of Directors and Executive Staff from time to time, as and when appropriate under the circumstances, and no less often then every seven (7) years, undertake a comprehensive review of the disposal methods being utilized and assess its viability for future periods of time. This assessment may include exploration and requests for proposals from developers of alternative waste disposal options including resource recovery facilities that are higher on the waste management hierarchy than landfilling.

### 8.2.4 Landfilling

#### 8.2.4.1 Current Conditions

Currently permitted and constructed landfill area are Cells I through VI. Cell VII was permitted in 2011. On an annual basis the Authority measures the volume of material already placed in the Regional Landfill by a topographic survey. HDR Engineering was hired by SPSA to perform the airspace calculations utilizing information from the topographic survey. In the January 2022 Airspace Management Report, HDR Engineers, presented information concerning when the currently constructed landfill cells could possibly reach capacity depending on the quantity of waste disposed annually and the density achieved in waste being placed for disposal. In the report, assuming current conditions continue, HDR Engineers estimated that as of December of 2021 the Regional Landfill had less than 3.2 million cubic yards of permitted airspace available in Cells V and VI, of which just 2.6 million cubic yards of disposal airspace was readily recoverable. The recoverable airspace include filling in areas within existing operating area and not recovering airspace available on lower slopes due to settlement of waste. The 2022 report assessed the impacts associated with the shift in waste disposal away from WIN Waste in July 2024 and estimated that Cells V and VI would reach capacity as early as **January 2027**, if the waste placement approached 1,400 lb/CY.

The capacity of the permitted but not yet constructed Cell VII is estimated to be 10,800,000 cubic yards. The construction of Cell VII is anticipated to commence in 2024 and be ready for receipt of waste by April 2026, according to SPSA. At a density of 1,400 lb/CY and a waste acceptance rate of approximately 500,000 tons per year, Cell VII would provide approximately 15 years of additional life or through 2042. However, the Cell VII capacity relies on overlap onto existing Cell V filled areas and the abandonment of the main landfill access road and relocation of critical infrastructure in that corridor including leachate forcemain, underground electric, fiber optic SCADA communication lines and drain lines. SPSA has stated that it intends to modify the Cell VII permit to include a separate phase of construction to delay the connection of Cell VII to Cell V and the relocation of this infrastructure. This adjustment to the phasing would reportedly truncate the effective capacity to between 8.60 million and 9.28 million cubic yards and reduce the life of Cell VII to 12 to 13 years.

#### 8.2.4.2 Needs

Landfills will be needed to provide for the disposal of MSW, CDD, industrial waste, sludges, and ash residue generated in the Region. The quantities of these waste streams that will require landfilling will depend on how much waste is recycled, incinerated, or otherwise processed. With the anticipated closure of the WIN Waste waste to energy facility, and having no viable alternative processing facility in the Region to reduce waste disposal quantities, providing adequate landfill disposal capacity within the Region or secure disposal capacity elsewhere is a priority.

The disposal capacity of the SPSA Regional Landfill, with the closure of the WIN Waste facility is only projected to provide disposal capacity through 2038. SPSA is required under the Use and Support Agreements with the Member Localities, to satisfy the waste disposal needs for at least the next 20 years. The proposed expansion of the Regional Landfill to add 129 acres to the solid waste boundary and addition of Cells VIII and IX to provide 16 million cubic yards of disposal capacity is needed in order for SPSA to meet this obligation and to continue to maintain and manage a safe, cost efficient, sanitary and environmentally sound solid waste disposal system for the receipt of the Member Localities solid waste.

## 8.3 OTHER WASTE MANAGEMENT NEEDS

### 8.3.1 Transfer of Solid Waste

SPSA indicates that all eight of the transfer stations are in operation and are generally operating within their design capacities.

#### 8.3.1.1 Needs

As the region continues to grow, improvements and upgrades will be required at the transfer stations to continue to meet the needs of the region in the most cost-effective manner. With the pending closure of the WIN Waste facility, a transfer operation for the City of Portsmouth will need to be developed. Potential use of the WIN Waste RDF facility is an option that may be considered in addition to construction of a new transfer station.

##### 8.3.1.1.1 Criteria for Transfer Station Improvements

The transfer stations are aging; however, the service levels must be maintained or improved as the population grows and the facilities reach their physical and functional limits. The following can be indicators that a transfer station is in need of upgrading:

- Time spent by customers on site becomes excessive.
- Facility hours are no longer meeting customer needs.
- The transfer station is experiencing difficulty in accommodating all vehicle and tonnage throughput during peak hours.
- The transfer station is experiencing damage due to changes in collection vehicle design.
- Traffic impacts on local streets are increasing.
- Environmental standards are not being met.

As the facilities age and the needs for solid waste services change, the transfer system may require upgrades to maintain operational efficiency. The 2017 SPSA Annual Survey Report prepared by CH2M describes the current condition of the SPSA transfer stations as well as recommended maintenance activities. SPSA indicates that all nine of the transfer stations are generally operating within their design capacities. The design capacity of each station and most recent annual waste quantities reported are provided in the table below.

**Table 21. SPSA Transfer Stations Design Capacity and Waste Quantities, FY 2015 - 2021**

| Transfer Station | Design Capcity (Tons/Day) | Tons Received | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 |
| Boykins[1] | 50 | 650 | 650 | 650 | 650 | 650 | 650 | 650 |
| Chesapeake | 500 | 141,030 | 135,637 | 137,053 | 122,729 | 130,282 | 124,492 | 131,243 |
| Franklin | 150 | 22,674 | 21,760 | 21,817 | 20,966 | 22,162 | 21,755 | 21,839 |
| Isle of Wight | 150 | 22,230 | 23,930 | 20,247 | 20,326 | 19,056 | 18,703 | 19,452 |
| Ivor[1] | 50 | 650 | 650 | 650 | 650 | 650 | 650 | 650 |
| Landstown | 1,300 | 169,468 | 176,966 | 163,360 | 147,696 | 142,522 | 147,816 | 166,798 |
| Norfolk | 1,300 | 218,208 | 195,975 | 196,339 | 162,697 | 155,733 | 155,473 | 150,971 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Oceana | 500 | 83,961 | 74,736 | 76,298 | 70,037 | 73,650 | 72,280 | 81,533 |
| Suffolk | 500 | 65,075 | 65,101 | 70,607 | 66,767 | 64,084 | 68,542 | 73,772 |
| RDF Facility[2] | N/A | 151,300 | 142,343 | 141,794 | 93,326 | 49,135 | 57,454 | 58,655 |
| Total | 5,500 | 875,246 | 837,748 | 828,815 | 705,844 | 657,924 | 667,815 | 705,563 |

Source: SPSA FY2023 Operating and Capital Budgets 1) Boykins and Ivor facilities average 650 tons/year. 2) The RDF facility is not a SPSA transfer station, but waste from Portsmouth and some waste from Chesapeake are delivered directly to the RDF facility.

##### 8.3.1.1.2 Expanded Transfer Station Capacity

A general rule for evaluating the need for collection vehicle transfer is based on hauling distance. Although cost-effectiveness will vary, transfer stations generally become economically viable when the one-way hauling distance to the disposal facility is greater than 15 to 20 miles. However, it should be noted that transportation conditions (i.e., traffic, road quality, size of vehicles used and collection routing) will impact the benefit of direct-haul versus consolidating refuse at a transfer station.

In rural areas, transfer stations also provide increased convenience for residential and non-residential self-haulers, who might otherwise have to travel long distances to reach a disposal site. Increased convenience helps reduce the amount of illegal dumping, illegal burning, and other inappropriate forms of disposal.

SPSA currently operates a transfer station network. Two possible reasons for adding an additional transfer station include:

- Economic growth in outlying areas of the region, particularly western Chesapeake, western Portsmouth and northern Suffolk and the southern sections of Chesapeake and Virginia Beach, may cause the waste stream to grow to a point where another transfer station may become feasible or desirable. Drive times would be significantly reduced and convenience for residents would be greatly improved.

- There also may be a need to build an additional transfer station in urban areas particularly if existing stations are being over utilized and any upgrades are not feasible.

- Relocation of an existing transfer station to better conform to existing or planned land uses within a jurisdiction. For example, the City of Virginia Beach is considering options for replacement of the Landstown Transfer Station because its current location is in an area that has an expanding educational land use, and the City would like the existing Landstown transfer station property to be used for different purposes.

The benefits of building a new transfer station must be weighed against the costs of adding new facilities. SPSA maintains the existing transfer stations which may require periodic upgrades.

SPSA could evaluate the long-term need for additional transfer stations based on the following:

- Projected population growth and growth patterns.

- Availability of suitable sites.
- Remaining capacity of existing transfer stations.
- Customer usage of existing transfer stations.
- Convenience and accessibility for the region's residents.
- Effect on transfer system costs.
- Land uses.

Sufficient time should be allowed for construction of new transfer stations as warranted.

## 9.0 IMPLEMENTATION PLAN

Previous versions of the SWMP provided a timeline for the development of several new facilities for the solid waste system. The following provides an overview of the alternatives that were considered and an update on the Region's progress in implementing these alternatives as well as new initiatives being considered. In addition, the HRPDC sponsored a study in 2008 which evaluated institutional, organizational, technology, and disposal options for managing waste in the region after 2018, when the use and support agreements between the SPSA Region members was set to expire.[4] The use and support agreements were extended with an initial term through June 30, 2027 prior to expiration in 2018. The use and support agreements shall automatically renew for successive additional 10-year terms, unless a Member Locality opts to not renew.

### 9.1 WASTE MANAGEMENT HIERARCHY

In accordance with the Virginia Solid Waste Management Regulations, the region's solid waste management plan must consider and address all components of the solid waste hierarchy. The solid waste hierarchy ranks methods of managing solid waste from most preferred to least preferred:

The Virginia Department of Environmental Quality has adopted a hierarchical approach to the management of solid waste. The hierarchy establishes the framework for solid waste management and includes the following components:

- Source Reduction
- Reuse
- Recycling
- Resource Recovery (Waste-to-Energy)
- Incineration
- Landfilling

SPSA and its member localities, as well as the HRPDC, continue to examine various alternatives for the management of solid waste in Southeastern Virginia. Historically SPSA has focused its efforts on disposal of the Region's solid waste and on alternative approaches to increasing

[4] SCS Engineers, Final Interim Report, Solid Waste Management for Southside Hampton Roads, Planning Horizon 2018-2047, Prepare for the Hampton Roads Planning District Commission, Revised January 5, 2009.

participation in the disposal programs offered to the region. The eight-member local governments continue to focus on improvements to the local solid waste collection and recycling systems as well. This section of the RSWMP summarizes the hierarchical approach to Integrated Waste Management envisioned by state and federal agencies and outlines the alternatives being considered.

#### 9.1.1.1 Source Reduction and Reuse

##### 9.1.1.1.1 Source Reduction

The Virginia Solid Waste Planning and Recycling Regulations define source reduction as "any action that reduces or eliminates the generation of waste at the source, usually within a process. Source reduction measures include process modifications, feedstock substitutions, improvements in feedstock purity, improvements in housekeeping and management practices, increases in the efficiency of machinery and recycling within a process."

Source reduction, as an approach to solid waste management, has been applied primarily to industrial and hazardous wastes. It reduces the amount of waste requiring disposal, thus prolonging the life of existing waste disposal alternatives. However, it does not eliminate the need for other disposal options.

The primary responsibility of local and regional agencies in source reduction must be in the area of public education and creation of a spirit of stewardship on the part of the citizens, both individual and corporate, due to the fact that packaging of items is out of the control of SPSA and local retailers. Each governmental entity in the region can practice source reduction, to some degree, through its buying practices. Source reduction is directly under the control of private individuals and businesses.

##### 9.1.1.1.2 Reuse

Reuse generally assumes the reuse of a material in a manner identical to its original use and is not significantly different from recycling or source reduction. Therefore, it is considered in this Plan as synonymous with source reduction. Refilling of returnable drink containers is an example of reuse. As with source reduction, the primary responsibility of local and regional agencies is in the area of public education.

#### 9.1.1.2 Actions

- **Continue Household Hazardous Waste (HHW) collection program:** SPSA continues to operate a regional HHW collection program through five collection facilities. One facility (at the Regional Landfill) is open on a full-time basis; the remaining four are open based on a monthly recurring schedule. The City of Virginia Beach has recently opened its own HHW drop-off facility at its Landfill No. 2, and the City of Norfolk also plans to begin operation of HHW facilities to serve their residents. These programs support other environmental programs such as the Hampton Roads Regional Stormwater Management Program which is built on a series of cooperative initiatives such as illicit discharge detection and elimination.

- **Consider Implementation of a Regional Waste/Material Exchange:** As discussed earlier, one company's disposal problem may be another's valuable resources. HRPDC can assess options for implementing a regional waste/material exchange for use by businesses and/or residents.

### 9.1.2 Recycling and Composting

Recycling is the third highest priority in strategies to manage materials in the waste stream. Recycling is defined by the Virginia regulations as "the process of separating a given waste material from the waste stream and processing it so that it may be used again as raw material for a product which may or may not be similar to the original product." Processing old newspapers to produce "new" paper and composting or mulching of yard wastes are examples of recycling.

Recycling reduces the amount of solid waste that requires disposal. It also reduces reliance on the use of virgin materials in manufacturing. Concurrently, recycling can further enhance the increased public awareness of solid waste management issues by involving the public directly in waste management.

#### 9.1.2.1 Actions

- **Evaluate Materials Recovery Facility:** Currently there is only one significant Materials Recovery Facility (MRF) in the Region that is capable of processing materials collected from various recycling programs. At the time the 2005 SWMP was written, SPSA was the primary provider of recycling collection services in the Region, with the exception of Virginia Beach. As an alternative, SPSA considered the construction and operation of a competing MRF. However, SPSA has discontinued recycling services and the member communities have taken over the responsibility for collection of recyclables. A SPSA-operated MRF is no longer a consideration for the Region and processing of recyclables will continue to remain a private sector function.

- **Yard waste facility:** SPSA has operated facilities where yard waste collected by member communities was handled, mulched and composed. Yard waste was transported by SPSA from member collection points to the yard waste management facility at the Virginia Beach Landfill No. 2. However, this facility was closed in 2007 to address neighbor complaints of excess odors from the facility. The Region does not currently have a facility dedicated to the handling and processing yard waste. Although the SPSA's regional yard waste management facility located at Virginia Beach's Landfill No. 2 was abandoned after it encountered operational challenges with odors, the development of a regional facility should be considered in the future if the SPSA member communities decide to cooperate in whole or in part their after use and support agreement with SPSA expire in 2027. However, in the interim, the member jurisdictions continue to evaluate options for utilization of their yard waste for beneficial purposes rather than disposing in a landfill.

- **The HRPDC has implemented a Web-Based Recycling Reporting System:** This system has facilitated easier, more accurate reporting of collected quantities.

### 9.1.3 Resource Recovery (Waste-to-Energy)

According to Virginia's Solid Waste Planning Regulations, resource recovery entails a comprehensive "solid waste management system which provides for collection, separation, recycling and recovery of energy or solid wastes, including disposal of non-recoverable waste residues." Combustible items are burned as a fuel to produce steam and/or electricity. Noncombustible items, including the ash from the combustibles, must be disposed of in some other fashion, such as landfill or Alternative Daily Cover (ADC). Recyclable materials, typically glass, ferrous metals and aluminum, are recycled following separation. Recycling and source reduction programs may enhance the effectiveness of the combustion alternatives.

#### 9.1.3.1 Actions

- **Operation of RDF WTE Facility:** As mentioned earlier, the sale of the RDF WTE Facility and subsequent transfer of non-processible waste to a private landfill located outside of the SPSA Region will be the primary disposal method in the Region through June 30, 2024. The RDF WTE Facility is anticipated to cease operations on July 1, 2024. Development of a new WTE Facility in the region by a developer is very unlikely with the current market conditions for waste disposal, energy generation revenue streams and community acceptance.

- **New Resource Recovery Facility:** SPSA will continue to monitor solid waste resource recovery technologies as they are developed and demonstrated both domestically and internationally. Assessment of the viability of these technologies will be reviewed periodically in accordance with the SPSA Strategic Operating Plan, if it is in the best interest of SPSA and the Member Localities, SPSA would issue Requests for Proposals for alternative technologies for disposal of all or portions of the systems solid waste.

### 9.1.4 Landfilling

Landfill disposal of solid waste is the most prevalent option in the United States. The Virginia Regulations define a landfill to include "a sanitary landfill, an industrial waste landfill, or a construction/demolition/debris (CDD) landfill." Landfills for municipal solid waste presently are operated as sanitary landfills, involving daily cover of the waste, required use of liners, and leachate collection systems. Landfilling is required for management of solid wastes that do not lend themselves to any of the other management options. Of the Southeastern Virginia landfills currently permitted and in operation, three are publicly owned while the others are private CDD landfills.

#### 9.1.4.1 Actions

- **New transfer stations**: In addition to the waste transfer facilities in the existing SPSA network, a new facility for the City of Portsmouth is anticipated to be required following the closure of the WIN Waste facility.

- **Regional Landfill**: Continue using Cells V and VI until capacity is consumed. Plan for the construction and operation of Cell VII. Plan and commence permitting of Cells VIII and IX to increase the disposal capacity of the Regional Landfill to provide at least 20 years of disposal capacity for the regional MSW.

- **Evaluate options for managing CDD waste:** The region has the total capacity to manage CDD waste over the planning period, however, CDD disposal capacity is limited. The region will need to explore options for managing CDD waste such as increased recycling, accommodating more CDD waste at the SPSA Regional Landfill, expanding the catchment area of the Portsmouth CDD landfill, or adding private CDD landfill capacity at existing or new landfills.

- **Continue operation of the Virginia Beach Landfill No. 2:** This landfill is owned by the City of Virginia Beach and continues to remain in operation. The landfill has ceased accepting ash from the RDF WTE Facility. The City is considering long term options for the facility.

## 9.2 IMPLEMENTATION OF ACTIONS

The timeline for implementation of most actions stated in the previous section is a subject of a strategic planning study authorized by the HRPDC in 2008 and updated in 2010. In addition, based on the study results and other considerations, the SPSA Member Localities determined that SPSA will continue to be the designated regional solid waste management agency. As long as SPSA is the regional solid waste management agency, it will be involved in the development of the regional solid waste management plan. In March 2010, the communities designated the HRPDC as the regional solid waste planning agency and the agency responsible for tracking and reporting on recycling activates in the Region. Key milestones are summarized below:

- Complete update to the 2018 and Beyond Study: The report finalized in October 2011.

- Termination of the WIN Waste service agreement, as WIN Waste is planning to close after June 30, 2024. The regions MSW currently being delivered to the WIN Waste facility will be transferred to the Regional Landfill or other out of service area disposal locations beginning July 1, 2024.

- Make decisions regarding the location of transfer station for the City of Portsmouth MSW, permit and construct as required to support operations following cessation of the WIN Waste facility.

- Regional Landfill Capacity: The Regional Landfill will continue to be used by SPSA member localities at least through 2027, under the terms of the Use and Support Agreements. The Member Localities will review from time to time the Designated Disposal Mechanism for the disposal of the regional MSW.

- SPSA has proceeded to begin permitting for the Cells VIII and IX expansions to meet its obligation to provide twenty plus years of disposal capacity.

- Plan for commencing construction of Cell VII in 2024 so that is ready for operations in 2026.

- Complete permitting, design and construction of alternative entrance flyover to the Regional Landfill as required by Conditional Use Permit with the City of Suffolk for Cell VII operations.

The implementation of many actions stated in Section 9.1 is ongoing. The HRPDC will continue to evaluate appropriate implementation actions based on assessments of regional needs.

## 9.3 FUNDING/FINANCING OF PROGRAMS AND FACILITIES

The following section provides an overview of the funding mechanisms established by the local governments of Southeastern Virginia to pay for management of solid waste.

- **SPSA**: Tipping fees are SPSA's primary source of revenue. A tipping fee is generally a fee levied to dispose of waste directly at a landfill or waste to energy facility. SPSA's tipping fee reflects the aggregate cost to maintain and operate nine transfer stations, a transportation network, a landfill, fleet maintenance, administration, and waste disposal at the WIN Waste WTE facility. Tipping fees are collected for disposal of municipal waste, waste from the Navy, CDD waste, and various other types of waste.

- **City of Chesapeake:** The Waste Management Division of the Public Works Department provides refuse collection services for single family and townhouse residences in the City. It allocates monies from the General Fund to cover the costs of this service.

- **City of Franklin:** The City uses General Fund revenues to pay for the costs of solid waste collection and disposal. Solid waste fees are paid by homeowners and businesses on their monthly utility bill.

- **City of Norfolk:** The City's Department of Public Works Waste Management Division collects approximately 83,000 tons of refuse annually from 64,500 residences and businesses. Since FY 2014-2015, Norfolk has utilized a Special Revenue Fund derived from charges to homeowners and businesses to pay for services.

- **City of Portsmouth:** Portsmouth charges a residential refuse collection fee on its public utilities bill. The City also charges a monthly rate for regularly scheduled service in the downtown commercial district. The City has established a separate Waste Management Fund as a revenue stream to pay for costs of service.

- **City of Suffolk:** The City's collection, disposal, and recycling services are funded through an Enterprise Fund. Residents who receive curbside service are assessed a monthly fee.

- **Virginia Beach:** The City's operations are funded through an Enterprise Fund. Residents are assessed a monthly fee for curbside services.

- **Isle of Wight County:** The County uses its General Fund to pay for refuse collection and disposal services. Within the County, the Towns of Smithfield and Windsor have their own arrangements for residential refuse collection, disposal and recycling services.

- **Southampton County:** The County uses the General Fund to cover costs for refuse collection and disposal services.

## 9.4 PUBLIC EDUCATION

Educational programs are ongoing throughout the region, and both SPSA and the localities continue to educate the public on the need for proper waste management and disposal practices. This is done through a variety of means, including a detailed SPSA website, classroom presentations, SPSA facility tours and print pieces such as brochures and informative booklets, and media spots. SPSA and the individual localities provide and participate in a variety of educational programs throughout the member localities and the Hampton Roads region. Programs include the following:

- **SPSA Programs:** SPSA continues to offer limited educational materials on its website.

- **Local Programs:** Most localities in Southeastern Virginia have Clean Community offices that provide educational information to the public about their specific locality, as well as an array of volunteer opportunities. Some of these opportunities include Clean the Bay Day, Adopt-a-Spot, Keep America Beautiful projects, and many more. Most Clean Community offices have program information and contact lists available through the host locality's website.

  Since the municipalities have taken the responsibility for collection of recyclables, information on recycling is available on city/county websites.

- **Regional Programs:** HR CLEAN, the recycling and litter prevention education program of the HRPDC, is a regional coalition of local and regional Clean Community, recycling, and environmental education coordinators who promote litter prevention, recycling, community beautification, and general environmental awareness through educational projects designed to reach all sectors of our communities.

## 9.5 PUBLIC/PRIVATE PARTNERSHIPS

A broad range of issues will influence the configuration of the regional solid waste system in the future. The economic dynamics of solid waste management are difficult to predict. Public/private partnerships may offer cost effective and efficient solutions to specific solid waste management problems in the future. SPSA continues to develop and explore opportunities and ideas for joint ventures. An example is the Landfill Gas-to-Energy Plant at the SPSA Regional Landfill and the methane recovery plant at Virginia Beach Landfill No. 2. The City of Virginia Beach has partnered with Ingenco in its efforts in this arena.

Through its relationship with Suffolk Energy Partners, SPSA was able to process landfill gas for use by either Dominion Virginia Power or BASF. Under the terms of amended and restated landfill gas rights, easement, and lease agreement between SPSA and Suffolk Energy Partners, now MAS Suffolk RNG, LLC, a landfill gas to renewable natural gas (RNG) facility is being constructed and the landfill gas to energy facility decommissioned and demolished. The agreement was executed in December 2021 and the RNG facility is planned to be operational in 2023.

Contracts between the localities and SPSA, as well as between WIN Waste, private waste haulers, and other vendors are and will continue to be important to the waste management programs offered throughout the region. The current agreements between SPSA and its eight member localities will expire on June 20, 2027. Efforts are already underway to promote continued and strengthened commitment of area local governments to SPSA, and to ensure the future viability of the authority.

### 9.5.1 Existing Role of the Private Sector

The private sector currently plays a significant role in handling and disposing solid waste generated within the SPSA localities. The existing role of both the public and private sector is explained in Section 2.0. The continued mix of public sector and private sector involvement will be needed to ensure that the waste management needs of South Hampton Roads are met in an efficient manner. For the several components of the solid waste stream the division of responsibility between SPSA, the localities, and the private sector is as follows:

- **Municipal Waste**

  - **Recyclable Materials:** Tidewater Fibre collects residential recyclables under contract to most member jurisdictions including Virginia Beach, Norfolk, and Suffolk. Portsmouth collects the recyclables and delivers the collected materials to RDS.

  - **Municipal Solid Waste:** Municipal solid waste currently is collected by the localities and delivered to SPSA. This waste stream is segregated into processible or non-processible waste. Processible waste is transferred by SPSA to the RDF WTE Facility. Non-Processible waste is transported by WIN Waste to other disposal facilities. This arrangement is governed by the service agreement between WIN Waste and SPSA and was anticipated to be effective through January 2027. In the event the RDF WTE Facility is not operational, waste is either diverted to the Regional Landfill or to other disposal facilities pursuant to the agreement between SPSA and WIN Waste. Both the operation of the RDF WTE Facility and final disposal of non-processible waste is managed by a private firm. The anticipated closure of the WIN Waste facility in July 2024 will be a major disruption to the private collection and disposal market in the region that also relied heavily on the processing capacity of the waste to energy facility. There will no longer be separate transfer and disposal of non-processible waste from the SPSA transfer stations. Private waste haulers collecting solid waste from commercial, industrial and multi-family generators in the region will need to secure disposal agreements with other private facilities outside the region. Limited quantities of commercial waste may be accepted by SPSA.

- **Other Recyclable Materials:** Other recyclable materials such as yard waste, white goods, and metals from ash residue generated from the RDF WTE Facility are handled, in part, by private firms.

- **Other Wastes**

  - **Construction and Demolition Debris**: The bulk of CDD handled and disposed of within the SPSA localities is processed by the private sector.

  - **Household Hazardous waste** is collected by SPSA. Disposal is handled by a private contractor.

  - **Special Wastes:** Several types of special wastes, including motor vehicle tires, waste oil and batteries are collected and processed by SPSA. These materials are also collected and processed by the private sector. Other types of special wastes, including stumps and land clearing debris, are for the most part processed as part of the CDD waste stream by the private sector. Septage and sludge are handled by a combination of SPSA, Hampton Roads Sanitation District, and a wide range of private companies.

  - **Petroleum-Contaminated Materials:** Opened in 1999, Soilex specializes in the treatment and recycling of petroleum-contaminated materials and receives the majority of the region's waste materials that come from oil spills and other emergency response actions. This facility will allow SPSA to receive larger volumes of materials that, once treated, may be used in other beneficial ways at the landfill. What the partnership means to SPSA is additional material to cover landfilled waste that SPSA does not need to pay for and avoided fuel and transportation costs.

- **Methane Gas:** In November 2010, an agreement between SPSA and Suffolk Energy Partners, LLC (SEP) was made that conveyed exclusive rights for all the landfill gas (LFG) at the Regional Landfill to SEP for capture and beneficial reuse. SEP had held the rights to the LFG under a previous agreement and owns and operates the LFG recovery system that consists of recovery wells and flare. In addition, SEP owns and operates an electrical power plant at the Landfill that generated electrical power for sale to Dominion Virginia Power. Gas was delivered to a BASF Plant on Wilroy

Road in Suffolk, approximately 2.3 miles from the Landfill via an existing pipeline constructed in 2001. In December 2021, SPSA executed an amended and restated landfill gas rights, easement and lease agreement with MAS Suffolk RNG, LLC (f/k/a Suffolk Energy Partners, LLC) for the finance, permit, construct, operate, and maintenance of a new landfill gas to renewable natural gas facility. The renewable natural gas will be transmitted to the Columbia Natural Gas transmission line that bisects the Regional Landfill site and MAS Suffolk RNG and LLC will share in the royalties generated from the work. Through the terms of the agreement, MAS Suffolk RNG will remain responsible for the capital and operation and maintenance costs for the landfill gas collection system and the processing facility.

### 9.5.2 Potential Future Role of the Private Sector: Municipal Solid Waste

The nature of the future role of the private sector in handling and processing municipal solid waste generated within the SPSA localities has changed over the past several years and will be determined by a combination of economic factors and political decisions made at the local and regional level. Under the existing contractual structure between the localities and SPSA, the division of responsibility between SPSA and the localities will remain relatively static until 2027. The existing contracts between the localities and SPSA will expire in 2027. The contract between SPSA and WIN Waste was also set to expire in 2027, but all indications are that the agreement will be terminated at the end of June 2024. If the agreements are not automatically renewed by the Member Localities in 2027, disposal of solid waste could become a function of the private sector.

## 9.6 SOLID WASTE MANAGEMENT PLAN IMPLEMENTATION

Various entities, both public and private, are responsible for implementing the SWMP. Public entities include, SPSA, HRPDC, and SPSA member localities. Private entities include waste haulers and processors, landfill operators, and numerous business that participate in the recycling system. Resident also play an important role in the recycling system by separating materials before the enter the commercial processing stream.

# 10.0 PUBLIC PARTICIPATION

## 10.1 CURRENT & FUTURE PROGRAMMING

SPSA offers an outlet for the public, both citizens and businesses, to give suggestions, make requests and comments on its website, www.spsa.com. In addition, SPSA offers the public an opportunity to speak to the Board of Directors at the monthly Board meetings held in the Regional Board Room at 723 Woodlake Drive, Chesapeake, VA 23320. These meetings, which are normally held on the fourth Wednesday of every month, are open to the public. The public may also participate in programs such as HRCLEAN which is sponsored by the HRPDC. The HRPDC also offers the public opportunities to speak at their Quarterly Commission meetings.

## 10.2 SOLID WASTE MANAGEMENT PLAN PUBLIC NOTICE AND HEARING

SPSA provided for public participation during the development of the original RSWMP. Public participation procedures include publication of a public notice announcing the availability of the revised RSWMP and commencement of a 30-day comment period and the person to be contacted with comments.

# 11.0 REGIONAL SOLID WASTE MANAGEMENT PLAN AMENDMENT PROCEDURES

HRPDC adopted the following procedures for interested parties to request an amendment to the approved RSWMP, and for HRPDC staff to review and process such requests. To initiate an amendment to the RSWMP, a completed application form which can be obtained from the HRPDC) with supporting documentation, must be submitted. The application will be reviewed for completeness and evaluated based on the justification of need for the proposed amendment. The HRPDC must approve all major and most minor amendments to the RSWMP prior to its submittal to the VDEQ. (Minor amendments described in Section 11.1.B.1 and 2 below require such approval.)

## 11.1 TYPES OF AMENDMENTS TO THE RSWMP

Virginia's Solid Waste Planning Regulations allow for two types of amendments to approved solid waste management plans. They are classified as major or minor amendments.

A. Section 9 VAC 20-130-175.A.1 of defines major amendments as:

1. Any addition, deletion, or cessation of operation of any solid waste disposal facility;
2. Any increase in landfill capacity;
3. Any change that moves toward implementation of a waste management strategy that is lower in the waste management hierarchy;
4. Action plan(s), including an action plan to address a planning unit's recycling rate that has fallen below the statutory minimum;
5. And any change to membership in the approved area.

B. Section 9 VAC 20-130-175.A.2 defines minor amendments as:

1. Any addition, deletion, or cessation or operation of any facility that is not a solid waste disposal facility;
2. Any change that moves toward implementation of a waste management strategy that is higher in the waste management hierarchy or;
3. Any non-substantive administrative change, such as a change in name.

## 11.2 RSWMP AMENDMENT PROCEDURES

A. To request an amendment to the RSWMP, an applicant shall:

1. Submit a completed application and supporting documentation to the HRPDC for the desired amendment and

2. Pay out of pocket expenses associated with its application such as advertisement of public notice.

3. The application and all supporting documents shall be submitted to the HRPDC.

B. HRPDC response to an application to amend the RSWMP shall include:

1. Within fifteen (15) days of receipt, HRPDC will acknowledge receipt of the application to amend the RSWMP.

2. Within thirty (30) days of receipt, HRPDC will evaluate the application for completeness. A letter acknowledging a complete application will be sent to the applicant.

3. If needed, a request for additional information will be sent to the applicant, who will have thirty (30) days to submit the additional information, or the request to amend the RSWMP will be denied.

4. Within ninety (90) days of receipt of a complete application, HRPDC staff will review and evaluate the justification of need for the proposed facility. This review may include discussions with the applicant, local government officials, members of SPSA staff and permitting staff at VDEQ.

5. The approved RSWMP will be the primary instrument used to evaluate the need for the requested amendment.

6. If the conclusion of the evaluation is that the requested amendment is consistent with the intent of the RSWMP and in the best interest of the planning region, HRPDC staff will amend the text of the approved RSWMP to accommodate the amendment request.

C. Public Participation

1. Public participation is required for all major RSWMP amendments and minor amendments described above.

2. HRPCD Staff will arrange for publication of a required public notice describing the proposed amendment, the commencement of a public comment period (30 days, at minimum), and date, time and location of a required public hearing.

3. Publication of the public notice will occur not less than fifteen (15) days prior to the scheduled hearing.

4. HRPDC staff will arrange for and conduct a public hearing not less than fifteen (15) days prior to the end of the public comment period, nor less that fifteen (15) days following the publication of notice of said hearing. The public hearing will most likely be part of a normally scheduled SPSA Board of Directors meeting.

5. HRPCD staff will ensure the text of the proposed amendment is available for review during the public comment period. The proposed amendment will be placed on HRPDC's website at www.hrpdc.org. Hard copies of the amendment will also be provided upon written request.

D. VDEQ Approval

1. Following the public comment period, HRPDC staff will forward the revised RSWMP to VDEQ. Minor amendments will be submitted to VDEQ for informational purposes. Major amendments will be submitted to VDEQ for its approval.

2. In either case, VDEQ must acknowledge receipt of and/or approve the amendment prior to HRPDC finalizing the amended RSWMP.

3. Amending the RSWMP does not remove the requirement for the applicant to obtain necessary environmental permits to construct and operate the solid waste facility in accordance with local and state regulations.

4. In the event a requested amendment is deemed to not be in keeping with the strategy outlined in the RSWMP or Solid Waste Planning Regulations, HRPDC will so advise the VDEQ, and the applicant.

## 11.3 GUIDANCE FOR DEMONSTRATING NEED OF A NEW OR EXPANDED SOLID WASTE MANAGEMENT FACILITY

Each application requesting amendment to the RSWMP to include a new facility not detailed in the Plan shall be accompanied by a demonstration of need for the facility in the planning region, which shall be of the form and content as the HRPDC may prescribe. It is the applicant's responsibility to provide reasonable and detailed information sufficient for this determination. Sources of data and information used to demonstrate need shall be cited.

A. The demonstration of need shall be specific as to the types of waste and/or recyclable materials to be managed and shall include, but not be limited to:

1. Documentation of the available capacity at existing facilities in the planning region to be served by the facility;

2. Documentation of the current volume of waste/recyclables generated in the region to be served by the facility and the volume of waste/recyclables reasonably expected to be generated in the area to be served over the next 20 years;

3. A description of additional factors, such as physical limitations on the transportation of materials or the existence of additional capacity outside the region to be served which may satisfied the projected need.

B. The following factors will be considered in evaluating the need for the proposed facility:

1. An approximate service area for the proposed facility which takes into account the economics of collection, processing, transportation, treatment, storage and/or disposal;

2. The quantity of waste/recyclables generated within the planning area suitable for treatment, processing, storage and/or disposal at the proposed facility;

3. The design capacity of existing facilities located within the planning area;

4. The extent to which the proposed facility is needed to replace other facilities, if the need for a proposed facility cannot be established under the above paragraphs.

C. If it is determined that a proposed facility is inconsistent with or contradictory to the above paragraphs or otherwise set forth in the RSWMP, the application to amend the RSWMP will be denied.

# Appendix A: Record of Public Hearings on Amendments to the

# Regional Solid Waste Management Plan for Southeastern Virginia:

# 2023 Major Amendment

**RSWMP Appendix on Public Hearings**

1. **Introduction:** Public hearings were held in June, July, and August of 2023 in each of the Southeastern Public Service Authority (SPSA) member localities for two major amendments to the Regional Solid Waste Management Plan (RSWMP). The two major amendments are:

    1. Movement down the waste disposal hierarchy from incineration to disposal: The shift from burning much of the regional solid waste for energy to landfilling that waste is considered by DEQ to be a major plan amendment.

    2. Expansion of the capacity of the SPSA Regional Landfill in Suffolk, VA (Solid Waste Permit No. 417): The amended RSWMP calls for the addition of 16 million cubic yards of capacity. The current capacity is 38.2 million cubic yards, and the requested total future capacity is 54.2 million cubic yards.

2. **Schedule overview:** The locality, date, time, and location of the public hearings are shown in the following table:

| Locality | Date | Time | Location |
|---|---|---|---|
| Virginia Beach | 28-Jun | 6:00 - 7:00 | Central Library, 4100 Virginia Beach Boulevard; Virginia Beach, VA |
| Chesapeake | 6-Jul | 1:00 - 2:00 | Regional Board Room, 723 Woodlake Dr., Chesapaeke, VA 23320 |
| Franklin | 12-Jul | 1:00 - 2:00 | Franklin Library, 280 N. College Drive Franklin, VA 23851 |
| Isle of Wight | 21-Jul | 1:00 - 2:00 | Smithfield branch of Blackwater Library, 255 James Street, Smithfield, VA 23430 |
| Norfolk | 26-Jul | 2:00 - 3:00 | Richard Tucker Memorial Library, 2350 Berkley Ave Ext, Norfolk, VA |
| Portsmouth | 2-Aug | 1:00 -2:00 | Churchland Branch of Portsmouth Library, 4934 High Street West Portsmouth, VA 23703 |
| Southampton | 9-Aug | 1:00 -2:00 | Courtland Library, 22511 Main Street Courtland, VA 23837 |
| Suffolk | 14-Aug | 1:00 -2:00 | City Council Conference Room, 442 West Washington Street Suffolk, VA 23434 |

3. **Documentation of individual hearings:** The following documents are included for each hearing. (note that sign-in sheets are included only for those hearings with non-staff attendees.)
   - Virginia Beach
     - Agenda
     - Attendance and comment record
   - Chesapeake
     - Agenda
     - Attendance and comment record
   - Franklin
     - Agenda
     - Attendance and comment record
     - Sign in sheet
   - Isle of Wight
     - Agenda
     - Attendance and comment record
     - Sign in sheet
   - Norfolk
     - Agenda
     - Attendance and comment record
   - Portsmouth
     - Agenda
     - Attendance and comment record
   - Southampton
     - Agenda
     - Attendance and comment record
   - Suffolk
     - Agenda
     - Attendance and comment record

HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Virginia Beach Central Library, 4100 Virginia Beach Boulevard, Virginia Beach, VA 23452**
**June 28, 2023, 6:00 – 7:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Virginia Beach Central Library, 4100 Virginia Beach Boulevard, Virginia Beach, VA 23452**

**June 28, 2023, 6:00 – 7:00 PM**

**Staff:**

- HRPDC: Eric Walberg, Sara Kidd
- SPSA: Dennis Bagley, Tressa Preston, Henry Strickland

**SPSA Board**

- Tom Leahy

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Regional Board Room, 723 Woodlake Drive, Chesapeake, VA 23320**
**July 6, 2023, 1:00 – 2:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Regional Board Room, 723 Woodlake Drive, Chesapeake, VA 23320**

**July 6, 2023, 1:00 – 2:00 PM**

**Staff:**

- HRPDC: Eric Walberg, Cindy Mulkey
- SPSA: Dennis Bagley, Tressa Preston, Henry Strickland

**SPSA Board**

- Greg Martin

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Franklin Branch of Blackwater Library System, 280 N. College Drive, Franklin, VA**
**July 12, 2023, 1:00 – 2:30 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Franklin Branch of Blackwater Library System, 280 N. College Drive, Franklin, VA**

**July 12, 2023, 1:00 – 2:30 PM**

**Staff:**

- HRPDC: Eric Walberg
- SPSA: Dennis Bagley, Tressa Preston

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

Two representatives of Chesapeake IBC, LLC, Ray Crabbs and Max Johnson, attended the hearing. Chesapeake IBC is a startup company that plans to eventually build a facility in Chesapeake, VA that will produce biofuels and other related products from solid waste. Following a PowerPoint presentation on the pending amendments to the Regional Solid Waste Management Plan (RSWMP) by Eric Walberg, the gentlemen asked several questions about the waste management hierarchy and the role that Chesapeake IBC might play in the future of waste management in the region. Mr. Bagley responded that moving back up the waste management hierarchy is desirable and that if Chesapeake IBC is able to build a functional facility that operates in a cost-effective manner, they could play an important role in the future of waste management in the region. Mr. Bagley emphasized that the immediate goal for the RSWMP amendments is to ensure that the region maintains a functional solid waste management system.

JULY 12, 2023
FRANKLIN, VA

# Sign In Sheet

| Name | Locality | Email |
|---|---|---|
| Max Johns | Fredericksburg | maxjohnsjr@gmail.com |
| RAY CRABBE | FAIRFAX | RAY.CRABBS@CIBE-RENEWABLES.COM |
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HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Smithfield Branch of Blackwater Library System, 255 James Street, Smithfield, VA**
**July 21, 2023, 1:00 – 2:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

THE REGIONAL BUILDING • 723 WOODLAKE DRIVE • CHESAPEAKE, VIRGINIA 23320 • (757) 420-8300

**HRPDC/SPSA RSWMP Public Hearing Record**

**Smithfield Branch of Blackwater Library System, 255 James Street, Smithfield, VA**

**July 21, 2023, 1:00 – 2:00 PM**

**Staff:**

- HRPDC: Eric Walberg
- SPSA: Dennis Bagley, Tressa Preston

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

Two representatives of Recycling and Disposal Solutions (RDS), Jason Mathis and Joseph Benedetto, attended the meeting. RDS is a recycling company that has been operating in the Virginia area for nearly twenty years. RDS started in Portsmouth, Virginia in 2004 and since has added two additional Virginia facilities as well as a facility in Athens, Georgia. They primarily handle Single Stream and Source Separated Material and employ advanced sortation techniques to extract recyclable materials from the Solid Waste Stream. They then send this material to recyclers both domestically and internationally. Their Portsmouth facility (PBR 558) is currently undergoing expansion. A new 33,000 sq ft building has been constructed on the premises and they are in the process of increasing permitted tonnage from 300 tons a day to 1200 tons a day. They are expecting to put a new sort line within this new building and extract more recyclables and handle more of the region's material. Their DEQ permit expansion request is almost complete and is in final review with Jeff Greer.

SMITHFIELD

JULY 21, 2023

# Sign In Sheet

| Name | Locality | Email |
|---|---|---|
| Jason Mathis | Portsmouth | jmathis@rds-virginia.com |
| Joe Benedetto | Portsmouth | JoeBenedetto@RDS-Virginia.com |
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HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Richard Tucker Memorial Library, 2350 Berkley Ave. Ext., Norfolk, VA**
**July 26, 2023, 2:00 – 3:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Richard Tucker Memorial Library, 2350 Berkley Ave. Ext., Norfolk, VA**

**July 26, 2023, 2:00 – 3:00 PM**

**Staff:**

- HRPDC: Eric Walberg, Simone Elmore
- SPSA: Dennis Bagley, Tressa Preston

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Churchland Branch of Portsmouth Library, 4934 High Street, Portsmouth, VA**
**August 2, 2023, 1:00 – 2:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Churchland Branch of Portsmouth Library, 4934 High Street, Portsmouth, VA**

**August 2, 2023, 1:00 – 2:00 PM**

**Staff:**

- HRPDC: Eric Walberg
- SPSA: Tressa Preston, Henry Strickland

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

**Regional Solid Waste Management Plan Public Hearing Agenda**

**Courtland Library, 22511 Main Street, Courtland, VA 23837**
**August 9, 2023, 1:00 – 2:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**Courtland Library, 22511 Main Street, Courtland, VA 23837**

**August 9, 2023, 1:00 – 2:00 PM**

**Staff:**

- HRPDC: Eric Walberg
- SPSA: Tressa Preston

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

**Regional Solid Waste Management Plan Public Hearing Agenda**

**City Council Conference Room, 442 West Washington St., Suffolk, VA 23434**
**August 14, 2023, 1:00 – 2:00 PM**

- Introduction of HRPDC and SPSA Staff
- Regional Solid Waste Management Plan (RSWMP) Overview
- Agency Roles and Responsibilities
- Changes at the Waste to Energy Facility in Portsmouth
- Major Amendment One
- Major Amendment Two
- Expansion of the Regional Landfill in Suffolk
- Additional Sources of Information and Opportunities for Comment
- Public Hearing Schedule
- Question and Answer Session
- Adjourn

**HRPDC/SPSA RSWMP Public Hearing Record**

**City Council Conference Room, 442 West Washington St., Suffolk, VA 23434**

**August 14, 2023, 1:00 – 2:00 PM**

**Staff:**

- HRPDC: Eric Walberg, Greg Grootendorst
- SPSA: Tressa Preston, Dennis Bagley

The hearing was advertised in the Virginian Pilot and the New Journal and Guide, and the HRPDC website: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia

No members of the public attended the hearing.

4. **Presentation file:** The PowerPoint presentation file used for the hearings follows.

HAMPTON ROADS PDC PLANNING DISTRICT COMMISSION

Eric Walberg | June - August, 2023


# Regional Solid Waste Management Plan Amendments

# Regional Solid Waste Management Plan for Southeastern Virginia 2020 - 2025

Prepared on behalf of the:

**SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA**

This amended RSWMP is based on a plan originally prepared by:

SCS ENGINEERS
6330 North Center Drive
Building 13, Suite 100
Norfolk, VA
(757) 466-3361

Last Amended: August 2022

# Agency Roles

- Hampton Roads Planning District Commission (HRPDC):
  - regional solid waste planning agency
- Southeastern Public Service Authority (SPSA):
  - regional solid waste management agency

# SPSA Member Localities

CITY OF CHESAPEAKE

CITY OF FRANKLIN

ISLE OF WIGHT COUNTY

CITY OF NORFOLK

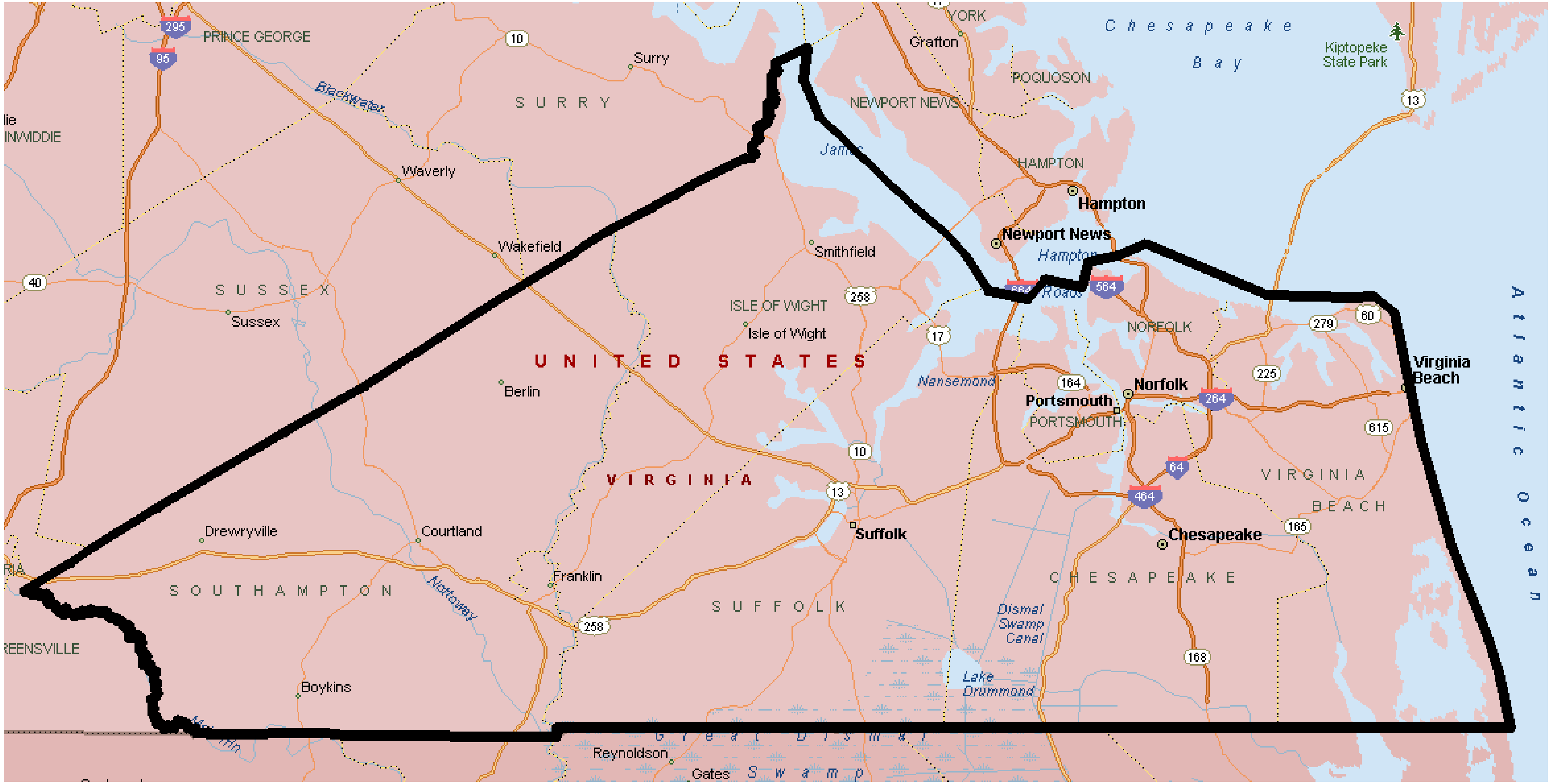
CITY OF PORTSMOUTH

SOUTHAMPTON COUNTY

CITY OF SUFFOLK

CITY OF VIRGINIA BEACH

# SPSA Service Area



# Changes at the Waste to Energy Facility in Portsmouth

- SPSA has utilized waste-to-energy (WTE) to reduce waste disposal since the 1980s reducing the waste stream on average by 70%.
- The current owner of the WTE facility, WIN Waste, supplies electricity to the grid and steam to Norfolk Naval Shipyard.

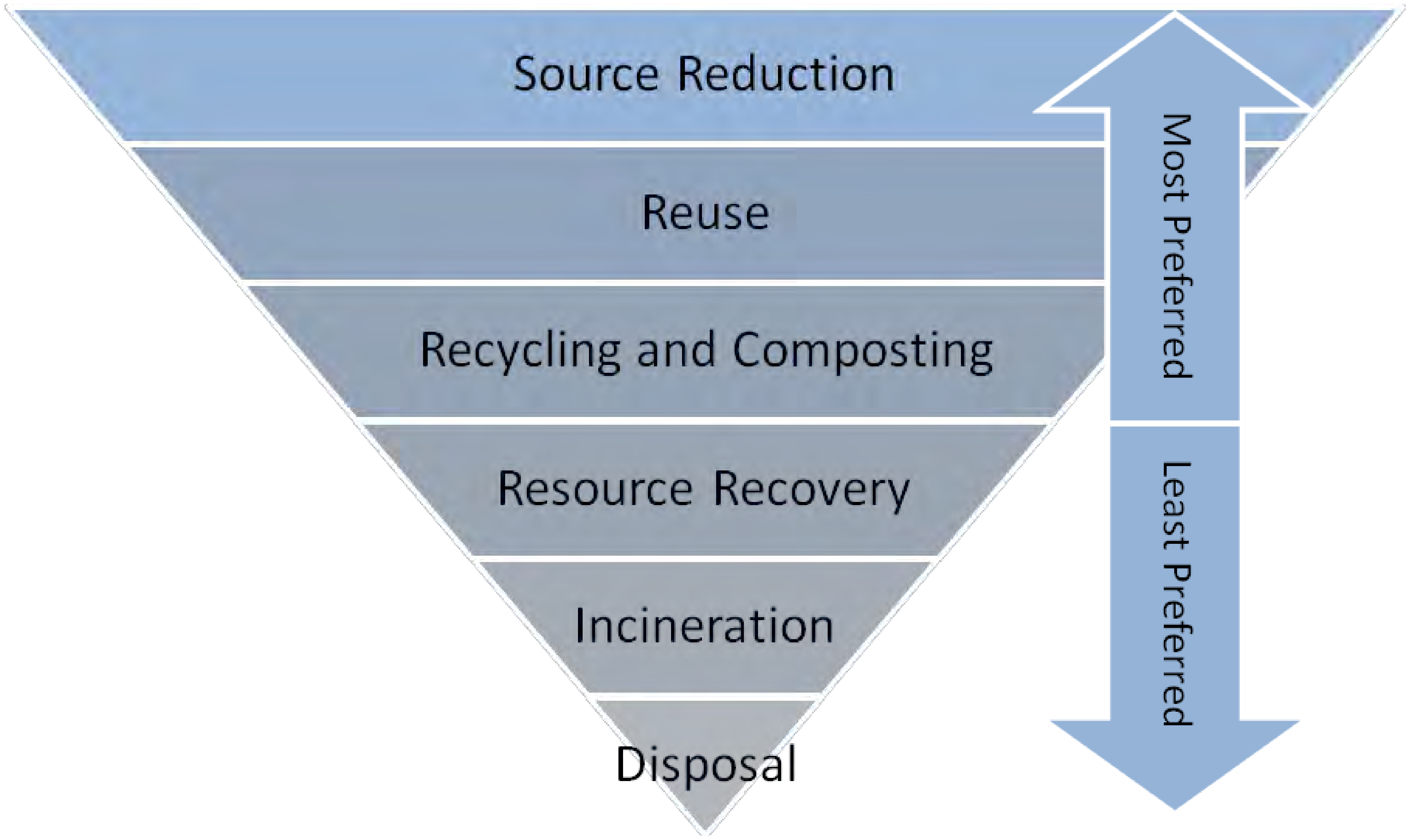
# Changes at the Waste to Energy Facility in Portsmouth

- A decision by the U.S. Navy to construct a combined heat and energy facility and end its contract with WIN Waste has resulted in a decision by WIN Waste to close the facility in July of 2024.
- The pending loss of the WTE facility has triggered two major plan amendments.

# Major Amendment One

- Movement down the waste disposal hierarchy from incineration to disposal: The shift from burning much of the regional solid waste for energy to landfilling that waste is considered by the Virginia Department of Environmental Quality (DEQ) to be a major plan amendment.

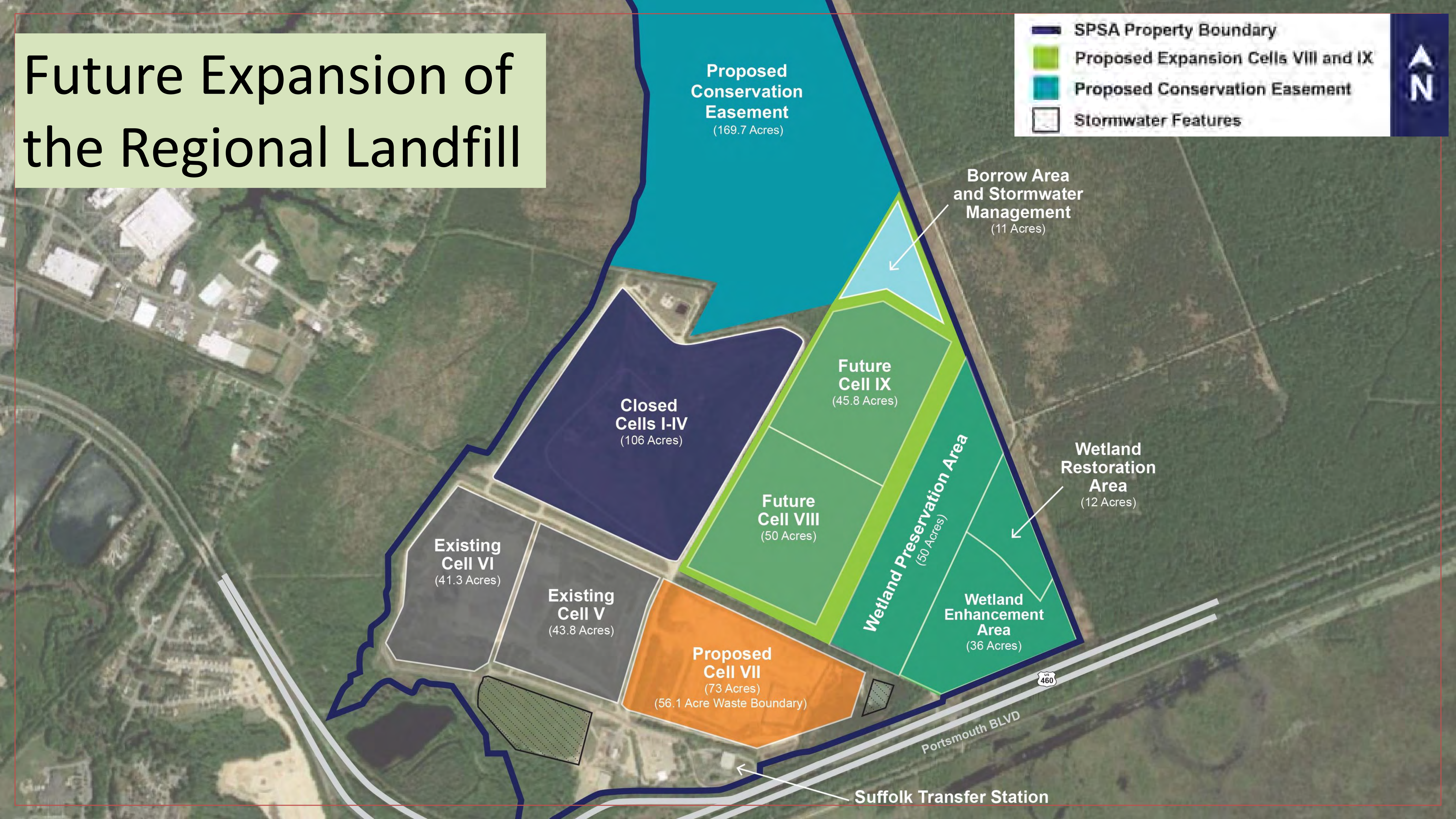
# Waste Management Hierarchy



# Major Amendment Two

- Expansion of the capacity of the SPSA Regional Landfill in Suffolk, VA (Solid Waste Permit No. 417): The amended RSWMP calls for the addition of 16 million cubic yards of capacity. The current capacity is 38.2 million cubic yards, and the requested total future capacity is 54.2 million cubic yards.

# Future Expansion of the Regional Landfill



# Need for Landfill Expansion

- Due to the increased volume of waste to be landfilled following the closure of the WTE:
  - Cells V and VI would reach capacity in April of 2027 at current post recycle waste volumes.
  - Cell VII, which has been permitted but not scheduled for construction until March of 2024, would reach capacity in June of 2037 at current post-recycling waste volumes.
  - Along with the currently permitted airspace at the RLF, the permitting of cells VIII and IX and would provide for the required 40 years of disposal capacity.

# Additional Information and Opportunities for Comment

- Link to track changes version of the plan: https://www.hrpdcva.gov/uploads/docs/2020-2025_RSWMP_for_Southeastern_Virginia-Major_Amendment.pdf
- Web page with schedule of public hearings and online comment form: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia/
- Scan the QR code on handout:

# Public Hearing Schedule

| Locality | Date | Time | Location |
|---|---|---|---|
| Virginia Beach | 28-Jun | 6:00 - 7:00 | Central Library, 4100 Virginia Beach Boulevard; Virginia Beach, VA |
| Chesapeake | 6-Jul | 1:00 - 2:00 | Regional Board Room, 723 Woodlake Dr., Chesapaeke, VA 23320 |
| Franklin | 12-Jul | 1:00 - 2:00 | Franklin Library, 280 N. College Drive Franklin, VA 23851 |
| Isle of Wight | 21-Jul | 1:00 - 2:00 | Smithfield branch of Blackwater Library, 255 James Street, Smithfield, VA 23430 |
| Norfolk | 26-Jul | 2:00 - 3:00 | Richard Tucker Memorial Library, 2350 Berkley Ave Ext, Norfolk, VA |
| Portsmouth | 2-Aug | 1:00 -2:00 | Churchland Branch of Portsmouth Library, 4934 High Street West Portsmouth, VA 23703 |
| Southampton | 9-Aug | 1:00 -2:00 | Courtland Library, 22511 Main Street Courtland, VA 23837 |
| Suffolk | 14-Aug | 1:00 -2:00 | City Council Conference Room, 442 West Washington Street Suffolk, VA 23434 |

# Discussion

# Thank you for coming out!

Contact Information:

- Eric Walberg
- Principal for Planning and Economics
- ewalberg@hrpdcva.gov
- 757 420-8300

5. **HRPDC Web Page on RSWMP Amendments:** Screen shots of the HRPDC web page on the amendments and the associated public comment form follow. No comments were received through the on-line comment form.

https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia/

# Regional Solid Waste Management Plan for Southeastern Virginia

The **Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides an overview and analysis of solid waste management in the Cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, the Counties of Isle of Wight and Southampton, and the Towns of Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield and Windsor. As required by the state regulations, the RSWMP presents background information on population and development patterns in southeastern Virginia, providing the context in which solid waste management occurs in the region. It also provides an inventory and projection of current solid waste management programs and current and future solid waste quantities generated in the region and the characteristics of those wastes. Finally, it discusses and presents available options for meeting the long-term solid waste management needs of the region in the form of a series of goals and objectives and an implementation plan.

A significant change in regional waste management will occur due to the pending closure of the WIN Waste (formerly known as Wheelabrator Portsmouth) facility at the end of June 2024. The WIN Waste facility currently burns the majority of the municipal solid waste generated in the region, producing electricity that is sold back to the grid and steam that is used to heat facilities at the Norfolk Naval Shipyard. Infrastructure changes on the part of the U.S. Navy will result in substitution of a new heat source for the steam from WIN Waste. That change has resulted in a decision by WIN Waste to close their facility. The loss of the WIN Waste facility will result in the need to increase the volume of waste disposed of at the SPSA Regional Landfill.

The Virginia Department of Environmental Quality (DEQ) requires that public hearings be held for major amendments to the RSWMP. The 2020-2025 RSWMP includes two major amendments that are triggered by the closure of WIN Waste;

1. ***Movement down the waste disposal hierarchy from incineration to disposal: The shift from burning much of the regional solid waste for energy to landfilling that waste is considered by DEQ to be a major plan amendment.***

2. ***Expansion of the capacity of the SPSA Regional Landfill in Suffolk, VA (Solid Waste Permit No. 417): The amended RSWMP calls for the addition of 16 million cubic yards of capacity. The current capacity is 38.2 million cubic yards, and the requested total future capacity is 54.2 million cubic yards. The landfill expansion is the second major plan amendment.***

The HRPDC and SPSA are hosting public hearings associated with major amendment 1 to be held in Virginia Beach, Chesapeake, Franklin, Isle of Wight, Norfolk, Portsmouth, and Southampton. A public hearing in Suffolk will include both amendments 1 and 2.

As of June 5, 2023, the date, time and locations for the first five meetings have been established. Meetings in the other localities will be announced at a later date.

| | |
|---|---|
| **Virginia Beach** | |
| June 28, 2023<br>6:00 PM | Virginia Beach Central Library<br>100 Virginia Beach Boulevard Virginia Beach, VA 23452 |
| **Chesapeake** | |
| July 6, 2023<br>1:00 PM | The Regional Building<br>723 Woodlake Drive Chesapeake, VA 23320 |
| **Franklin** | |
| July 12, 2023<br>1:00 PM | Ruth Camp Campbell Memorial Library<br>280 N College Drive Franklin, VA 23851 |
| **Isle of Wight** | |
| July 21, 2023<br>1:00 PM | Smithfield branch of Blackwater Library<br>255 James Street, Smithfield, VA 23430 |
| **Norfolk** | |
| July 26, 2023<br>2:00 PM | Richard Tucker Memorial Library<br>2350 Berkley Ave Ext, Norfolk, VA 23324 |
| **Portsmouth** | |
| August 2, 2023<br>1:00 pm | Churchland Branch of Portsmouth Library<br>4934 High Street West, Portsmouth, VA 23703 |
| **Southampton County** | |
| August 9, 2023<br>1:00 pm | Courtland Library<br>22511 Main Street, Courtland, VA 23837 |
| **Suffolk** | |
| August 14, 2023<br>1:00 pm | City Council Conference Room<br>442 West Washington Street, Suffolk, VA 23434 |

The track changes version of the 2020-2025 RSWMP linked below includes all the modifications associated with the major amendments and multiple additional edits to reflect changing demographics and statistics on regional waste management. The companion document is a bulleted synopsis of all the plan edits.

### 2020-2025 RSWMP for Southeastern Virginia -Major Amendment

### Proposed Changes to RSWMP

## Public Comment Opportunities

Public comment opportunities include participation in the public hearings and/or **completion of the Constant Contact online survey** (link opens a Constant Contact survey).

# Regional Solid Waste Plan Comments

* Name

0/50

* Locality of Residence

0/50

Email (for reply if necessary, not required)

0/250

* Comments on Major Amendment One: Movement down the waste disposal hierarchy from incineration to disposal. (NA if no comment)

0/500

* Comments on Major Amendment Two: Expansion of the landfill capacity at the SPSA Regional Landfill in Suffolk: To accommodate the diversion of waste from WIN Waste to the SPSA Regional Landfill in Suffolk will require an expansion of the capacity of the facility. (NA if no comment)

0/500

Submit Survey

6. **Record of advertisements:** Invoices and proofs are included for both newspapers used for advertising the public hearings.

    - Virginian Pilot
    - New Journal and Guide

Order ID: 7452286

* Agency Commission not included

**GROSS PRICE * :** **$763.85**

**PACKAGE NAME: VP_Legal**

Order ID: 7452286

Printed: 6/16/2023 10:18:19 AM



* Agency Commission not included

**GROSS PRICE * :** **$763.85**

**PACKAGE NAME: VP_Legal**

**Product(s):** Virginian Pilot, classified.virginianpilot.com, virginianpilot_VApublicnotices.com
**AdSize(s):** 2 Col x 1"
**Run Date(s):** Tuesday, June 20, 2023
**Zone:** Full Run
**Color Spec.** B/W

## Preview

**The Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides an overview and analysis of solid waste management in the Cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, the Counties of Isle of Wight and Southampton. The Virginia Department of Environmental Quality (DEQ) requires that public hearings be held for major amendments to the RSWMP. The 2022 version of the RSWMP includes two major amendments that are triggered by the pending closure of the WIN Waste facility in Portsmouth.

1) Movement down the waste disposal hierarchy from incineration to disposal: The shift from burning much of the regional solid waste for energy at the WIN Waste facility to landfilling that waste is considered by DEQ to be a major plan amendment.

2) Expansion of the capacity of the SPSA Regional Landfill in Suffolk, VA (Solid Waste Permit No. 417): The amended RSWMP calls for the addition of 16 million cubic yards of capacity. The current capacity is 38.2 million cubic yards, and the requested total future capacity is 54.2 million cubic yards. The landfill expansion is the second major plan amendment.

For more information about the plan, please visit the Hampton Roads Planning District Commission (HRPDC) website: **https://www.hrpdcva.gov/RSWMP**

The HRPDC and SPSA are hosting public hearings associated with major amendment 1 will be held in Virginia Beach, Chesapeake, Franklin, Isle of Wight, Norfolk, Portsmouth, and Southampton. A public hearing in Suffolk will include both amendments 1 and 2.

The date, time and locations for the first five meetings have been established. Meetings in the other localities will be announced at a later date.

| | | |
|---|---|---|
| | **Virginia Beach** | |
| June 28, 2023<br>6pm | Virginia Beach Central Library<br>100 Virginia Beach Boulevard Virginia Beach, VA 23452 | Main Auditorium |
| | **Chesapeake** | |
| July 6, 2023<br>1pm | The Regional Building<br>723 Woodlake Drive Chesapeake, VA 23320 | Regional Board Room |
| | **Franklin** | |
| July 12, 2023<br>1pm | Ruth Camp Campbell Memorial Library<br>280 N College Drive Franklin, VA 23851 | Conference Room |
| | **Isle of Wight** | |
| July 21, 2023<br>1pm | Smithfield Branch of Blackwater Library<br>255 James Street Smithfield, VA 23430 | Meeting Room |
| | **Norfolk** | |
| July 26, 2023<br>2pm | Richard Tucker Memorial Library<br>2350 Berkley Ave Ext, Norfolk, VA 23324 | Meeting Room |

7452286 6/20/23

Order ID: 7472380

* Agency Commission not included

**GROSS PRICE * :** **$886.84**

**PACKAGE NAME: VP_Legal**

Order ID: 7472380

* Agency Commission not included

**GROSS PRICE * :** **$886.84**

**PACKAGE NAME: VP_Legal**

**Product(s):** Virginian Pilot, classified.virginianpilot.com, virginianpilot_VApublicnotices.com

**AdSize(s):** 2 Col x 1"

**Run Date(s):** Thursday, July 27, 2023

**Zone:** Full Run

**Color Spec.** B/W

**Preview**

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| Portsmouth | |
|---|---|
| August 2, 2023<br>1pm | Churchland Branch of Portsmouth Library<br>4934 High Street West<br>Portsmouth, VA 23703 |
| **Southampton County** | |
| August 9, 2023<br>1pm | Courtland Library<br>22511 Main Street<br>Courtland, VA 23837 |
| **Suffolk** | |
| August 14, 2023<br>1pm | City Council Conference Room<br>442 West Washington Street<br>Suffolk, VA 23434 |

July 27, 2023 - 7472380

# Invoice

New Journal & Guide
P. O. Box 209
Norfolk, VA 23501
Office (757) 543-6531

| Date | Invoice # |
|---|---|
| 6/22/2023 | 060401-23 |

| Bill To |
|---|
| Attn: Joe Turner<br>HRPDC / HRPTO<br>723 Woodlake Dr.<br>Chesapeake, VA 23320 |

| P.O. No. | Terms | Project |
|---|---|---|
| | Net 20 | |

| Quantity | Description | Rate | Amount |
|---|---|---|---|
| | Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP) | 269.10 | 269.10 |
| | Issue 06/22/2023<br>pricing based on paid in full by 30 days of run date<br>Or A 2% Past Due Fee Will Apply | | |
| | Please INCLUDE the INVOICE # above on your check / credit cards are accepted | | |

SAVE THE DATE Oct. 21, 2023 NJG Impacting Lives Breakfast

**Total** $269.10


**NATIONAL** BLACK MUSIC MONTH 2023

# PHIL NELSON: "MR. QUIET STORM" BLACK MUSIC RADIO PERSONALITY

**By Rev. Dr. Glenda P. Murray Kelly, aka gparis**
Special to the
New Journal and Guide

In 1979, former President Jimmy Carter signed into proclamation that the month of June would be a national month of celebration for African-American Music. This year marks the 44th year of celebration. The Hampton Roads area has been blessed to have so many great artists.

This year for "Black Music Month" in the Hampton Roads area, we would like to spotlight the work and the achievement of Mr. Phil Nelson, who served the Hampton Roads area from 1984-2004, as a radio personality/announcer.

"I can't believe it's been a 40-year journey, yet it's been since I was 10 years of age about 50 plus years ago," said Mr. Nelson.

He is the owner and CEO of Nelson Media & Investments, LLC dba Mr. FM Productions. He attended Virginia State University, majoring in Mass Communications/English. He is a native son of Newport News, VA and at an early age he knew the desires of his heart would be in radio/television.

Phil Nelson is known and recognized as the original Mr. Quiet Storm, host of WOWI 103 Jamz, Norfolk, VA, and, former The Quiet Storm Host/ Norfolk, VA at Vibe 105.3 when management shifted the show upon a merger. He has received numerous awards and recognitions.


Photo: Courtesy
Hard at work

In April 2023, The Presidential Volunteer Lifetime Achievement Award was bestowed upon him in Atlantic City, NJ during the celebration of the New Jersey Walk of Fame hosted by the National R & B Music Society.

After leaving the Hampton Roads area, he became the Announcer/Personality for Howard University's Overnights-Quiet Storm at WHUR 96.3 Washington D.C. and former On-Air Personality/Radio One Washington DC at PRAISE 104.1 FM. He has hosted Stellar Award-winning radio stations.

"It's has truly been a journey for me in the industry and I am so grateful for the opportunity that the Hampton Roads area offered me. I'm currently writing my book about my experience in the business, and on the airwaves in the Hampton Roads area and Washington, D.C."

What better way to celebrate a legend than to bring him back home? He was able to be among his peers on Sunday, May 21, 2023, at the Chesapeake Conference Center. The Virginia Aires celebrated their 42nd Anniversary in music with performances by the Virginia Aires, Dr. Shirley Caesar Williams, the Gospel Sensations. Peggy Britt and a few other guest artists.

Special guests in attendance were Chesapeake Councilwoman, Ella Ward, Virginia State Senator Louise L. Lucas, radio announcers, promoters, managers, engineers, musicians, stage managers. productions managers, coordinators, legislators, and fans who played a major role in the success.


Photo: Courtesy
*(L-R)* Rev. Dr. Glenda P. Murray Kelly, Phil Nelson, and Doc Christian during recent event.



# FILM DOCUMENTS CIVIL RIGHTS ACTIVISM OF FIVE BLACK ELDERS

**By Rosaland Tyler**
Associate Editor
New Journal and Guide

Two Philadelphia journalists recently launched The Black Elders Project, which features five Black Baby Boomers who unflinchingly reflect on the 1960s Civil Rights Movement, segregation and slavery.

Five Black men and women appear on camera and describe many of the hardships that they overcame in North Philadelphia, in the new documentary produced by Marilyn Kai Jewett, age 69, a 1975 Howard University journalism graduate, and journalist Jacqueline Wiggins, age 73, who studied journalism at Penn State

"Our people and others need to hear these stories, [they] need to hear the stories of some of these hardships, if you will, but also the resilience," said Wiggins, who has lived the majority of her life in North Philly. "If we can have those honest stories, then it's almost like looking at literature."

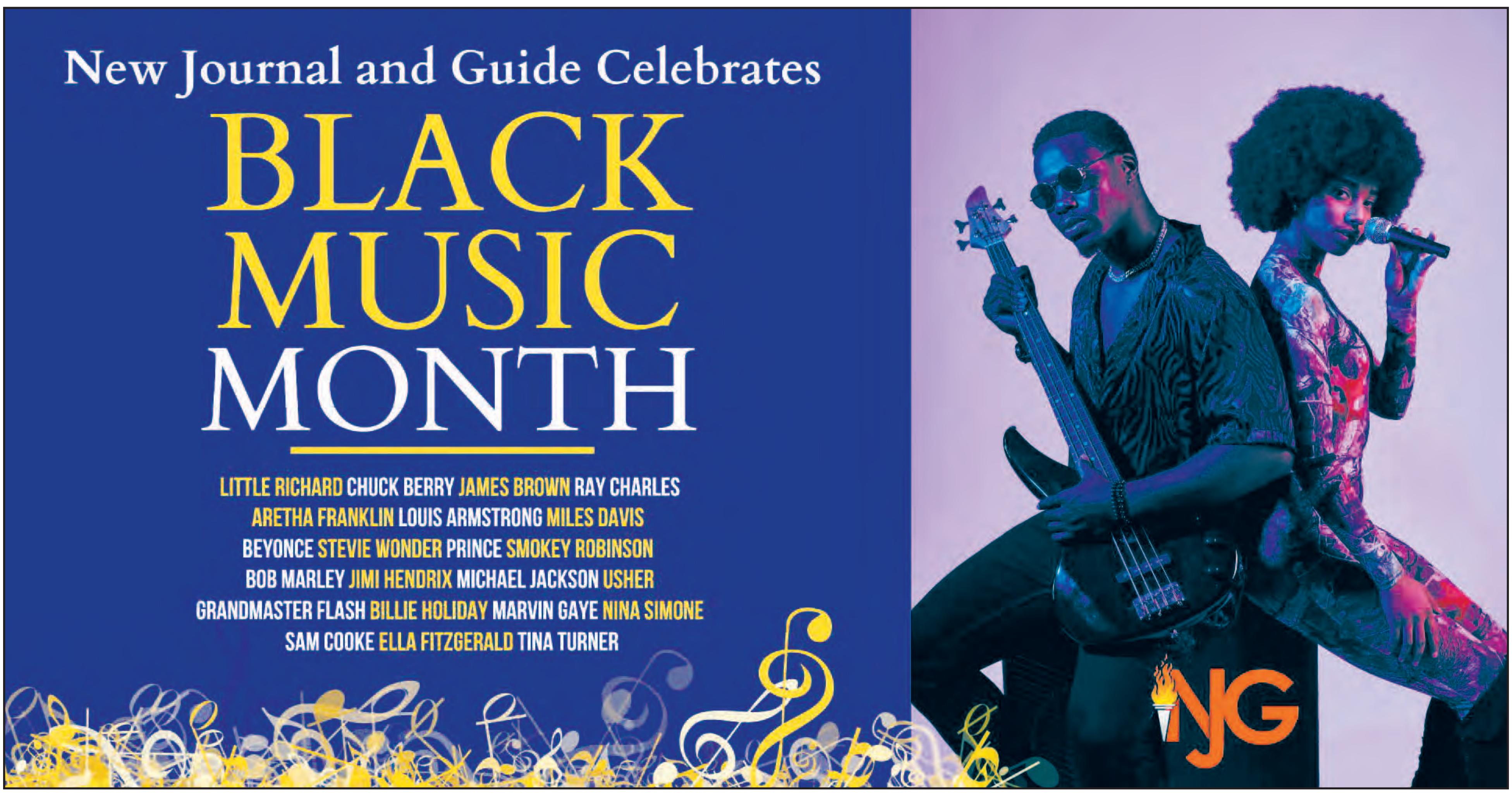
Jewett, a 1975 Howard University graduate, who studied under noted Black journalist Tony Brown said, "The history of our people [is] not gonna be in the books." As dean, Brown urged students to educate, agitate, and communicate," she said.

"We [are] in a country that told us everything about us was no good," she added. "We didn't see anything of ourselves [on TV], anything positive. And even in the media, it's still sort of like that," Jewett said, referring to the increasing number of GOP efforts that aim to ban history books and literature on racial and social inequalities.

"We have to get their history while they're still here," Jewett said. "Because people are leaving and when they leave, if nobody's writing that history down, the history is gone."

The new documentary cites narratives from Curtis Brown, an artist and educator who grew up in Francisville in the 1940s and '50s, and Edna Devlin, an East Poplar community activist, who is still fighting for her neighbors in her 70s. Another subject in the documentary, Delores Carter Berry was born on the 1900 block of North 24th Street in the early 1930s, to the Fullers, a well-known family in the neighborhood, at a time when elders would ask, "Who's your people and who that child belong to?"

The Black Elders project contains "things that would make you smile," the two journalists said.



# Invoice

New Journal & Guide
P. O. Box 209
Norfolk, VA 23501
Office (757) 543-6531

| Date | Invoice # |
|---|---|
| 7/27/2023 | 70403-23 |

| Bill To |
|---|
| ATTN: D.Latimore, MS<br>116 Virginia Beach Higher Edu Ctr<br>1881 University Drive<br>Virgina Beach,VA 23453<br>email:both |

| P.O. No. | Terms | Project |
|---|---|---|
| | Net 20 | |

| Quantity | Description | Rate | Amount |
|---|---|---|---|
| | The Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP) | 257.40 | 257.40 |
| | Please INCLUDE the INVOICE # above on your check / credit cards are accepted | | |

SAVE THE DATE Oct. 21, 2023 NJG Impacting Lives Breakfast

**Total** $257.40

# SENIORS: What You Should Know About Home Health

By Andrew Agwunobi, M.D.

**Seniors should speak with their health care provider to understand if home health is right for them.**

One of the major lessons learned during the pandemic is that hospitals and medical facilities are not always the safest places to recover, especially for seniors and those living with chronic conditions.

Compounding this issue is that 85 percent of seniors in the U.S. live with one or more chronic conditions. With the state of Virginia home to over 1.4 million seniors, this is a very real, local issue.

The home is often the most comfortable, convenient and safe place to recover from an illness, injury, surgery or hospitalization. However, seniors in Virginia may not be aware that this option is available to them.

Many also don't know what Home health offers. Home health can include skilled nursing care, physical, occupational, and speech therapy, as well as advanced specialty care for diabetes, complex wounds, heart failure and balance and mobility conditions.

If you have Original Medicare or a Medicare Advantage health plan, home health benefits are often covered at no cost – although it's always good to check with your insurance provider.

There are many advantages to receiving care in the home. In addition to safety and convenience, it is usually less expensive and just as effective as the care provided in a hospital or skilled nursing facility. It can also offer a more holistic approach to care – addressing both physical and mental well-being as well as assessing various social health needs.

### The Whole-Person Approach to Home Health

Because home health clinicians, for example, nurses and therapists, bring care to patient homes, they're able to spend more time with patients and get to know all the factors that are impacting their health. This allows clinicians to engage and collaborate with patients and their family – building relationships and friendships, understanding their goals and challenges, and providing the tools they need to regain their independence.

One of the benefits of being cared for in the home is that home health clinicians can identify challenges a patient may be experiencing as well as potential safety risks that could impede recovery or cause further harm.

For instance, having a healthy diet and proper nutrition is vital to a person's ability to recover from an injury or illness and is also critical for the health of patients with conditions such as diabetes, high blood pressure and heart failure. Home health clinicians are specially trained to educate patients and their caregivers on a personalized nutrition plan. Prior to developing that plan, they'll assess whether the patient is experiencing food insecurity (or other social health challenges), and if so, help secure the appropriate food sources and assistance programs.

Similarly, home health clinicians can identify home safety issues that could cause trips and falls, such as slippery areas and throw rugs, lack of stair handrails or difficult-to-reach household items. For example CenterWell Home Health's Safe Strides® program employs a multidisciplinary care team to get to the root of balance issues and reduce falls risk by assessing patients' inner ear, visual, sensory and musculoskeletal functions, as well as the safety of their home environment.

Seniors should speak with their health care provider to understand if home health is right for them. Whether they're being discharged from a hospital or rehabilitation facility, or have an ongoing medical condition that has become difficult to manage – the home may be the best place to recover so they can get back to doing the things they love.

*Andrew Agwunobi, M.D., is CEO of CenterWell Home Health.*

# Unused State Funds Would Help Va.'s Teacher Shortfall

By Leonard E. Colvin
Chief Reporter
New Journal and Guide

Is Virginia Governor Glenn Youngkin's administration seeking to abolish a state grant program designed to help increase the number of Black teachers in the state's public K-12 classrooms?

Recently the Virginia Education Association (VEA) and educators who support the program say they fear the Youngkin administration is working to dismantle it and stop any dissemination of the grants intended to help provisionally licensed teachers of color receive their full teaching license.

Much of the funding from the state legislature has not been used, causing education advocates to question if Youngkin may have ordered that anything related to the grant be scrubbed, including the application link from the Virginia Department of Education (VDOE) website.

Without public notice, the state education department stopped announcing and disseminating the grants last year for fiscal year 2023. Although the legislature had approved the funding, unused funds, essentially, sit in the state's coffers.

Education advocates said they noted that the department failed to announce a continuation of the program after the Republican governor took over VDOE two years ago.

Along with the challenge of the shortfall of teachers overall, public-school divisions have also been seeking to increase the number of African-American teachers in their classrooms.

During the past three school years, according to VDOE figures, the number of Black K-12 teachers has dropped from roughly 15 to 10 percent.

About 82 percent of Virginia's teachers were white during the same period, according to the most recent federal data.

This trend reflects the percentage of Black teachers nationally.

At the same time, Virginia's K-12 public student population has grown more diverse.

Last year, fewer than half of Virginia's 1.3 million students were white, according to the VDOE.

Black students made up 22 percent of the state's enrollment, followed by 19 percent Hispanic students and 8 percent Asian students.

Leslie T. Fenwick, the author of the award-winning and best-selling book "Jim Crow's Pink Slip," is a finalist for the position of U.S. Education Secretary in the Biden administration. She is dean emerita and professor of education policy at Howard University.

The book details how Black teachers were pushed out of the classroom during the desegregation of the nation's public schools in the 1950s and 60s, after the Supreme Court's Brown Decision declaring segregated schools illegal.

Before Brown, in 17 southern states that sanctioned segregated public schools, 35-50 percent of teachers were Black.

Today, no state approaches these percentages. Less than 7 percent of the nation's 3.2 million teachers, 11 percent of our 93,000 principals, and less than 3 percent of nearly 14,000 superintendents are Black, even though Black educators are the nation's most academically credentialed.

In a Richmond Times Dispatch Article last week, Jeremy Raley, the VDOEs chief of staff, said: "The VDOE is currently evaluating this grant program."

He said, "The Department will communicate more information as it becomes available."

But supporters of the grant program are not buying the administration's explanation.

"Many of us want a strong teaching force in Virginia with a diversity of backgrounds and perspectives," said Dr. James J. Fedderman, President of the Virginia Education Association (VEA).

"Unfortunately, the Governor's arbitrary decision to remove this grant opportunity to bring more teachers of color into the field will limit these efforts. While the Governor may not value diversity in the Virginia teaching core, he absolutely should not stand in the way of state lawmakers that collectively decided they do."

...see Teachers, page 8A

## Williams

Continued from page 4A

We were on a roll. Then along came Florida's Governor Ron DeSantis who decided he could out Trump Donald Trump! He banned books by and about many of our heroes and sheroes. He picked a fight with Disney World! He totally disrespects women and Black people. He claims it's okay for him to force people across the country to believe that we were somehow blessed to be enslaved because of the great things slavery did for us! He's tried to distort the brutality of slavery for our people and how slavery still has scars on us.

All of us need to keep our hands on the plow and figure out our response together!

*Dr. E. Faye Williams, President of The Dick Gregory Society – www.thedickgregorysociety.org*

## Jealous

Continued from page 4A

Transportation and electricity use make up nearly 60 percent of Maryland's greenhouse gas emissions, which makes this federal support vital and targeted.

The real test is to make sure the benefits of clean energy and the good jobs that will come with it are shared widely and fairly across Maryland and every state.

"The climate crisis impacts everybody, but it does not impact all communities equally," the vice president noted. "Poor communities, rural communities, Native communities and communities of color are often the hardest hit and the least able to recover."

We see this in places like West Baltimore where I spent summers with my grandparents and where the childhood asthma rate is five times higher.

We need more contractors to do those energy upgrades, and there are federal dollars to provide that, for example. We must ensure that people from the communities most in need have a place in that training, as they're the ones most likely to serve their neighbors.

"When the President and I invest in climate, we intend to invest in jobs, invest in families, and invest in America," Harris told the crowd at Coppin State University.

In the 1920s, National Geographic called Maryland "America in Miniature" for its terrain and waters. Let's hope that nickname takes on a broader meaning as my state becomes the clean energy model it aspires to be and does it in a way that allows all residents feel the benefit. It's then we'll know that this Earth shot led to that "one giant leap for mankind" we've heard about.

*Ben Jealous is executive director of the Sierra Club, the nation's largest and most influential grassroots environmental organization. He is a professor of practice at the University of Pennsylvania and author of "Never Forget Our People Were Always Free," published in January.*

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| **Suffolk** | |
| August 14, 2023<br>1pm | City Council Conference Room<br>442 West Washington Street<br>Suffolk, VA 23434 |

## 7. Handout for Public Hearings


# Regional Solid Waste Management Plan Amendments

The pending closure of the waste to energy facility in Portsmouth has triggered two major plan amendments:

1. Movement down the waste disposal hierarchy from incineration to disposal,

2. Expansion of the capacity of the SPSA Regional Landfill in Suffolk, VA (Solid Waste Permit No. 417): The amended RSWMP calls for the addition of 16 million cubic yards of capacity. The current capacity is 38.2 million cubic yards, and the requested total future capacity is 54.2 million cubic yards.

**Additional Information and Opportunities for Comment**

- Link to track changes version of the plan: https://www.hrpdcva.gov/uploads/docs/2020-2025_RSWMP_for_Southeastern_Virginia-Major_Amendment.pdf

- Web page with schedule of public hearings and online comment form: https://www.hrpdcva.gov/departments/planning/regional-solid-waste-management-plan-for-southeastern-virginia/

Scan the QR code to access the plan information page:

# Appendix B: Record of Adoption of Amendments to the Regional Solid Waste Management Plan for Southeastern Virginia and DEQ Acceptance Letter: 2023 Major Amendment

# HRPDC October 19, 2023, Meeting Minutes:

# Record of vote approving the plan on Page 5

**Hampton Roads Planning District Commission**
**Minutes of October 19, 2023 Meeting**

The October 19, 2023 meeting of the Hampton Roads Planning District Commission (HRPDC) was called to order by the Chair at 12:34 p.m. in the Regional Board Room located at 723 Woodlake Drive in Chesapeake, Virginia with the following in attendance:

**Commissioners in Attendance:**
Douglas Pons, Chair (WM)
Shannon Glover, Vice-Chair (PO)
Randy Keaton, Treasurer (IW)
Amanda Newins (CH)
Christopher Price (CH)
Debbie Ritter (CH)
Brian Solis (CH)
Ella Ward (CH)
Gregory McLemore (FR)
Carol Steele (GL)
Steven Brown (HA)
Mary Bunting (HA)
Phillip Jones (NN)
Courtney Doyle (NO)
Andria McClellan (NO)
Patrick Roberts (NO)
Gordon Helsel (PQ)
Randy Wheeler (PQ)
Mimi Terry (PO)
Brian Thrower (SH)
Michael Stallings (SM)
Leroy Bennett (SU)
Albert Moor (SU)
Patrick Duhaney (VB)*
Robert Dyer (VB)
Barbara Henley (VB)
Amelia Ross-Hammond (VB)
Joash Schulman (VB)
Sabrina Wooten (VB)*

**Commissioners Absent:**
Amanda Jarratt (FR)
Phillip Bazzani (GL)
Donnie Tuck (HA)
Joel Acree (IW)
Michael Hipple (JC)
Scott Stevens (JC)
Cleon Long (NN)
Kenneth Alexander (NO)
Danica Royster (NO)
William Gillette (SH)
Steven Bowman (SM)
Robert Elliott (SY)
Melissa Rollins (SY)
Chris Taylor (VB)
Andrew Trivette (WM)
Neil Morgan (YK)
Sheila Noll (YK)

**Executive Director:**
Robert A. Crum, Jr., Secretary

**Other Participants:**
Alan Archer (NN)
Mark Geduldig-Yatrofsky (CAC)

**Indicates late arrival or early departure*

**Others Recorded Attending:**
David Westcott, Jr. (Chesapeake); Brian DeProfio (Hampton); Donald Campbell (Mode5); Angela Hopkins (Newport News); Jessica Dennis (Norfolk); Michael Garber (PBMares); Sherri Neil (Portsmouth); Kate Baker and Ed Reed (Two Capitols Consulting); Andrew Damon and Mabinty Scott (Virginia Beach); Diane Kaufman (U.S. Senator Tim Kaine's Office); Drew Lumpkin (U.S. Senator Mark Warner's Office); Queen Crittendon and Carolyn Tanner (VDOT); and Kelli Arledge, Shernita Bethea, Robert Cofield, Katie Cullipher, Rebekah Eastep, Simone Elmore, Greg Grootendorst, Whitney Katchmark, Sara Kidd, Matt Klepeisz, Andrew Margason, Ben McFarlane, Quan McLaurin, Cynthia Mulkey, Keith Nichols, Pavithra Parthasarathi, Tiffany Smith, Jill Sunderland, Jaquil Tatum, Joseph Turner, Quanda Tynes, Christopher Vaigneur, Eric Walberg, and Sheila Wilson (HRPDC/HRTPO Staff).

**Approval/Modification of Agenda**

Chair Doug Pons called for a motion to approve the October 19, 2023 agenda as presented.

**Motion:** Commissioner Gordon Helsel Moved to approve the agenda as presented; seconded by Commissioner Shannon Glover. The Motion Carried.

**Public Comments**

Mr. Robert Crum, HRPDC Executive Director, stated that there were no submitted public comments. He invited members of the public to address the Commission. There were no in-person requests to comment.

**Executive Director's Report**

Mr. Crum referenced his monthly report in the agenda packet and mentioned a few items of interest for Commission member information.

The Hampton Roads Sanitation District (HRSD) is offering a tour of the Sustainable Water Initiative for Tomorrow (SWIFT) Research Center for Commission members on October 27, 2023. He asked the Commission members to indicate their availability on a sign-in sheet that he circulated.

The HRPDC Housing Team, consisting of Ms. Shernita Bethea, HRPDC Housing & Human Services Administrator, and Ms. Deidre Garrett, HRPDC Housing Program Specialist, was recognized by the Hampton Roads Housing Consortium (HRHC) and received the Across the Region Service Award for the regional housing down payment and closing cost assistance program. Mr. Crum thanked Ms. Bethea and Ms. Garrett for their incredible work.

Mr. Crum informed the Commission members about the following HRPDC staff updates:

- Ms. Garrett will be joining the City of Suffolk in the role of Community Development Grant Administrator. He thanked Ms. Garrett for her hard work and contributions to the HRPDC.

- Ms. Quanda Tynes joined the HRPDC to fill the open position of Staff Accountant.

Mr. Crum invited Ms. Rebekah Eastep, HRPDC Senior Environmental Education Planner, to provide an update on an environmental education effort called GreenBeats.

Ms. Eastep stated that many localities received special grant funding for styrofoam outreach. This allowed the regional askHRgreen.org program to collaborate with WHRO public media on a GreenBeats production called "Foam Free." She explained that GreenBeats is a WHRO-produced series of animated shorts that educates children on environmental issues through art and entertainment. Ms. Eastep introduced the Foam Free video to the Commission.

The video is available on YouTube using the following link: https://www.youtube.com/watch?v=8yWc9GTmixc.

Mr. Crum shared the devastating news of Mr. Dmitry Rekther's, HRPDC Information Technology Manager, untimely passing and asked the Commission members to join him in a moment of silence.

**Community Advisory Committee Report**

Mr. Mark Geduldig-Yatrofsky reported that the Community Advisory Committee (CAC) met on August 10, 2023 and October 12, 2023. The focus of the meetings was to provide onboarding for the new committee members and to remind existing members of the purpose of the CAC. He stated that the committee members benefitted from a tour of the Regional Building at their last meeting and that the HRPDC staff is doing an impressive job.

**Consent Agenda**

The Consent Agenda included the following items for consideration and approval:

- Meeting Minutes – July 20, 2023 Commission Meeting
- Treasurer's Report – August 2023
- HRPDC Homeland Security Grant Acceptance and Contracts
- Personnel Policies

**Motion:** Commissioner Robert Dyer Moved to approve the Consent Agenda as presented; seconded by Commissioner Amelia Ross-Hammond. The Motion Carried.

**Fiscal Year 2023 Audited Financial Statements**

Mr. Crum introduced Mr. Michael Garber, PBMares Partner, to brief the Commission on the FY 2023 Audited Financial Statements. Mr. Crum added that the PBMares representative presented the detailed results to the Personnel & Budget (P&B) Committee that morning.

Mr. Garber presented the highlights of the FY 2023 Financial Audit and reported that the HRPDC/HRTPO received a clean, unmodified opinion on the financial statements. The reports regarding compliance, internal control, and the single audit on federal dollars were also clean without findings or recommendations. He stated that PBMares had no issues performing the audit, and there were no journal entries or past adjustments. He concluded his remarks by commending Ms. Sheila Wilson, HRPDC/HRTPO Chief Financial Officer, and her team for their preparation efforts for a clean audit with no findings.

The audited financial statements, supplemental management letters, and the auditor's opinion report, based on census data reported to the Virginia Retirement System (VRS), are available on both websites using the following link: https://www.hrpdcva.gov/uploads/docs/FY23%20Audit%20Financial%20Statements%20-%20Combined.pdf.

Chair Pons reported that the P&B Committee had no questions or concerns and recommended approval of the financial statements. He asked the Commission members if there were any questions or comments. There were none.

**Motion:** Commissioner Randy Keaton Moved to approve the FY 2023 Audited Financial Statements as presented; seconded by Commissioner Glover. The Motion Carried.

Mr. Crum thanked Mr. Garber for his comments and recognized Ms. Wilson and her team for doing a great job once again.

**Appointment of Nominating Committee**

Chair Pons appointed the following Commissioners to serve on the HRPDC Nominating Committee and provide a report to the Commission at its January meeting:

Ella Ward, Chesapeake
Gregory McLemore, Franklin
Phillip Bazzani, Gloucester
Donnie Tuck, Hampton
Joel Acree, Isle of Wight
Michael Hipple, James City County
Phillip Jones, Newport News
Andria McClellan, Norfolk
Gordon Helsel, Poquoson
Shannon Glover, Portsmouth
Steven Bowman, Smithfield
William Gillette, Southampton
Leroy Bennett, Suffolk
Robert Elliot, Surry
Robert Dyer, Virginia Beach
Doug Pons, Williamsburg
Sheila Noll, York

**Regional Solid Waste Management Plan Amendment**

Mr. Eric Walberg, HRPDC Principal Planner, briefed the Commission on the Regional Solid Waste Management Plan (RSWMP) amendment.

In 2010, the HRPDC was designated by the Commonwealth of Virginia to be the regional solid waste planning agency for eight of the HRPDC member jurisdictions, namely Chesapeake, Franklin, Isle of Wight County, Norfolk, Portsmouth, Southampton County, Suffolk, and Virginia Beach. As the solid waste planning agency, the HRPDC is responsible for maintaining the RSWMP. This responsibility includes amending the plan when changes occur in the waste management system.

Mr. Walberg stated that the Southeastern Public Service Authority (SPSA) is the regional solid waste management agency that operates the waste management system. Since the 1980s, SPSA has included waste-to-energy as a component of managing solid waste on the Southside, which reduced the waste stream by 70%. Two years ago, the U.S. Navy decided to build a combined heat and energy facility and end its contract with WIN Waste. This will result in the closure of the waste-to-energy facility in Portsmouth, and it triggered two significant amendments to the *Regional Solid Waste Management Plan for Southeastern Virginia 2020 – 2025*: 1) a movement down the waste disposal hierarchy from incineration to disposal, and 2) a 16 million cubic yard expansion of the SPSA Regional Landfill in Suffolk for a requested total future capacity of 54.2 million cubic yards.

Mr. Walberg summarized the amendment process as follows:

- The Virginia Department of Environmental Quality required public hearings in each SPSA member locality.
- The hearings were advertised in the Virginian Pilot and the New Journal and Guide. They were also announced on the HRPDC website.
- An online comment form was available on the HRPDC website.
- The public hearings were held June – August 2023.
- Little in the way of public input was received. Representatives of Chesapeake-IBC and Recycling and Disposal Solutions (RDS) attended two hearings.
- A meeting of the Chief Administrative Officers (CAO)-designated Solid Waste Planning Unit Work Group was held on August 18, 2023, to brief staff of SPSA member localities on the amendment process.
- The region's CAOs were briefed on September 6, 2023.
- Following HRPDC approval, the amended plan will be submitted to the Virginia Department of Environmental Quality (DEQ).

Commissioner Andria McClellan asked for clarification on the 70% waste reduction and how long the landfill extension is supposed to last. Mr. Walberg stated that the volume of trash was significantly reduced due to the waste-to-energy facility only landfilling the ashes. The additional cells will extend the landfill's capacity for about 40 more years.

Commissioner Keaton clarified that Cell 7 is currently under construction. After Cell 7 reaches its capacity, Cells 8 and 9 will go online.

Commissioner McClellan inquired about the impact of recycling on the capacity of the landfill. Mr. Walberg commented that if recycling diminishes significantly, it could impact the landfill capacities and shorten the timeline. Commissioner Keaton added that SPSA is sending out requests for information, and ultimately, proposals for alternative waste disposal options.

The full presentation is available on the HRPDC website using the following link: https://www.hrpdcva.gov/uploads/docs/101923%20PDC%2009_Presentation%20RSWMP%20Amendment.pdf.

Chair Pons asked for a motion to approve the amendments to the RSWMP for Southeastern Virginia 2020-2025 for transmittal to the DEQ.

**Motion:** Commissioner Keaton Moved to approve the motion as stated by Chair Pons; seconded by Commissioner Brian Thrower. The Motion Carried.

**Title VI and Limited English Proficiency Plan**

Mr. Quan McLaurin, HRPDC Diversity, Equity, and Inclusion (DEI) & Title VI/Civil Rights Liaison, briefed the Commission on the Title VI and Limited English Proficiency (LEP) Plan.

Title VI states that any entity receiving federal funding needs to be non-discriminatory in the administration of its operations. Compliance with this federal law includes Environmental Justice, Limited English Proficiency (LEP), Americans with Disabilities Act (ADA), and other requirements.

The developed Title VI and LEP plan was available for public comments from July 20, 2023 to September 3, 2023. No comments were received during the public comment period. Feedback received from the Virginia Department of Transportation (VDOT) was incorporated into the final plan. The key updates to the plan implementation are as follows:

- Joint approach for HRPDC and HRTPO that allows for improved efficiency and reduced confusion
- Meets Federal Highway Administration (FHWA) and VDOT Title VI and LEP Plan requirements
- Includes reference to the historical importance of Title VI to Hampton Roads and disadvantaged communities
- Includes updated Environmental Justice indicator maps and data

Mr. McLaurin stated that the HRPDC and HRTPO are on track to achieve Title VI compliance by November 8, 2023. Additional resources are available, and the organization can now access translation services. He added that equity frameworks, such as intentional outreach to underserved communities and better strategies to serve socially vulnerable and disadvantaged communities, will be developed and implemented.

The full presentation is available on the HRPDC website using the following link: https://www.hrpdcva.gov/uploads/docs/101923%20PDC%2010_Presentation%20Title%20VI%20and%20LEP%20Plan.pdf.

**Motion:** Commissioner Ross-Hammond Moved to adopt the Title VI and LEP Plan as presented; seconded by Commissioner Helsel. The Motion Carried.

**Regional Legislative Agenda**

Mr. Crum stated that for several years, the HRPDC and HRTPO have adopted a Regional Legislative Agenda to convey to the General Assembly and Federal Delegation issues of regional significance that should be addressed on behalf of Hampton Roads.

The Joint HRPDC and HRTPO Regional Legislative Committee developed a recommendation for a Regional Legislative Agenda to be considered by the Commission and HRTPO Board. The membership of this Regional Legislative Committee was as follows:

| | |
|---|---|
| Douglas Pons, Williamsburg | HRPDC Chair |
| William McCarty, Isle of Wight County | HRTPO Chair |
| Shannon Glover, Portsmouth | HRPDC Vice-Chair |
| Gordon Helsel, Poquoson | HRTPO Vice-Chair |
| Mary Bunting, Hampton | CAO Committee Chair |
| Chris Price, Chesapeake | CAO Committee Vice-Chair |

The process for preparation and approval of the Regional Legislative Agenda included meetings with several Committees and groups, such as CAC, CAOs, Regional Transit Advisory Panel (RTAP), Freight Transportation Advisory Committee (FTAC), Regional Legislative Committee and Legislative Liaisons, Regional Housing Assessment Working Group, and numerous community partners.

Mr. Crum reported that the CAOs provided significant guidance for the Regional Legislative Agenda. It was suggested to include a short list of priorities and to identify topics that could be better supported by other entities. Furthermore, it was recommended to divide the agenda into two categories: 1) priority areas that the HRPDC will actively advocate for and 2) position statements, which will be monitored during the General Assembly session and supported or opposed as appropriate.

Mr. Crum stated that the agenda should only include items with unanimous support from the region's localities and should be complementary to local priorities. The following priority areas were identified:

- Recurrent flooding
    - Support the formation of the Chief Flooding Officer Position at the State level with six staff
    - Provide a minimum of $200 million/year through the Commonwealth Flood Prevention Program to support smaller projects and planning efforts
    - Develop State funding program to provide non-federal match for federal grants to support large-scale projects
    - Support need for the Peninsula Army Corp Study
- Continued support for Jefferson Lab
- Support legislative efforts to make Hampton Roads a hub for the emerging offshore wind industry

- Continued state financial assistance to support shovel-ready economic development sites
- Restore state funding for Planning District Commissions
- Mitigate toll impacts at the Downtown and Mid-Town tunnels
- Reliable passenger rail service
- Funding for Hampton Roads' three transit providers
- Support actions by the General Assembly to assist in housing opportunities for all
- Funding to build the Birthplace of America Trail (BoAT)

The position statements included timely construction of the I-64 Gap, funding for transportation network maintenance and repair, considering the formation of a Primary/Secondary Road Fund, rejecting unfunded mandates, federal/state broadband funding flexibility, amendments to the Virginia barrier crime statute regulations, protection of local land use authority, support efforts that improve the delivery of a quality juvenile detention system, support actions that increase access to affordable and quality childcare, and various items related to public safety.

Commissioner Debbie Ritter inquired how the Commission would be informed about the HRPDC's position on the statements and if items not included in the regional agenda would not be supported. Mr. Crum clarified that the HRPDC would only weigh in if there was an opportunity to discuss the items with the Commission first. There will also be collaboration with the local legislative liaisons to ensure the positions of the localities are considered.

Commissioner Ritter suggested collaborating with Ms. Amy Floriano, Director of the Department of Juvenile Justice (DJJ). She stated that Ms. Floriano has a new approach to programming efforts that includes workforce training and re-entry measures. Additionally, Commissioner Ritter mentioned that the Governor has a legacy program on advancing treatment and access to behavioral health. Therefore, she thinks behavioral health should be its own item on the legislative agenda. She stated her disappointment that law enforcement support, especially regarding gun confiscation and illegal drugs, was not included in the legislative agenda.

Chair Pons thanked everyone for their comments. He emphasized that the Regional Legislative Agenda only includes items that had unanimous consensus among the localities.

The presentation is available on the HRPDC website using the following link:
[https://www.hrpdcva.gov/uploads/docs/101923%20PDC%2011_Presentation%20Regional%20Legislative%20Agenda.pdf](https://www.hrpdcva.gov/uploads/docs/101923%20PDC%2011_Presentation%20Regional%20Legislative%20Agenda.pdf).

**Motion:** Commissioner Dyer Moved to approve the 2024 HRPDC Regional Legislative Agenda as presented; seconded by Commissioner Glover. The Motion Carried.

**Commissioners Patrick Duhaney and Sabrina Wooten departed*

**Regional Housing Assessment Update**

Ms. Bethea briefed the Commission on the Regional Housing Assessment.

For the past year, the Regional Housing Assessment Working Group has met several times to discuss the framework, scope, funding opportunities, and importance of establishing a regional housing assessment. Some of those meetings included CAC members, RTAP members, developers, and locality staff to receive input from different perspectives.

Ms. Bethea summarized the most pressing issues that were identified:

- Rental (affordability, eviction, housing choice vouchers, and short-term housing)
- Homeownership (affordable housing stock, lack of resources, and location)
- Special Populations (senior housing, accessible housing, and veterans/military housing)
- Existing Homeowners (aging housing, foreclosures, aging in place, and rehab)
- Poverty (deconcentration of poverty, crime reduction, and mobility)
- Homelessness (transitional, shelter housing, and permanent supportive housing)

It was recognized that housing intersects with many aspects, such as health, transportation, culture, economic development, employment, poverty/wealth, quality of life, education, and safety/well-being. Additionally, other stakeholders that should be involved in the process of the regional housing assessment were determined. These stakeholders included representatives of the Federal Delegation, community partners, military, economic development, and state and local government, were determined.

Regional partners provided additional insight on what information the housing assessment could collect and what it could accomplish. Included in these conversations were the Hampton Roads Workforce Council, the Association of Realtors, Sentara, and representatives from builders, foundations, and financial institutions. A Sentara representative mentioned issues finding housing for their staff, which impedes the patients as well. A representative of the Association of Home Builders stated that for a single-family house, there are $93,000 of regulatory expenses such as codes, stormwater, and ordinances. Furthermore, there were conversations about the current housing supply, the correlation between supply and zoning codes, low-income tax programs, opportunities to receive state or federal funding, creating a central location for residents to gather information and methodologies to rehab, restore, and preserve existing housing.

The following components were determined to be included in the housing assessment:

- Analysis of current policies, strategies, and conditions
- Housing demand analysis
- Gap analysis of current programs and services
- Best practices and toolkits
- Housing strategies that incorporate transportation and economic development

Ms. Bethea called on the Housing Assessment Working Group members to provide comments and remarks.

Commissioner Dyer stated that this is a housing crisis that affects many people and industries. Additionally, the region has limited options and is running out of space. He added that projects will be more expensive and new revenue streams to fund school modernization and infrastructure replacements need to be created. While the subsea cables in Virginia Beach, combined with the broadband efforts of the Southside Network Authority, offer opportunities to create new jobs, attainable housing needs to be available to attract new businesses. He recommended the evaluation of existing structures, such as repurposing underperforming strip malls and turning them into multi-purpose use. Commissioner Dyer stated that housing is an emotional topic, and the public needs to be involved to understand what is being done and why. He thinks that having these conversations is the first step to betterment.

Commissioner Keaton stated that in rural counties, there is often too much housing in one area and not enough in another. Additionally, developmental service districts restrict where housing can be developed, and restrictive zoning stipulates how it needs to look, which makes it unattainable for many people. He stated that several items discussed with the Regional Housing Assessment Working Group will be implemented in Isle of Wight County.

Commissioner Brian Solis stated that each locality has different variables concerning the assessment components. He suggested establishing a regional baseline so that all components can be covered consistently and across the region.

Mr. Crum asked for a motion to authorize staff to proceed in establishing the components of the regional housing assessment, secure funding for the study, and initiate a search for consultants to execute the study.

The full presentation is available on the HRPDC website using the following link:
https://www.hrpdcva.gov/uploads/docs/101923%20PDC%2012_Presentation%20Regional%20Housing%20Assessment%20Update.pdf.

**Motion:** Commissioner Dyer Moved the motion as stated by Mr. Crum; seconded by Commissioner Ella Ward. The Motion Carried.

**Three-Month Tentative Schedule**

Chair Pons noted that the next meeting was scheduled for November 16, 2023. Per the regional meetings schedule, there is no Commission meeting scheduled in December.

**Advisory Committee Meeting Minutes**

Mr. Crum stated that the HRPDC Advisory Committee meeting minutes approved since the last Commission meeting were included in the agenda packet for information purposes.

**Technical Committee Meeting Summaries**

Mr. Crum indicated that summaries of HRPDC Technical Committee meetings held since the last Commission meeting were included in the agenda for information purposes.

**For Your Information**

Mr. Crum noted the correspondence of interest included for information purposes.

**Old/New Business**

There was no old or new business.

**Adjournment**

With no further business to come before the Commission, the meeting adjourned at 1:56 p.m.

| | |
|---|---|
| Douglas G. Pons<br>Chair | Robert A. Crum, Jr.<br>Executive Director/ Secretary |

# SPSA December 13, 2023, Meeting Minutes:

# Record of vote approving the plan on Page 8

# MINUTES OF THE BOARD OF DIRECTORS OF THE SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA

**December 13, 2023**

The Regular Meeting of the Board of Directors of the Southeastern Public Service Authority (SPSA) was held at 9:30 a.m. in the Regional Board Room at the Regional Building, 723 Woodlake Drive, Chesapeake, Virginia. The following members were in attendance or as noted:

| | | | |
|---|---|---|---|
| Mr. John Maxwell | (CH) | Mr. Earl Sorey | (CH) |
| Ms. Sheryl Raulston | (FR) | Ms. Amanda Jarratt[1] | (FR) |
| Dr. Dale Baugh | (IW) | Mr. Randy Keaton[2] | (IW) |
| Mr. John Keifer | (NO) | Mr. Richard Broad | (NO) |
| Mr. C.W. "Luke" McCoy | (PO) | Ms. Lavonda Graham-Williams[3] | (PO) |
| Mr. Tony Parnell[4] | (SH) | Ms. Lynette Lowe[5] | (SH) |
| Mr. D. Rossen S. Greene | (SU) | Mr. Albert Moor[6] | (SU) |
| Mr. Thomas Leahy | (VB) | Mr. L.J. Hansen | (VB) |

(CH) Chesapeake; (FR) Franklin; (IW) Isle of Wight; (NO) Norfolk; (PO) Portsmouth, (SH) Southampton County; (SU) Suffolk; (VB) Virginia Beach

Others present at the meeting included Alternate Ex-Officio Members Mr. Michael Etheridge (IW), Mr. Jeremy Kline (VB), Mr. Robert Lewis[7] (SU), Mr. Oliver Love, Jr. (NO), Ms. Jocelyn Terry-Adumuah[8] (PO), and Mr. Greg Martin (CH), SPSA executives, Mr. Dennis Bagley, Executive Director, Ms. Tressa Preston, Secretary and Director of Administration, Ms. Sandy Schreiber, Treasurer and Director of Finance, and Mr. Brett Spain, General Counsel.

To accommodate those who could not attend in person, through the meeting notice, members of the public were also invited to listen to, and view presentations displayed at the meeting, by registering for attendance using a GoTo Webinar teleconferencing platform. Members of the public were also invited to speak at the SPSA Board of Directors Meeting during the designated public comment period at the beginning of the meeting by registering in advance with the Secretary through contact information published in the meeting notice. Members of the public were also invited to listen to the SPSA Board Meeting via toll-free telephone.

## 1. CALL MEETING TO ORDER

Dr. Dale E. Baugh, Chair of the Board of Directors, called the December Board Meeting to order at 9:30 a.m. and then he led the Pledge of Allegiance.

[1] Ms. Jarratt was absent from the meeting.
[2] Mr. Keaton left the meeting at 11:38 a.m.
[3] Ms. Graham-Williams was absent from the meeting and Ms. Terry-Adumuah served as voting member from the City of Portsmouth.
[4] Mr. Parnell was absent from the meeting.
[5] Ms. Lowe arrived at 9:37 a.m.
[6] Mr. Moor arrived at 9:42 a.m. during closed session.
[7] Mr. Lewis arrived at 9:38 a.m.
[8] Ms. Terry-Adumuah left the meeting at 11:37 a.m.

## 2. PUBLIC COMMENT

Ms. Preston reported that there were no requests for public comment.

## 3. CHAIRMAN'S COMMENTS

Chairman Baugh informed the Board that, for the sake of time, the order of some agenda items would be altered to allow the RFI Presentation to take place after the conclusion of all other business in the event that discussion ran long. He also allowed Ms. Preston to explain that the speakers in the center of the room were for broadcasting and recording, but that the Board was to use their microphones as usual and that they could be assured that there would be no recording or broadcasting during the closed session portion of the meeting.

## 4. APPROVAL OF MINUTES

The minutes of the October 25, 2023 Board Meeting had been distributed. Chairman Baugh asked if there were any additions or changes and there were none.

**Mr. Keifer moved, seconded by Mr. Sorey, to approve the October 25, 2023 minutes of the SPSA Board of Directors, as presented. The motion was adopted by a unanimous vote in favor.**

## 5. 2024 BOARD MEETING DATES

Ms. Preston asked the Board to turn their attention to the final page of their agenda packets where the proposed dates for the 2024 Board Meetings were listed. Ms. Preston explained that the 2024 dates follow the same pattern as they have previously: 9:30 a.m. on the fourth Wednesday of the month, with the exception of November, when there is no meeting, and December, when the meeting falls on the second Wednesday of the month. By following this pattern, major State holidays and other established regional meeting schedules should be accommodated.

**Mr. Broad moved, seconded by Mr. McCoy, to approve the 2024 Board Meeting dates, as presented. The motion was adopted by a unanimous vote in favor.**

## 6. CLOSED SESSION

Chairman Baugh reminded those present that a closed session to discuss the annual performance review of the Executive Director was on the agenda and announced that only Board Members would be present for that closed session. There were no objections to that plan. Prior to the beginning of the closed session, Chairman Baugh asked that Mr. Spain also participate in the closed session and there were no objections.

Motion to Approve Request for Closed Meeting.

> *I move that a closed session be held for discussion regarding the annual performance review of the Executive Director, in accordance with Virginia Code Section 2.2 3711(A)(1) relating to the performance of a specific public officer.*

**At 9:38 a.m., Mr. Broad moved, seconded by Mr. McCoy, to enter closed session, as presented. The motion was adopted by a unanimous roll call vote in favor.**

Once back in open session both in person and electronically the following motions took place.

Motion to Approve Certification after Closed Meeting.

*The Board hereby certifies that, to the best of each member's knowledge: (i) only public business matters lawfully exempted from open meeting requirements by Virginia law under the Virginia Freedom of Information Act; and (ii) only such public business matters as were identified in the motion convening the closed meeting were heard, discussed or considered in the closed meeting just concluded.*

**The Board came back into open session at 10:11 a.m., at which time Mr. Hansen moved, seconded by Mr. McCoy, to certify the closed session, as presented. The motion was adopted by a unanimous roll call vote in favor.**

**Mr. Leahy moved, seconded by Mr. Moor, to approve, in recognition of the outstanding performance of Executive Director, Dennis Bagley, a 3.2% cost of living increase in base salary and a 5% one-time cash bonus for 2023 performance, to be effective January 1, 2024. The motion was adopted by a unanimous vote in favor.**

## 7. EXECUTIVE DIRECTOR UPDATES

Mr. Bagley began his report by thanking Chairman Baugh and voicing his appreciation for the Board's confidence in him, noting that it had been a challenging year, with many challenges ahead, but that he and staff are looking forward to hitting the ground running and facing those challenges head-on.

Mr. Bagley recognized Mr. Marshall "Bubba" Tatem, recently promoted Transportation Manager, as the SPSA Values in Action Employee of the Month. Mr. Bagley chose to recognize Mr. Tatem not only for his excellent work at SPSA, but for the community stewardship that he and his wife provide for area families this time of year, opening their home as Mr. and Mrs. Claus so that children can visit and take pictures with Santa free of charge every Friday and Saturday from Thanksgiving to Christmas. Chairman Baugh presented Mr. Tatem with a certificate and lapel pin as tokens of the Board's appreciation.

Ms. Jasmin Walters presented the Board with a final briefing on the Salary Study and implementation of the Board-approved Pay Plan effective December 1, 2023. She covered the details of the process, including messaging to staff, methodologies used to assess changes, costs, implementation, and continued efforts toward future goals in evaluations and merit-based pay. She thanked the Board for their support and vision in using this project as a catalyst to move competitive pay forward for the entire region.


HR UPDATE
"OUR JOURNEY IS NOT FINISHED BUT WE HAVE COME A LONG WAY"
MUHAMMADU BUHARI

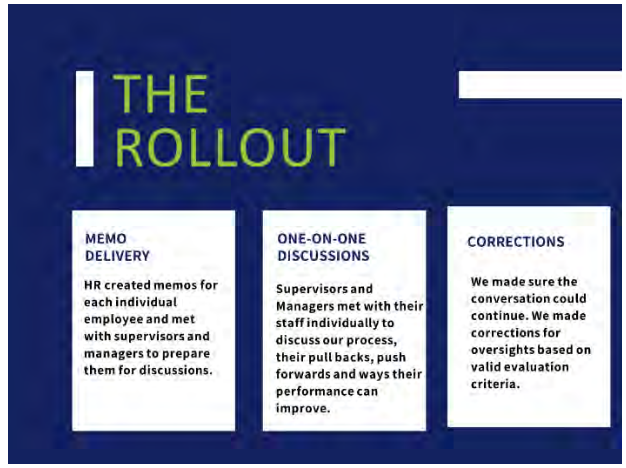

SALARY STUDY
THIS SUMMER, THE BOARD APPROVED:
• JULY 1 COLA
• SIGN-ON BONUS
• DEC 1 PAY PLAN
AS A MEANS TO LEAD THE CHARGE IN COMPETITIVE PAY FOR THE ENTIRE REGION.


5% INCREASE
ADJUST TO MINIMUM
ACCOUNT FOR COMPRESSION
PERSONNEL REVIEWS
THANK YOU!
WE COULDN'T HAVE DONE IT WITHOUT YOU!


THE PROCESS
GROUP COACHING SESSION
The Executive Team and HR met with all of the supervisors and managers as a group so that they were clear on our expectations.
DEPARTMENT MEETINGS
The Executive Team and HR met with each department individually to discuss employee performance at each site.
EXECUTIVE REVIEW
The Executive Team and HR met to discuss each individual employee and make a final determination.


EXECUTIVE REVIEW
• ADDRESS COMPRESSION
• ACCOUNT FOR TENURE
• ACCOUNT FOR EXPERIENCE PRIOR TO SPSA
• PULL BACKS
• PUSH FORWARDS


ANNUAL INCREASE
ALL EMPLOYEES
ADJUST TO MINIMUM
25 EMPLOYEES
ACCOUNT FOR COMPRESSION
ALL EMPLOYEES REVIEWED
PERSONNEL REVIEWS
ALL EMPLOYEES




While staff and members of the Executive Committee were already aware, Mr. Bagley informed the full Board that Ms. Walters had made the difficult decision to return to Maryland to be closer to family at this time. While a great loss for SPSA, staff fully support her, thank her, and wish her all the best. Because of Ms. Walter's dedication to SPSA, she and staff took the time to find and train the best possible candidate for SPSA's new HR Manager and are confident that person has been found in Ms. Cam Smith. Ms. Smith is a Navy Veteran with a master's degree in human resources management from Temple University and 12 years of experience. Even more importantly, she understands the vision for service-based HR at SPSA and is ready to carry forward the momentum that has been created under Ms. Walters' tenure. Ms. Smith presented the latest recruitment statistics and upcoming SPSA Human Resources events, like the Employee Appreciation event, and the Trash Bash, taking place on February 3, 2024 from 6:00 p.m. to 11:00 p.m. at the Founders Inn in Virginia Beach.





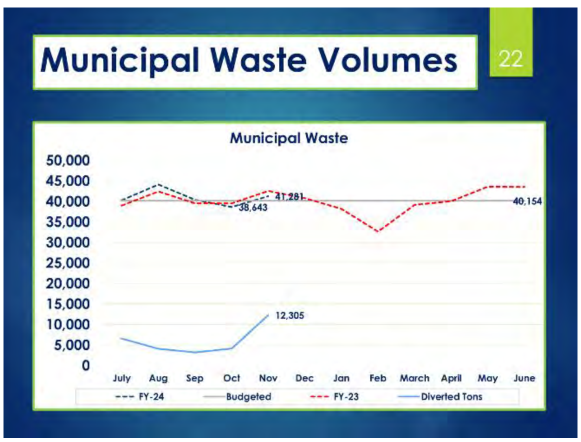
Ms. Walters and Ms. Smith offered to answer any questions. Chairman Baugh commented that SPSA has been extremely well served by Ms. Walters and, on behalf of the Board, he thanked her for her positive contributions, noting that she will be missed and that everyone wishes her well. He welcomed Ms. Smith aboard and said they were delighted to have her join the organization.

Regarding the wetlands permitting process required for the proposed expansion at the Regional Landfill and the Army Corps of Engineers' Environmental Impact Statement (EIS), staff met with with the Corps the previous day and learned of some new developments that must be assessed and will be brought back to the Board at the January Meeting. Archaeologists have been on site doing field work for the Phase 1-B study, but more work may be necessary, as well as additional information needing to be provided. The target date for the record of decision may also need to be pushed back from March of 2024 to June of 2024, however staff is hopeful that things may move faster than that, particularly because Colonel Hallberg has expressed a desire to come to a decision before he changes his post this coming summer.

Mr. Bagley reminded the Board that there was a recent fire at the WIN/Wheelabrator facility that caused major damage to one of the three processing lines. That line is not being repaired, but WIN has resumed operations with the two remaining lines and is able to process 1000 tons per day for SPSA, as agreed upon. Mr. Bagley added that once SPSA takes possession of the facility in July of 2024, that line was scheduled for demolition, so as long as WIN can continue to process 1000 tons per day per the terns of the agreement, the damaged line does not impact SPSA in any way.

Mr. Bagley went on to say that the Purchase and Sale Agreement, Waste Disposal and Service Agreement Amendment, and Demolition Agreement with WIN Waste have all been fully executed. The first two payments have been received and the payment bonds and guarantees are in place. Chairman Baugh, Mr. Bagley and Mr. Strickland had a very productive meeting with the Captain from the Navy Shipyard the previous week and feel they have his support, including the assignment of the WIN Waste easement to SPSA. All parties look forward to continuing SPSA's longstanding mutually beneficial relationship with the Navy. As an extra measure of due diligence, SPSA has issued a task order to SCS Engineers to perform a Phase I Environmental Assessment of the RDF site before closing.

Mr. Bagley reviewed municipal and commercial waste volumes for the reporting period, as well as total waste volumes and tons diverted, noting that municipal waste volumes were above average for November and below average for October, as is the trend year over year. He also pointed out increased diversions due to the fire at WIN Waste and increased commercial tonnages which are comfortable anomalies from a revenue and operations standpoint.






Ms. Grace Roquemore presented an Environmental Update in her new role as Environmental Manager, making the Board aware of SPSA's receiving the Elizabeth River Project's River Star "Sustained Distingusihed Performance at Model Level" Award. Ms. Roquemore explained that the Elizabeth River Project is a local non-profit organization dedicated to the preservation of the Elizabeth River, the creaton and preservation of wildlife habitat, and community outreach and education. The River Star Program recognizes businesses that perform meaningful environmental stewardship and SPSA has been involved in the program since its inception in 1997 and has been recognized at "Model Level" since 2006. Ms. Roquemore went on to say that this new distinction of Sustained Distinguished Performance is only awarded to organizations that show significant environmental initiative, so it is truly something to be proud of and speaks to SPSA's dedication to continuous improvement. She thanked all of the SPSA staff across various departments for their contributions toward this recognition, as well as the HRSD Platinum Award and staff's continued work with the Wildlife Habitat Council. There were no questions for Ms. Roquemore, but Mr. Bagley commented that her work has contributed significantly to SPSA's long range goals of making the value of environmental stewardship more visible in daily operations. He thanked her for her excellent results.

**8. REGIONAL SOLID WASTE MANAGEMENT PLAN APPROVAL**

As the Board has discussed at length, the Regional Solid Waste Management Plan (RSWMP), following the completion of the required public hearings, all parties being briefed on the changes to the RSWMP, and the Hampton Roads Planning District Commission (HRPDC) Board of Directors voting to approve, the final step before presenting to DEQ, is for the SPSA Board of Directors to vote to approve. Mr. Bagley reminded the Board that the major amendments to the RSWMP are expansion to the Regional Landfill in Suffolk to include proposed expansion into Cells VIII and IX, and a movement down the waste disposal hierarchy due to the unavoidable early closure of the WIN Waste/Wheelabrator Waste to Energy facility. There were no questions about the RSWMP itself, but Mr. Eric Walberg, Principal for Planning and Economics for the HRPDC clarified that the HRPDC's Solid Waste Planning Group is a standing committee that will continue to function and may assist in other relevant discussions. Mr. Bagley added, on that topic, that a meeting was being scheduled with that group and the SPSA member communities' Chief Administrative Officers to continue discussions about SPSA's long-term future planning.

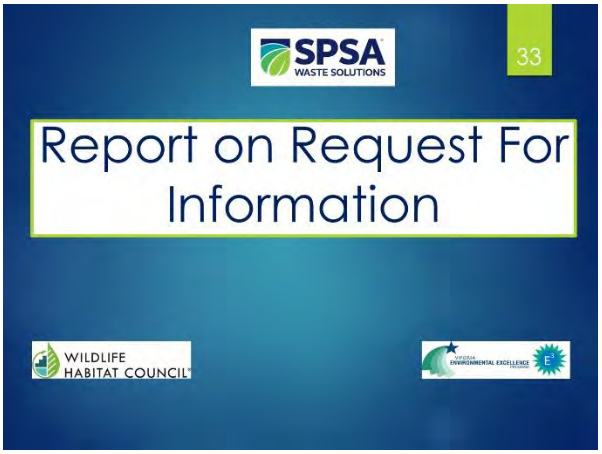
**Mr. Keifer moved, seconded by Mr. Leahy, to approve the Regional Solid Waste Management Plan, as presented. The motion was adopted by a unanimous vote in favor.**

**9. WRITTEN REPORTS**

Chairman Baugh asked if there were any questions regarding the WIN Waste Report or the Financial Reports, but there were none.

**10. RFI PRESENTATION**

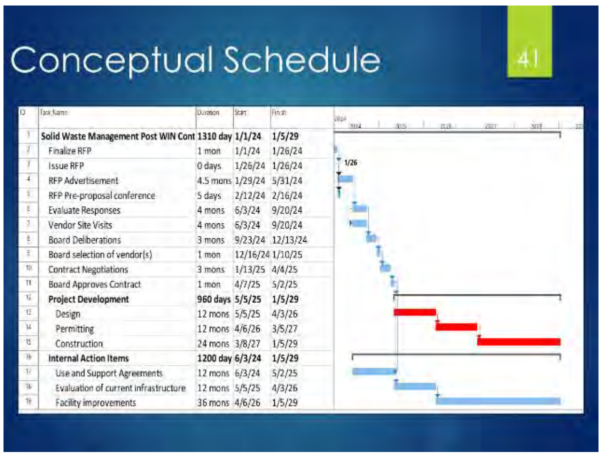
Mr. Bagley reintroduced Mr. Bob Gardner of SCS Engineers who would be guiding the Board through the responses to the Request for Information on Alternative Waste Disposal which had been reviewed by staff and consultants. Mr. Bagley encouraged the Board not to get bogged down in the technical terms and details at this point but assured them that the consultants would walk though things at the Board's comfort level. He told the Board how excited he and staff are for this next chapter for SPSA and turned the RFI Response presentation over to Mr. Gardner. Mr. Gardner reviewed each of the technologies that were presented in the eight responses received, the diversion claims that were made, the contract terms requested for non-landfilling solutions, as well as their range of development schedules. He also reviewed prospective financing options, proposed tonnage capacities and space utilization. Mr. Gardner then spoke more specifically of responders with demonstrated experience and those without demonstrated experience. He also reviewed staff and consultant recommendations about next steps and what a potential conceptual schedule might look like.










The Board engaged in extensive discussions on how best to move forward with preparations for an RFP, given the information learned from RFI responses and staff and consultant recommendations. Concerns were raised about financing sources, specific technologies, the need for demonstrable results, revenue and cost assumptions, and implications for long-term planning. It was agreed that issuing the RFI was a worthwhile exercise that provided valuable insight. Once it was determined that the discussion had concluded, Chairman Baugh summarized the plan moving forward. Before the January Board Meeting, Mr. Bagley, staff, and consultants would take the essence of the comments provided at the day's meeting and incorporate them into a draft of the RFP format that will then be provided to the Board in advance of the meeting for their consideration, comment, and discussion at the January Board Meeting. The conceptual schedule presented at the day's meeting would also be enlarged and disseminated. SCS Engineers and special counsel, Mr. Brad Nowak, who was instrumental in previous successful waste disposal contractual agreements, will be present at the meeting to aid the discussion. As is customary, the draft RFP will include proposal evaluation criteria which will be subject discussion and commentary.

## 11. ADJOURN MEETING

There being no further business to come before the Board of Directors, the regular meeting was adjourned at 11:39 a.m.

Dennis L. Bagley

Dennis L. Bagley
Executive Director

Submitted by: Tressa Preston, Secretary, SPSA Board of Directors

# Virginia Department of Environmental Quality
# July 3, 2024, Acceptance Letter

*Commonwealth of Virginia*

*VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY*

www.deq.virginia.gov



July 3, 2024

Mr. Dennis L. Bagley
Executive Director
SPSA
723 Woodlake Drive
Chesapeake, VA 23320

**Re: Acceptance of the Major Amendment to the Southeastern Public Service Authority (SPSA) Solid Waste Management Plan**

Dear Mr. Bagley:

The Major and Minor Amendments to Southeastern Public Service Authority's (SPSA) Solid Waste Management Plan received in this office on December 21, 2023 along with additional information provided on May 1, 2024 and June 20, 2024, as required by the Solid Waste Planning and Recycling Regulations, 9VAC20-130-175 are hereby accepted and acknowledged respectively. The Major Amendments to the SWMP consist of a decrease in hierarchy from incineration to landfilling as well as an increase in landfill capacity of 16,000,000 cubic yards for Cells VIII-IX of the SPSA Regional Landfill (SWP417) taking the total capacity from 38,200,000 cubic yards to 54,200,000 cubic yards. The Minor Amendment was for the closure and removal of a waste-to-energy facility, Wheelabrator Portsmouth Inc - Waste to Energy Facility (PBR500).

Per 9VAC20-130-175.B.1.a, any addition, deletion, or cessation of operation of any solid waste disposal facility shall constitute a major amendment to the SWMP. Major amendments shall require the same public participation as detailed in 9VAC20-130-130.B before being submitted to DEQ for approval prior to implementation. Please submit a major amendment if there is a future increase in capacity for Cells V-VII.

All Solid Waste Planning Units are required to maintain current plans, including any updates submitted to DEQ.

Thank you for your efforts and cooperation in this matter. If you have any questions, please contact Prina Chudasama at (804) 659-1530 or via email at prina.chudasama@deq.virginia.gov.

Sincerely,

Sanjay Thirunagari, Programs Manager
Virginia Department of Environmental Quality
804-659-1532

sanjay.thirunagari@deq.virginia.gov
Office of Financial Responsibility & Waste Programs
Division of Land Protection and Revitalization
1111 East Main Street, Suite 1400
Richmond, VA 23219

Enclosures

Cc: Prina Chudasama, DEQ, CO
Melinda Woodruff, DEQ, TRO
Robert A. Crum, HRPDC
Eric Walberg, HRPDC
Tressa Preston, SPSA

# Appendix F: SPSA Regional Landfill Traffic Study

SPSA
WASTE SOLUTIONS

# Traffic Impact Study

## Part A Modification Application for Cells VIII and IX Expansion

SPSA Regional Landfill

*Suffolk, Virginia*
January 2021

COMMONWEALTH OF VIRGINIA
CLAUDIA A. WALSH
Lic. No. 033472
PROFESSIONAL ENGINEER

Claudia A Walsh
2021.02.03 16:16:46 -05'00'

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# Contents



## Figures



## Tables



## Appendices

# 1. Introduction

The Southeastern Public Service Authority (SPSA) is submitting an application to modify Part A of its Solid Waste Permit (Permit No. 417) for its Regional Landfill, located at #1 Bob Foeller Drive in the City of Suffolk. The modification includes a request to increase the solid waste facility boundary by 129 acres to include expansion for Cells VIII and IX, and development of a soil borrow and stormwater management area on the existing property north of Cell VII. The property is located north of the West Military Highway (US 13/58/460), Bob Foeller Drive, and Welsh Parkway intersection. **Figure 1** displays a study area map.

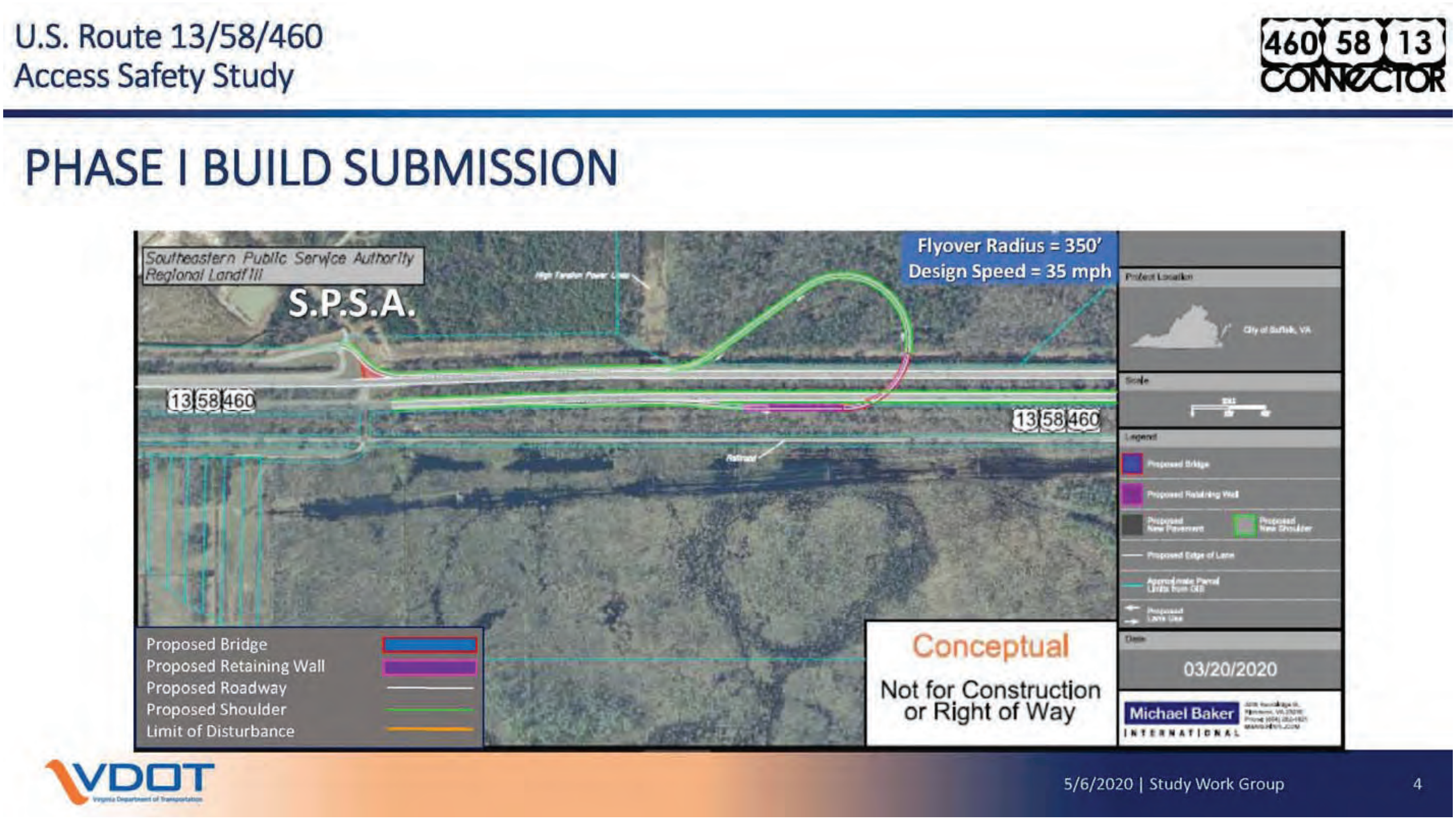
It is anticipated that construction of Cell VIII will take place one to two years prior to the completion of waste filling operations in Cell VII, currently anticipated to be in 2037. Operations in existing Cells V and VI are anticipated to continue through at least 2027, based on current and anticipated disposal rates. Cell VII is anticipated to begin construction in 2025 and be operational prior to cessation of filling in Cells V and VI. In accordance with the Conditional Use Permit Issued by the City of Suffolk (C08-16), SPSA must construct a flyover to accommodate left turning vehicles entering the landfill site prior to receipt of waste in Cell VII. For purposes of this study, HDR has assumed that Cell VII will be constructed and operational and that a flyover would be constructed in the Build of Phase 1.

Cells VII, VIII and IX operations will be accessed using the existing facility entrance roadway, Bob Foeller Drive. HDR is analyzing the existing access onto Bob Foeller Drive (**Figure 1**) and the proposed access on US 13/58/460 of a flyover across the highway for eastbound traffic that connects to Bob Foeller Drive (**Figure 2**). The flyover will be located approximately 3,000’ from the existing intersection at Bob Foeller Drive/Welsh Parkway.

The purpose of this report is to document the operational conditions of the existing entrance and exit and compare to the proposed flyover alternative for years 2040 and 2054. Analysis of 2020 no-build conditions is presented in **Section 2**. Volume growth is presented in **Section 3** of this report. The capacity analysis for the proposed facility with development is documented in **Section 4**. Finally, **Section 5** summarizes the study findings and presents conclusions.

**Figure 1: Study Area Map**

**Figure 2: Proposed Build Configuration**



# 2. 2020 No-Build Conditions

This section presents the 2020 no-build traffic operational analysis for the peak hour traffic volumes for the analyzed intersections and weaving segment.

As shown in **Figure 1**, the study area includes one intersection plus a weave segment of US 13/58/460 that are being analyzed for this project:

- US 13/58/460 and Bob Foeller Drive/Welsh Parkway
- US 13/58/460 WB from Bob Foeller Drive to US 13/58/460 Business Interchange

The current entrance to the SPSA Regional Landfill can only be accessed via Bob Foeller Drive located at the southern edge of the site. Bob Foeller Drive intersects with US 13/58/460 to the southeast of the SPSA Regional Landfill. Bob Foeller Drive is named as Welsh Parkway on the south side of US 13/58/460. Presently, a locked gate controls access to Welsh Parkway. US 13/58/460 is a divided six-lane highway with a grass median and Bob Foeller Drive and Welsh Parkway are both two-lane local roadways. There are exclusive left turn lanes onto both Bob Foeller Drive and Welsh Parkway along with a yield controlled right turn lane into the SPSA Regional Landfill site on the westbound approach. The storage bays' approximate lengths are 330 feet for the eastbound left turn lane, 240 feet for the westbound left turn lane, and 435 feet for the westbound right turn lane. All the movements to and from Bob Foeller Drive are stop controlled except the yield controlled right turn movement to Bob Foeller Drive from US 13/58/460 and the free-flowing right turn movement from Bob Foeller Drive to onto US 13/58/460.

To determine the 2020 no-build conditions, a 24-hour traffic count was conducted for the following areas:

- The weave section of US 13/58/460
- The free-flow right turn from Bob Foeller Drive onto US 13/58/460
- The Westbound ramp from US 13/58/460 to US 58 Business

In addition to the 24-hour counts conducted, a turning movement count was conducted for the peak hour periods at the following intersections:

- US 13/58/460 and Bob Foeller Drive/Welsh Parkway

The peak hour turning movement counts were collected from 7:00-9:00 AM and 2:00-4:30 PM in 15-minute intervals. All counts were conducted on October 13, 2020 and October 14, 2020. The peak hour periods were determined to be 7:15 – 8:15 in the AM and 3:30 – 4:30 in the PM.

Level of service (LOS) is a qualitative measure used to describe the condition of traffic flow, ranging from excellent free-flow conditions at LOS A to overloaded stop-and-go conditions at LOS F. LOS C is typically considered to be the minimum acceptable level of service in rural areas. LOS at US 13/58/460 and Bob Foeller Drive/Welsh Parkway were analyzed using Synchro 10. LOS for the weaving segment was analyzed using Highway Capacity Software 7.

## 2.1 No-Build LOS Summaries

### 2.1.1 Intersection of US 13/58/460, Bob Foeller Drive, and Welsh Parkway

The intersection functions at an unacceptable LOS in the AM and PM peak hour. This is due to the heavy thru volumes along US 13/58/460 creating few gaps available for vehicles making a left turn to access Bob Foeller Drive. **Figure 3** presents the AM and PM peak hour volumes. Analysis results are summarized in **Table 1**. For further detail, please refer to **Appendix A** for the traffic counts and **Appendix B** for the Synchro reports.

### 2.1.2 Weave Segment from Bob Foeller Drive to US 13/58/460 Business Interchange

The weave segment functions at an acceptable level of service in the AM and PM peak hour. This can be attributed to the low volumes seen at the on ramp. Analysis results are summarized in **Table 2**. For further detail, please refer to **Appendix C**.

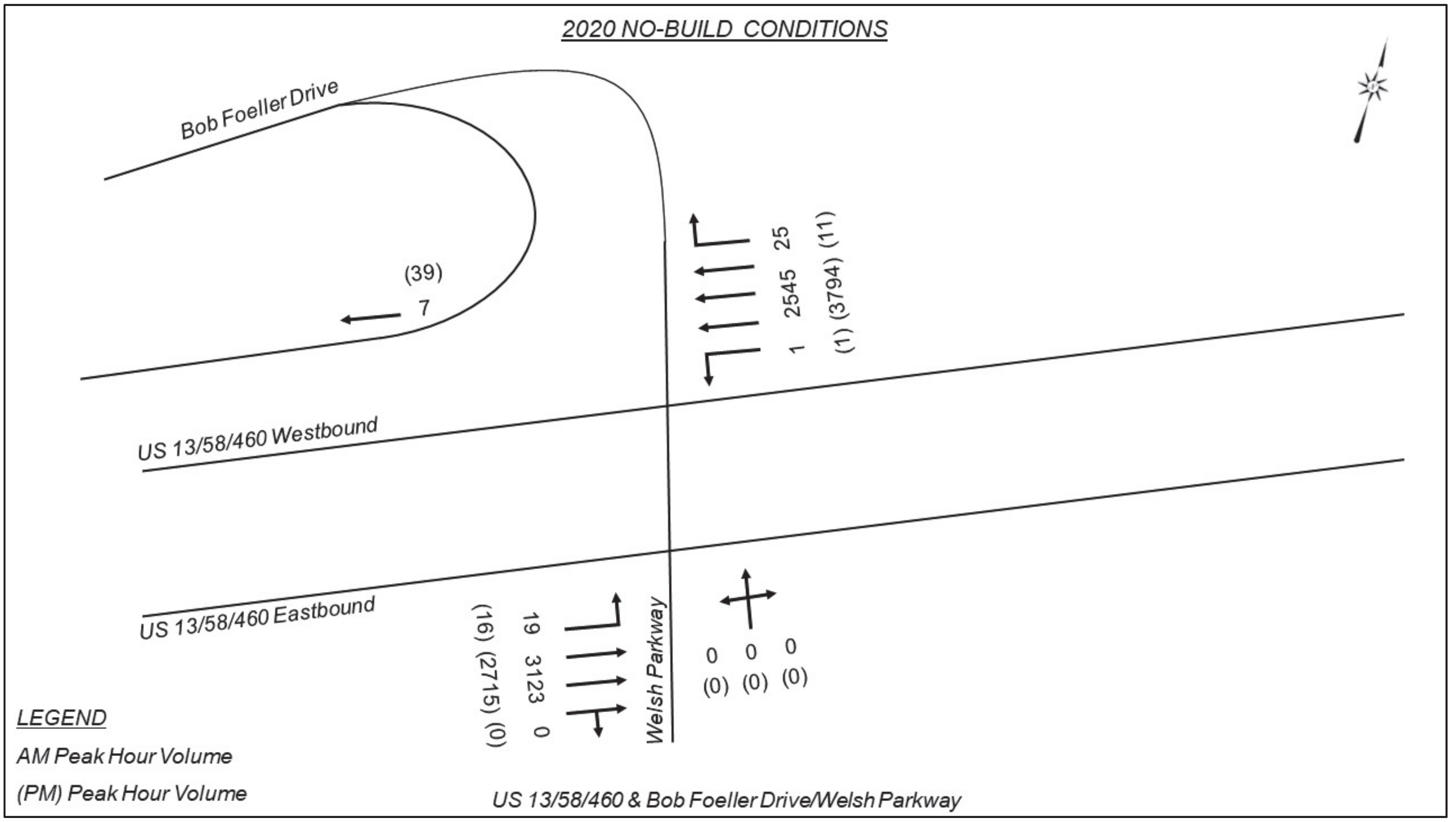
**Table 1: 2020 No-Build Intersection Analysis Results**

| Analysis Year | Primary Street | Secondary Street | Config. | Approach | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | LOS | Delay (s/veh) | Max. v/c | LOS | Delay (s/veh) | Max. v/c |
| 2020 No-Build | US 13 (Portsmouth Boulevard) | Bob Foeller Drive / Welsh Parkway | TWSC | EBL | F | 252.8 | 0.95 | F | > 300 | 3.41 |
| | | | | WBL | F | > 300 | 0.11 | F | 105.2 | 0.03 |

**Table 2: 2020 No-Build HCS Analysis Results**

| Analysis Year | Primary Street | Freeway Segment | Config. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | LOS | Density (pc/mi/hr) | Max. v/c | LOS | Density (pc/mi/hr) | Max. v/c |
| 2020 No-Build | US 13 (Portsmouth Boulevard) WB | Bob Foeller Drive to US 13 Business | Weave | B | 13.9 | 0.40 | B | 19.0 | 0.54 |

**Figure 3: 2020 No-Build Volumes**



# 3. Volume Growth

The volumes from the 2020 traffic count were grown to assess conditions in the year 2040 and 2054. A growth rate of 2.5% was determined as an appropriate and conservative rate from the previous study completed in June 2016. This rate was verified by analyzing the most recent 9 years of traffic counts reported by the Virginia Department of Transportation (VDOT) for this segment of US 13/58/460. The 24-hr bidirectional count in the weaving segment was compared to the 2019 count reported by VDOT to confirm the volumes were not impacted by COVID 19. Upon review, the volumes along the corridor were in-line with previous counts and no adjustment was determined to be necessary.

The set of calculations used to determine the growth rate used for the Future Year Build analyses can be seen below, in **Figure 4.**

**Figure 4: Compound Growth Rate Development for US 13/58/460**

**Annual Average Daily Traffic**

**US 13/58/460 & Bob Foeller Drive/Welsh Parkway**

| Year | Bidirectional Volume | Growth Rate (%) |
|---|---|---|
| 2011 | 64000 | - |
| 2019 | 76000 | 2.17 |

**Growth Rate Calculation**

Average Daily Traffic for initial year (ADTi)
Average Daily Traffic for future year (ADTf)
Initial year for ADT (I)
Future year for ADT (F)

GR = [{(ADTf/ADTi)^(1/(F-I))}-1] x 100

Growth Rate Used (%) = 2.50%

For the traffic to and from the SPSA Regional Landfill, a conservative growth rate of 0.8% was used for all deliveries with the exception of ash from the Portsmouth Waste to Energy Facility. This rate was determined using the facility's anticipated growth over the next 20 years. In June 2027 SPSA's agreement with the Portsmouth Waste to Energy Facility expires. Upon expiration of the agreement, waste from the eastern communities of SPSA's service areas may be delivered to the Regional Landfill for disposal, and receipt of ash residue would cease. The 2040 projections assume that MSW from the eastern community transfer stations would be hauled to the site via 100 CY trailers with an average capacity of 20 tons each. Details on how the growth rate and future projections was determined can be found in **Appendix D**.

# 4. Analysis of Future Build Configuration

## 4.1 Future Year Build Analysis

The analyzed Build configuration consists of a proposed VDOT funded flyover for the eastbound traffic that would cross over US 13/58/460 to the east of the Bob Foeller Drive/Welsh Parkway intersection. The configuration would provide a route that allows traffic onto Bob Foeller Drive without the conflict points that were previously present for eastbound left and U-turn users. Users of the flyover will exit from EB US 13/58/460 and merge with WB US 13/58/460 east of the Bob Foeller Drive intersection where it will create an auxiliary lane that ends in the existing right turn lane into the site which creates a weaving scenario for motorists on this segment of highway.

This Build configuration would be used by the City of Suffolk refuse and yard waste trucks and residential traffic to enter the facility and by general traffic to reverse direction as the proposed configuration would eliminate the median crossing. Motorists would still use the existing route to exit the SPSA facility to get on US 13/58/460 WB. To analyze the Build conditions, the background traffic was projected using the growth rates found in the prior section and volumes can be seen in **Figures 5 and 6**. The AM and PM peak hour levels of service for weave segments were computed by utilizing HCS 7.

### 4.1.1 Weave Segment from US 13/58/460 Flyover to Bob Foeller Drive

Due to the proposed flyover, a new weaving segment along US 13/58/460 WB from US 13/58/460 Flyover to Bob Foeller Drive was analyzed to determine how the proposed configuration would operate. This weave segment functions acceptably at LOS C in the AM peak hour for 2040 and an unacceptable LOS D in the PM peak hour for 2040. In both the AM and PM peak hours for the 2054, the results of the weave analysis showed that the weave segment would operate at LOS E and F respectively. The roadway is operating below the acceptable level due to background traffic along US 13/58/460 as a minimal number of vehicles (under 150 vehicles in each time period) are anticipated to perform a weaving move in this segment.

While the analysis produces results that are less then acceptable, the flyover will improve safety by preventing trucks from having to turn left into the facility and instead allowing trucks to safely crossover the WB traffic to enter the site without changing lanes. Safety is also greatly increased for the traffic wanting to U-turn onto US 13/58/460 WB as motorists are able to utilize the flyover as well. A summary of the results from the analysis are provided in **Tables 3 and 4** and with full reports from HCS analyses provided in **Appendix C**.

### 4.1.2 Weave Segment from Bob Foeller Drive to US 13/58/460 Business Interchange

The weave segment from Bob Foeller Drive onto US 13/58/460 functions at an acceptable LOS C in the AM peak hour for 2040 and an unacceptable LOS in the PM peak hour for 2040. In 2054, both the AM and PM peak hours operated at an unacceptable LOS. The roadway is operating below the acceptable level due to background traffic along US 13/58/460 as minimal volume are anticipated to enter the highway from the SPSA Driveway (under 100 vehicles in each time period). For analysis results summary, see **Tables 3 and 4** and full reports from the HCS analyses in **Appendix C**.

**Table 3: 2040 Build Analysis Results**

| Analysis Year | Primary Street | Freeway Segment | Config. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | LOS | Density (pc/mi/hr) | Max. v/c | LOS | Density (pc/mi/hr) | Max. v/c |
| 2040 Build | US 13 (Portsmouth Boulevard) WB | Bob Foeller Drive to US 13 Business | Weave | C | 23.8 | 0.60 | D | 32.4 | 0.81 |
| | US 13 (Portsmouth Boulevard) WB | US 13 EB Flyover to Bob Foeller Drive | Weave | C | 25.9 | 0.66 | D | 33.1 | 0.81 |

**Table 4: 2054 Build Analysis Results**

| Analysis Year | Primary Street | Freeway Segment | Config. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | LOS | Density (pc/mi/hr) | Max. v/c | LOS | Density (pc/mi/hr) | Max. v/c |
| 2054 Build | US 13 (Portsmouth Boulevard) WB | Bob Foeller Drive to US 13 Business | Weave | D | 34.9 | 0.85 | F | - | 1.14* |
| | US 13 (Portsmouth Boulevard) WB | US 13 EB Flyover to Bob Foeller Drive | Weave | E | 38.5 | 0.92 | F | - | 1.14* |

**v/c ratio over 1.00 is considered to be overcapacity which results in the segment having a LOS of F and no density determined.*

**Figure 5: Future 2040 Build Volumes**

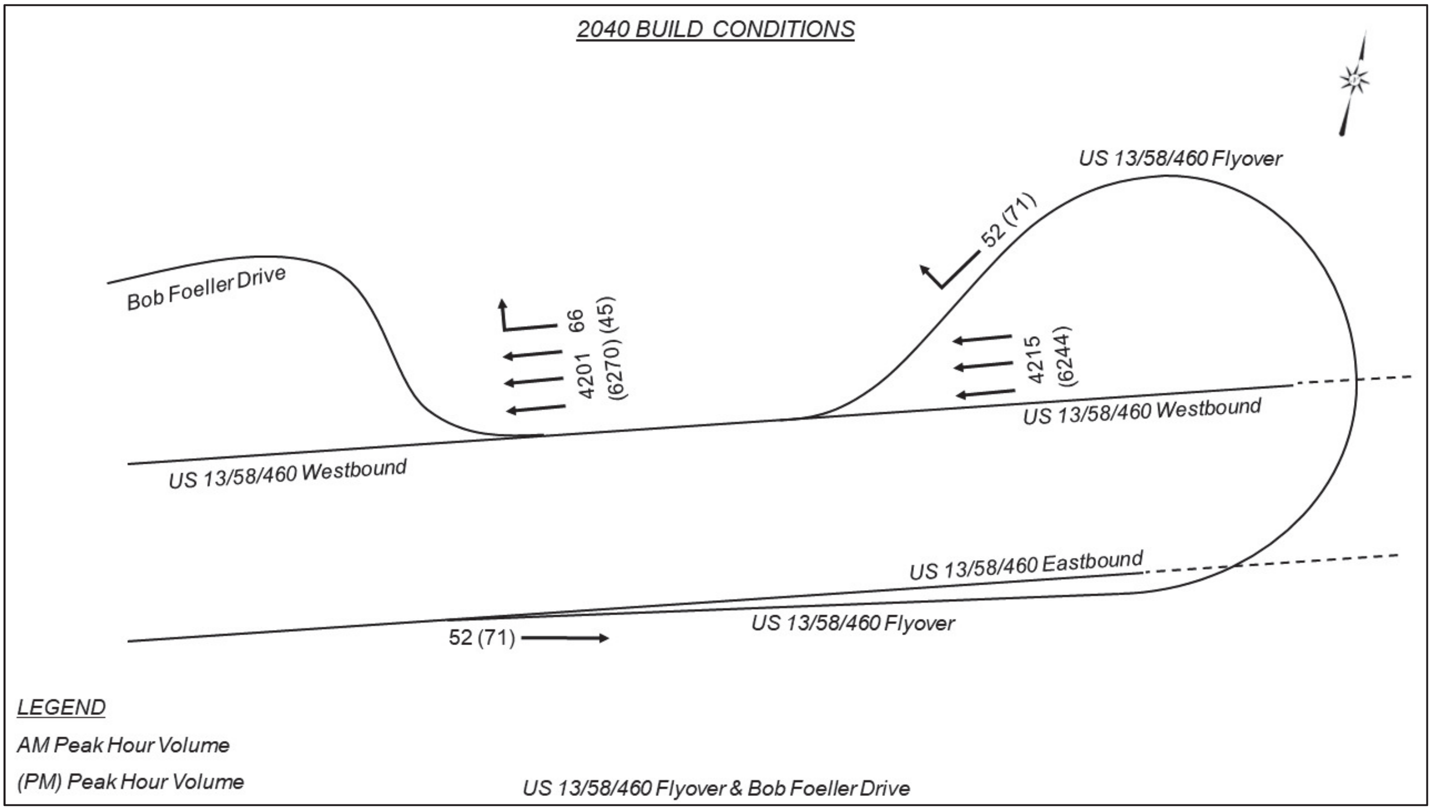
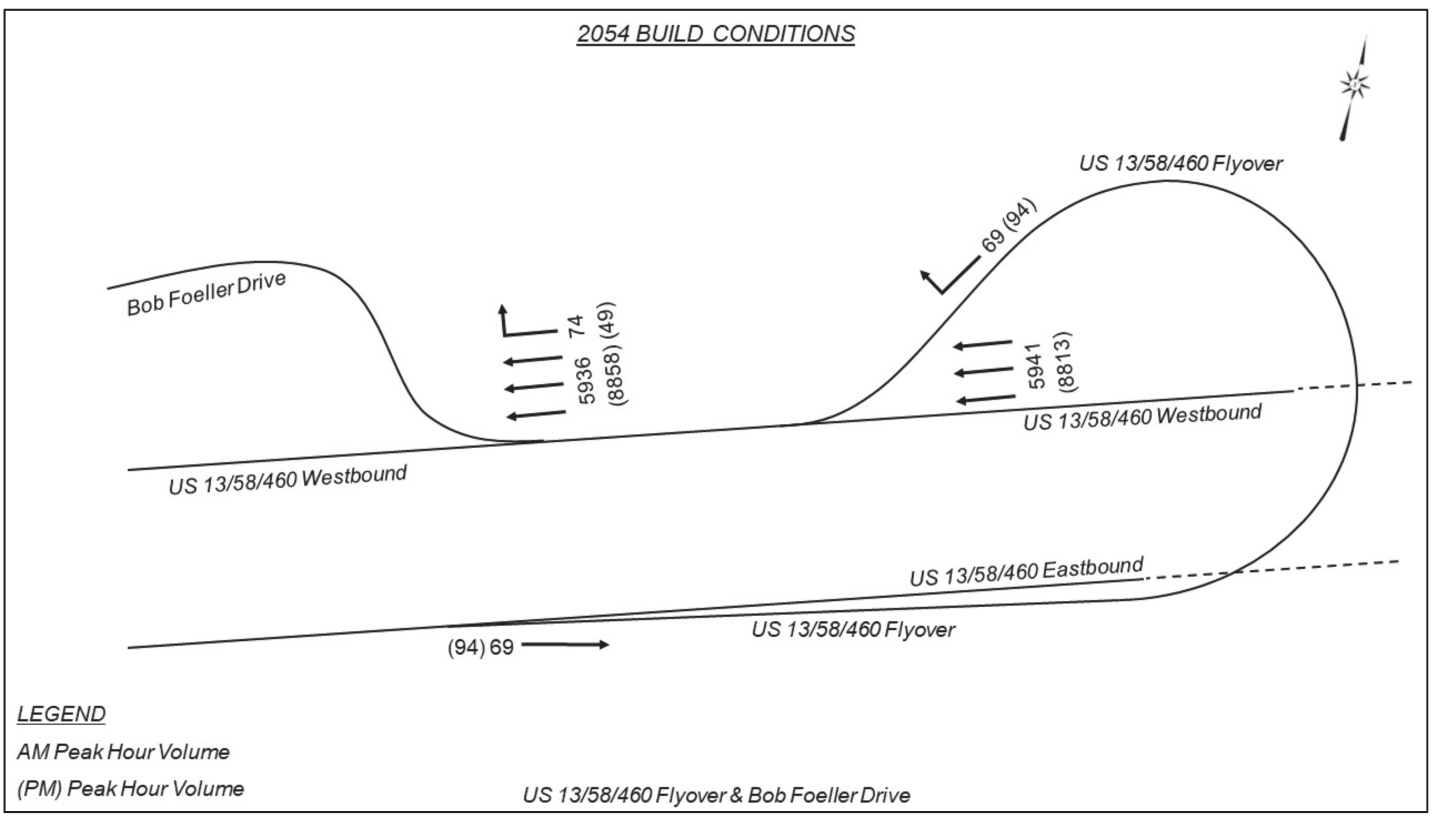



**Figure 6: Future 2054 Build Volumes**



# 5. Conclusion

The Southeastern Public Service Authority (SPSA) is submitting an application to modify Part A of its Solid Waste Permit (Permit No. 417) for its Regional Landfill, located at #1 Bob Foeller Drive in the City of Suffolk. The modification includes a request to increase the solid waste facility boundary by 129 acres to include expansion for Cells VIII and IX, and development of a soil borrow and stormwater management area on the existing property north of Cell VII. This Traffic Impact Study analyzed the traffic conditions of the 2020 No-Build and future year 2040 and 2054 Build scenarios at the intersection and weave segments:

- US 13/58/460 and Bob Foeller Drive/Welsh Parkway – *Intersection (No-Build Only)*
- Bob Foeller Drive to US 13 Business – *Weave Segment (Build and No Build)*
- US 13/58/460 Flyover to Bob Foeller Drive – *Weave Segment (Build Only)*

In the 2020 No-Build scenario, the intersection of US 13/58/460 and Bob Foeller Drive/Welsh Parkway operates at LOS F in both peak hour periods and the weave segment operates with LOS B.

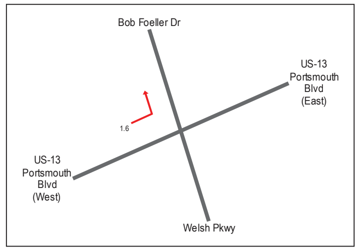
For the 2040 Build conditions, both weave segments were found to operate acceptably at LOS C in the AM peak hour and operated at LOS D in the PM peak hour. For 2054 Build Conditions, both weave segments were found to operate below the acceptable LOS C threshold in each time period. The high densities along US 13/58/460 were due to growth to the background traffic along US 13/58/460. While the analysis produces results that may not show significant improvements with respect to the weave operations, the elimination of the left turn crossover at the existing intersection and replacing this with a flyover will provide a major improvement to safety of users trying to access the site.

# A

Appendix A – Traffic Count Data

**Suffolk, VA**
Classified Traffic Count

**Site 1**
US-13 Portsmouth Blvd
Bob Foeller Dr




**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Movement 1.5 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0015 - 0030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0030 - 0045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0045 - 0100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0100 - 0115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0115 - 0130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0130 - 0145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0145 - 0200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0200 - 0215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0215 - 0230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0230 - 0245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0245 - 0300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0300 - 0315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0315 - 0330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0330 - 0345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0345 - 0400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0400 - 0415 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0415 - 0430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0430 - 0445 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0445 - 0500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0500 - 0515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0515 - 0530 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0530 - 0545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0545 - 0600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0600 - 0615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0615 - 0630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0630 - 0645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0645 - 0700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 0900 - 0915 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 0915 - 0930 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 0930 - 0945 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 0945 - 1000 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1000 - 1015 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1015 - 1030 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1030 - 1045 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1045 - 1100 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| 1100 - 1115 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1115 - 1130 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1130 - 1145 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1145 - 1200 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1200 - 1215 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1215 - 1230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1230 - 1245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1245 - 1300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1300 - 1315 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1315 - 1330 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1330 - 1345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1345 - 1400 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1630 - 1645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1645 - 1700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1700 - 1715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1715 - 1730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1730 - 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1745 - 1800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1800 - 1815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1815 - 1830 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** |
| 1830 - 1845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1845 - 1900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1900 - 1915 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1915 - 1930 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1930 - 1945 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 1945 - 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2000 - 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2015 - 2030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2030 - 2045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2045 - 2100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2100 - 2115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2115 - 2130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2130 - 2145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2145 - 2200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2200 - 2215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2215 - 2230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2230 - 2245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2245 - 2300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2300 - 2315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2315 - 2330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2330 - 2345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| 2345 - 0000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Session Total | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | **45** |
| Session Average | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,36 | 0,00 | 0,10 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | **0,47** |
| Session Percentage | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 77,78 | 0,00 | 22,22 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | - | - | - | - | - | 0930 - 1030 | - | - | - | - | - | - | - | **0930 - 1030** |
| AM Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Noon Peak Hour | - | - | - | - | - | 1430 - 1530 | - | 1045 - 1145 | - | - | - | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **10** |
| PM Peak Hour | - | - | - | - | - | 1500 - 1600 | - | 1730 - 1830 | - | - | - | - | - | **1500 - 1600** |
| PM Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **8** |

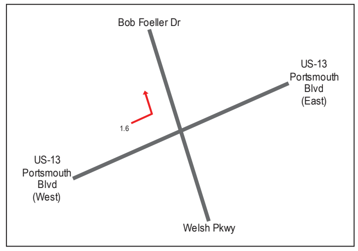
**Suffolk, VA**
Classified Traffic Count

**Site 1**
US-13 Portsmouth Blvd
Bob Foeller Dr

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Bi-Directional 15min | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | TOTAL |
| 0000 - 0015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0015 - 0030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0030 - 0045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0045 - 0100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0100 - 0115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0115 - 0130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0130 - 0145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0145 - 0200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0200 - 0215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0215 - 0230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0230 - 0245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0245 - 0300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0300 - 0315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0315 - 0330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0330 - 0345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0345 - 0400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0400 - 0415 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0415 - 0430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0430 - 0445 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0445 - 0500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0500 - 0515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0515 - 0530 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0530 - 0545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0545 - 0600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0600 - 0615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0615 - 0630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0630 - 0645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0645 - 0700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0900 - 0915 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0915 - 0930 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0930 - 0945 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0945 - 1000 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1000 - 1015 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1015 - 1030 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1030 - 1045 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1045 - 1100 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| 1100 - 1115 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1115 - 1130 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1130 - 1145 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1145 - 1200 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1200 - 1215 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1215 - 1230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1230 - 1245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1245 - 1300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1300 - 1315 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1315 - 1330 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1330 - 1345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1345 - 1400 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1630 - 1645 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1645 - 1700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1700 - 1715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1715 - 1730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1730 - 1745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1745 - 1800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1800 - 1815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1815 - 1830 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1830 - 1845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1845 - 1900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1900 - 1915 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1915 - 1930 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1930 - 1945 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1945 - 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 - 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 - 2030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2030 - 2045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2045 - 2100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2100 - 2115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2115 - 2130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2130 - 2145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2145 - 2200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2200 - 2215 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2215 - 2230 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2230 - 2245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2245 - 2300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2300 - 2315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2315 - 2330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2330 - 2345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2345 - 0000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Session Total | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 45 |
| Session Average | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,36 | 0,00 | 0,10 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,47 |
| Session Percentage | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 77,78 | 0,00 | 22,22 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | - | - | - | - | - | 0930 - 1030 | - | - | - | - | - | - | - | 0930 - 1030 |
| AM Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Noon Peak Hour | - | - | - | - | - | 1430 - 1530 | - | 1045 - 1145 | - | - | - | - | - | 1445 - 1545 |
| Noon Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 10 |
| PM Peak Hour | - | - | - | - | - | 1500 - 1600 | - | 1730 - 1830 | - | - | - | - | - | 1500 - 1600 |
| PM Peak Hour Volume | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 8 |

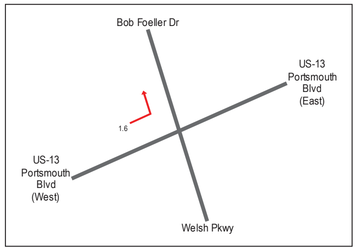
**Suffolk, VA**
Classified Traffic Count

**Site 1**
US-13 Portsmouth Blvd
Bob Foeller Dr

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

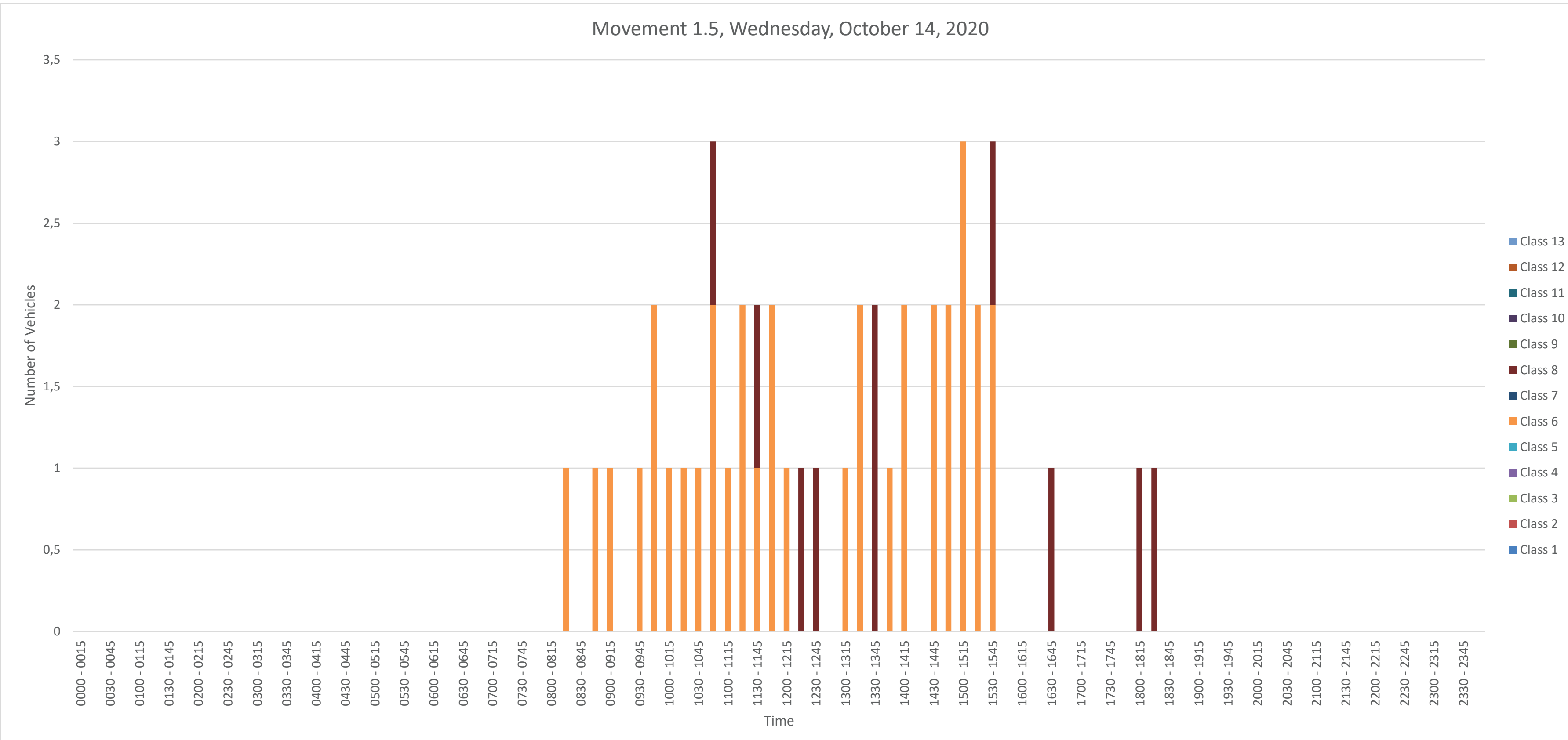



0000 - 2400 (Weekday 24h Session)

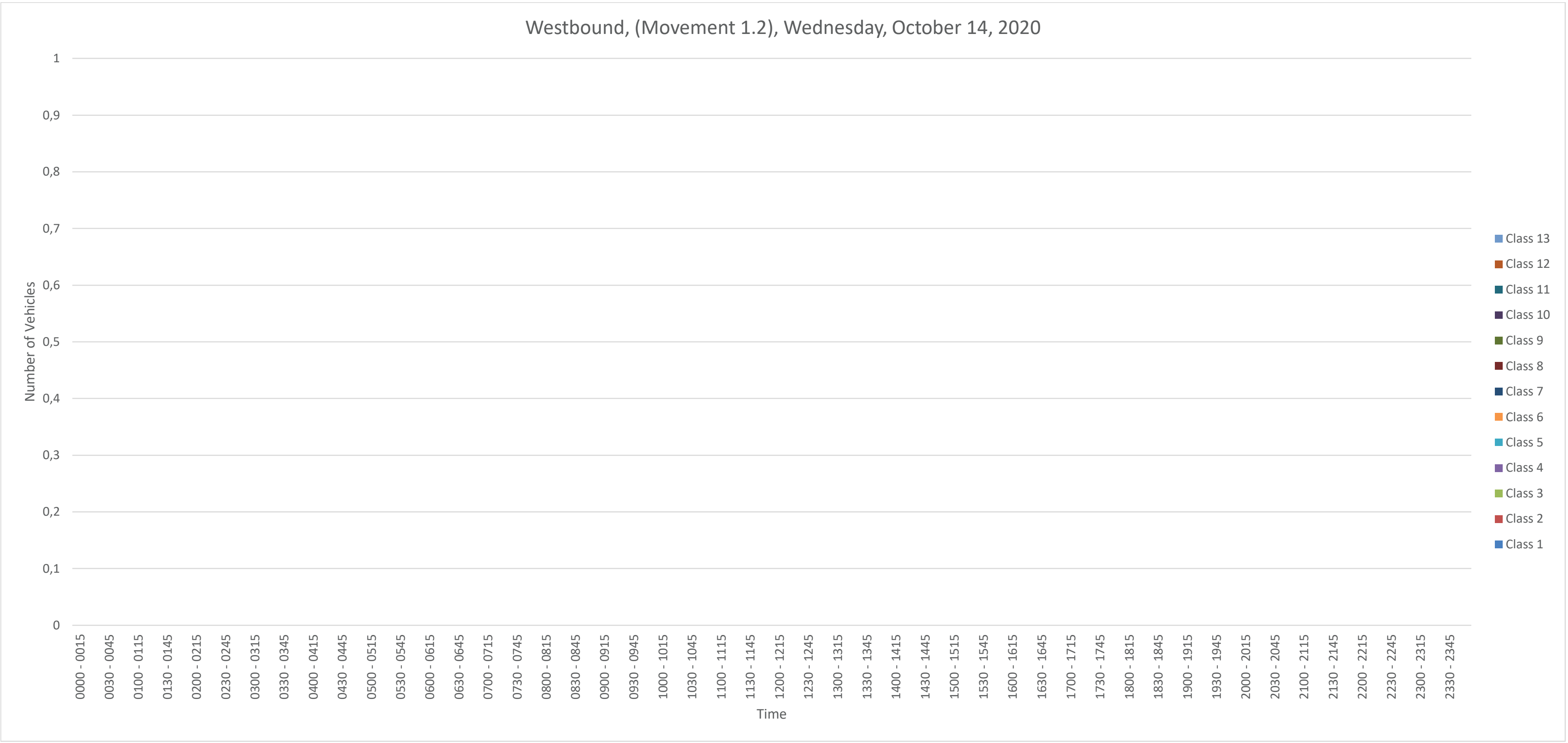
undertaken on Tuesday, October 13th, 2020

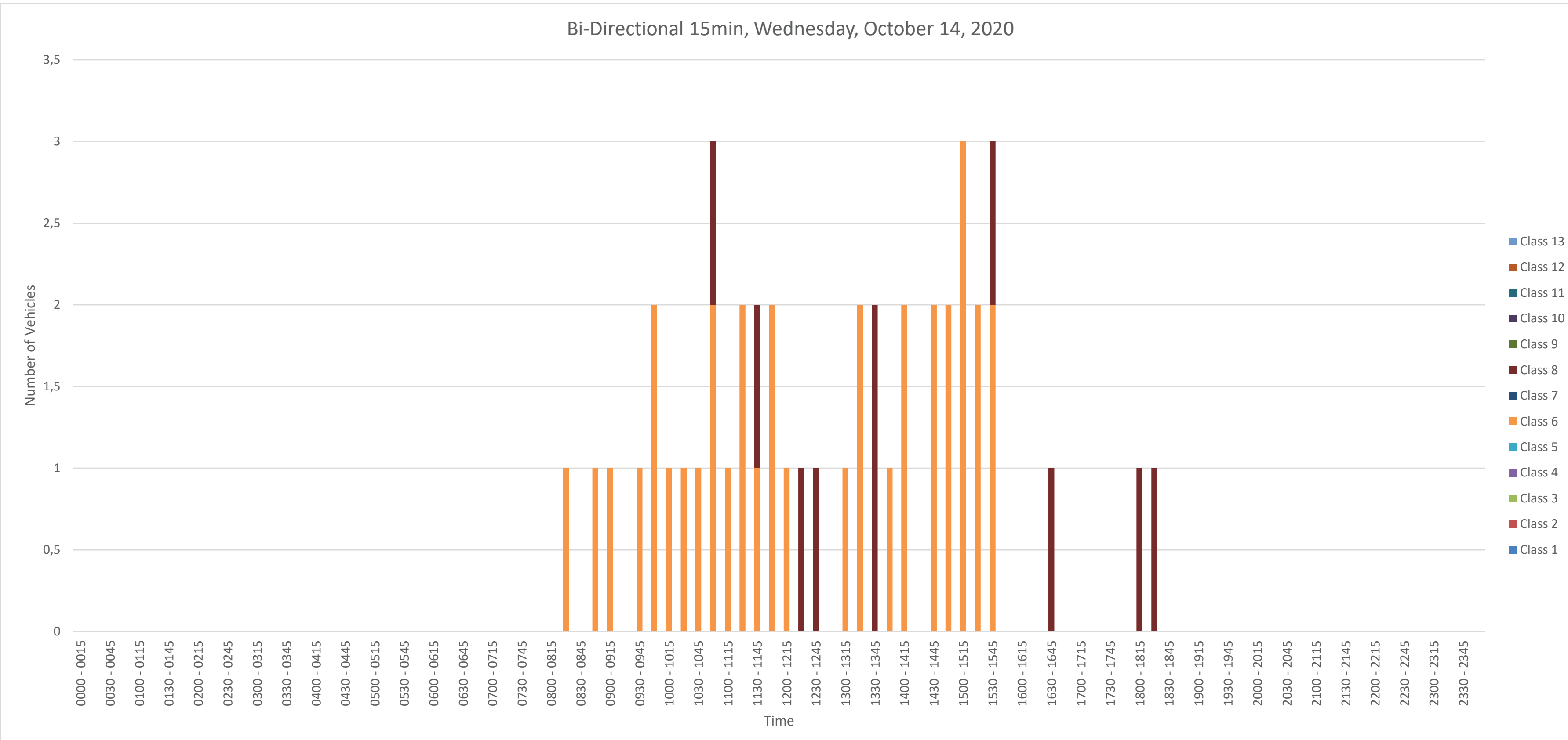
| | Site 1 | | |
|---|---|---|---|
| TIME | EB | WB | **TOTAL** |
| 0000 - 0015 | 0 | 0 | **0** |
| 0015 - 0030 | 0 | 0 | **0** |
| 0030 - 0045 | 0 | 0 | **0** |
| 0045 - 0100 | 0 | 0 | **0** |
| 0100 - 0115 | 0 | 0 | **0** |
| 0115 - 0130 | 0 | 0 | **0** |
| 0130 - 0145 | 0 | 0 | **0** |
| 0145 - 0200 | 0 | 0 | **0** |
| 0200 - 0215 | 0 | 0 | **0** |
| 0215 - 0230 | 0 | 0 | **0** |
| 0230 - 0245 | 0 | 0 | **0** |
| 0245 - 0300 | 0 | 0 | **0** |
| 0300 - 0315 | 0 | 0 | **0** |
| 0315 - 0330 | 0 | 0 | **0** |
| 0330 - 0345 | 0 | 0 | **0** |
| 0345 - 0400 | 0 | 0 | **0** |
| 0400 - 0415 | 0 | 0 | **0** |
| 0415 - 0430 | 0 | 0 | **0** |
| 0430 - 0445 | 0 | 0 | **0** |
| 0445 - 0500 | 0 | 0 | **0** |
| 0500 - 0515 | 0 | 0 | **0** |
| 0515 - 0530 | 0 | 0 | **0** |
| 0530 - 0545 | 0 | 0 | **0** |
| 0545 - 0600 | 0 | 0 | **0** |
| 0600 - 0615 | 0 | 0 | **0** |
| 0615 - 0630 | 0 | 0 | **0** |
| 0630 - 0645 | 0 | 0 | **0** |
| 0645 - 0700 | 0 | 0 | **0** |
| 0700 - 0715 | 0 | 0 | **0** |
| 0715 - 0730 | 0 | 0 | **0** |
| 0730 - 0745 | 0 | 0 | **0** |
| 0745 - 0800 | 0 | 0 | **0** |
| 0800 - 0815 | 0 | 0 | **0** |
| 0815 - 0830 | 1 | 0 | **1** |
| 0830 - 0845 | 0 | 0 | **0** |
| 0845 - 0900 | 1 | 0 | **1** |
| 0900 - 0915 | 1 | 0 | **1** |
| 0915 - 0930 | 0 | 0 | **0** |
| 0930 - 0945 | 1 | 0 | **1** |
| 0945 - 1000 | 2 | 0 | **2** |
| 1000 - 1015 | 1 | 0 | **1** |
| 1015 - 1030 | 1 | 0 | **1** |
| 1030 - 1045 | 1 | 0 | **1** |
| 1045 - 1100 | 3 | 0 | **3** |
| 1100 - 1115 | 1 | 0 | **1** |
| 1115 - 1130 | 2 | 0 | **2** |
| 1130 - 1145 | 2 | 0 | **2** |
| 1145 - 1200 | 2 | 0 | **2** |
| 1200 - 1215 | 1 | 0 | **1** |
| 1215 - 1230 | 1 | 0 | **1** |
| 1230 - 1245 | 1 | 0 | **1** |
| 1245 - 1300 | 0 | 0 | **0** |
| 1300 - 1315 | 1 | 0 | **1** |
| 1315 - 1330 | 2 | 0 | **2** |
| 1330 - 1345 | 2 | 0 | **2** |
| 1345 - 1400 | 1 | 0 | **1** |
| 1400 - 1415 | 2 | 0 | **2** |
| 1415 - 1430 | 0 | 0 | **0** |
| 1430 - 1445 | 2 | 0 | **2** |
| 1445 - 1500 | 2 | 0 | **2** |
| 1500 - 1515 | 3 | 0 | **3** |
| 1515 - 1530 | 2 | 0 | **2** |
| 1530 - 1545 | 3 | 0 | **3** |
| 1545 - 1600 | 0 | 0 | **0** |
| 1600 - 1615 | 0 | 0 | **0** |
| 1615 - 1630 | 0 | 0 | **0** |
| 1630 - 1645 | 1 | 0 | **1** |
| 1645 - 1700 | 0 | 0 | **0** |
| 1700 - 1715 | 0 | 0 | **0** |
| 1715 - 1730 | 0 | 0 | **0** |
| 1730 - 1745 | 0 | 0 | **0** |
| 1745 - 1800 | 0 | 0 | **0** |
| 1800 - 1815 | 1 | 0 | **1** |
| 1815 - 1830 | 1 | 0 | **1** |
| 1830 - 1845 | 0 | 0 | **0** |
| 1845 - 1900 | 0 | 0 | **0** |
| 1900 - 1915 | 0 | 0 | **0** |
| 1915 - 1930 | 0 | 0 | **0** |
| 1930 - 1945 | 0 | 0 | **0** |
| 1945 - 2000 | 0 | 0 | **0** |
| 2000 - 2015 | 0 | 0 | **0** |
| 2015 - 2030 | 0 | 0 | **0** |
| 2030 - 2045 | 0 | 0 | **0** |
| 2045 - 2100 | 0 | 0 | **0** |
| 2100 - 2115 | 0 | 0 | **0** |
| 2115 - 2130 | 0 | 0 | **0** |
| 2130 - 2145 | 0 | 0 | **0** |
| 2145 - 2200 | 0 | 0 | **0** |
| 2200 - 2215 | 0 | 0 | **0** |
| 2215 - 2230 | 0 | 0 | **0** |
| 2230 - 2245 | 0 | 0 | **0** |
| 2245 - 2300 | 0 | 0 | **0** |
| 2300 - 2315 | 0 | 0 | **0** |
| 2315 - 2330 | 0 | 0 | **0** |
| 2330 - 2345 | 0 | 0 | **0** |
| 2345 - 0000 | 0 | 0 | **0** |

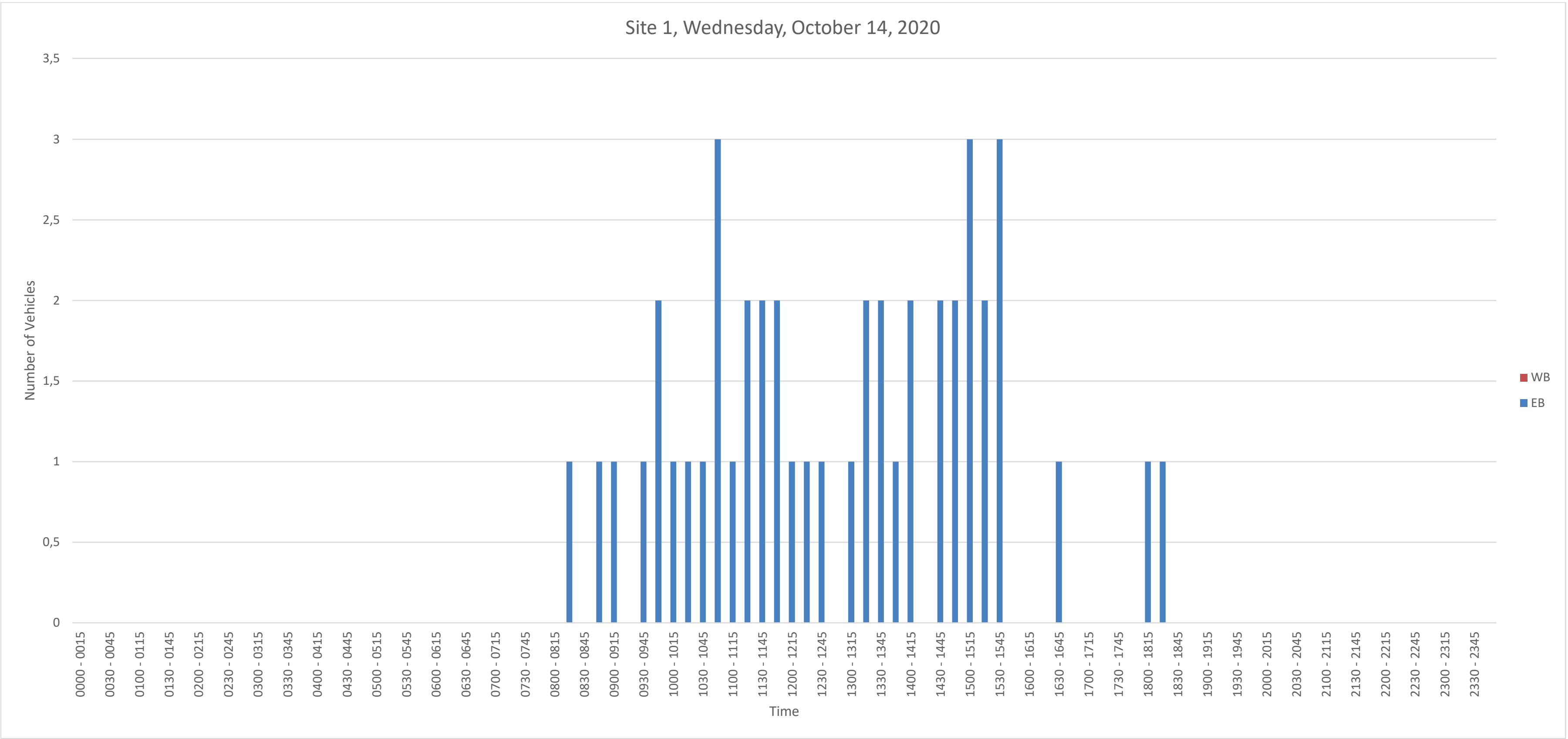
| | | | |
|---|---|---|---|
| Session Total | 45 | 0 | **45** |
| Session Average | 0,47 | 0,00 | **0,47** |



Movement 1.5, Wednesday, October 14, 2020
Number of Vehicles
Time
0
0,5
1
1,5
2
2,5
3
3,5
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Westbound, (Movement 1.2), Wednesday, October 14, 2020
Number of Vehicles
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Bi-Directional 15min, Wednesday, October 14, 2020
Number of Vehicles
3,5
3
2,5
2
1,5
1
0,5
0
Time
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1



Site 1, Wednesday, October 14, 2020
Number of Vehicles
3,5
3
2,5
2
1,5
1
0,5
0
WB
EB
Time
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345

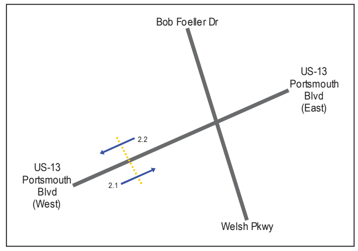
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)
Eastbound / Westbound

undertaken on Tuesday, October 13th, 2020

| | Eastbound, (Movement 2.1) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0015 | 0 | 40 | 1 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 0 | 4 | 0 | **53** |
| 0015 - 0030 | 0 | 59 | 0 | 0 | 1 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **67** |
| 0030 - 0045 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 3 | 0 | **57** |
| 0045 - 0100 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | **45** |
| 0100 - 0115 | 0 | 36 | 1 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | **47** |
| 0115 - 0130 | 0 | 23 | 2 | 0 | 0 | 1 | 0 | 0 | 6 | 0 | 0 | 3 | 0 | **35** |
| 0130 - 0145 | 0 | 32 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **36** |
| 0145 - 0200 | 0 | 24 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | **34** |
| 0200 - 0215 | 0 | 20 | 0 | 0 | 3 | 1 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | **33** |
| 0215 - 0230 | 0 | 39 | 1 | 0 | 0 | 2 | 0 | 1 | 4 | 0 | 0 | 1 | 0 | **48** |
| 0230 - 0245 | 0 | 49 | 1 | 0 | 4 | 0 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | **62** |
| 0245 - 0300 | 0 | 34 | 2 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 1 | 0 | **51** |
| 0300 - 0315 | 0 | 54 | 1 | 0 | 2 | 1 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | **68** |
| 0315 - 0330 | 0 | 54 | 4 | 0 | 3 | 0 | 0 | 2 | 11 | 0 | 0 | 1 | 0 | **75** |
| 0330 - 0345 | 0 | 65 | 2 | 0 | 3 | 1 | 0 | 1 | 20 | 0 | 0 | 2 | 0 | **94** |
| 0345 - 0400 | 0 | 108 | 2 | 0 | 1 | 1 | 0 | 0 | 15 | 0 | 0 | 3 | 0 | **130** |
| 0400 - 0415 | 0 | 126 | 5 | 0 | 1 | 1 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | **149** |
| 0415 - 0430 | 0 | 164 | 8 | 0 | 4 | 0 | 0 | 0 | 13 | 0 | 0 | 3 | 0 | **192** |
| 0430 - 0445 | 0 | 252 | 8 | 0 | 3 | 0 | 0 | 0 | 18 | 0 | 0 | 1 | 0 | **282** |
| 0445 - 0500 | 2 | 389 | 24 | 0 | 5 | 6 | 0 | 0 | 18 | 0 | 0 | 4 | 0 | **448** |
| 0500 - 0515 | 2 | 412 | 41 | 0 | 14 | 4 | 0 | 0 | 19 | 0 | 0 | 1 | 0 | **493** |
| 0515 - 0530 | 0 | 461 | 56 | 0 | 6 | 2 | 0 | 0 | 30 | 0 | 2 | 3 | 0 | **560** |
| 0530 - 0545 | 5 | 514 | 77 | 0 | 4 | 4 | 0 | 5 | 43 | 1 | 3 | 2 | 0 | **658** |
| 0545 - 0600 | 0 | 482 | 68 | 0 | 7 | 4 | 0 | 5 | 43 | 0 | 1 | 1 | 0 | **611** |
| 0600 - 0615 | 1 | 580 | 54 | 0 | 8 | 1 | 0 | 0 | 49 | 0 | 1 | 4 | 0 | **698** |
| 0615 - 0630 | 6 | 699 | 54 | 0 | 4 | 3 | 0 | 1 | 38 | 0 | 0 | 1 | 0 | **806** |
| 0630 - 0645 | 2 | 698 | 95 | 2 | 11 | 3 | 0 | 1 | 38 | 0 | 0 | 2 | 0 | **852** |
| 0645 - 0700 | 4 | 563 | 141 | 2 | 5 | 10 | 0 | 0 | 49 | 0 | 0 | 3 | 0 | **777** |
| 0700 - 0715 | 4 | 549 | 148 | 0 | 14 | 6 | 0 | 2 | 52 | 3 | 0 | 4 | 0 | **782** |
| 0715 - 0730 | 6 | 705 | 154 | 0 | 13 | 8 | 0 | 2 | 60 | 0 | 3 | 2 | 0 | **953** |
| 0730 - 0745 | 0 | 576 | 162 | 0 | 13 | 8 | 0 | 1 | 50 | 0 | 0 | 0 | 0 | **810** |
| 0745 - 0800 | 2 | 539 | 131 | 0 | 10 | 3 | 0 | 3 | 38 | 1 | 1 | 0 | 0 | **728** |
| 0800 - 0815 | 0 | 463 | 113 | 0 | 19 | 11 | 0 | 3 | 60 | 0 | 0 | 0 | 0 | **669** |
| 0815 - 0830 | 0 | 400 | 146 | 1 | 17 | 11 | 0 | 2 | 60 | 0 | 0 | 3 | 0 | **640** |
| 0830 - 0845 | 0 | 392 | 111 | 0 | 19 | 13 | 0 | 2 | 58 | 2 | 2 | 0 | 0 | **599** |
| 0845 - 0900 | 1 | 333 | 101 | 0 | 10 | 12 | 0 | 3 | 55 | 2 | 1 | 0 | 0 | **518** |
| 0900 - 0915 | 1 | 275 | 97 | 0 | 12 | 8 | 0 | 1 | 47 | 1 | 1 | 1 | 0 | **444** |
| 0915 - 0930 | 1 | 329 | 88 | 1 | 7 | 4 | 0 | 1 | 58 | 1 | 0 | 0 | 0 | **490** |
| 0930 - 0945 | 0 | 335 | 75 | 0 | 20 | 10 | 0 | 2 | 66 | 0 | 0 | 0 | 0 | **508** |
| 0945 - 1000 | 3 | 299 | 78 | 0 | 14 | 5 | 0 | 4 | 62 | 0 | 1 | 0 | 0 | **466** |
| 1000 - 1015 | 2 | 297 | 91 | 0 | 16 | 7 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | **475** |
| 1015 - 1030 | 1 | 312 | 87 | 0 | 15 | 12 | 0 | 0 | 69 | 0 | 0 | 0 | 0 | **496** |
| 1030 - 1045 | 0 | 303 | 90 | 1 | 15 | 15 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | **489** |
| 1045 - 1100 | 1 | 331 | 105 | 0 | 13 | 8 | 0 | 1 | 94 | 1 | 0 | 0 | 0 | **554** |
| 1100 - 1115 | 1 | 313 | 88 | 0 | 10 | 5 | 0 | 0 | 86 | 0 | 0 | 0 | 0 | **503** |
| 1115 - 1130 | 2 | 325 | 101 | 1 | 6 | 10 | 3 | 0 | 64 | 0 | 0 | 0 | 0 | **512** |
| 1130 - 1145 | 0 | 320 | 93 | 1 | 10 | 11 | 3 | 2 | 79 | 1 | 0 | 0 | 0 | **520** |
| 1145 - 1200 | 3 | 335 | 85 | 0 | 17 | 19 | 0 | 2 | 62 | 0 | 0 | 0 | 0 | **523** |
| 1200 - 1215 | 0 | 313 | 90 | 1 | 20 | 8 | 5 | 2 | 65 | 0 | 0 | 0 | 0 | **504** |
| 1215 - 1230 | 0 | 343 | 79 | 0 | 17 | 4 | 2 | 1 | 65 | 2 | 0 | 0 | 0 | **513** |
| 1230 - 1245 | 1 | 319 | 75 | 0 | 12 | 12 | 3 | 2 | 73 | 4 | 0 | 0 | 0 | **501** |
| 1245 - 1300 | 0 | 338 | 102 | 1 | 18 | 9 | 1 | 1 | 56 | 0 | 0 | 0 | 0 | **526** |
| 1300 - 1315 | 2 | 298 | 96 | 0 | 16 | 7 | 2 | 3 | 62 | 2 | 0 | 0 | 0 | **488** |
| 1315 - 1330 | 2 | 342 | 105 | 1 | 18 | 6 | 2 | 3 | 62 | 1 | 0 | 0 | 0 | **542** |
| 1330 - 1345 | 0 | 343 | 98 | 0 | 19 | 14 | 1 | 4 | 50 | 3 | 0 | 0 | 0 | **532** |
| 1345 - 1400 | 0 | 337 | 97 | 1 | 22 | 8 | 1 | 0 | 45 | 1 | 0 | 0 | 0 | **512** |
| 1400 - 1415 | 2 | 348 | 130 | 0 | 18 | 12 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | **563** |
| 1415 - 1430 | 1 | 386 | 127 | 0 | 18 | 8 | 0 | 1 | 49 | 0 | 0 | 0 | 0 | **590** |
| 1430 - 1445 | 1 | 373 | 111 | 0 | 17 | 12 | 1 | 1 | 57 | 2 | 0 | 0 | 0 | **575** |
| 1445 - 1500 | 2 | 390 | 111 | 0 | 13 | 7 | 0 | 3 | 50 | 2 | 0 | 0 | 0 | **578** |
| 1500 - 1515 | 0 | 421 | 123 | 0 | 25 | 8 | 2 | 2 | 44 | 0 | 0 | 0 | 0 | **625** |
| 1515 - 1530 | 0 | 476 | 125 | 5 | 16 | 13 | 2 | 0 | 36 | 0 | 0 | 0 | 0 | **673** |
| 1530 - 1545 | 1 | 532 | 154 | 1 | 13 | 13 | 1 | 3 | 33 | 2 | 0 | 0 | 0 | **753** |
| 1545 - 1600 | 1 | 464 | 120 | 0 | 16 | 6 | 0 | 0 | 33 | 1 | 0 | 0 | 0 | **641** |
| 1600 - 1615 | 1 | 510 | 116 | 0 | 15 | 10 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | **699** |
| 1615 - 1630 | 4 | 504 | 105 | 1 | 15 | 6 | 0 | 3 | 31 | 0 | 0 | 0 | 0 | **669** |
| 1630 - 1645 | 1 | 488 | 99 | 0 | 7 | 3 | 1 | 8 | 33 | 1 | 1 | 0 | 0 | **642** |
| 1645 - 1700 | 2 | 480 | 96 | 0 | 14 | 1 | 0 | 2 | 34 | 1 | 1 | 0 | 0 | **631** |
| 1700 - 1715 | 1 | 537 | 102 | 0 | 11 | 7 | 0 | 3 | 25 | 0 | 0 | 0 | 0 | **686** |
| 1715 - 1730 | 1 | 556 | 72 | 0 | 20 | 3 | 0 | 3 | 34 | 2 | 0 | 0 | 0 | **691** |
| 1730 - 1745 | 1 | 476 | 105 | 0 | 9 | 3 | 0 | 2 | 27 | 0 | 0 | 0 | 0 | **623** |
| 1745 - 1800 | 0 | 428 | 78 | 0 | 11 | 6 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | **550** |
| 1800 - 1815 | 1 | 398 | 87 | 0 | 9 | 3 | 0 | 3 | 22 | 0 | 0 | 0 | 0 | **523** |
| 1815 - 1830 | 0 | 401 | 74 | 0 | 8 | 2 | 0 | 5 | 16 | 0 | 0 | 1 | 0 | **507** |
| 1830 - 1845 | 3 | 274 | 60 | 0 | 10 | 4 | 0 | 2 | 22 | 0 | 0 | 0 | 0 | **375** |
| 1845 - 1900 | 0 | 267 | 58 | 0 | 4 | 2 | 0 | 2 | 20 | 0 | 0 | 0 | 0 | **353** |
| 1900 - 1915 | 0 | 311 | 14 | 0 | 7 | 0 | 0 | 1 | 16 | 0 | 0 | 0 | 0 | **349** |
| 1915 - 1930 | 3 | 295 | 17 | 0 | 6 | 0 | 0 | 2 | 17 | 0 | 0 | 0 | 0 | **340** |
| 1930 - 1945 | 1 | 274 | 14 | 0 | 4 | 1 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | **309** |
| 1945 - 2000 | 0 | 222 | 6 | 0 | 2 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | **248** |
| 2000 - 2015 | 0 | 206 | 10 | 0 | 2 | 0 | 0 | 1 | 22 | 0 | 0 | 0 | 0 | **241** |
| 2015 - 2030 | 1 | 210 | 6 | 0 | 3 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | **234** |
| 2030 - 2045 | 0 | 208 | 3 | 0 | 4 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | **231** |
| 2045 - 2100 | 0 | 192 | 5 | 0 | 1 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **209** |
| 2100 - 2115 | 0 | 171 | 4 | 0 | 4 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | **191** |
| 2115 - 2130 | 0 | 149 | 1 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **159** |
| 2130 - 2145 | 0 | 127 | 2 | 0 | 6 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **143** |
| 2145 - 2200 | 0 | 124 | 2 | 0 | 3 | 0 | 0 | 2 | 10 | 0 | 0 | 2 | 0 | **143** |
| 2200 - 2215 | 1 | 102 | 1 | 0 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | **115** |
| 2215 - 2230 | 0 | 112 | 1 | 0 | 2 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | **132** |
| 2230 - 2245 | 0 | 90 | 2 | 0 | 2 | 0 | 0 | 2 | 8 | 0 | 0 | 2 | 0 | **106** |
| 2245 - 2300 | 0 | 93 | 1 | 0 | 2 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | **108** |
| 2300 - 2315 | 0 | 91 | 1 | 0 | 3 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **102** |
| 2315 - 2330 | 0 | 81 | 0 | 0 | 2 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **93** |
| 2330 - 2345 | 0 | 79 | 0 | 0 | 2 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **89** |
| 2345 - 0000 | 0 | 57 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **64** |
| Session Total | 84 | 28323 | 5678 | 20 | 834 | 432 | 30 | 116 | 3173 | 37 | 18 | 66 | 0 | **38811** |
| Session Average | 0,88 | 295,03 | 59,15 | 0,21 | 8,69 | 4,50 | 0,31 | 1,21 | 33,05 | 0,39 | 0,19 | 0,69 | 0,00 | **404,28** |
| Session Percentage | 0,22 | 72,98 | 14,63 | 0,05 | 2,15 | 1,11 | 0,08 | 0,30 | 8,18 | 0,10 | 0,05 | 0,17 | 0,00 | |
| AM Peak Hour | 0615 - 0715 | 0600 - 0700 | 0645 - 0745 | 0600 - 0700 | 0745 - 0845 | 0800 - 0900 | - | 0530 - 0630 | 0930 - 1030 | 0830 - 0930 | 0515 - 0615 | 0630 - 0730 | - | **0630 - 0730** |
| AM Peak Hour Volume | 16 | 2540 | 605 | 4 | 65 | 47 | 0 | 11 | 259 | 6 | 7 | 11 | 0 | **3364** |
| Noon Peak Hour | 1100 - 1200 | 1445 - 1545 | 1445 - 1545 | 1445 - 1545 | 1315 - 1415 | 1115 - 1215 | 1115 - 1215 | 1245 - 1345 | 1045 - 1145 | 1215 - 1315 | - | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 6 | 1819 | 513 | 6 | 77 | 48 | 11 | 11 | 323 | 8 | 0 | 0 | 0 | **2629** |
| PM Peak Hour | 1600 - 1700 | 1630 - 1730 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1515 - 1615 | 1500 - 1600 | 1615 - 1715 | 1515 - 1615 | 1630 - 1730 | 1600 - 1700 | 1730 - 1830 | - | **1515 - 1615** |
| PM Peak Hour Volume | 8 | 2061 | 522 | 6 | 70 | 42 | 5 | 16 | 149 | 4 | 2 | 1 | 0 | **2766** |

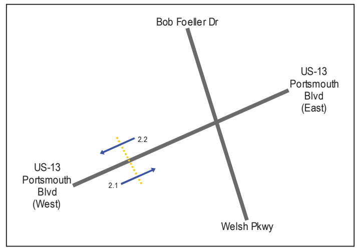
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Westbound, (Movement 2.2) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | TOTAL |
| 0000 - 0015 | 0 | 43 | 18 | 0 | 0 | 1 | 0 | 1 | 7 | 0 | 1 | 0 | 0 | **71** |
| 0015 - 0030 | 0 | 55 | 30 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **95** |
| 0030 - 0045 | 1 | 22 | 24 | 0 | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **58** |
| 0045 - 0100 | 0 | 25 | 17 | 0 | 2 | 0 | 0 | 0 | 12 | 0 | 1 | 0 | 0 | **57** |
| 0100 - 0115 | 0 | 19 | 22 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **52** |
| 0115 - 0130 | 0 | 55 | 40 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | **102** |
| 0130 - 0145 | 0 | 44 | 14 | 0 | 1 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **71** |
| 0145 - 0200 | 0 | 29 | 15 | 0 | 2 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | **57** |
| 0200 - 0215 | 0 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | **33** |
| 0215 - 0230 | 0 | 25 | 19 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | **51** |
| 0230 - 0245 | 0 | 15 | 9 | 0 | 1 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | **37** |
| 0245 - 0300 | 0 | 18 | 10 | 0 | 0 | 1 | 0 | 0 | 11 | 0 | 1 | 1 | 0 | **42** |
| 0300 - 0315 | 0 | 11 | 16 | 0 | 1 | 2 | 0 | 1 | 25 | 0 | 1 | 0 | 0 | **57** |
| 0315 - 0330 | 0 | 12 | 13 | 0 | 1 | 1 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | **44** |
| 0330 - 0345 | 0 | 22 | 12 | 0 | 2 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | **55** |
| 0345 - 0400 | 0 | 24 | 13 | 0 | 0 | 1 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | **56** |
| 0400 - 0415 | 0 | 31 | 14 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 1 | 0 | 0 | **67** |
| 0415 - 0430 | 0 | 59 | 18 | 0 | 0 | 1 | 0 | 1 | 28 | 0 | 1 | 1 | 0 | **109** |
| 0430 - 0445 | 0 | 81 | 23 | 0 | 1 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0 | **142** |
| 0445 - 0500 | 0 | 83 | 27 | 0 | 2 | 2 | 0 | 1 | 19 | 0 | 0 | 0 | 0 | **134** |
| 0500 - 0515 | 0 | 118 | 21 | 0 | 3 | 2 | 0 | 0 | 35 | 0 | 1 | 0 | 0 | **180** |
| 0515 - 0530 | 0 | 179 | 49 | 0 | 3 | 0 | 0 | 2 | 31 | 0 | 0 | 0 | 0 | **264** |
| 0530 - 0545 | 0 | 217 | 69 | 0 | 3 | 4 | 0 | 0 | 37 | 0 | 1 | 1 | 0 | **332** |
| 0545 - 0600 | 0 | 170 | 64 | 0 | 4 | 3 | 0 | 1 | 36 | 0 | 0 | 0 | 0 | **278** |
| 0600 - 0615 | 0 | 163 | 62 | 0 | 4 | 2 | 0 | 1 | 34 | 0 | 0 | 0 | 0 | **266** |
| 0615 - 0630 | 0 | 234 | 76 | 0 | 8 | 1 | 0 | 1 | 31 | 0 | 2 | 0 | 0 | **353** |
| 0630 - 0645 | 0 | 277 | 105 | 0 | 7 | 2 | 0 | 2 | 46 | 0 | 1 | 0 | 0 | **440** |
| 0645 - 0700 | 3 | 280 | 109 | 0 | 12 | 4 | 0 | 2 | 69 | 0 | 0 | 2 | 0 | **481** |
| 0700 - 0715 | 1 | 264 | 96 | 1 | 16 | 5 | 0 | 2 | 57 | 1 | 0 | 0 | 0 | **443** |
| 0715 - 0730 | 1 | 347 | 99 | 0 | 13 | 11 | 0 | 9 | 50 | 2 | 0 | 0 | 0 | **532** |
| 0730 - 0745 | 2 | 424 | 116 | 4 | 16 | 8 | 0 | 7 | 67 | 1 | 0 | 0 | 0 | **645** |
| 0745 - 0800 | 3 | 501 | 134 | 1 | 26 | 7 | 1 | 6 | 66 | 2 | 1 | 0 | 0 | **748** |
| 0800 - 0815 | 2 | 419 | 116 | 1 | 12 | 6 | 0 | 3 | 85 | 1 | 0 | 0 | 0 | **645** |
| 0815 - 0830 | 0 | 358 | 134 | 1 | 16 | 11 | 0 | 6 | 67 | 3 | 0 | 0 | 0 | **596** |
| 0830 - 0845 | 2 | 295 | 106 | 1 | 25 | 10 | 1 | 5 | 64 | 1 | 0 | 0 | 0 | **510** |
| 0845 - 0900 | 7 | 328 | 113 | 0 | 13 | 9 | 2 | 3 | 71 | 2 | 0 | 0 | 0 | **548** |
| 0900 - 0915 | 0 | 282 | 122 | 1 | 16 | 9 | 0 | 1 | 72 | 1 | 0 | 0 | 0 | **504** |
| 0915 - 0930 | 1 | 258 | 95 | 0 | 23 | 9 | 0 | 0 | 86 | 0 | 0 | 0 | 0 | **472** |
| 0930 - 0945 | 2 | 266 | 119 | 0 | 35 | 9 | 0 | 2 | 67 | 0 | 0 | 0 | 0 | **500** |
| 0945 - 1000 | 1 | 301 | 113 | 0 | 11 | 5 | 0 | 2 | 76 | 0 | 0 | 0 | 0 | **509** |
| 1000 - 1015 | 1 | 263 | 106 | 0 | 10 | 10 | 0 | 0 | 59 | 0 | 2 | 0 | 0 | **451** |
| 1015 - 1030 | 0 | 257 | 123 | 1 | 19 | 11 | 0 | 2 | 62 | 0 | 0 | 0 | 0 | **475** |
| 1030 - 1045 | 0 | 256 | 122 | 1 | 16 | 12 | 0 | 3 | 76 | 1 | 0 | 0 | 0 | **487** |
| 1045 - 1100 | 3 | 319 | 97 | 1 | 8 | 8 | 0 | 0 | 69 | 0 | 0 | 0 | 0 | **505** |
| 1100 - 1115 | 1 | 275 | 112 | 1 | 17 | 9 | 0 | 2 | 57 | 0 | 0 | 0 | 0 | **474** |
| 1115 - 1130 | 2 | 297 | 110 | 0 | 16 | 12 | 0 | 1 | 53 | 0 | 0 | 0 | 0 | **491** |
| 1130 - 1145 | 14 | 324 | 120 | 0 | 12 | 14 | 0 | 2 | 56 | 0 | 0 | 0 | 0 | **542** |
| 1145 - 1200 | 2 | 296 | 127 | 0 | 16 | 13 | 0 | 1 | 67 | 0 | 0 | 0 | 0 | **522** |
| 1200 - 1215 | 3 | 274 | 92 | 0 | 16 | 7 | 2 | 4 | 68 | 0 | 0 | 0 | 0 | **466** |
| 1215 - 1230 | 0 | 346 | 120 | 2 | 18 | 6 | 2 | 5 | 65 | 0 | 0 | 0 | 0 | **564** |
| 1230 - 1245 | 1 | 286 | 119 | 2 | 14 | 4 | 2 | 3 | 62 | 2 | 0 | 0 | 0 | **495** |
| 1245 - 1300 | 2 | 317 | 118 | 0 | 20 | 11 | 1 | 4 | 58 | 1 | 0 | 0 | 0 | **532** |
| 1300 - 1315 | 0 | 300 | 124 | 1 | 21 | 10 | 1 | 3 | 53 | 1 | 1 | 0 | 0 | **515** |
| 1315 - 1330 | 0 | 292 | 127 | 2 | 13 | 8 | 2 | 2 | 53 | 0 | 0 | 0 | 0 | **499** |
| 1330 - 1345 | 2 | 314 | 127 | 0 | 10 | 4 | 2 | 4 | 69 | 0 | 1 | 0 | 0 | **533** |
| 1345 - 1400 | 0 | 318 | 147 | 4 | 21 | 8 | 2 | 2 | 61 | 0 | 0 | 0 | 0 | **563** |
| 1400 - 1415 | 3 | 438 | 130 | 0 | 17 | 3 | 0 | 7 | 51 | 0 | 0 | 0 | 0 | **649** |
| 1415 - 1430 | 1 | 405 | 130 | 0 | 10 | 5 | 0 | 10 | 72 | 1 | 0 | 0 | 0 | **634** |
| 1430 - 1445 | 1 | 440 | 144 | 1 | 17 | 3 | 1 | 8 | 57 | 2 | 0 | 0 | 0 | **674** |
| 1445 - 1500 | 2 | 481 | 166 | 0 | 13 | 5 | 1 | 8 | 53 | 0 | 0 | 0 | 0 | **729** |
| 1500 - 1515 | 8 | 577 | 197 | 0 | 15 | 8 | 2 | 12 | 65 | 2 | 0 | 0 | 0 | **886** |
| 1515 - 1530 | 4 | 579 | 194 | 0 | 9 | 5 | 1 | 4 | 58 | 1 | 0 | 0 | 0 | **855** |
| 1530 - 1545 | 1 | 613 | 184 | 1 | 12 | 8 | 1 | 5 | 52 | 1 | 0 | 0 | 0 | **878** |
| 1545 - 1600 | 5 | 675 | 186 | 0 | 10 | 2 | 0 | 3 | 38 | 0 | 0 | 0 | 0 | **919** |
| 1600 - 1615 | 3 | 726 | 226 | 3 | 10 | 5 | 0 | 3 | 56 | 1 | 0 | 0 | 0 | **1033** |
| 1615 - 1630 | 3 | 728 | 237 | 2 | 18 | 7 | 1 | 5 | 31 | 2 | 0 | 0 | 0 | **1034** |
| 1630 - 1645 | 5 | 657 | 187 | 0 | 14 | 6 | 0 | 2 | 55 | 0 | 0 | 0 | 0 | **926** |
| 1645 - 1700 | 1 | 717 | 188 | 0 | 15 | 4 | 1 | 0 | 21 | 0 | 0 | 0 | 0 | **947** |
| 1700 - 1715 | 3 | 720 | 173 | 0 | 10 | 2 | 0 | 1 | 27 | 0 | 0 | 0 | 0 | **936** |
| 1715 - 1730 | 2 | 756 | 154 | 0 | 15 | 4 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | **956** |
| 1730 - 1745 | 3 | 651 | 155 | 0 | 8 | 1 | 1 | 1 | 20 | 1 | 0 | 0 | 0 | **841** |
| 1745 - 1800 | 2 | 588 | 119 | 0 | 13 | 0 | 0 | 0 | 16 | 0 | 0 | 1 | 0 | **739** |
| 1800 - 1815 | 0 | 523 | 115 | 0 | 8 | 2 | 2 | 2 | 15 | 0 | 1 | 0 | 0 | **668** |
| 1815 - 1830 | 2 | 474 | 96 | 0 | 8 | 0 | 0 | 0 | 18 | 0 | 0 | 2 | 0 | **600** |
| 1830 - 1845 | 1 | 419 | 82 | 0 | 4 | 1 | 0 | 2 | 14 | 0 | 0 | 1 | 0 | **524** |
| 1845 - 1900 | 0 | 375 | 67 | 0 | 9 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | **464** |
| 1900 - 1915 | 0 | 343 | 22 | 1 | 10 | 1 | 0 | 1 | 14 | 0 | 0 | 2 | 0 | **394** |
| 1915 - 1930 | 0 | 285 | 17 | 0 | 4 | 2 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **319** |
| 1930 - 1945 | 0 | 296 | 25 | 0 | 5 | 1 | 0 | 0 | 13 | 0 | 0 | 1 | 0 | **341** |
| 1945 - 2000 | 0 | 283 | 18 | 0 | 4 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | **322** |
| 2000 - 2015 | 0 | 282 | 16 | 0 | 5 | 2 | 0 | 1 | 11 | 0 | 1 | 8 | 0 | **326** |
| 2015 - 2030 | 0 | 238 | 14 | 0 | 5 | 0 | 0 | 1 | 15 | 0 | 0 | 6 | 0 | **279** |
| 2030 - 2045 | 0 | 254 | 10 | 0 | 2 | 1 | 0 | 0 | 10 | 0 | 0 | 5 | 0 | **282** |
| 2045 - 2100 | 0 | 213 | 10 | 0 | 1 | 1 | 0 | 1 | 8 | 0 | 0 | 4 | 0 | **238** |
| 2100 - 2115 | 0 | 185 | 3 | 0 | 1 | 0 | 0 | 0 | 18 | 0 | 8 | 0 | 0 | **215** |
| 2115 - 2130 | 0 | 169 | 4 | 0 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | **184** |
| 2130 - 2145 | 0 | 168 | 1 | 0 | 4 | 0 | 0 | 0 | 13 | 0 | 4 | 0 | 0 | **190** |
| 2145 - 2200 | 0 | 158 | 2 | 0 | 3 | 0 | 0 | 0 | 10 | 0 | 2 | 0 | 0 | **175** |
| 2200 - 2215 | 0 | 195 | 5 | 0 | 3 | 0 | 0 | 0 | 17 | 0 | 3 | 1 | 0 | **224** |
| 2215 - 2230 | 0 | 154 | 4 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 4 | 0 | 0 | **169** |
| 2230 - 2245 | 0 | 148 | 2 | 0 | 5 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | **163** |
| 2245 - 2300 | 0 | 114 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | **122** |
| 2300 - 2315 | 0 | 110 | 2 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | **124** |
| 2315 - 2330 | 0 | 131 | 0 | 0 | 1 | 1 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | **145** |
| 2330 - 2345 | 0 | 90 | 1 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **99** |
| 2345 - 0000 | 0 | 98 | 1 | 0 | 1 | 0 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | **110** |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Session Total | 107 | 26554 | 7459 | 33 | 825 | 356 | 29 | 175 | 3410 | 30 | 48 | 37 | 0 | **39063** |
| Session Average | 1,11 | 276,60 | 77,70 | 0,34 | 8,59 | 3,71 | 0,30 | 1,82 | 35,52 | 0,31 | 0,50 | 0,39 | 0,00 | **406,91** |
| Session Percentage | 0,27 | 67,98 | 19,09 | 0,08 | 2,11 | 0,91 | 0,07 | 0,45 | 8,73 | 0,08 | 0,12 | 0,09 | 0,00 | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 0800 - 0900 | 0730 - 0830 | 0730 - 0830 | 0730 - 0830 | 0845 - 0945 | 0815 - 0915 | 0800 - 0900 | 0715 - 0815 | 0900 - 1000 | 0730 - 0830 | 0530 - 0630 | 0600 - 0700 | - | **0730 - 0830** |
| AM Peak Hour Volume | 11 | 1702 | 500 | 7 | 87 | 39 | 3 | 25 | 301 | 7 | 3 | 2 | 0 | **2634** |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Noon Peak Hour | 1115 - 1215 | 1445 - 1545 | 1445 - 1545 | 1300 - 1400 | 1215 - 1315 | 1100 - 1200 | 1200 - 1300 | 1415 - 1515 | 1000 - 1100 | 1415 - 1515 | 1000 - 1100 | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 21 | 2250 | 741 | 7 | 73 | 48 | 7 | 38 | 266 | 5 | 2 | 0 | 0 | **3348** |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM Peak Hour | 1500 - 1600 | 1630 - 1730 | 1600 - 1700 | 1530 - 1630 | 1600 - 1700 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1715 - 1815 | 0,00 | - | **1600 - 1700** |
| PM Peak Hour Volume | 18 | 2850 | 838 | 6 | 57 | 23 | 4 | 24 | 213 | 4 | 1 | 19 | 0 | **3940** |

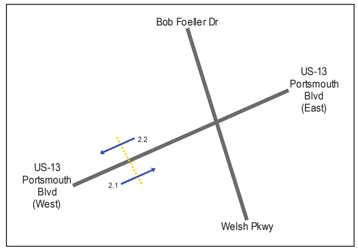
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Bi-Directional 15min | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | TOTAL |
| 0000 - 0015 | 0 | 83 | 19 | 0 | 2 | 1 | 0 | 1 | 13 | 0 | 1 | 4 | 0 | **124** |
| 0015 - 0030 | 0 | 114 | 30 | 0 | 1 | 1 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | **162** |
| 0030 - 0045 | 1 | 65 | 24 | 0 | 1 | 0 | 0 | 0 | 21 | 0 | 0 | 3 | 0 | **115** |
| 0045 - 0100 | 0 | 61 | 17 | 0 | 2 | 0 | 0 | 0 | 19 | 0 | 1 | 2 | 0 | **102** |
| 0100 - 0115 | 0 | 55 | 23 | 0 | 0 | 0 | 0 | 1 | 20 | 0 | 0 | 0 | 0 | **99** |
| 0115 - 0130 | 0 | 78 | 42 | 0 | 0 | 1 | 0 | 0 | 11 | 0 | 1 | 4 | 0 | **137** |
| 0130 - 0145 | 0 | 76 | 14 | 0 | 2 | 2 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | **107** |
| 0145 - 0200 | 0 | 53 | 15 | 0 | 3 | 1 | 0 | 0 | 17 | 0 | 0 | 2 | 0 | **91** |
| 0200 - 0215 | 0 | 30 | 9 | 0 | 3 | 1 | 0 | 0 | 21 | 0 | 0 | 2 | 0 | **66** |
| 0215 - 0230 | 0 | 64 | 20 | 0 | 0 | 2 | 0 | 1 | 11 | 0 | 0 | 1 | 0 | **99** |
| 0230 - 0245 | 0 | 64 | 10 | 0 | 5 | 0 | 0 | 0 | 19 | 0 | 0 | 1 | 0 | **99** |
| 0245 - 0300 | 0 | 52 | 12 | 0 | 0 | 1 | 0 | 0 | 25 | 0 | 1 | 2 | 0 | **93** |
| 0300 - 0315 | 0 | 65 | 17 | 0 | 3 | 3 | 0 | 1 | 34 | 0 | 1 | 1 | 0 | **125** |
| 0315 - 0330 | 0 | 66 | 17 | 0 | 4 | 1 | 0 | 2 | 28 | 0 | 0 | 1 | 0 | **119** |
| 0330 - 0345 | 0 | 87 | 14 | 0 | 5 | 1 | 0 | 1 | 39 | 0 | 0 | 2 | 0 | **149** |
| 0345 - 0400 | 0 | 132 | 15 | 0 | 1 | 2 | 0 | 0 | 33 | 0 | 0 | 3 | 0 | **186** |
| 0400 - 0415 | 0 | 157 | 19 | 0 | 1 | 1 | 0 | 0 | 37 | 0 | 1 | 0 | 0 | **216** |
| 0415 - 0430 | 0 | 223 | 26 | 0 | 4 | 1 | 0 | 1 | 41 | 0 | 1 | 4 | 0 | **301** |
| 0430 - 0445 | 0 | 333 | 31 | 0 | 4 | 0 | 0 | 1 | 54 | 0 | 0 | 1 | 0 | **424** |
| 0445 - 0500 | 2 | 472 | 51 | 0 | 7 | 8 | 0 | 1 | 37 | 0 | 0 | 4 | 0 | **582** |
| 0500 - 0515 | 2 | 530 | 62 | 0 | 17 | 6 | 0 | 0 | 54 | 0 | 1 | 1 | 0 | **673** |
| 0515 - 0530 | 0 | 640 | 105 | 0 | 9 | 2 | 0 | 2 | 61 | 0 | 2 | 3 | 0 | **824** |
| 0530 - 0545 | 5 | 731 | 146 | 0 | 7 | 8 | 0 | 5 | 80 | 1 | 4 | 3 | 0 | **990** |
| 0545 - 0600 | 0 | 652 | 132 | 0 | 11 | 7 | 0 | 6 | 79 | 0 | 1 | 1 | 0 | **889** |
| 0600 - 0615 | 1 | 743 | 116 | 0 | 12 | 3 | 0 | 1 | 83 | 0 | 1 | 4 | 0 | **964** |
| 0615 - 0630 | 6 | 933 | 130 | 0 | 12 | 4 | 0 | 2 | 69 | 0 | 2 | 1 | 0 | **1159** |
| 0630 - 0645 | 2 | 975 | 200 | 2 | 18 | 5 | 0 | 3 | 84 | 0 | 1 | 2 | 0 | **1292** |
| 0645 - 0700 | 7 | 843 | 250 | 2 | 17 | 14 | 0 | 2 | 118 | 0 | 0 | 5 | 0 | **1258** |
| 0700 - 0715 | 5 | 813 | 244 | 1 | 30 | 11 | 0 | 4 | 109 | 4 | 0 | 4 | 0 | **1225** |
| 0715 - 0730 | 7 | 1052 | 253 | 0 | 26 | 19 | 0 | 11 | 110 | 2 | 3 | 2 | 0 | **1485** |
| 0730 - 0745 | 2 | 1000 | 278 | 4 | 29 | 16 | 0 | 8 | 117 | 1 | 0 | 0 | 0 | **1455** |
| 0745 - 0800 | 5 | 1040 | 265 | 1 | 36 | 10 | 1 | 9 | 104 | 3 | 2 | 0 | 0 | **1476** |
| 0800 - 0815 | 2 | 882 | 229 | 1 | 31 | 17 | 0 | 6 | 145 | 1 | 0 | 0 | 0 | **1314** |
| 0815 - 0830 | 0 | 758 | 280 | 2 | 33 | 22 | 0 | 8 | 127 | 3 | 0 | 3 | 0 | **1236** |
| 0830 - 0845 | 2 | 687 | 217 | 1 | 44 | 23 | 1 | 7 | 122 | 3 | 2 | 0 | 0 | **1109** |
| 0845 - 0900 | 8 | 661 | 214 | 0 | 23 | 21 | 2 | 6 | 126 | 4 | 1 | 0 | 0 | **1066** |
| 0900 - 0915 | 1 | 557 | 219 | 1 | 28 | 17 | 0 | 2 | 119 | 2 | 1 | 1 | 0 | **948** |
| 0915 - 0930 | 2 | 587 | 183 | 1 | 30 | 13 | 0 | 1 | 144 | 1 | 0 | 0 | 0 | **962** |
| 0930 - 0945 | 2 | 601 | 194 | 0 | 55 | 19 | 0 | 4 | 133 | 0 | 0 | 0 | 0 | **1008** |
| 0945 - 1000 | 4 | 600 | 191 | 0 | 25 | 10 | 0 | 6 | 138 | 0 | 1 | 0 | 0 | **975** |
| 1000 - 1015 | 3 | 560 | 197 | 0 | 26 | 17 | 0 | 0 | 121 | 0 | 2 | 0 | 0 | **926** |
| 1015 - 1030 | 1 | 569 | 210 | 1 | 34 | 23 | 0 | 2 | 131 | 0 | 0 | 0 | 0 | **971** |
| 1030 - 1045 | 0 | 559 | 212 | 2 | 31 | 27 | 0 | 3 | 141 | 1 | 0 | 0 | 0 | **976** |
| 1045 - 1100 | 4 | 650 | 202 | 1 | 21 | 16 | 0 | 1 | 163 | 1 | 0 | 0 | 0 | **1059** |
| 1100 - 1115 | 2 | 588 | 200 | 1 | 27 | 14 | 0 | 2 | 143 | 0 | 0 | 0 | 0 | **977** |
| 1115 - 1130 | 4 | 622 | 211 | 1 | 22 | 22 | 3 | 1 | 117 | 0 | 0 | 0 | 0 | **1003** |
| 1130 - 1145 | 14 | 644 | 213 | 1 | 22 | 25 | 3 | 4 | 135 | 1 | 0 | 0 | 0 | **1062** |
| 1145 - 1200 | 5 | 631 | 212 | 0 | 33 | 32 | 0 | 3 | 129 | 0 | 0 | 0 | 0 | **1045** |
| 1200 - 1215 | 3 | 587 | 182 | 1 | 36 | 15 | 7 | 6 | 133 | 0 | 0 | 0 | 0 | **970** |
| 1215 - 1230 | 0 | 689 | 199 | 2 | 35 | 10 | 4 | 6 | 130 | 2 | 0 | 0 | 0 | **1077** |
| 1230 - 1245 | 2 | 605 | 194 | 2 | 26 | 16 | 5 | 5 | 135 | 6 | 0 | 0 | 0 | **996** |
| 1245 - 1300 | 2 | 655 | 220 | 1 | 38 | 20 | 2 | 5 | 114 | 1 | 0 | 0 | 0 | **1058** |
| 1300 - 1315 | 2 | 598 | 220 | 1 | 37 | 17 | 3 | 6 | 115 | 3 | 1 | 0 | 0 | **1003** |
| 1315 - 1330 | 2 | 634 | 232 | 3 | 31 | 14 | 4 | 5 | 115 | 1 | 0 | 0 | 0 | **1041** |
| 1330 - 1345 | 2 | 657 | 225 | 0 | 29 | 18 | 3 | 8 | 119 | 3 | 1 | 0 | 0 | **1065** |
| 1345 - 1400 | 0 | 655 | 244 | 5 | 43 | 16 | 3 | 2 | 106 | 1 | 0 | 0 | 0 | **1075** |
| 1400 - 1415 | 5 | 786 | 260 | 0 | 35 | 15 | 0 | 7 | 104 | 0 | 0 | 0 | 0 | **1212** |
| 1415 - 1430 | 2 | 791 | 257 | 0 | 28 | 13 | 0 | 11 | 121 | 1 | 0 | 0 | 0 | **1224** |
| 1430 - 1445 | 2 | 813 | 255 | 1 | 34 | 15 | 2 | 9 | 114 | 4 | 0 | 0 | 0 | **1249** |
| 1445 - 1500 | 4 | 871 | 277 | 0 | 26 | 12 | 1 | 11 | 103 | 2 | 0 | 0 | 0 | **1307** |
| 1500 - 1515 | 8 | 998 | 320 | 0 | 40 | 16 | 4 | 14 | 109 | 2 | 0 | 0 | 0 | **1511** |
| 1515 - 1530 | 4 | 1055 | 319 | 5 | 25 | 18 | 3 | 4 | 94 | 1 | 0 | 0 | 0 | **1528** |
| 1530 - 1545 | 2 | 1145 | 338 | 2 | 25 | 21 | 2 | 8 | 85 | 3 | 0 | 0 | 0 | **1631** |
| 1545 - 1600 | 6 | 1139 | 306 | 0 | 26 | 8 | 0 | 3 | 71 | 1 | 0 | 0 | 0 | **1560** |
| 1600 - 1615 | 4 | 1236 | 342 | 3 | 25 | 15 | 0 | 3 | 103 | 1 | 0 | 0 | 0 | **1732** |
| 1615 - 1630 | 7 | 1232 | 342 | 3 | 33 | 13 | 1 | 8 | 62 | 2 | 0 | 0 | 0 | **1703** |
| 1630 - 1645 | 6 | 1145 | 286 | 0 | 21 | 9 | 1 | 10 | 88 | 1 | 1 | 0 | 0 | **1568** |
| 1645 - 1700 | 3 | 1197 | 284 | 0 | 29 | 5 | 1 | 2 | 55 | 1 | 1 | 0 | 0 | **1578** |
| 1700 - 1715 | 4 | 1257 | 275 | 0 | 21 | 9 | 0 | 4 | 52 | 0 | 0 | 0 | 0 | **1622** |
| 1715 - 1730 | 3 | 1312 | 226 | 0 | 35 | 7 | 0 | 3 | 59 | 2 | 0 | 0 | 0 | **1647** |
| 1730 - 1745 | 4 | 1127 | 260 | 0 | 17 | 4 | 1 | 3 | 47 | 1 | 0 | 0 | 0 | **1464** |
| 1745 - 1800 | 2 | 1016 | 197 | 0 | 24 | 6 | 0 | 0 | 43 | 0 | 0 | 1 | 0 | **1289** |
| 1800 - 1815 | 1 | 921 | 202 | 0 | 17 | 5 | 2 | 5 | 37 | 0 | 1 | 0 | 0 | **1191** |
| 1815 - 1830 | 2 | 875 | 170 | 0 | 16 | 2 | 0 | 5 | 34 | 0 | 0 | 3 | 0 | **1107** |
| 1830 - 1845 | 4 | 693 | 142 | 0 | 14 | 5 | 0 | 4 | 36 | 0 | 0 | 1 | 0 | **899** |
| 1845 - 1900 | 0 | 642 | 125 | 0 | 13 | 2 | 0 | 2 | 33 | 0 | 0 | 0 | 0 | **817** |
| 1900 - 1915 | 0 | 654 | 36 | 1 | 17 | 1 | 0 | 2 | 30 | 0 | 0 | 2 | 0 | **743** |
| 1915 - 1930 | 3 | 580 | 34 | 0 | 10 | 2 | 0 | 2 | 28 | 0 | 0 | 0 | 0 | **659** |
| 1930 - 1945 | 1 | 570 | 39 | 0 | 9 | 2 | 0 | 0 | 28 | 0 | 0 | 1 | 0 | **650** |
| 1945 - 2000 | 0 | 505 | 24 | 0 | 6 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | **570** |
| 2000 - 2015 | 0 | 488 | 26 | 0 | 7 | 2 | 0 | 2 | 33 | 0 | 1 | 8 | 0 | **567** |
| 2015 - 2030 | 1 | 448 | 20 | 0 | 8 | 0 | 0 | 1 | 29 | 0 | 0 | 6 | 0 | **513** |
| 2030 - 2045 | 0 | 462 | 13 | 0 | 6 | 1 | 0 | 0 | 26 | 0 | 0 | 5 | 0 | **513** |
| 2045 - 2100 | 0 | 405 | 15 | 0 | 2 | 2 | 0 | 1 | 18 | 0 | 0 | 4 | 0 | **447** |
| 2100 - 2115 | 0 | 356 | 7 | 0 | 5 | 0 | 0 | 1 | 29 | 0 | 8 | 0 | 0 | **406** |
| 2115 - 2130 | 0 | 318 | 5 | 0 | 5 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | **343** |
| 2130 - 2145 | 0 | 295 | 3 | 0 | 10 | 0 | 0 | 0 | 21 | 0 | 4 | 0 | 0 | **333** |
| 2145 - 2200 | 0 | 282 | 4 | 0 | 6 | 0 | 0 | 2 | 20 | 0 | 2 | 2 | 0 | **318** |
| 2200 - 2215 | 1 | 297 | 6 | 0 | 5 | 0 | 0 | 0 | 26 | 0 | 3 | 1 | 0 | **339** |
| 2215 - 2230 | 0 | 266 | 5 | 0 | 4 | 0 | 0 | 0 | 22 | 0 | 4 | 0 | 0 | **301** |
| 2230 - 2245 | 0 | 238 | 4 | 0 | 7 | 0 | 0 | 2 | 15 | 0 | 1 | 2 | 0 | **269** |
| 2245 - 2300 | 0 | 207 | 1 | 0 | 4 | 0 | 0 | 0 | 16 | 0 | 2 | 0 | 0 | **230** |
| 2300 - 2315 | 0 | 201 | 3 | 0 | 6 | 1 | 0 | 0 | 12 | 0 | 3 | 0 | 0 | **226** |
| 2315 - 2330 | 0 | 212 | 0 | 0 | 3 | 1 | 0 | 0 | 21 | 0 | 1 | 0 | 0 | **238** |
| 2330 - 2345 | 0 | 169 | 1 | 0 | 2 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | **188** |
| 2345 - 0000 | 0 | 155 | 2 | 0 | 1 | 0 | 0 | 0 | 15 | 0 | 1 | 0 | 0 | **174** |
| Session Total | 191 | 54877 | 13137 | 53 | 1659 | 788 | 59 | 291 | 6583 | 67 | 66 | 103 | 0 | **77874** |
| Session Average | 1,99 | 571,64 | 136,84 | 0,55 | 17,28 | 8,21 | 0,61 | 3,03 | 68,57 | 0,70 | 0,69 | 1,07 | 0,00 | **811,19** |
| Session Percentage | 0,25 | 70,47 | 16,87 | 0,07 | 2,13 | 1,01 | 0,08 | 0,37 | 8,45 | 0,09 | 0,08 | 0,13 | 0,00 | |
| AM Peak Hour | 0630 - 0730 | 0715 - 0815 | 0730 - 0830 | 0730 - 0830 | 0745 - 0845 | 0800 - 0900 | 0800 - 0900 | 0715 - 0815 | 0915 - 1015 | 0815 - 0915 | 0500 - 0600 | 0630 - 0730 | - | **0715 - 0815** |
| AM Peak Hour Volume | 21 | 3974 | 1052 | 8 | 144 | 83 | 3 | 34 | 536 | 12 | 8 | 13 | 0 | **5730** |
| Noon Peak Hour | 1115 - 1215 | 1445 - 1545 | 1445 - 1545 | 1300 - 1400 | 1300 - 1400 | 1115 - 1215 | 1200 - 1300 | 1415 - 1515 | 1015 - 1115 | 1215 - 1315 | 1000 - 1100 | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 26 | 4069 | 1254 | 9 | 140 | 94 | 18 | 45 | 578 | 12 | 2 | 0 | 0 | **5977** |
| PM Peak Hour | 1545 - 1645 | 1630 - 1730 | 1530 - 1630 | 1515 - 1615 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | 1600 - 1700 | 0,00 | - | **1530 - 1630** |
| PM Peak Hour Volume | 23 | 4911 | 1328 | 10 | 116 | 63 | 9 | 29 | 359 | 7 | 2 | 19 | 0 | **6626** |

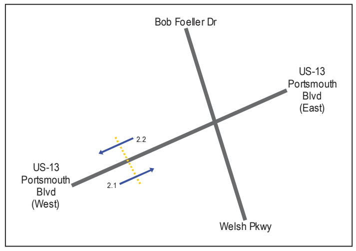
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Site 2 | | |
|---|---|---|---|
| TIME | EB | WB | TOTAL |
| 0000 - 0015 | 53 | 71 | **124** |
| 0015 - 0030 | 67 | 95 | **162** |
| 0030 - 0045 | 57 | 58 | **115** |
| 0045 - 0100 | 45 | 57 | **102** |
| 0100 - 0115 | 47 | 52 | **99** |
| 0115 - 0130 | 35 | 102 | **137** |
| 0130 - 0145 | 36 | 71 | **107** |
| 0145 - 0200 | 34 | 57 | **91** |
| 0200 - 0215 | 33 | 33 | **66** |
| 0215 - 0230 | 48 | 51 | **99** |
| 0230 - 0245 | 62 | 37 | **99** |
| 0245 - 0300 | 51 | 42 | **93** |
| 0300 - 0315 | 68 | 57 | **125** |
| 0315 - 0330 | 75 | 44 | **119** |
| 0330 - 0345 | 94 | 55 | **149** |
| 0345 - 0400 | 130 | 56 | **186** |
| 0400 - 0415 | 149 | 67 | **216** |
| 0415 - 0430 | 192 | 109 | **301** |
| 0430 - 0445 | 282 | 142 | **424** |
| 0445 - 0500 | 448 | 134 | **582** |
| 0500 - 0515 | 493 | 180 | **673** |
| 0515 - 0530 | 560 | 264 | **824** |
| 0530 - 0545 | 658 | 332 | **990** |
| 0545 - 0600 | 611 | 278 | **889** |
| 0600 - 0615 | 698 | 266 | **964** |
| 0615 - 0630 | 806 | 353 | **1159** |
| 0630 - 0645 | 852 | 440 | **1292** |
| 0645 - 0700 | 777 | 481 | **1258** |
| 0700 - 0715 | 782 | 443 | **1225** |
| 0715 - 0730 | 953 | 532 | **1485** |
| 0730 - 0745 | 810 | 645 | **1455** |
| 0745 - 0800 | 728 | 748 | **1476** |
| 0800 - 0815 | 669 | 645 | **1314** |
| 0815 - 0830 | 640 | 596 | **1236** |
| 0830 - 0845 | 599 | 510 | **1109** |
| 0845 - 0900 | 518 | 548 | **1066** |
| 0900 - 0915 | 444 | 504 | **948** |
| 0915 - 0930 | 490 | 472 | **962** |
| 0930 - 0945 | 508 | 500 | **1008** |
| 0945 - 1000 | 466 | 509 | **975** |
| 1000 - 1015 | 475 | 451 | **926** |
| 1015 - 1030 | 496 | 475 | **971** |
| 1030 - 1045 | 489 | 487 | **976** |
| 1045 - 1100 | 554 | 505 | **1059** |
| 1100 - 1115 | 503 | 474 | **977** |
| 1115 - 1130 | 512 | 491 | **1003** |
| 1130 - 1145 | 520 | 542 | **1062** |
| 1145 - 1200 | 523 | 522 | **1045** |
| 1200 - 1215 | 504 | 466 | **970** |
| 1215 - 1230 | 513 | 564 | **1077** |
| 1230 - 1245 | 501 | 495 | **996** |
| 1245 - 1300 | 526 | 532 | **1058** |
| 1300 - 1315 | 488 | 515 | **1003** |
| 1315 - 1330 | 542 | 499 | **1041** |
| 1330 - 1345 | 532 | 533 | **1065** |
| 1345 - 1400 | 512 | 563 | **1075** |
| 1400 - 1415 | 563 | 649 | **1212** |
| 1415 - 1430 | 590 | 634 | **1224** |
| 1430 - 1445 | 575 | 674 | **1249** |
| 1445 - 1500 | 578 | 729 | **1307** |
| 1500 - 1515 | 625 | 886 | **1511** |
| 1515 - 1530 | 673 | 855 | **1528** |
| 1530 - 1545 | 753 | 878 | **1631** |
| 1545 - 1600 | 641 | 919 | **1560** |
| 1600 - 1615 | 699 | 1033 | **1732** |
| 1615 - 1630 | 669 | 1034 | **1703** |
| 1630 - 1645 | 642 | 926 | **1568** |
| 1645 - 1700 | 631 | 947 | **1578** |
| 1700 - 1715 | 686 | 936 | **1622** |
| 1715 - 1730 | 691 | 956 | **1647** |
| 1730 - 1745 | 623 | 841 | **1464** |
| 1745 - 1800 | 550 | 739 | **1289** |
| 1800 - 1815 | 523 | 668 | **1191** |
| 1815 - 1830 | 507 | 600 | **1107** |
| 1830 - 1845 | 375 | 524 | **899** |
| 1845 - 1900 | 353 | 464 | **817** |
| 1900 - 1915 | 349 | 394 | **743** |
| 1915 - 1930 | 340 | 319 | **659** |
| 1930 - 1945 | 309 | 341 | **650** |
| 1945 - 2000 | 248 | 322 | **570** |
| 2000 - 2015 | 241 | 326 | **567** |
| 2015 - 2030 | 234 | 279 | **513** |
| 2030 - 2045 | 231 | 282 | **513** |
| 2045 - 2100 | 209 | 238 | **447** |
| 2100 - 2115 | 191 | 215 | **406** |
| 2115 - 2130 | 159 | 184 | **343** |
| 2130 - 2145 | 143 | 190 | **333** |
| 2145 - 2200 | 143 | 175 | **318** |
| 2200 - 2215 | 115 | 224 | **339** |
| 2215 - 2230 | 132 | 169 | **301** |
| 2230 - 2245 | 106 | 163 | **269** |
| 2245 - 2300 | 108 | 122 | **230** |
| 2300 - 2315 | 102 | 124 | **226** |
| 2315 - 2330 | 93 | 145 | **238** |
| 2330 - 2345 | 89 | 99 | **188** |
| 2345 - 0000 | 64 | 110 | **174** |

| | | | |
|---|---|---|---|
| Session Total | 38811 | 39063 | **77874** |
| Session Average | 404,28 | 406,91 | **811,19** |

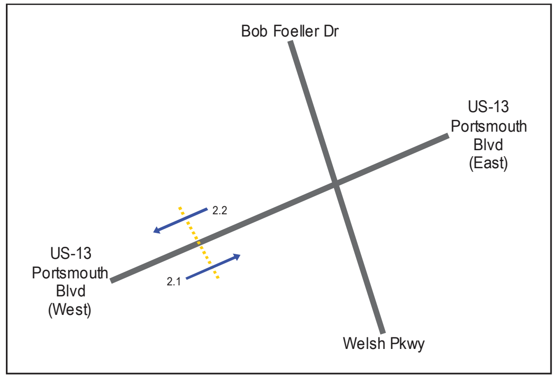
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Eastbound, (Movement 2.1) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0100 | 0 | 178 | 1 | 0 | 3 | 1 | 0 | 0 | 30 | 0 | 0 | 9 | 0 | **222** |
| 0100 - 0200 | 0 | 115 | 3 | 0 | 2 | 1 | 0 | 1 | 25 | 0 | 0 | 5 | 0 | **152** |
| 0200 - 0300 | 0 | 142 | 4 | 0 | 7 | 3 | 0 | 1 | 32 | 0 | 0 | 5 | 0 | **194** |
| 0300 - 0400 | 0 | 281 | 9 | 0 | 9 | 3 | 0 | 3 | 55 | 0 | 0 | 7 | 0 | **367** |
| 0400 - 0500 | 2 | 931 | 45 | 0 | 13 | 7 | 0 | 0 | 65 | 0 | 0 | 8 | 0 | **1071** |
| 0500 - 0600 | 7 | 1869 | 242 | 0 | 31 | 14 | 0 | 10 | 135 | 1 | 6 | 7 | 0 | **2322** |
| 0600 - 0700 | 13 | 2540 | 344 | 4 | 28 | 17 | 0 | 2 | 174 | 0 | 1 | 10 | 0 | **3133** |
| 0700 - 0800 | 12 | 2369 | 595 | 0 | 50 | 25 | 0 | 8 | 200 | 4 | 4 | 6 | 0 | **3273** |
| 0800 - 0900 | 1 | 1588 | 471 | 1 | 65 | 47 | 0 | 10 | 233 | 4 | 3 | 3 | 0 | **2426** |
| 0900 - 1000 | 5 | 1238 | 338 | 1 | 53 | 27 | 0 | 8 | 233 | 2 | 2 | 1 | 0 | **1908** |
| 1000 - 1100 | 4 | 1243 | 373 | 1 | 59 | 42 | 0 | 1 | 290 | 1 | 0 | 0 | 0 | **2014** |
| 1100 - 1200 | 6 | 1293 | 367 | 2 | 43 | 45 | 6 | 4 | 291 | 1 | 0 | 0 | 0 | **2058** |
| 1200 - 1300 | 1 | 1313 | 346 | 2 | 67 | 33 | 11 | 6 | 259 | 6 | 0 | 0 | 0 | **2044** |
| 1300 - 1400 | 4 | 1320 | 396 | 2 | 75 | 35 | 6 | 10 | 219 | 7 | 0 | 0 | 0 | **2074** |
| 1400 - 1500 | 6 | 1497 | 479 | 0 | 66 | 39 | 1 | 5 | 209 | 4 | 0 | 0 | 0 | **2306** |
| 1500 - 1600 | 2 | 1893 | 522 | 6 | 70 | 40 | 5 | 5 | 146 | 3 | 0 | 0 | 0 | **2692** |
| 1600 - 1700 | 8 | 1982 | 416 | 1 | 51 | 20 | 1 | 13 | 145 | 2 | 2 | 0 | 0 | **2641** |
| 1700 - 1800 | 3 | 1997 | 357 | 0 | 51 | 19 | 0 | 8 | 113 | 2 | 0 | 0 | 0 | **2550** |
| 1800 - 1900 | 4 | 1340 | 279 | 0 | 31 | 11 | 0 | 12 | 80 | 0 | 0 | 1 | 0 | **1758** |
| 1900 - 2000 | 4 | 1102 | 51 | 0 | 19 | 1 | 0 | 3 | 66 | 0 | 0 | 0 | 0 | **1246** |
| 2000 - 2100 | 1 | 816 | 24 | 0 | 10 | 1 | 0 | 1 | 62 | 0 | 0 | 0 | 0 | **915** |
| 2100 - 2200 | 0 | 571 | 9 | 0 | 16 | 0 | 0 | 3 | 35 | 0 | 0 | 2 | 0 | **636** |
| 2200 - 2300 | 1 | 397 | 5 | 0 | 8 | 0 | 0 | 2 | 46 | 0 | 0 | 2 | 0 | **461** |
| 2300 - 2400 | 0 | 308 | 2 | 0 | 7 | 1 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | **348** |
| Session Total | 84 | 28323 | 5678 | 20 | 834 | 432 | 30 | 116 | 3173 | 37 | 18 | 66 | 0 | **38811** |
| Session Average | 3,50 | 1180,13 | 236,58 | 0,83 | 34,75 | 18,00 | 1,25 | 4,83 | 132,21 | 1,54 | 0,75 | 2,75 | 0,00 | **1617,13** |
| Session Percentage | 0,22 | 72,98 | 14,63 | 0,05 | 2,15 | 1,11 | 0,08 | 0,30 | 8,18 | 0,10 | 0,05 | 0,17 | 0,00 | |
| AM Peak Hour | 0700 - 0800 | 0700 - 0800 | 0800 - 0900 | 0700 - 0800 | 0900 - 1000 | 0900 - 1000 | - | 0600 - 0700 | 0900 - 1000 | 0800 - 0900 | 0600 - 0700 | 0700 - 0800 | - | **0800 - 0900** |
| AM Peak Hour Volume | 13 | 2540 | 595 | 4 | 65 | 47 | 0 | 10 | 233 | 4 | 6 | 10 | 0 | **3273** |
| Noon Peak Hour | 1200 - 1300 | 1500 - 1600 | 1500 - 1600 | 1200 - 1300 | 1400 - 1500 | 1200 - 1300 | 1300 - 1400 | 1400 - 1500 | 1200 - 1300 | 1400 - 1500 | - | - | - | **1500 - 1600** |
| Noon Peak Hour Volume | 6 | 1497 | 479 | 2 | 75 | 45 | 11 | 10 | 291 | 7 | 0 | 0 | 0 | **2306** |
| PM Peak Hour | 1700 - 1800 | 1800 - 1900 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1700 - 1800 | 1600 - 1700 | 1600 - 1700 | 1700 - 1800 | 1900 - 2000 | - | **1600 - 1700** |
| PM Peak Hour Volume | 8 | 1997 | 522 | 6 | 70 | 40 | 5 | 13 | 146 | 3 | 2 | 1 | 0 | **2692** |

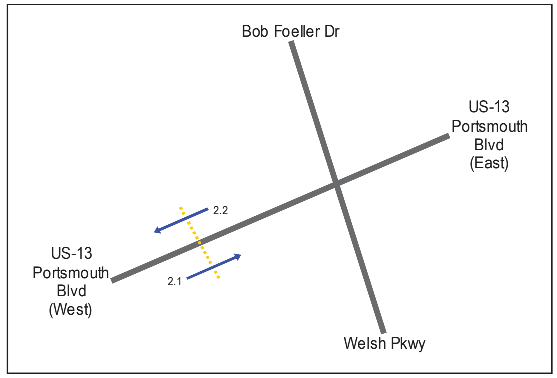
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Westbound, (Movement 2.2) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | TOTAL |
| 0000 - 0100 | 1 | 145 | 89 | 0 | 3 | 1 | 0 | 1 | 39 | 0 | 2 | 0 | 0 | **281** |
| 0100 - 0200 | 0 | 147 | 91 | 0 | 3 | 3 | 0 | 0 | 36 | 0 | 1 | 1 | 0 | **282** |
| 0200 - 0300 | 0 | 68 | 47 | 0 | 1 | 1 | 0 | 0 | 44 | 0 | 1 | 1 | 0 | **163** |
| 0300 - 0400 | 0 | 69 | 54 | 0 | 4 | 4 | 0 | 1 | 79 | 0 | 1 | 0 | 0 | **212** |
| 0400 - 0500 | 0 | 254 | 82 | 0 | 3 | 3 | 0 | 3 | 104 | 0 | 2 | 1 | 0 | **452** |
| 0500 - 0600 | 0 | 684 | 203 | 0 | 13 | 9 | 0 | 3 | 139 | 0 | 2 | 1 | 0 | **1054** |
| 0600 - 0700 | 3 | 954 | 352 | 0 | 31 | 9 | 0 | 6 | 180 | 0 | 3 | 2 | 0 | **1540** |
| 0700 - 0800 | 7 | 1536 | 445 | 6 | 71 | 31 | 1 | 24 | 240 | 6 | 1 | 0 | 0 | **2368** |
| 0800 - 0900 | 11 | 1400 | 469 | 3 | 66 | 36 | 3 | 17 | 287 | 7 | 0 | 0 | 0 | **2299** |
| 0900 - 1000 | 4 | 1107 | 449 | 1 | 85 | 32 | 0 | 5 | 301 | 1 | 0 | 0 | 0 | **1985** |
| 1000 - 1100 | 4 | 1095 | 448 | 3 | 53 | 41 | 0 | 5 | 266 | 1 | 2 | 0 | 0 | **1918** |
| 1100 - 1200 | 19 | 1192 | 469 | 1 | 61 | 48 | 0 | 6 | 233 | 0 | 0 | 0 | 0 | **2029** |
| 1200 - 1300 | 6 | 1223 | 449 | 4 | 68 | 28 | 7 | 16 | 253 | 3 | 0 | 0 | 0 | **2057** |
| 1300 - 1400 | 2 | 1224 | 525 | 7 | 65 | 30 | 7 | 11 | 236 | 1 | 2 | 0 | 0 | **2110** |
| 1400 - 1500 | 7 | 1764 | 570 | 1 | 57 | 16 | 2 | 33 | 233 | 3 | 0 | 0 | 0 | **2686** |
| 1500 - 1600 | 18 | 2444 | 761 | 1 | 46 | 23 | 4 | 24 | 213 | 4 | 0 | 0 | 0 | **3538** |
| 1600 - 1700 | 12 | 2828 | 838 | 5 | 57 | 22 | 2 | 10 | 163 | 3 | 0 | 0 | 0 | **3940** |
| 1700 - 1800 | 10 | 2715 | 601 | 0 | 46 | 7 | 1 | 2 | 88 | 1 | 0 | 1 | 0 | **3472** |
| 1800 - 1900 | 3 | 1791 | 360 | 0 | 29 | 3 | 2 | 4 | 60 | 0 | 1 | 3 | 0 | **2256** |
| 1900 - 2000 | 0 | 1207 | 82 | 1 | 23 | 4 | 0 | 1 | 55 | 0 | 0 | 3 | 0 | **1376** |
| 2000 - 2100 | 0 | 987 | 50 | 0 | 13 | 4 | 0 | 3 | 44 | 0 | 1 | 23 | 0 | **1125** |
| 2100 - 2200 | 0 | 680 | 10 | 0 | 10 | 0 | 0 | 0 | 50 | 0 | 14 | 0 | 0 | **764** |
| 2200 - 2300 | 0 | 611 | 11 | 0 | 12 | 0 | 0 | 0 | 33 | 0 | 10 | 1 | 0 | **678** |
| 2300 - 2400 | 0 | 429 | 4 | 0 | 5 | 1 | 0 | 0 | 34 | 0 | 5 | 0 | 0 | **478** |
| Session Total | 107 | 26554 | 7459 | 33 | 825 | 356 | 29 | 175 | 3410 | 30 | 48 | 37 | 0 | **39063** |
| Session Average | 4,46 | 1106,42 | 310,79 | 1,38 | 34,38 | 14,83 | 1,21 | 7,29 | 142,08 | 1,25 | 2,00 | 1,54 | 0,00 | **1627,63** |
| Session Percentage | 0,27 | 67,98 | 19,09 | 0,08 | 2,11 | 0,91 | 0,07 | 0,45 | 8,73 | 0,08 | 0,12 | 0,09 | 0,00 | |
| AM Peak Hour | 0900 - 1000 | 0800 - 0900 | 0900 - 1000 | 0800 - 0900 | 1000 - 1100 | 0900 - 1000 | 0900 - 1000 | 0800 - 0900 | 1000 - 1100 | 0900 - 1000 | 0700 - 0800 | 0700 - 0800 | - | **0800 - 0900** |
| AM Peak Hour Volume | 11 | 1536 | 469 | 6 | 85 | 36 | 3 | 24 | 301 | 7 | 3 | 2 | 0 | **2368** |
| Noon Peak Hour | 1200 - 1300 | 1500 - 1600 | 1500 - 1600 | 1400 - 1500 | 1300 - 1400 | 1200 - 1300 | 1300 - 1400 | 1500 - 1600 | 1100 - 1200 | 1300 - 1400 | 1100 - 1200 | - | - | **1500 - 1600** |
| Noon Peak Hour Volume | 19 | 1764 | 570 | 7 | 68 | 48 | 7 | 33 | 266 | 3 | 2 | 0 | 0 | **2686** |
| PM Peak Hour | 1600 - 1700 | 1700 - 1800 | 1700 - 1800 | 1700 - 1800 | 1700 - 1800 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1900 - 2000 | 1900 - 2000 | - | **1700 - 1800** |
| PM Peak Hour Volume | 18 | 2828 | 838 | 5 | 57 | 23 | 4 | 24 | 213 | 4 | 1 | 3 | 0 | **3940** |

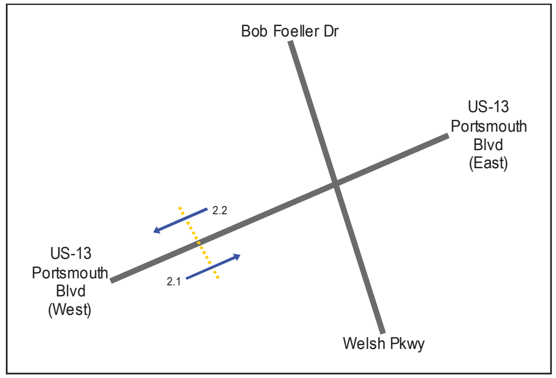
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Bi-Directional 60min | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0100 | 1 | 323 | 90 | 0 | 6 | 2 | 0 | 1 | 69 | 0 | 2 | 9 | 0 | **503** |
| 0100 - 0200 | 0 | 262 | 94 | 0 | 5 | 4 | 0 | 1 | 61 | 0 | 1 | 6 | 0 | **434** |
| 0200 - 0300 | 0 | 210 | 51 | 0 | 8 | 4 | 0 | 1 | 76 | 0 | 1 | 6 | 0 | **357** |
| 0300 - 0400 | 0 | 350 | 63 | 0 | 13 | 7 | 0 | 4 | 134 | 0 | 1 | 7 | 0 | **579** |
| 0400 - 0500 | 2 | 1185 | 127 | 0 | 16 | 10 | 0 | 3 | 169 | 0 | 2 | 9 | 0 | **1523** |
| 0500 - 0600 | 7 | 2553 | 445 | 0 | 44 | 23 | 0 | 13 | 274 | 1 | 8 | 8 | 0 | **3376** |
| 0600 - 0700 | 16 | 3494 | 696 | 4 | 59 | 26 | 0 | 8 | 354 | 0 | 4 | 12 | 0 | **4673** |
| 0700 - 0800 | 19 | 3905 | 1040 | 6 | 121 | 56 | 1 | 32 | 440 | 10 | 5 | 6 | 0 | **5641** |
| 0800 - 0900 | 12 | 2988 | 940 | 4 | 131 | 83 | 3 | 27 | 520 | 11 | 3 | 3 | 0 | **4725** |
| 0900 - 1000 | 9 | 2345 | 787 | 2 | 138 | 59 | 0 | 13 | 534 | 3 | 2 | 1 | 0 | **3893** |
| 1000 - 1100 | 8 | 2338 | 821 | 4 | 112 | 83 | 0 | 6 | 556 | 2 | 2 | 0 | 0 | **3932** |
| 1100 - 1200 | 25 | 2485 | 836 | 3 | 104 | 93 | 6 | 10 | 524 | 1 | 0 | 0 | 0 | **4087** |
| 1200 - 1300 | 7 | 2536 | 795 | 6 | 135 | 61 | 18 | 22 | 512 | 9 | 0 | 0 | 0 | **4101** |
| 1300 - 1400 | 6 | 2544 | 921 | 9 | 140 | 65 | 13 | 21 | 455 | 8 | 2 | 0 | 0 | **4184** |
| 1400 - 1500 | 13 | 3261 | 1049 | 1 | 123 | 55 | 3 | 38 | 442 | 7 | 0 | 0 | 0 | **4992** |
| 1500 - 1600 | 20 | 4337 | 1283 | 7 | 116 | 63 | 9 | 29 | 359 | 7 | 0 | 0 | 0 | **6230** |
| 1600 - 1700 | 20 | 4810 | 1254 | 6 | 108 | 42 | 3 | 23 | 308 | 5 | 2 | 0 | 0 | **6581** |
| 1700 - 1800 | 13 | 4712 | 958 | 0 | 97 | 26 | 1 | 10 | 201 | 3 | 0 | 1 | 0 | **6022** |
| 1800 - 1900 | 7 | 3131 | 639 | 0 | 60 | 14 | 2 | 16 | 140 | 0 | 1 | 4 | 0 | **4014** |
| 1900 - 2000 | 4 | 2309 | 133 | 1 | 42 | 5 | 0 | 4 | 121 | 0 | 0 | 3 | 0 | **2622** |
| 2000 - 2100 | 1 | 1803 | 74 | 0 | 23 | 5 | 0 | 4 | 106 | 0 | 1 | 23 | 0 | **2040** |
| 2100 - 2200 | 0 | 1251 | 19 | 0 | 26 | 0 | 0 | 3 | 85 | 0 | 14 | 2 | 0 | **1400** |
| 2200 - 2300 | 1 | 1008 | 16 | 0 | 20 | 0 | 0 | 2 | 79 | 0 | 10 | 3 | 0 | **1139** |
| 2300 - 2400 | 0 | 737 | 6 | 0 | 12 | 2 | 0 | 0 | 64 | 0 | 5 | 0 | 0 | **826** |
| Session Total | 191 | 54877 | 13137 | 53 | 1659 | 788 | 59 | 291 | 6583 | 67 | 66 | 103 | 0 | **77874** |
| Session Average | 7,96 | 2286,54 | 547,38 | 2,21 | 69,13 | 32,83 | 2,46 | 12,13 | 274,29 | 2,79 | 2,75 | 4,29 | 0,00 | **3244,75** |
| Session Percentage | 0,25 | 70,47 | 16,87 | 0,07 | 2,13 | 1,01 | 0,08 | 0,37 | 8,45 | 0,09 | 0,08 | 0,13 | 0,00 | |
| AM Peak Hour | 0800 - 0900 | 0800 - 0900 | 0800 - 0900 | 0800 - 0900 | 1000 - 1100 | 0900 - 1000 | 0900 - 1000 | 0800 - 0900 | 1000 - 1100 | 0900 - 1000 | 0600 - 0700 | 0700 - 0800 | - | **0800 - 0900** |
| AM Peak Hour Volume | 19 | 3905 | 1040 | 6 | 138 | 83 | 3 | 32 | 534 | 11 | 8 | 12 | 0 | **5641** |
| Noon Peak Hour | 1200 - 1300 | 1500 - 1600 | 1500 - 1600 | 1400 - 1500 | 1400 - 1500 | 1200 - 1300 | 1300 - 1400 | 1500 - 1600 | 1100 - 1200 | 1300 - 1400 | 1100 - 1200 | - | - | **1500 - 1600** |
| Noon Peak Hour Volume | 25 | 3261 | 1049 | 9 | 140 | 93 | 18 | 38 | 556 | 9 | 2 | 0 | 0 | **4992** |
| PM Peak Hour | 1600 - 1700 | 1700 - 1800 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1700 - 1800 | 1900 - 2000 | - | **1700 - 1800** |
| PM Peak Hour Volume | 20 | 4810 | 1283 | 7 | 116 | 63 | 9 | 29 | 359 | 7 | 2 | 4 | 0 | **6581** |

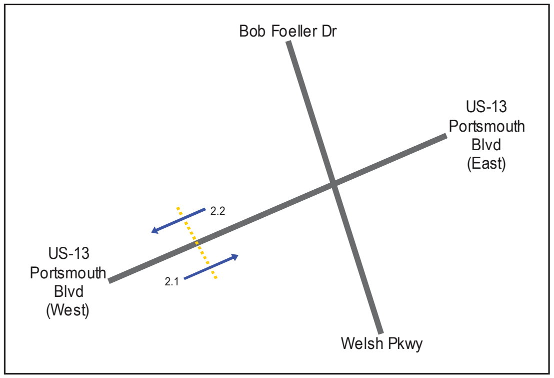
**Suffolk, VA**
Classified Traffic Count

**Site 2**
US-13 Portsmouth Blvd,
west of Bob Foeller Dr

**Lat/Long**
36,754463°, -76,514703°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

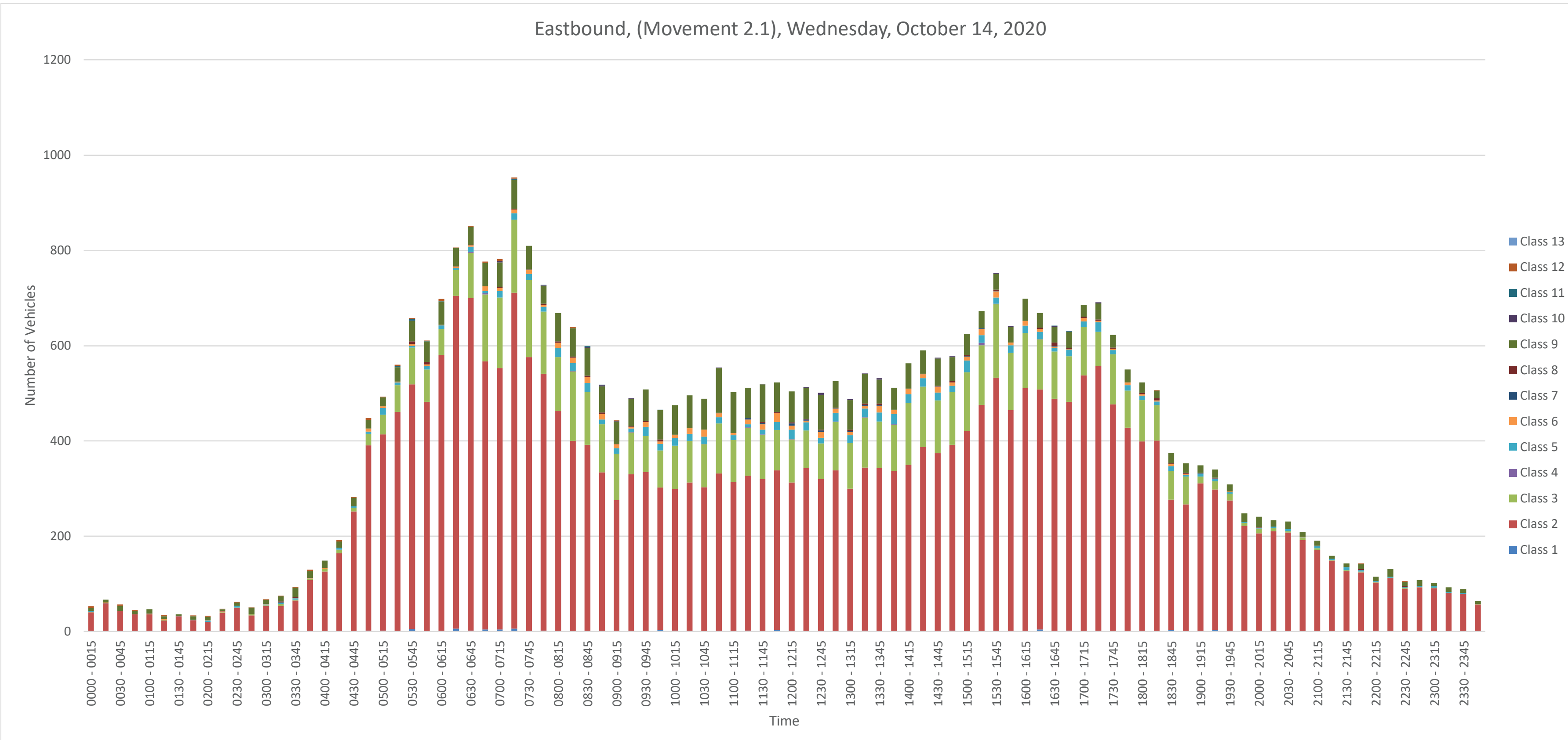


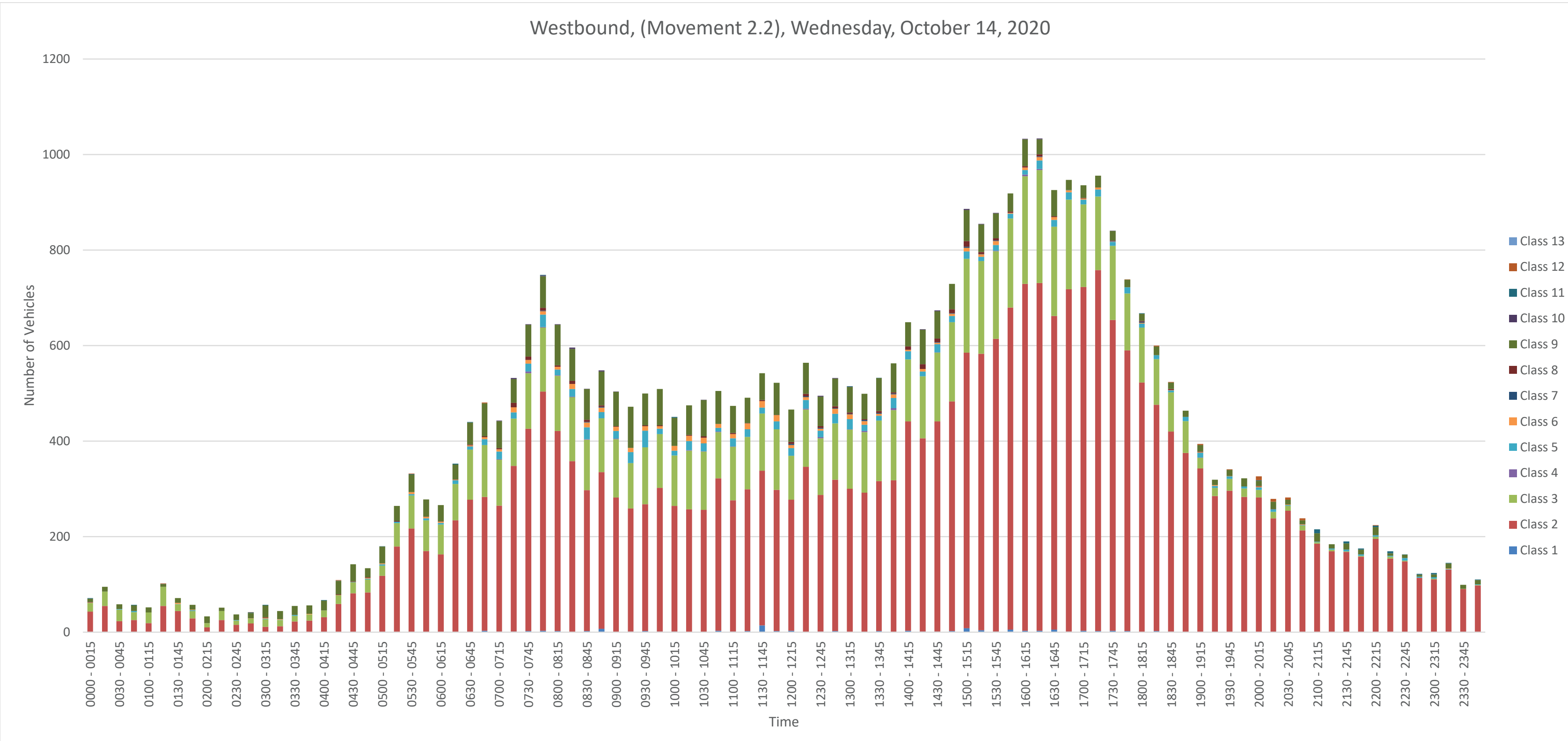

0000 - 2400 (Weekday 24h Session)

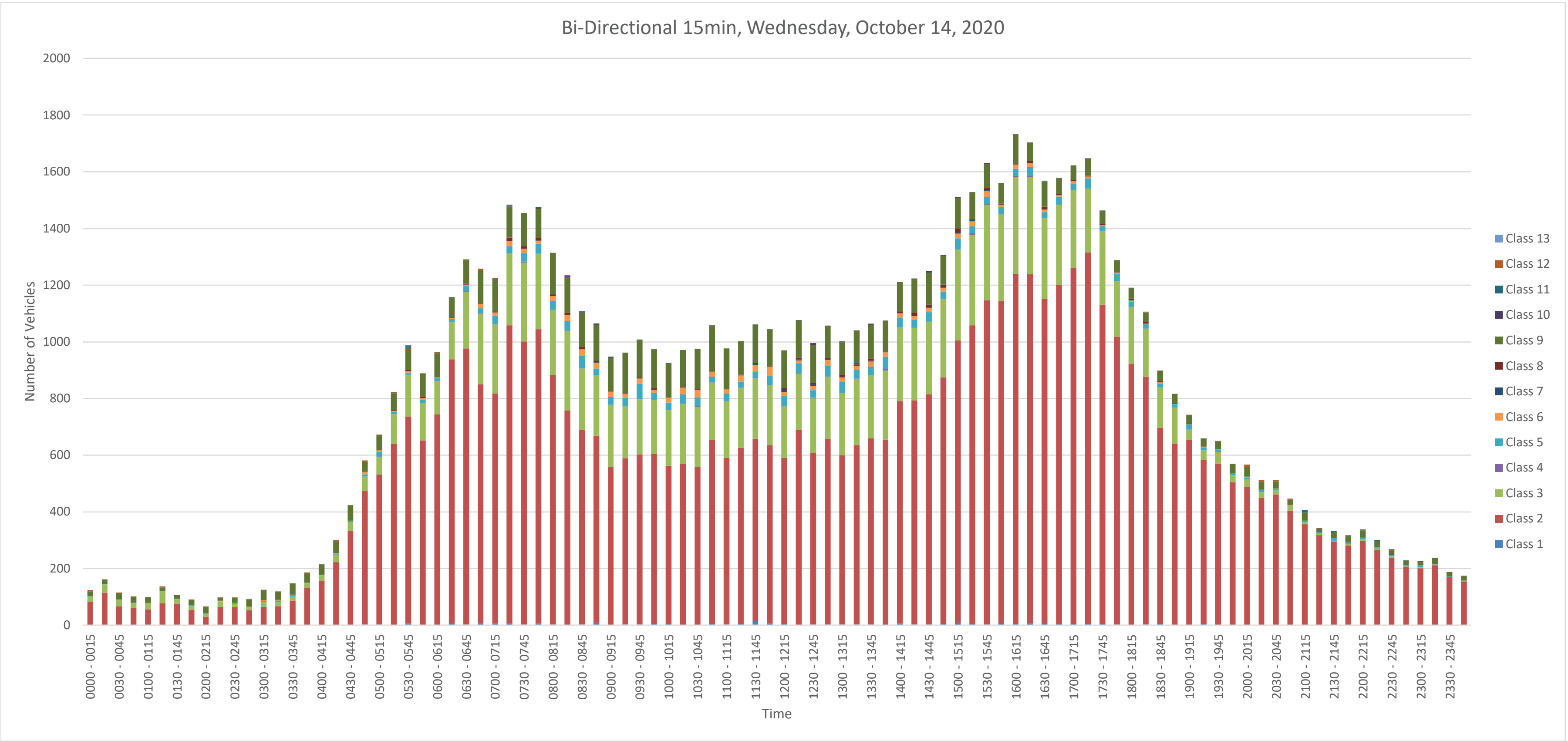
(highlighted) undertaken on Tuesday, October 13th, 2020

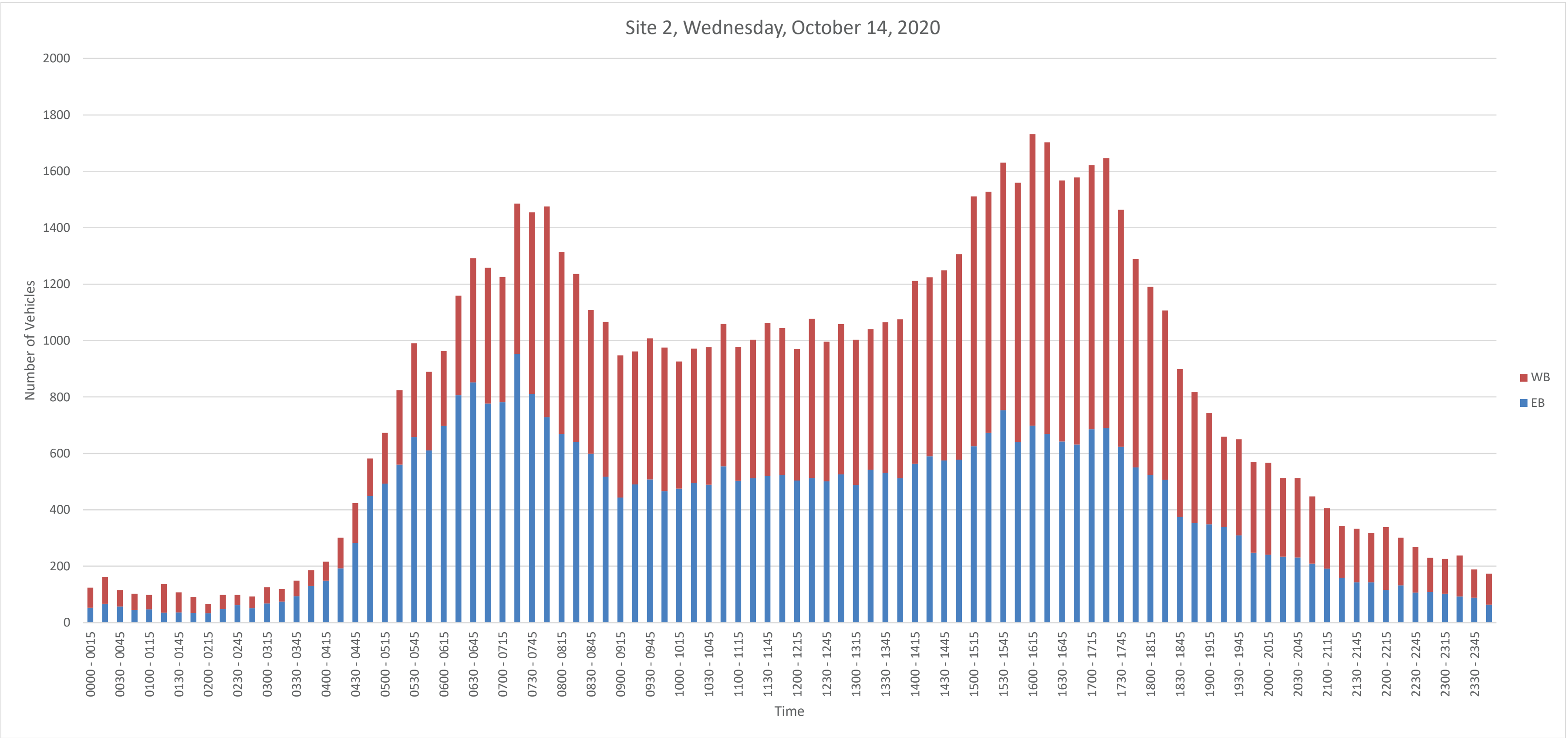
| | Volume Summary 60min | | |
|---|---|---|---|
| TIME | EB | WB | **TOTAL** |
| 0000 - 0100 | 222 | 281 | **503** |
| 0100 - 0200 | 152 | 282 | **434** |
| 0200 - 0300 | 194 | 163 | **357** |
| 0300 - 0400 | 367 | 212 | **579** |
| 0400 - 0500 | 1071 | 452 | **1523** |
| 0500 - 0600 | 2322 | 1054 | **3376** |
| 0600 - 0700 | 3133 | 1540 | **4673** |
| 0700 - 0800 | 3273 | 2368 | **5641** |
| 0800 - 0900 | 2426 | 2299 | **4725** |
| 0900 - 1000 | 1908 | 1985 | **3893** |
| 1000 - 1100 | 2014 | 1918 | **3932** |
| 1100 - 1200 | 2058 | 2029 | **4087** |
| 1200 - 1300 | 2044 | 2057 | **4101** |
| 1300 - 1400 | 2074 | 2110 | **4184** |
| 1400 - 1500 | 2306 | 2686 | **4992** |
| 1500 - 1600 | 2692 | 3538 | **6230** |
| 1600 - 1700 | 2641 | 3940 | **6581** |
| 1700 - 1800 | 2550 | 3472 | **6022** |
| 1800 - 1900 | 1758 | 2256 | **4014** |
| 1900 - 2000 | 1246 | 1376 | **2622** |
| 2000 - 2100 | 915 | 1125 | **2040** |
| 2100 - 2200 | 636 | 764 | **1400** |
| 2200 - 2300 | 461 | 678 | **1139** |
| 2300 - 2400 | 348 | 478 | **826** |

| | | | |
|---|---|---|---|
| Session Total | 38811 | 39063 | **77874** |
| Session Average | 1617,13 | 1627,63 | **3244,75** |
| Session Percentage | 49,84 | 50,16 | |

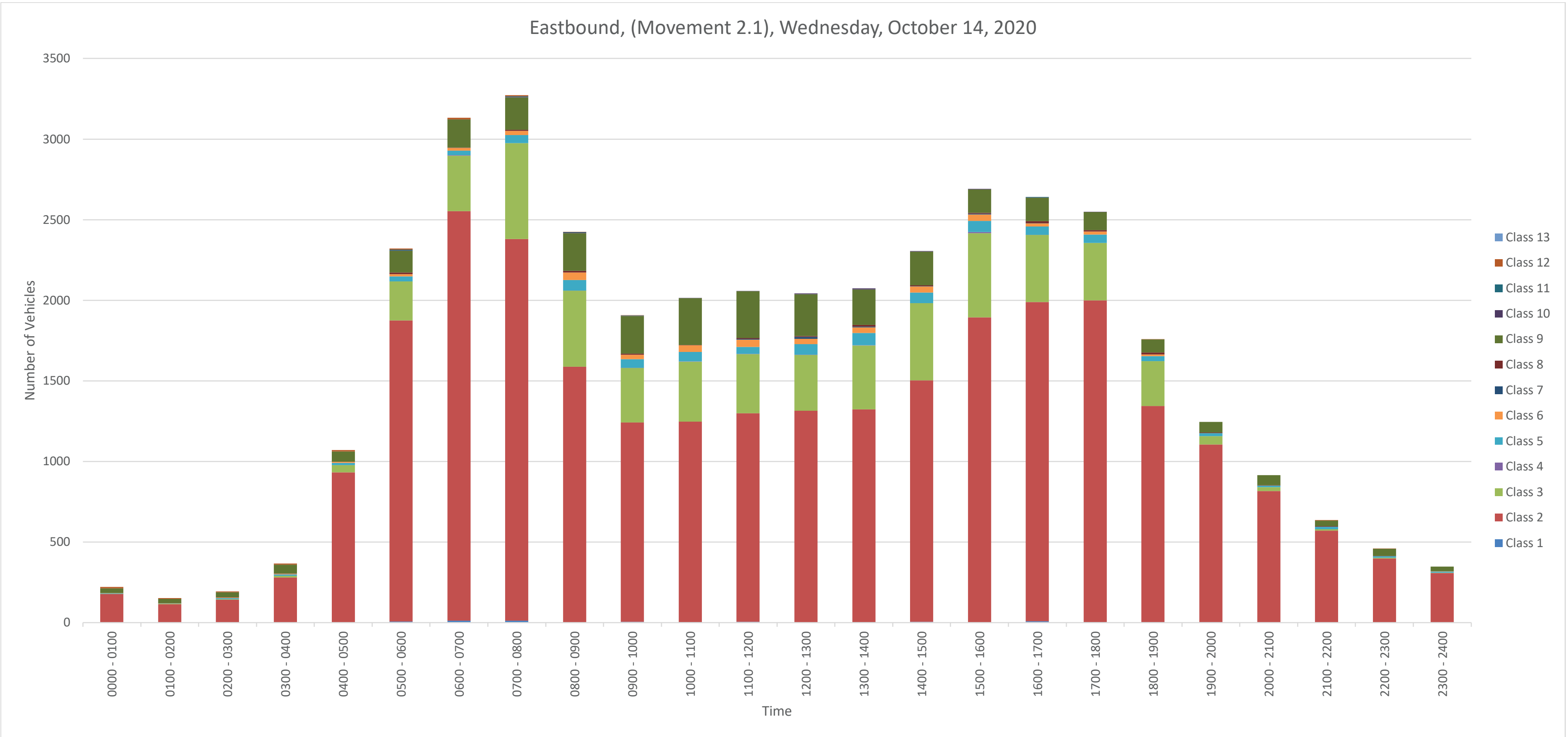

Eastbound, (Movement 2.1), Wednesday, October 14, 2020
Number of Vehicles
Time
1200
1000
800
600
400
200
0
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345


Westbound, (Movement 2.2), Wednesday, October 14, 2020
Number of Vehicles
1200
1000
800
600
400
200
0
Time
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1

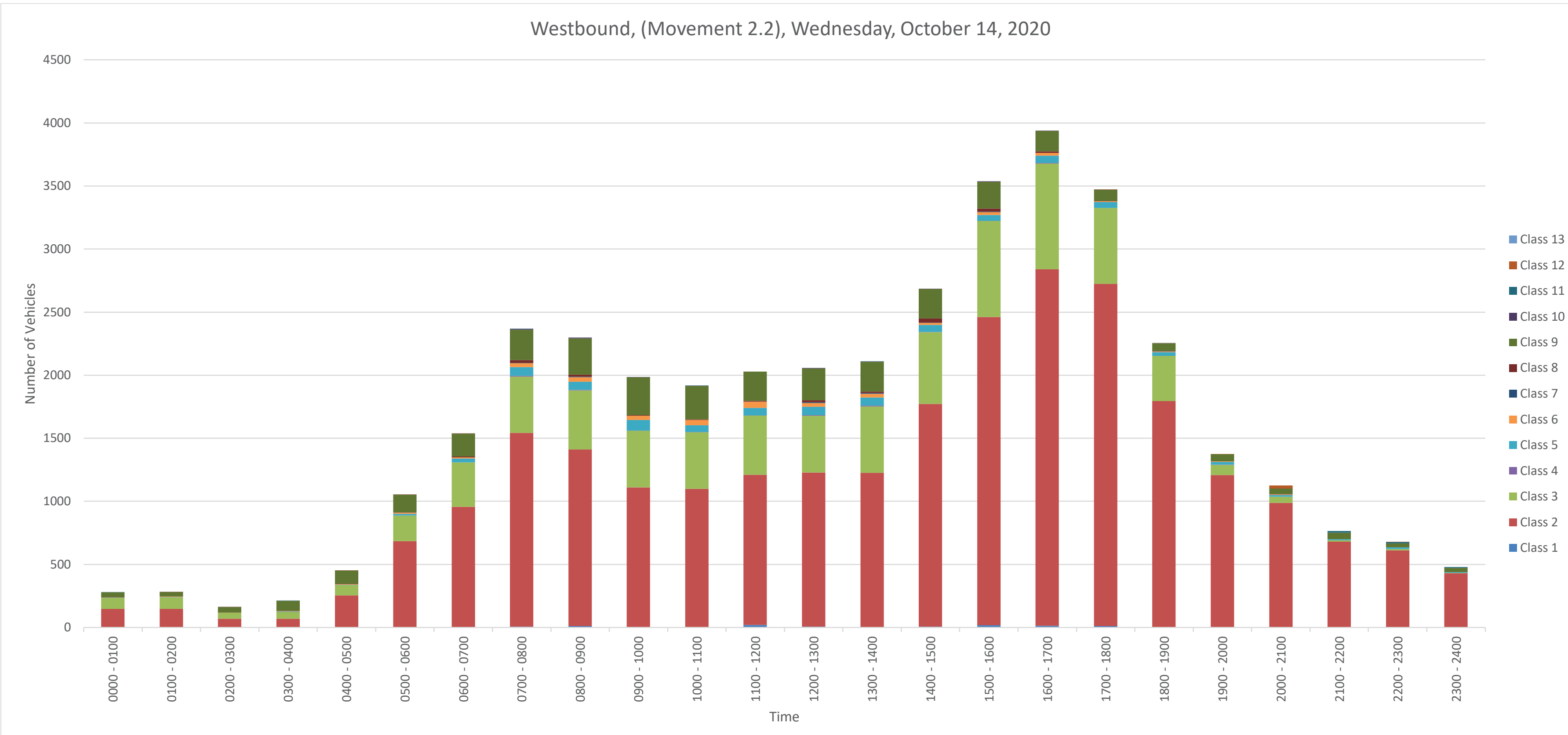

Bi-Directional 15min, Wednesday, October 14, 2020
Number of Vehicles
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1



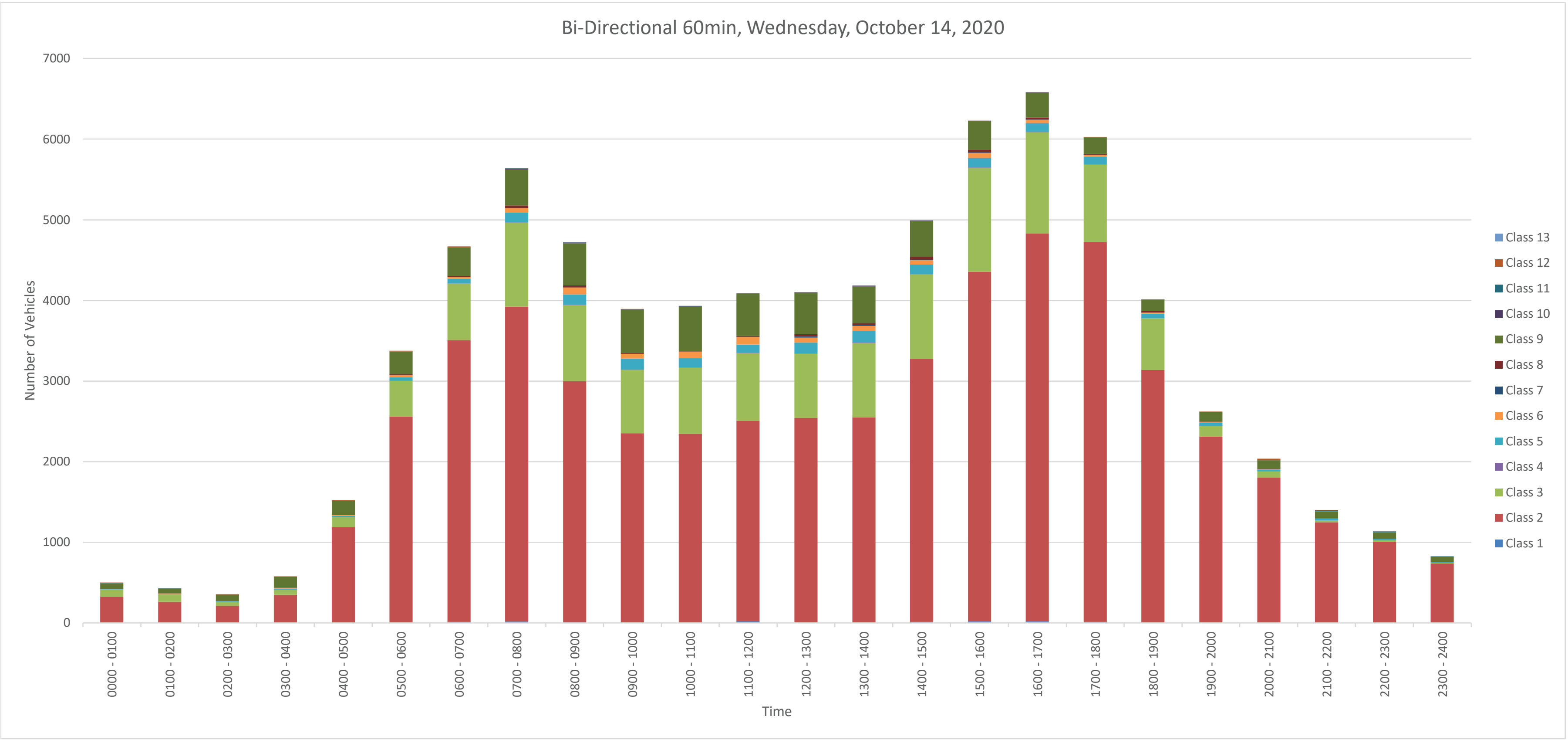
Site 2, Wednesday, October 14, 2020
Number of Vehicles
Time
WB
EB

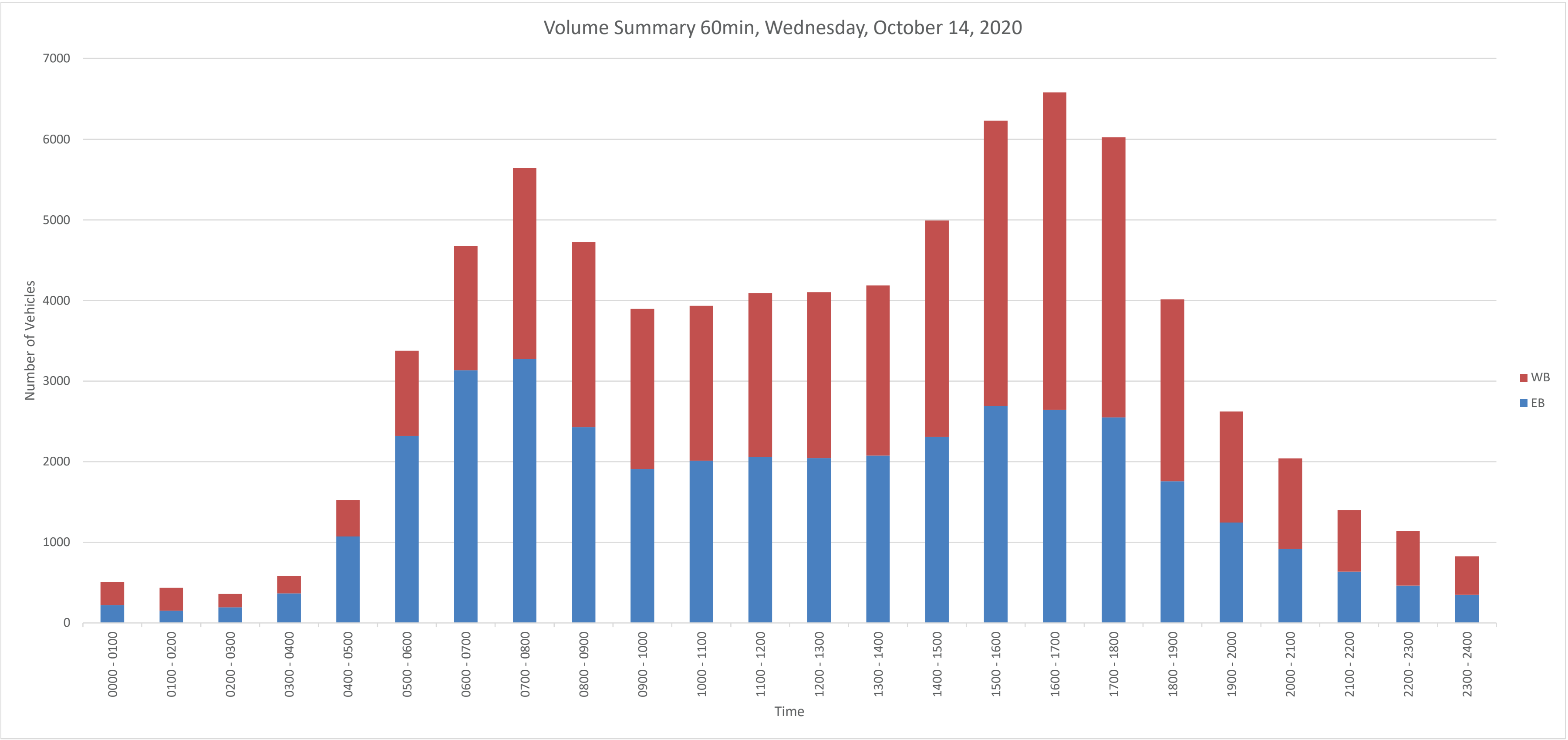


Eastbound, (Movement 2.1), Wednesday, October 14, 2020
Number of Vehicles
3500
3000
2500
2000
1500
1000
500
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1



Westbound, (Movement 2.2), Wednesday, October 14, 2020
Number of Vehicles
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Bi-Directional 60min, Wednesday, October 14, 2020
Number of Vehicles
7000
6000
5000
4000
3000
2000
1000
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1



Volume Summary 60min, Wednesday, October 14, 2020
Number of Vehicles
7000
6000
5000
4000
3000
2000
1000
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
WB
EB

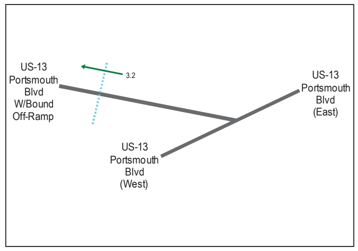
**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd

**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Westbound, (Movement 3.2) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0015 | 0 | 28 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **30** |
| 0015 - 0030 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **37** |
| 0030 - 0045 | 0 | 20 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **22** |
| 0045 - 0100 | 0 | 25 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **28** |
| 0100 - 0115 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **24** |
| 0115 - 0130 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **32** |
| 0130 - 0145 | 0 | 17 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **20** |
| 0145 - 0200 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **18** |
| 0200 - 0215 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| 0215 - 0230 | 0 | 18 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **20** |
| 0230 - 0245 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| 0245 - 0300 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **12** |
| 0300 - 0315 | 0 | 18 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **22** |
| 0315 - 0330 | 0 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **9** |
| 0330 - 0345 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **15** |
| 0345 - 0400 | 0 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **15** |
| 0400 - 0415 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **14** |
| 0415 - 0430 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **25** |
| 0430 - 0445 | 0 | 34 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **35** |
| 0445 - 0500 | 0 | 33 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **38** |
| 0500 - 0515 | 0 | 42 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **44** |
| 0515 - 0530 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **50** |
| 0530 - 0545 | 0 | 51 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **55** |
| 0545 - 0600 | 0 | 71 | 4 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **79** |
| 0600 - 0615 | 0 | 57 | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **63** |
| 0615 - 0630 | 0 | 94 | 9 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **106** |
| 0630 - 0645 | 0 | 117 | 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **130** |
| 0645 - 0700 | 0 | 122 | 19 | 0 | 4 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | **151** |
| 0700 - 0715 | 0 | 81 | 26 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **112** |
| 0715 - 0730 | 1 | 117 | 25 | 0 | 3 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **151** |
| 0730 - 0745 | 0 | 147 | 28 | 0 | 4 | 3 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | **191** |
| 0745 - 0800 | 0 | 188 | 18 | 1 | 6 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **217** |
| 0800 - 0815 | 0 | 171 | 24 | 0 | 5 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **203** |
| 0815 - 0830 | 0 | 146 | 39 | 0 | 8 | 2 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | **204** |
| 0830 - 0845 | 1 | 113 | 33 | 0 | 6 | 1 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **160** |
| 0845 - 0900 | 0 | 118 | 26 | 0 | 6 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | **155** |
| 0900 - 0915 | 0 | 102 | 35 | 1 | 4 | 1 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **148** |
| 0915 - 0930 | 1 | 104 | 28 | 0 | 11 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **153** |
| 0930 - 0945 | 0 | 108 | 35 | 0 | 12 | 7 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **173** |
| 0945 - 1000 | 0 | 113 | 31 | 0 | 6 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **160** |
| 1000 - 1015 | 0 | 76 | 37 | 0 | 5 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **127** |
| 1015 - 1030 | 1 | 87 | 36 | 0 | 9 | 5 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | **145** |
| 1030 - 1045 | 0 | 83 | 32 | 0 | 5 | 5 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **136** |
| 1045 - 1100 | 0 | 125 | 34 | 0 | 8 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **180** |
| 1100 - 1115 | 0 | 109 | 36 | 0 | 6 | 5 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **161** |
| 1115 - 1130 | 0 | 125 | 45 | 0 | 8 | 6 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | **191** |
| 1130 - 1145 | 0 | 123 | 40 | 0 | 5 | 3 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **178** |
| 1145 - 1200 | 1 | 104 | 37 | 0 | 6 | 5 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | **161** |
| 1200 - 1215 | 0 | 118 | 28 | 0 | 8 | 1 | 2 | 2 | 9 | 0 | 0 | 0 | 0 | **168** |
| 1215 - 1230 | 0 | 123 | 38 | 0 | 9 | 2 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | **178** |
| 1230 - 1245 | 1 | 118 | 38 | 0 | 3 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **168** |
| 1245 - 1300 | 1 | 147 | 36 | 0 | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | **194** |
| 1300 - 1315 | 0 | 133 | 34 | 0 | 10 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **187** |
| 1315 - 1330 | 0 | 128 | 43 | 0 | 4 | 6 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **187** |
| 1330 - 1345 | 0 | 139 | 37 | 0 | 9 | 1 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | **199** |
| 1345 - 1400 | 0 | 135 | 39 | 0 | 11 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **192** |
| 1400 - 1415 | 2 | 158 | 49 | 0 | 5 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **221** |
| 1415 - 1430 | 1 | 144 | 40 | 0 | 2 | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | **194** |
| 1430 - 1445 | 1 | 151 | 45 | 0 | 6 | 2 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | **211** |
| 1445 - 1500 | 1 | 167 | 44 | 0 | 10 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | **234** |
| 1500 - 1515 | 0 | 194 | 61 | 0 | 1 | 7 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **269** |
| 1515 - 1530 | 1 | 224 | 62 | 0 | 2 | 2 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **297** |
| 1530 - 1545 | 0 | 216 | 58 | 0 | 7 | 4 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **291** |
| 1545 - 1600 | 0 | 219 | 74 | 0 | 8 | 2 | 1 | 0 | 5 | 1 | 0 | 0 | 0 | **310** |
| 1600 - 1615 | 2 | 263 | 76 | 1 | 4 | 1 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | **355** |
| 1615 - 1630 | 2 | 271 | 52 | 0 | 9 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **339** |
| 1630 - 1645 | 2 | 240 | 27 | 0 | 2 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **278** |
| 1645 - 1700 | 1 | 238 | 63 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **308** |
| 1700 - 1715 | 1 | 282 | 51 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **339** |
| 1715 - 1730 | 0 | 245 | 48 | 0 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **299** |
| 1730 - 1745 | 2 | 240 | 39 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **286** |
| 1745 - 1800 | 1 | 212 | 25 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **244** |
| 1800 - 1815 | 0 | 207 | 29 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **240** |
| 1815 - 1830 | 1 | 187 | 18 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **208** |
| 1830 - 1845 | 0 | 174 | 23 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **200** |
| 1845 - 1900 | 1 | 156 | 27 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **188** |
| 1900 - 1915 | 0 | 146 | 9 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **160** |
| 1915 - 1930 | 1 | 124 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **129** |
| 1930 - 1945 | 1 | 142 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **149** |
| 1945 - 2000 | 0 | 132 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **139** |
| 2000 - 2015 | 0 | 123 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **126** |
| 2015 - 2030 | 0 | 104 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **113** |
| 2030 - 2045 | 0 | 112 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **116** |
| 2045 - 2100 | 0 | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **97** |
| 2100 - 2115 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **88** |
| 2115 - 2130 | 0 | 78 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **79** |
| 2130 - 2145 | 0 | 83 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **84** |
| 2145 - 2200 | 0 | 69 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **71** |
| 2200 - 2215 | 0 | 84 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **87** |
| 2215 - 2230 | 1 | 79 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **83** |
| 2230 - 2245 | 0 | 74 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **77** |
| 2245 - 2300 | 1 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **58** |
| 2300 - 2315 | 0 | 53 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **54** |
| 2315 - 2330 | 0 | 50 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **52** |
| 2330 - 2345 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **44** |
| 2345 - 0000 | 0 | 53 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **55** |
| Session Total | 30 | 10368 | 1945 | 4 | 305 | 131 | 10 | 25 | 238 | 9 | 0 | 0 | 0 | **13065** |
| Session Average | 0,31 | 108,00 | 20,26 | 0,04 | 3,18 | 1,36 | 0,10 | 0,26 | 2,48 | 0,09 | 0,00 | 0,00 | 0,00 | **136,09** |
| Session Percentage | 0,23 | 79,36 | 14,89 | 0,03 | 2,33 | 1,00 | 0,08 | 0,19 | 1,82 | 0,07 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | 0830 - 0930 | 0730 - 0830 | 0930 - 1030 | 0700 - 0800 | 0915 - 1015 | 0930 - 1030 | 0930 - 1030 | 0815 - 0915 | 0900 - 1000 | - | - | - | - | **0730 - 0830** |
| AM Peak Hour Volume | 2 | 652 | 139 | 2 | 34 | 18 | 1 | 5 | 29 | 0 | 0 | 0 | 0 | **815** |
| Noon Peak Hour | 1400 - 1500 | 1445 - 1545 | 1445 - 1545 | - | 1300 - 1400 | 1030 - 1130 | 1115 - 1215 | 1130 - 1230 | 1300 - 1400 | 1330 - 1430 | - | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 5 | 801 | 225 | 0 | 34 | 22 | 4 | 5 | 31 | 1 | 0 | 0 | 0 | **1091** |
| PM Peak Hour | 1600 - 1700 | 1615 - 1715 | 1515 - 1615 | 1515 - 1615 | 1530 - 1630 | 1500 - 1600 | 1500 - 1600 | 1515 - 1615 | 1500 - 1600 | 0,00 | - | - | - | **1530 - 1630** |
| PM Peak Hour Volume | 7 | 1031 | 270 | 1 | 28 | 15 | 1 | 4 | 21 | 2 | 0 | 0 | 0 | **1295** |

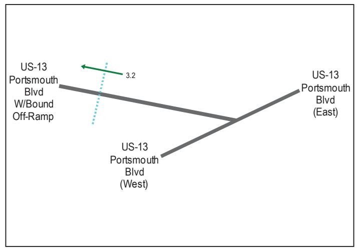
**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd

**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F



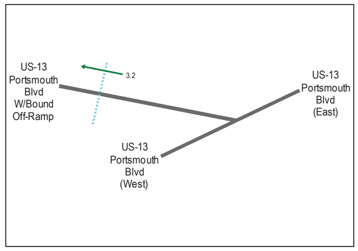

0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Bi-Directional 15min | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0015 | 0 | 28 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **30** |
| 0015 - 0030 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **37** |
| 0030 - 0045 | 0 | 20 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **22** |
| 0045 - 0100 | 0 | 25 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **28** |
| 0100 - 0115 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **24** |
| 0115 - 0130 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **32** |
| 0130 - 0145 | 0 | 17 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **20** |
| 0145 - 0200 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **18** |
| 0200 - 0215 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| 0215 - 0230 | 0 | 18 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **20** |
| 0230 - 0245 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| 0245 - 0300 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **12** |
| 0300 - 0315 | 0 | 18 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **22** |
| 0315 - 0330 | 0 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **9** |
| 0330 - 0345 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **15** |
| 0345 - 0400 | 0 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **15** |
| 0400 - 0415 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **14** |
| 0415 - 0430 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **25** |
| 0430 - 0445 | 0 | 34 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **35** |
| 0445 - 0500 | 0 | 33 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **38** |
| 0500 - 0515 | 0 | 42 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **44** |
| 0515 - 0530 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **50** |
| 0530 - 0545 | 0 | 51 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **55** |
| 0545 - 0600 | 0 | 71 | 4 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **79** |
| 0600 - 0615 | 0 | 57 | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **63** |
| 0615 - 0630 | 0 | 94 | 9 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **106** |
| 0630 - 0645 | 0 | 117 | 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **130** |
| 0645 - 0700 | 0 | 122 | 19 | 0 | 4 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | **151** |
| 0700 - 0715 | 0 | 81 | 26 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **112** |
| 0715 - 0730 | 1 | 117 | 25 | 0 | 3 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **151** |
| 0730 - 0745 | 0 | 147 | 28 | 0 | 4 | 3 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | **191** |
| 0745 - 0800 | 0 | 188 | 18 | 1 | 6 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **217** |
| 0800 - 0815 | 0 | 171 | 24 | 0 | 5 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **203** |
| 0815 - 0830 | 0 | 146 | 39 | 0 | 8 | 2 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | **204** |
| 0830 - 0845 | 1 | 113 | 33 | 0 | 6 | 1 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **160** |
| 0845 - 0900 | 0 | 118 | 26 | 0 | 6 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | **155** |
| 0900 - 0915 | 0 | 102 | 35 | 1 | 4 | 1 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **148** |
| 0915 - 0930 | 1 | 104 | 28 | 0 | 11 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **153** |
| 0930 - 0945 | 0 | 108 | 35 | 0 | 12 | 7 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **173** |
| 0945 - 1000 | 0 | 113 | 31 | 0 | 6 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **160** |
| 1000 - 1015 | 0 | 76 | 37 | 0 | 5 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **127** |
| 1015 - 1030 | 1 | 87 | 36 | 0 | 9 | 5 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | **145** |
| 1030 - 1045 | 0 | 83 | 32 | 0 | 5 | 5 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | **136** |
| 1045 - 1100 | 0 | 125 | 34 | 0 | 8 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **180** |
| 1100 - 1115 | 0 | 109 | 36 | 0 | 6 | 5 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | **161** |
| 1115 - 1130 | 0 | 125 | 45 | 0 | 8 | 6 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | **191** |
| 1130 - 1145 | 0 | 123 | 40 | 0 | 5 | 3 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | **178** |
| 1145 - 1200 | 1 | 104 | 37 | 0 | 6 | 5 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | **161** |
| 1200 - 1215 | 0 | 118 | 28 | 0 | 8 | 1 | 2 | 2 | 9 | 0 | 0 | 0 | 0 | **168** |
| 1215 - 1230 | 0 | 123 | 38 | 0 | 9 | 2 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | **178** |
| 1230 - 1245 | 1 | 118 | 38 | 0 | 3 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **168** |
| 1245 - 1300 | 1 | 147 | 36 | 0 | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | **194** |
| 1300 - 1315 | 0 | 133 | 34 | 0 | 10 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | **187** |
| 1315 - 1330 | 0 | 128 | 43 | 0 | 4 | 6 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **187** |
| 1330 - 1345 | 0 | 139 | 37 | 0 | 9 | 1 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | **199** |
| 1345 - 1400 | 0 | 135 | 39 | 0 | 11 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **192** |
| 1400 - 1415 | 2 | 158 | 49 | 0 | 5 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **221** |
| 1415 - 1430 | 1 | 144 | 40 | 0 | 2 | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | **194** |
| 1430 - 1445 | 1 | 151 | 45 | 0 | 6 | 2 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | **211** |
| 1445 - 1500 | 1 | 167 | 44 | 0 | 10 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | **234** |
| 1500 - 1515 | 0 | 194 | 61 | 0 | 1 | 7 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | **269** |
| 1515 - 1530 | 1 | 224 | 62 | 0 | 2 | 2 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **297** |
| 1530 - 1545 | 0 | 216 | 58 | 0 | 7 | 4 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | **291** |
| 1545 - 1600 | 0 | 219 | 74 | 0 | 8 | 2 | 1 | 0 | 5 | 1 | 0 | 0 | 0 | **310** |
| 1600 - 1615 | 2 | 263 | 76 | 1 | 4 | 1 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | **355** |
| 1615 - 1630 | 2 | 271 | 52 | 0 | 9 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **339** |
| 1630 - 1645 | 2 | 240 | 27 | 0 | 2 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **278** |
| 1645 - 1700 | 1 | 238 | 63 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **308** |
| 1700 - 1715 | 1 | 282 | 51 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **339** |
| 1715 - 1730 | 0 | 245 | 48 | 0 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **299** |
| 1730 - 1745 | 2 | 240 | 39 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **286** |
| 1745 - 1800 | 1 | 212 | 25 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **244** |
| 1800 - 1815 | 0 | 207 | 29 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **240** |
| 1815 - 1830 | 1 | 187 | 18 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **208** |
| 1830 - 1845 | 0 | 174 | 23 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **200** |
| 1845 - 1900 | 1 | 156 | 27 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **188** |
| 1900 - 1915 | 0 | 146 | 9 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **160** |
| 1915 - 1930 | 1 | 124 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **129** |
| 1930 - 1945 | 1 | 142 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **149** |
| 1945 - 2000 | 0 | 132 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **139** |
| 2000 - 2015 | 0 | 123 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **126** |
| 2015 - 2030 | 0 | 104 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **113** |
| 2030 - 2045 | 0 | 112 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **116** |
| 2045 - 2100 | 0 | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **97** |
| 2100 - 2115 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **88** |
| 2115 - 2130 | 0 | 78 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **79** |
| 2130 - 2145 | 0 | 83 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **84** |
| 2145 - 2200 | 0 | 69 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **71** |
| 2200 - 2215 | 0 | 84 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **87** |
| 2215 - 2230 | 1 | 79 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **83** |
| 2230 - 2245 | 0 | 74 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **77** |
| 2245 - 2300 | 1 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **58** |
| 2300 - 2315 | 0 | 53 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **54** |
| 2315 - 2330 | 0 | 50 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **52** |
| 2330 - 2345 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **44** |
| 2345 - 0000 | 0 | 53 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **55** |
| Session Total | 30 | 10368 | 1945 | 4 | 305 | 131 | 10 | 25 | 238 | 9 | 0 | 0 | 0 | **13065** |
| Session Average | 0,31 | 108,00 | 20,26 | 0,04 | 3,18 | 1,36 | 0,10 | 0,26 | 2,48 | 0,09 | 0,00 | 0,00 | 0,00 | **136,09** |
| Session Percentage | 0,23 | 79,36 | 14,89 | 0,03 | 2,33 | 1,00 | 0,08 | 0,19 | 1,82 | 0,07 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | 0830 - 0930 | 0730 - 0830 | 0930 - 1030 | 0700 - 0800 | 0915 - 1015 | 0930 - 1030 | 0930 - 1030 | 0815 - 0915 | 0900 - 1000 | - | - | - | - | **0730 - 0830** |
| AM Peak Hour Volume | 2 | 652 | 139 | 2 | 34 | 18 | 1 | 5 | 29 | 0 | 0 | 0 | 0 | **815** |
| Noon Peak Hour | 1400 - 1500 | 1445 - 1545 | 1445 - 1545 | - | 1300 - 1400 | 1030 - 1130 | 1115 - 1215 | 1130 - 1230 | 1300 - 1400 | 1330 - 1430 | - | - | - | **1445 - 1545** |
| Noon Peak Hour Volume | 5 | 801 | 225 | 0 | 34 | 22 | 4 | 5 | 31 | 1 | 0 | 0 | 0 | **1091** |
| PM Peak Hour | 1600 - 1700 | 1615 - 1715 | 1515 - 1615 | 1515 - 1615 | 1530 - 1630 | 1500 - 1600 | 1500 - 1600 | 1515 - 1615 | 1500 - 1600 | 0,00 | - | - | - | **1530 - 1630** |
| PM Peak Hour Volume | 7 | 1031 | 270 | 1 | 28 | 15 | 1 | 4 | 21 | 2 | 0 | 0 | 0 | **1295** |

**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd




**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Site 3 | | |
|---|---|---|---|
| TIME | EB | WB | TOTAL |
| 0000 - 0015 | 0 | 30 | **30** |
| 0015 - 0030 | 0 | 37 | **37** |
| 0030 - 0045 | 0 | 22 | **22** |
| 0045 - 0100 | 0 | 28 | **28** |
| 0100 - 0115 | 0 | 24 | **24** |
| 0115 - 0130 | 0 | 32 | **32** |
| 0130 - 0145 | 0 | 20 | **20** |
| 0145 - 0200 | 0 | 18 | **18** |
| 0200 - 0215 | 0 | 10 | **10** |
| 0215 - 0230 | 0 | 20 | **20** |
| 0230 - 0245 | 0 | 10 | **10** |
| 0245 - 0300 | 0 | 12 | **12** |
| 0300 - 0315 | 0 | 22 | **22** |
| 0315 - 0330 | 0 | 9 | **9** |
| 0330 - 0345 | 0 | 15 | **15** |
| 0345 - 0400 | 0 | 15 | **15** |
| 0400 - 0415 | 0 | 14 | **14** |
| 0415 - 0430 | 0 | 25 | **25** |
| 0430 - 0445 | 0 | 35 | **35** |
| 0445 - 0500 | 0 | 38 | **38** |
| 0500 - 0515 | 0 | 44 | **44** |
| 0515 - 0530 | 0 | 50 | **50** |
| 0530 - 0545 | 0 | 55 | **55** |
| 0545 - 0600 | 0 | 79 | **79** |
| 0600 - 0615 | 0 | 63 | **63** |
| 0615 - 0630 | 0 | 106 | **106** |
| 0630 - 0645 | 0 | 130 | **130** |
| 0645 - 0700 | 0 | 151 | **151** |
| 0700 - 0715 | 0 | 112 | **112** |
| 0715 - 0730 | 0 | 151 | **151** |
| 0730 - 0745 | 0 | 191 | **191** |
| 0745 - 0800 | 0 | 217 | **217** |
| 0800 - 0815 | 0 | 203 | **203** |
| 0815 - 0830 | 0 | 204 | **204** |
| 0830 - 0845 | 0 | 160 | **160** |
| 0845 - 0900 | 0 | 155 | **155** |
| 0900 - 0915 | 0 | 148 | **148** |
| 0915 - 0930 | 0 | 153 | **153** |
| 0930 - 0945 | 0 | 173 | **173** |
| 0945 - 1000 | 0 | 160 | **160** |
| 1000 - 1015 | 0 | 127 | **127** |
| 1015 - 1030 | 0 | 145 | **145** |
| 1030 - 1045 | 0 | 136 | **136** |
| 1045 - 1100 | 0 | 180 | **180** |
| 1100 - 1115 | 0 | 161 | **161** |
| 1115 - 1130 | 0 | 191 | **191** |
| 1130 - 1145 | 0 | 178 | **178** |
| 1145 - 1200 | 0 | 161 | **161** |
| 1200 - 1215 | 0 | 168 | **168** |
| 1215 - 1230 | 0 | 178 | **178** |
| 1230 - 1245 | 0 | 168 | **168** |
| 1245 - 1300 | 0 | 194 | **194** |
| 1300 - 1315 | 0 | 187 | **187** |
| 1315 - 1330 | 0 | 187 | **187** |
| 1330 - 1345 | 0 | 199 | **199** |
| 1345 - 1400 | 0 | 192 | **192** |
| 1400 - 1415 | 0 | 221 | **221** |
| 1415 - 1430 | 0 | 194 | **194** |
| 1430 - 1445 | 0 | 211 | **211** |
| 1445 - 1500 | 0 | 234 | **234** |
| 1500 - 1515 | 0 | 269 | **269** |
| 1515 - 1530 | 0 | 297 | **297** |
| 1530 - 1545 | 0 | 291 | **291** |
| 1545 - 1600 | 0 | 310 | **310** |
| 1600 - 1615 | 0 | 355 | **355** |
| 1615 - 1630 | 0 | 339 | **339** |
| 1630 - 1645 | 0 | 278 | **278** |
| 1645 - 1700 | 0 | 308 | **308** |
| 1700 - 1715 | 0 | 339 | **339** |
| 1715 - 1730 | 0 | 299 | **299** |
| 1730 - 1745 | 0 | 286 | **286** |
| 1745 - 1800 | 0 | 244 | **244** |
| 1800 - 1815 | 0 | 240 | **240** |
| 1815 - 1830 | 0 | 208 | **208** |
| 1830 - 1845 | 0 | 200 | **200** |
| 1845 - 1900 | 0 | 188 | **188** |
| 1900 - 1915 | 0 | 160 | **160** |
| 1915 - 1930 | 0 | 129 | **129** |
| 1930 - 1945 | 0 | 149 | **149** |
| 1945 - 2000 | 0 | 139 | **139** |
| 2000 - 2015 | 0 | 126 | **126** |
| 2015 - 2030 | 0 | 113 | **113** |
| 2030 - 2045 | 0 | 116 | **116** |
| 2045 - 2100 | 0 | 97 | **97** |
| 2100 - 2115 | 0 | 88 | **88** |
| 2115 - 2130 | 0 | 79 | **79** |
| 2130 - 2145 | 0 | 84 | **84** |
| 2145 - 2200 | 0 | 71 | **71** |
| 2200 - 2215 | 0 | 87 | **87** |
| 2215 - 2230 | 0 | 83 | **83** |
| 2230 - 2245 | 0 | 77 | **77** |
| 2245 - 2300 | 0 | 58 | **58** |
| 2300 - 2315 | 0 | 54 | **54** |
| 2315 - 2330 | 0 | 52 | **52** |
| 2330 - 2345 | 0 | 44 | **44** |
| 2345 - 0000 | 0 | 55 | **55** |

| | | | |
|---|---|---|---|
| Session Total | 0 | 13065 | **13065** |
| Session Average | 0,00 | 136,09 | **136,09** |

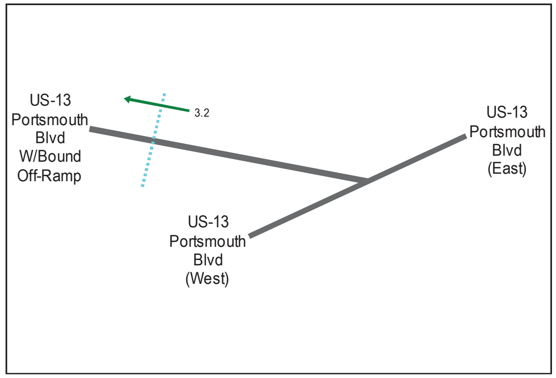
**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd

**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Westbound, (Movement 3.2) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0100 | 0 | 110 | 1 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **117** |
| 0100 - 0200 | 0 | 89 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **94** |
| 0200 - 0300 | 0 | 48 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **52** |
| 0300 - 0400 | 0 | 54 | 2 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **61** |
| 0400 - 0500 | 0 | 106 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **112** |
| 0500 - 0600 | 0 | 213 | 4 | 0 | 7 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **228** |
| 0600 - 0700 | 0 | 390 | 43 | 0 | 7 | 4 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | **450** |
| 0700 - 0800 | 1 | 533 | 97 | 2 | 16 | 7 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | **671** |
| 0800 - 0900 | 1 | 548 | 122 | 0 | 25 | 5 | 0 | 4 | 17 | 0 | 0 | 0 | 0 | **722** |
| 0900 - 1000 | 1 | 427 | 129 | 1 | 33 | 12 | 0 | 2 | 29 | 0 | 0 | 0 | 0 | **634** |
| 1000 - 1100 | 1 | 371 | 139 | 0 | 27 | 20 | 1 | 3 | 26 | 0 | 0 | 0 | 0 | **588** |
| 1100 - 1200 | 1 | 461 | 158 | 0 | 25 | 19 | 2 | 3 | 22 | 0 | 0 | 0 | 0 | **691** |
| 1200 - 1300 | 2 | 506 | 140 | 0 | 23 | 7 | 3 | 3 | 24 | 0 | 0 | 0 | 0 | **708** |
| 1300 - 1400 | 0 | 535 | 153 | 0 | 34 | 10 | 0 | 2 | 31 | 0 | 0 | 0 | 0 | **765** |
| 1400 - 1500 | 5 | 620 | 178 | 0 | 23 | 14 | 3 | 2 | 14 | 1 | 0 | 0 | 0 | **860** |
| 1500 - 1600 | 1 | 853 | 255 | 0 | 18 | 15 | 1 | 2 | 21 | 1 | 0 | 0 | 0 | **1167** |
| 1600 - 1700 | 7 | 1012 | 218 | 1 | 19 | 10 | 0 | 2 | 11 | 0 | 0 | 0 | 0 | **1280** |
| 1700 - 1800 | 4 | 979 | 163 | 0 | 14 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | **1168** |
| 1800 - 1900 | 2 | 724 | 97 | 0 | 8 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **836** |
| 1900 - 2000 | 2 | 544 | 22 | 0 | 6 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **577** |
| 2000 - 2100 | 0 | 434 | 9 | 0 | 5 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | **452** |
| 2100 - 2200 | 0 | 317 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **322** |
| 2200 - 2300 | 2 | 294 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **305** |
| 2300 - 2400 | 0 | 200 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **205** |
| Session Total | 30 | 10368 | 1945 | 4 | 305 | 131 | 10 | 25 | 238 | 9 | 0 | 0 | 0 | **13065** |
| Session Average | 1,25 | 432,00 | 81,04 | 0,17 | 12,71 | 5,46 | 0,42 | 1,04 | 9,92 | 0,38 | 0,00 | 0,00 | 0,00 | **544,38** |
| Session Percentage | 0,23 | 79,36 | 14,89 | 0,03 | 2,33 | 1,00 | 0,08 | 0,19 | 1,82 | 0,07 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | 0800 - 0900 | 0900 - 1000 | 1000 - 1100 | 0800 - 0900 | 1000 - 1100 | 1000 - 1100 | - | 0900 - 1000 | 1000 - 1100 | - | - | - | - | **0900 - 1000** |
| AM Peak Hour Volume | 1 | 548 | 129 | 2 | 33 | 12 | 0 | 4 | 29 | 0 | 0 | 0 | 0 | **722** |
| Noon Peak Hour | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | - | 1400 - 1500 | 1100 - 1200 | 1300 - 1400 | 1100 - 1200 | 1400 - 1500 | 1500 - 1600 | - | - | - | **1500 - 1600** |
| Noon Peak Hour Volume | 5 | 620 | 178 | 0 | 34 | 20 | 3 | 3 | 31 | 1 | 0 | 0 | 0 | **860** |
| PM Peak Hour | 1700 - 1800 | 1700 - 1800 | 1600 - 1700 | 1700 - 1800 | 1700 - 1800 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | - | - | - | **1700 - 1800** |
| PM Peak Hour Volume | 7 | 1012 | 255 | 1 | 19 | 15 | 1 | 2 | 21 | 1 | 0 | 0 | 0 | **1280** |

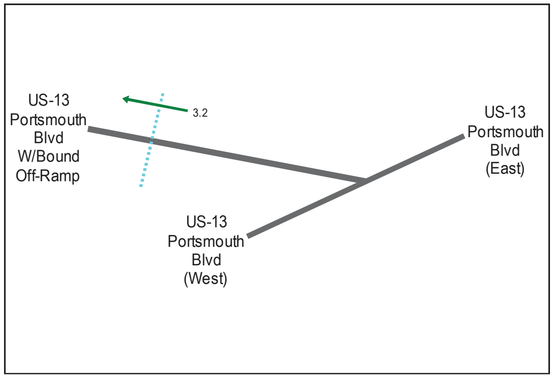
**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd

**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




0000 - 2400 (Weekday 24h Session)

undertaken on Tuesday, October 13th, 2020

| | Bi-Directional 60min | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8 | Class 9 | Class 10 | Class 11 | Class 12 | Class 13 | **TOTAL** |
| 0000 - 0100 | 0 | 110 | 1 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **117** |
| 0100 - 0200 | 0 | 89 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **94** |
| 0200 - 0300 | 0 | 48 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **52** |
| 0300 - 0400 | 0 | 54 | 2 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **61** |
| 0400 - 0500 | 0 | 106 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **112** |
| 0500 - 0600 | 0 | 213 | 4 | 0 | 7 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **228** |
| 0600 - 0700 | 0 | 390 | 43 | 0 | 7 | 4 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | **450** |
| 0700 - 0800 | 1 | 533 | 97 | 2 | 16 | 7 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | **671** |
| 0800 - 0900 | 1 | 548 | 122 | 0 | 25 | 5 | 0 | 4 | 17 | 0 | 0 | 0 | 0 | **722** |
| 0900 - 1000 | 1 | 427 | 129 | 1 | 33 | 12 | 0 | 2 | 29 | 0 | 0 | 0 | 0 | **634** |
| 1000 - 1100 | 1 | 371 | 139 | 0 | 27 | 20 | 1 | 3 | 26 | 0 | 0 | 0 | 0 | **588** |
| 1100 - 1200 | 1 | 461 | 158 | 0 | 25 | 19 | 2 | 3 | 22 | 0 | 0 | 0 | 0 | **691** |
| 1200 - 1300 | 2 | 506 | 140 | 0 | 23 | 7 | 3 | 3 | 24 | 0 | 0 | 0 | 0 | **708** |
| 1300 - 1400 | 0 | 535 | 153 | 0 | 34 | 10 | 0 | 2 | 31 | 0 | 0 | 0 | 0 | **765** |
| 1400 - 1500 | 5 | 620 | 178 | 0 | 23 | 14 | 3 | 2 | 14 | 1 | 0 | 0 | 0 | **860** |
| 1500 - 1600 | 1 | 853 | 255 | 0 | 18 | 15 | 1 | 2 | 21 | 1 | 0 | 0 | 0 | **1167** |
| 1600 - 1700 | 7 | 1012 | 218 | 1 | 19 | 10 | 0 | 2 | 11 | 0 | 0 | 0 | 0 | **1280** |
| 1700 - 1800 | 4 | 979 | 163 | 0 | 14 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | **1168** |
| 1800 - 1900 | 2 | 724 | 97 | 0 | 8 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **836** |
| 1900 - 2000 | 2 | 544 | 22 | 0 | 6 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **577** |
| 2000 - 2100 | 0 | 434 | 9 | 0 | 5 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | **452** |
| 2100 - 2200 | 0 | 317 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **322** |
| 2200 - 2300 | 2 | 294 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **305** |
| 2300 - 2400 | 0 | 200 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **205** |
| Session Total | 30 | 10368 | 1945 | 4 | 305 | 131 | 10 | 25 | 238 | 9 | 0 | 0 | 0 | **13065** |
| Session Average | 1,25 | 432,00 | 81,04 | 0,17 | 12,71 | 5,46 | 0,42 | 1,04 | 9,92 | 0,38 | 0,00 | 0,00 | 0,00 | **544,38** |
| Session Percentage | 0,23 | 79,36 | 14,89 | 0,03 | 2,33 | 1,00 | 0,08 | 0,19 | 1,82 | 0,07 | 0,00 | 0,00 | 0,00 | |
| AM Peak Hour | 0800 - 0900 | 0900 - 1000 | 1000 - 1100 | 0800 - 0900 | 1000 - 1100 | 1000 - 1100 | - | 0900 - 1000 | 1000 - 1100 | - | - | - | - | **0900 - 1000** |
| AM Peak Hour Volume | 1 | 548 | 129 | 2 | 33 | 12 | 0 | 4 | 29 | 0 | 0 | 0 | 0 | **722** |
| Noon Peak Hour | 1500 - 1600 | 1500 - 1600 | 1500 - 1600 | - | 1400 - 1500 | 1100 - 1200 | 1300 - 1400 | 1100 - 1200 | 1400 - 1500 | 1500 - 1600 | - | - | - | **1500 - 1600** |
| Noon Peak Hour Volume | 5 | 620 | 178 | 0 | 34 | 20 | 3 | 3 | 31 | 1 | 0 | 0 | 0 | **860** |
| PM Peak Hour | 1700 - 1800 | 1700 - 1800 | 1600 - 1700 | 1700 - 1800 | 1700 - 1800 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | 1600 - 1700 | - | - | - | **1700 - 1800** |
| PM Peak Hour Volume | 7 | 1012 | 255 | 1 | 19 | 15 | 1 | 2 | 21 | 1 | 0 | 0 | 0 | **1280** |

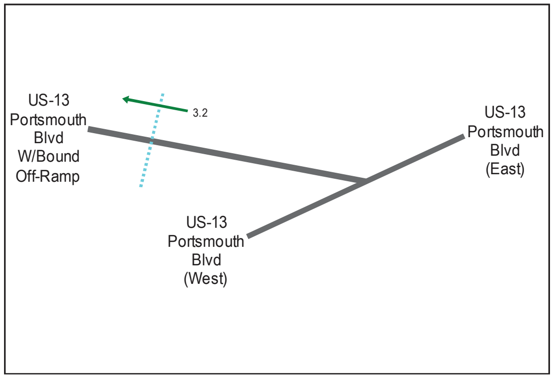
**Suffolk, VA**
Classified Traffic Count

**Site 3**
US-13 Portsbouth Blvd W/Bound Off-Ramp,
west of US-13 Portsmouth Blvd

**Lat/Long**
36,753956°, -76,518575°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

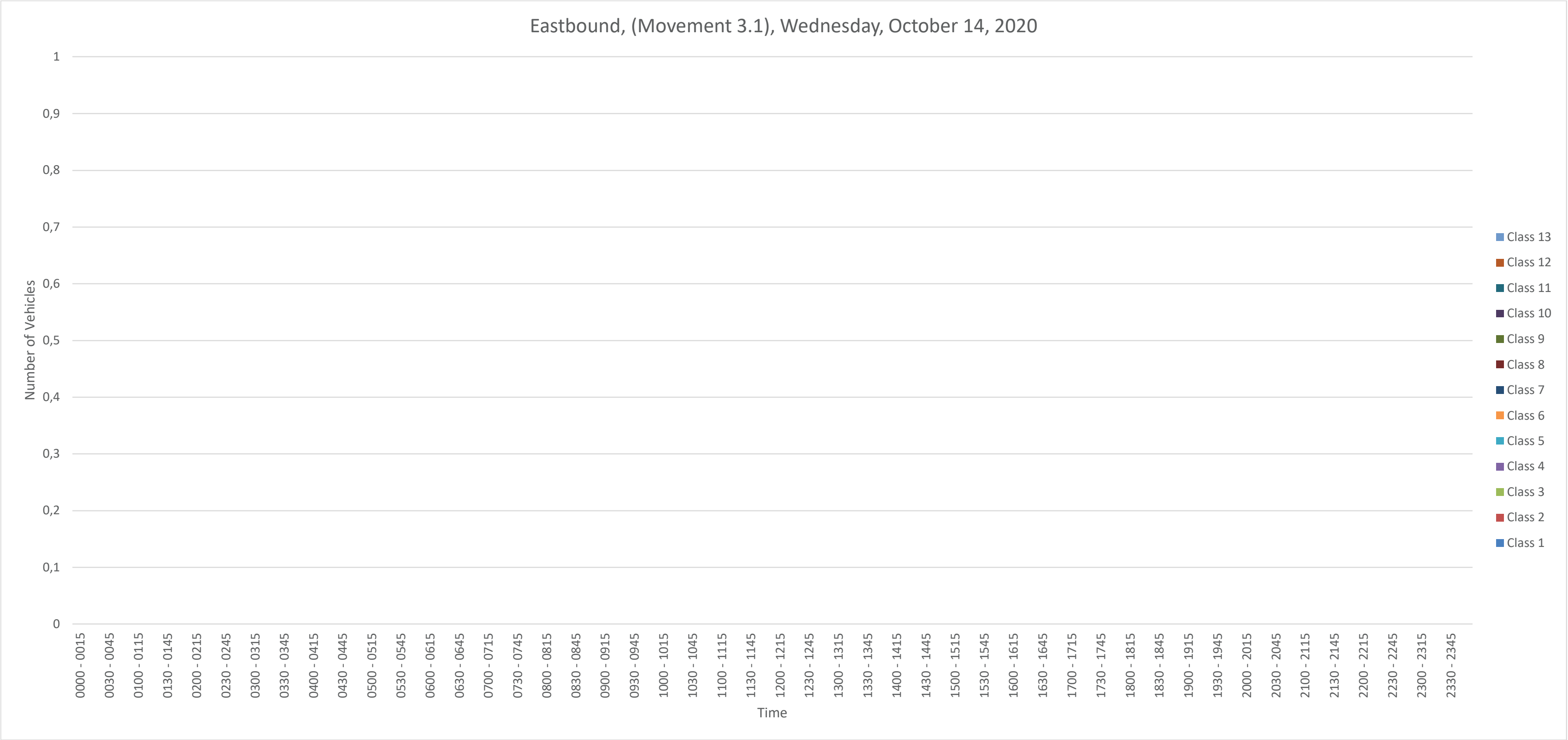


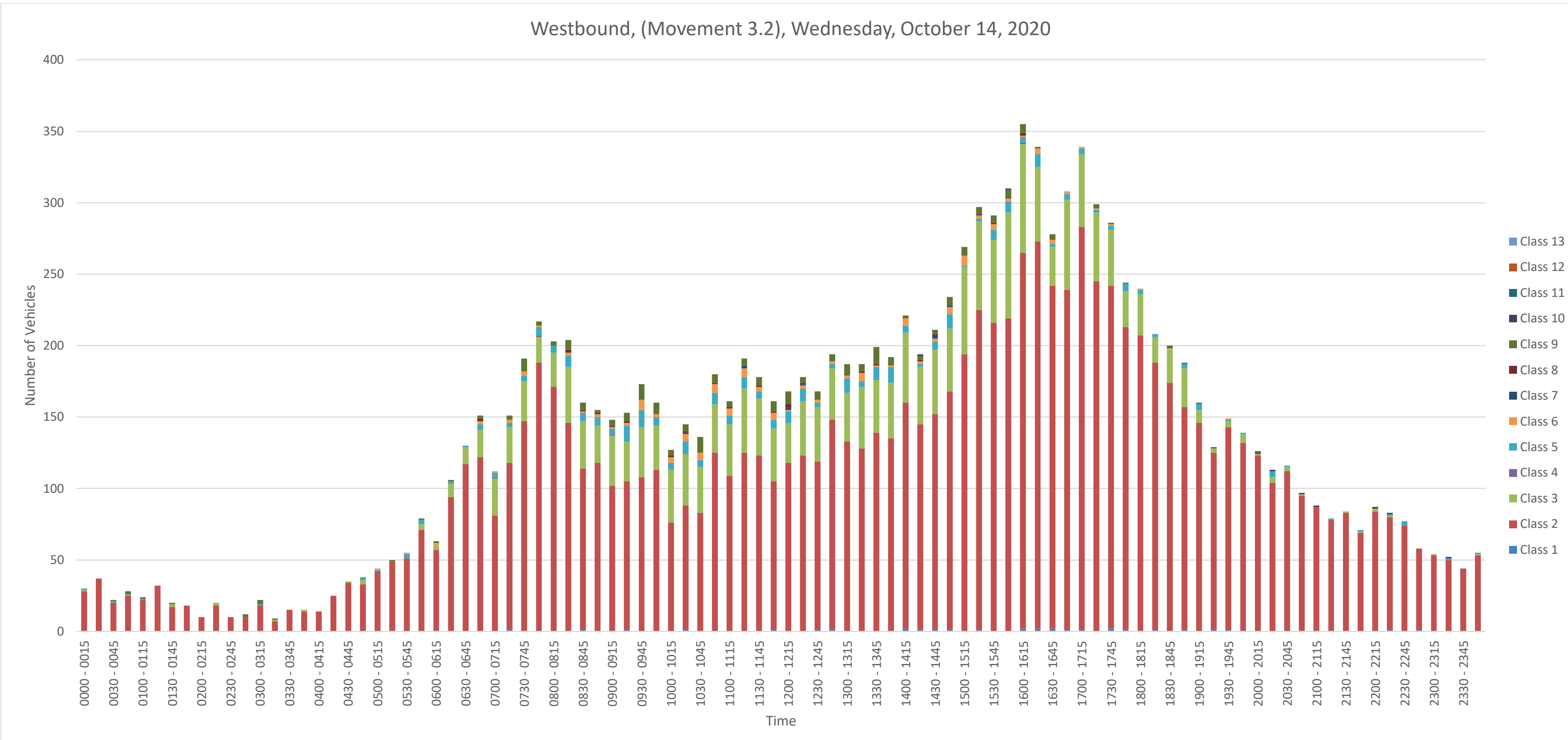

0000 - 2400 (Weekday 24h Session)

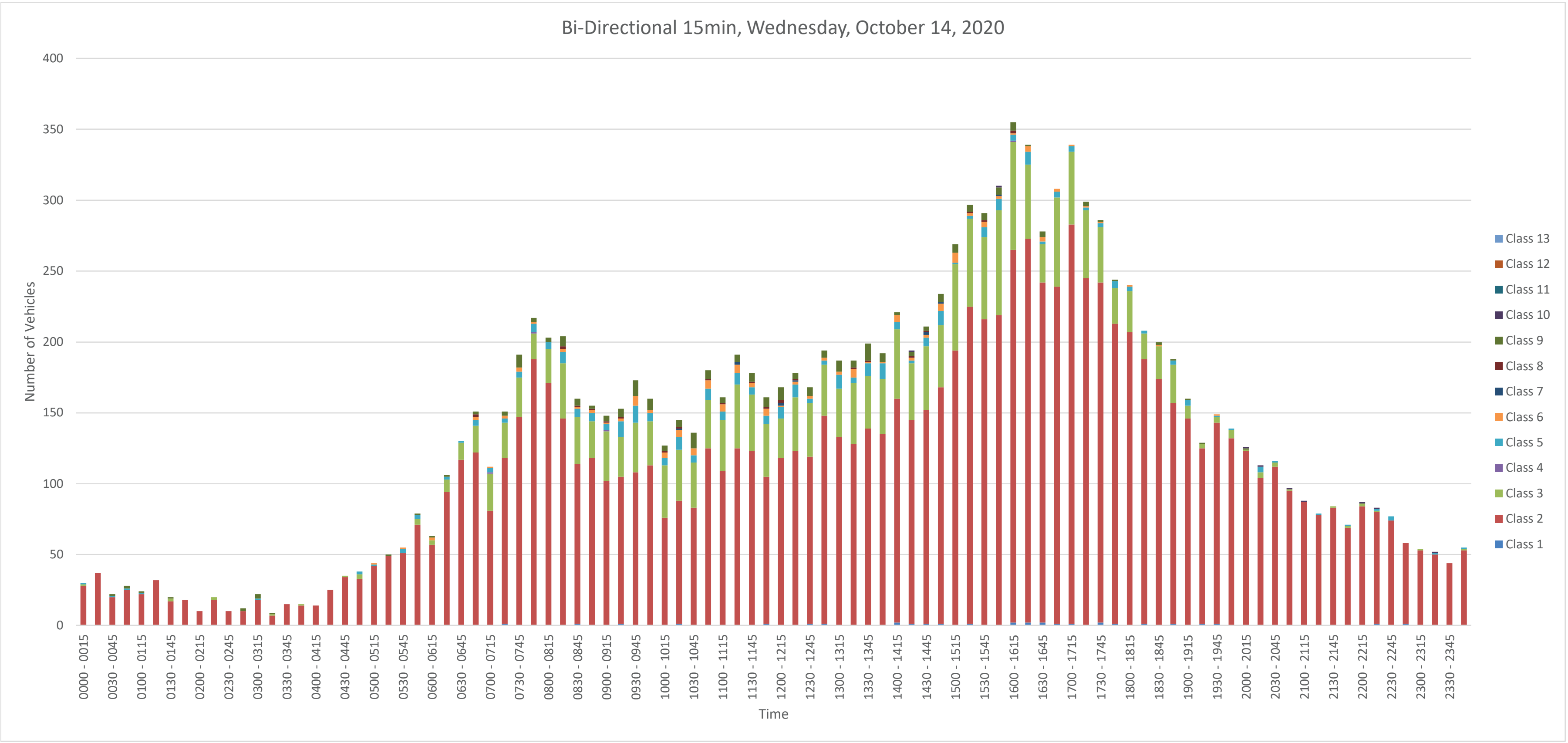
undertaken on Tuesday, October 13th, 2020

| | Volume Summary 60min | | |
|---|---|---|---|
| TIME | EB | WB | **TOTAL** |
| 0000 - 0100 | 0 | 117 | **117** |
| 0100 - 0200 | 0 | 94 | **94** |
| 0200 - 0300 | 0 | 52 | **52** |
| 0300 - 0400 | 0 | 61 | **61** |
| 0400 - 0500 | 0 | 112 | **112** |
| 0500 - 0600 | 0 | 228 | **228** |
| 0600 - 0700 | 0 | 450 | **450** |
| 0700 - 0800 | 0 | 671 | **671** |
| 0800 - 0900 | 0 | 722 | **722** |
| 0900 - 1000 | 0 | 634 | **634** |
| 1000 - 1100 | 0 | 588 | **588** |
| 1100 - 1200 | 0 | 691 | **691** |
| 1200 - 1300 | 0 | 708 | **708** |
| 1300 - 1400 | 0 | 765 | **765** |
| 1400 - 1500 | 0 | 860 | **860** |
| 1500 - 1600 | 0 | 1167 | **1167** |
| 1600 - 1700 | 0 | 1280 | **1280** |
| 1700 - 1800 | 0 | 1168 | **1168** |
| 1800 - 1900 | 0 | 836 | **836** |
| 1900 - 2000 | 0 | 577 | **577** |
| 2000 - 2100 | 0 | 452 | **452** |
| 2100 - 2200 | 0 | 322 | **322** |
| 2200 - 2300 | 0 | 305 | **305** |
| 2300 - 2400 | 0 | 205 | **205** |

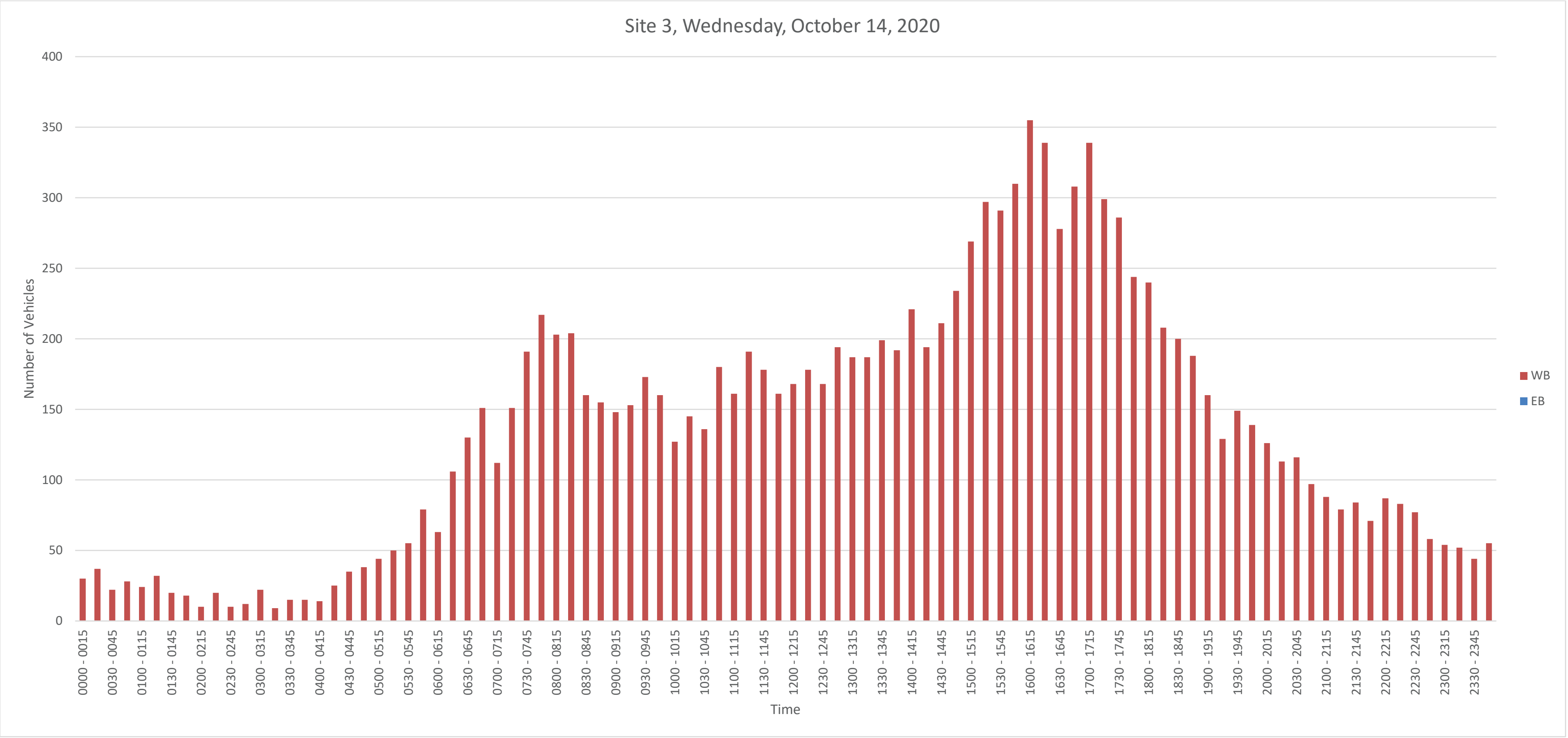
| | | | |
|---|---|---|---|
| Session Total | 0 | 13065 | **13065** |
| Session Average | 0,00 | 544,38 | **544,38** |
| Session Percentage | 0,00 | 100,00 | |

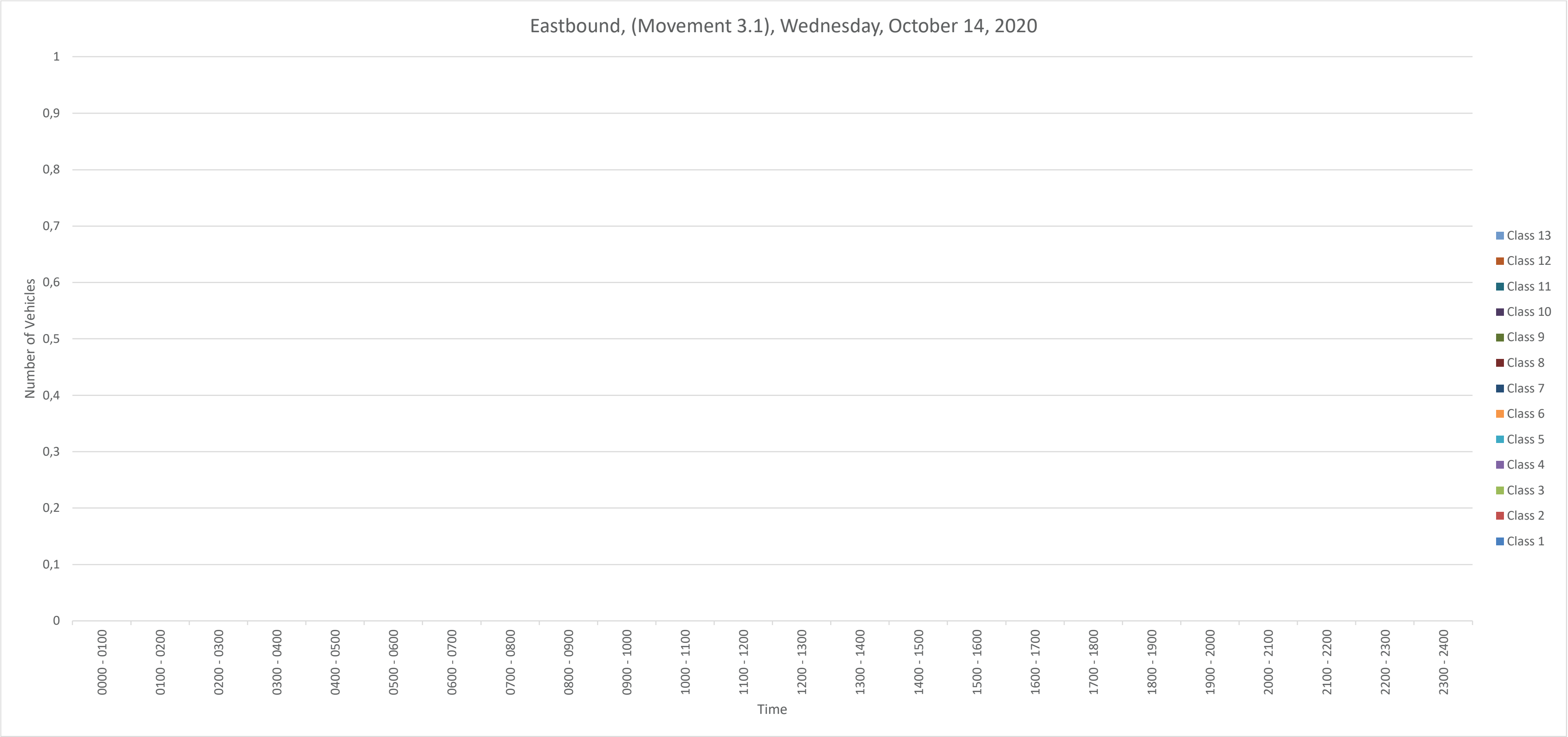

Eastbound, (Movement 3.1), Wednesday, October 14, 2020
Number of Vehicles
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
Time
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Westbound, (Movement 3.2), Wednesday, October 14, 2020
Number of Vehicles
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1

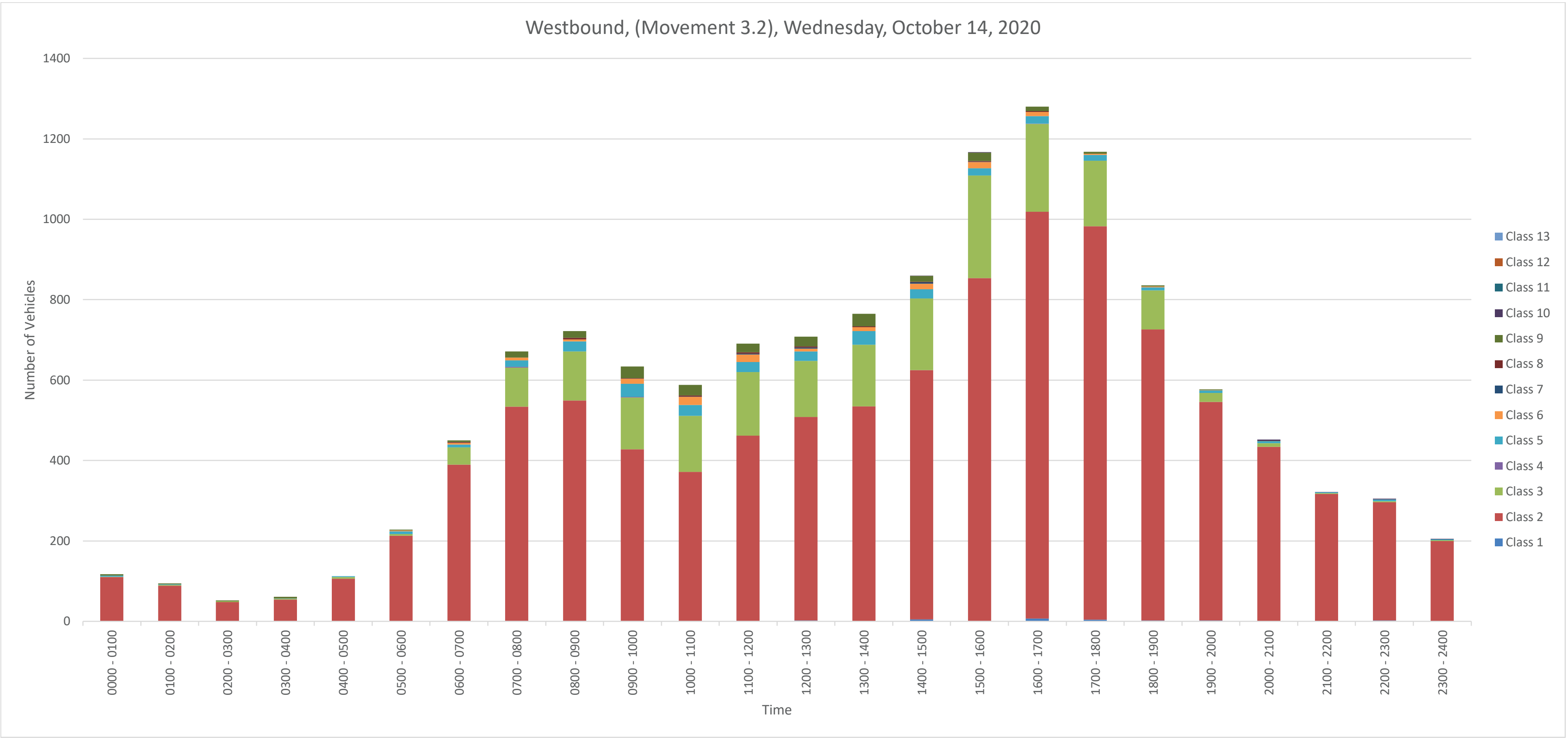


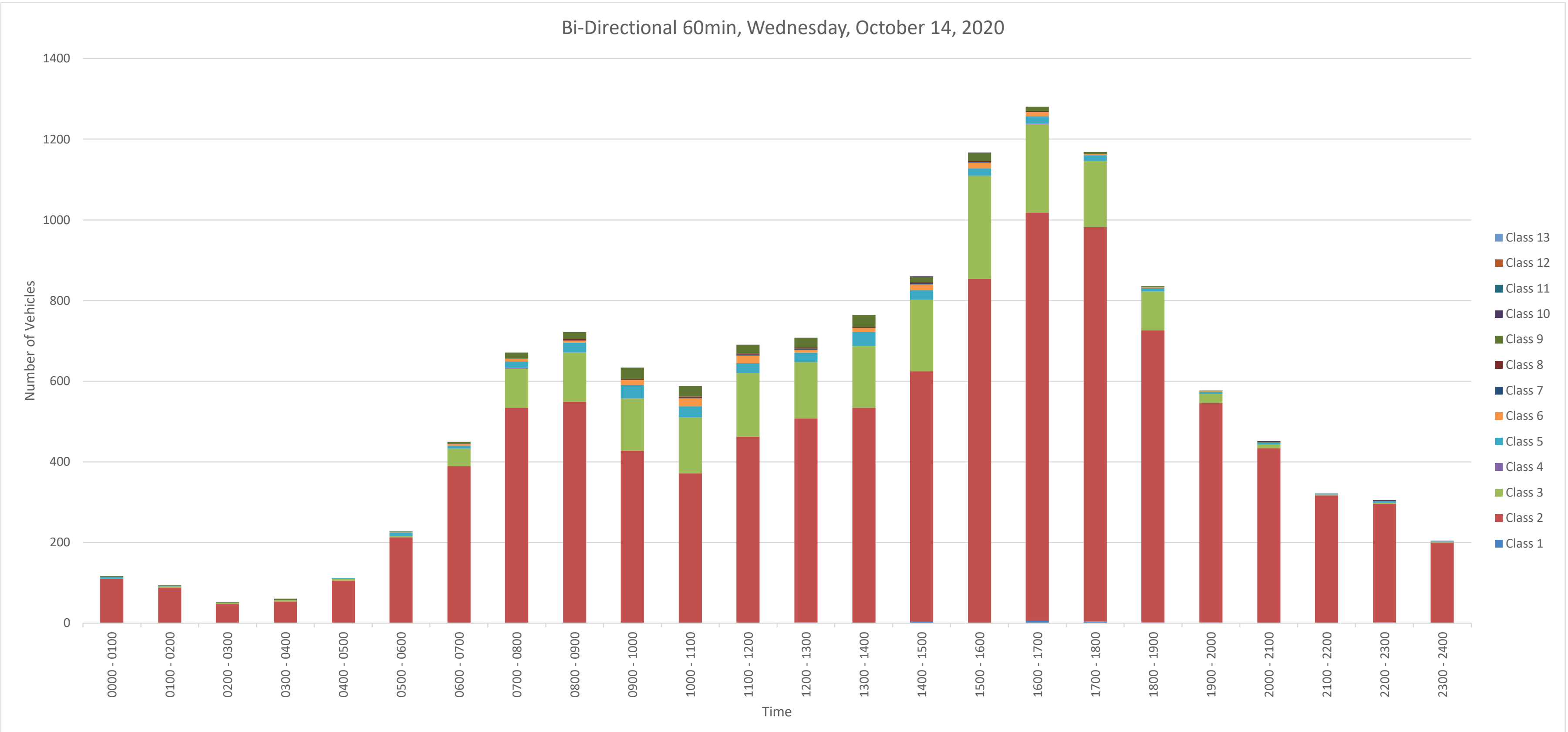
Bi-Directional 15min, Wednesday, October 14, 2020
Number of Vehicles
400
350
300
250
200
150
100
50
0
0000 - 0015
0030 - 0045
0100 - 0115
0130 - 0145
0200 - 0215
0230 - 0245
0300 - 0315
0330 - 0345
0400 - 0415
0430 - 0445
0500 - 0515
0530 - 0545
0600 - 0615
0630 - 0645
0700 - 0715
0730 - 0745
0800 - 0815
0830 - 0845
0900 - 0915
0930 - 0945
1000 - 1015
1030 - 1045
1100 - 1115
1130 - 1145
1200 - 1215
1230 - 1245
1300 - 1315
1330 - 1345
1400 - 1415
1430 - 1445
1500 - 1515
1530 - 1545
1600 - 1615
1630 - 1645
1700 - 1715
1730 - 1745
1800 - 1815
1830 - 1845
1900 - 1915
1930 - 1945
2000 - 2015
2030 - 2045
2100 - 2115
2130 - 2145
2200 - 2215
2230 - 2245
2300 - 2315
2330 - 2345
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1

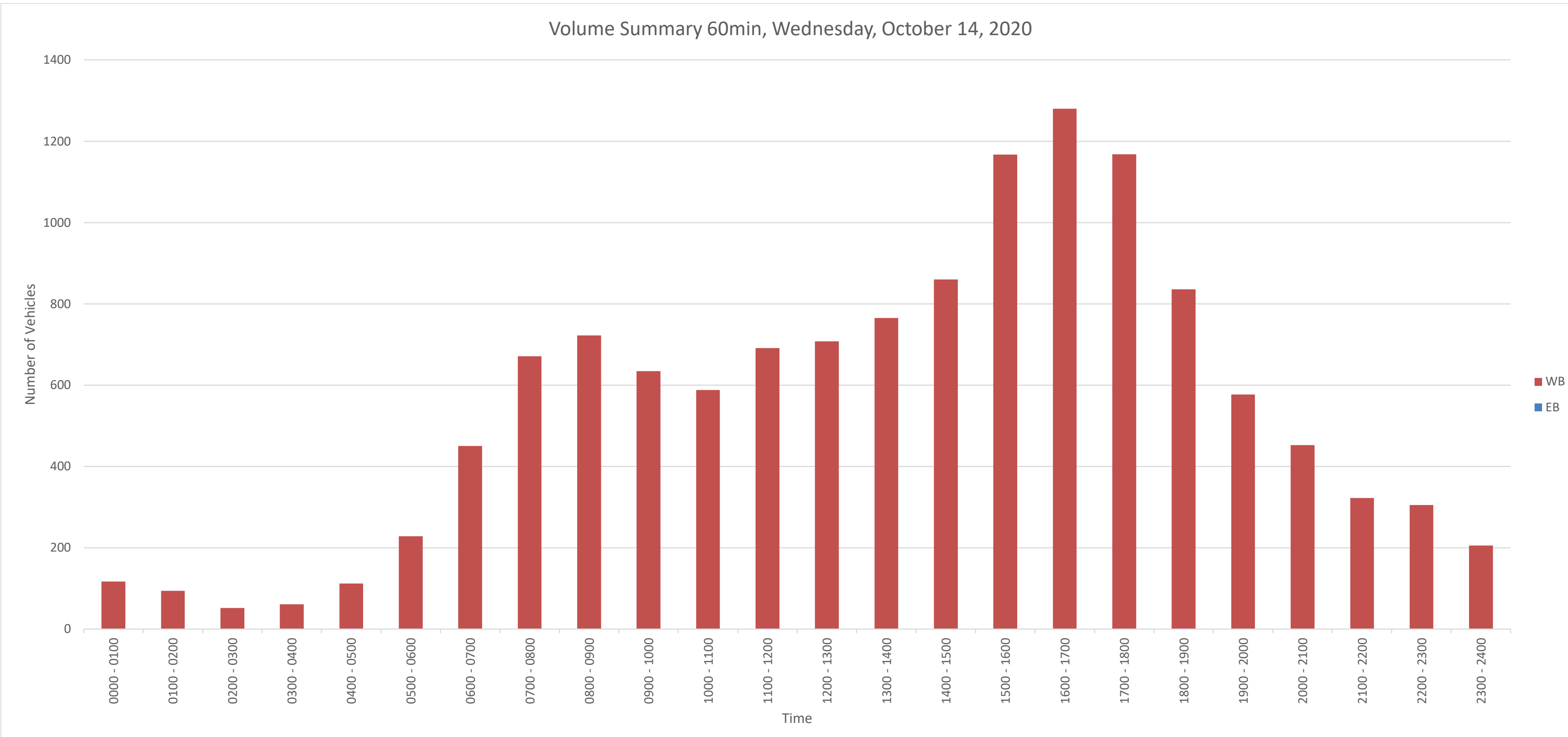

Site 3, Wednesday, October 14, 2020
Number of Vehicles
Time
WB
EB



Eastbound, (Movement 3.1), Wednesday, October 14, 2020
Number of Vehicles
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Westbound, (Movement 3.2), Wednesday, October 14, 2020
Number of Vehicles
0
200
400
600
800
1000
1200
1400
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1


Bi-Directional 60min, Wednesday, October 14, 2020
Number of Vehicles
1400
1200
1000
800
600
400
200
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
Class 13
Class 12
Class 11
Class 10
Class 9
Class 8
Class 7
Class 6
Class 5
Class 4
Class 3
Class 2
Class 1



Volume Summary 60min, Wednesday, October 14, 2020
Number of Vehicles
1400
1200
1000
800
600
400
200
0
0000 - 0100
0100 - 0200
0200 - 0300
0300 - 0400
0400 - 0500
0500 - 0600
0600 - 0700
0700 - 0800
0800 - 0900
0900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
Time
WB
EB

**Suffolk, VA**
Classified Turn Movement Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

Marr Traffic Inc
www.marrtraffic.com

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0700 - 0900 (Weekday 2h Session) (14-10-2020)
All vehicles

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 776 | 0 | 3 | 782 | 0 | 440 | 2 | 0 | 442 | 1224 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 945 | 0 | 4 | 953 | 0 | 528 | 4 | 0 | 532 | 1485 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 800 | 0 | 7 | 810 | 0 | 636 | 9 | 0 | 645 | 1457 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 8 | 719 | 0 | 1 | 728 | 1 | 745 | 8 | 0 | 754 | 1484 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 4 | **4** | 18 | 3240 | 0 | 15 | **3273** | 1 | 2349 | 23 | 0 | **2373** | **5650** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 4 | 659 | 0 | 6 | 669 | 0 | 636 | 4 | 0 | 640 | 1312 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 4 | 627 | 0 | 9 | 640 | 1 | 574 | 7 | 0 | 582 | 1235 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 4 | 589 | 0 | 6 | 599 | 0 | 496 | 5 | 0 | 501 | 1108 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 507 | 0 | 10 | 518 | 0 | 535 | 7 | 0 | 542 | 1063 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 27 | **27** | 13 | 2382 | 0 | 31 | **2426** | 1 | 2241 | 23 | 0 | **2265** | **4718** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 31 | **31** | 31 | 5622 | 0 | 46 | **5699** | 2 | 4590 | 46 | 0 | **4638** | **10368** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,54 | 98,65 | 0,00 | 0,81 | - | 0,04 | 98,97 | 0,99 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,30 | 0,30 | 0,30 | 54,22 | 0,00 | 0,44 | 54,97 | 0,02 | 44,27 | 0,44 | 0,00 | 44,73 | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,58 | **0,58** | 0,59 | 0,83 | 0,00 | 0,64 | **0,83** | 0,25 | 0,85 | 0,69 | 0,00 | **0,85** | **0,97** |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
All vehicles

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 10 | 546 | 0 | 7 | 563 | 0 | 635 | 8 | 0 | 643 | 1213 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 0 | 586 | 0 | 4 | 590 | 1 | 616 | 10 | 0 | 627 | 1231 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 6 | 563 | 0 | 6 | 575 | 1 | 655 | 4 | 0 | 660 | 1248 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 5 | 570 | 0 | 3 | 578 | 1 | 716 | 7 | 0 | 724 | 1312 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 44 | **44** | 21 | 2265 | 0 | 20 | **2306** | 3 | 2622 | 29 | 0 | **2654** | **5004** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 7 | 614 | 0 | 4 | 625 | 1 | 862 | 5 | 0 | 868 | 1513 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 5 | 663 | 0 | 5 | 673 | 0 | 840 | 0 | 0 | 840 | 1523 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 6 | 740 | 0 | 7 | 753 | 0 | 861 | 4 | 0 | 865 | 1628 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 6 | 630 | 0 | 5 | 641 | 0 | 907 | 4 | 0 | 911 | 1559 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 47 | **47** | 24 | 2647 | 0 | 21 | **2692** | 1 | 3470 | 13 | 0 | **3484** | **6223** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 18 | 18 | 3 | 686 | 0 | 10 | 699 | 0 | 1005 | 2 | 0 | 1007 | 1724 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 1 | 659 | 0 | 9 | 669 | 1 | 1021 | 1 | 0 | 1023 | 1696 |
| 1/2 Hourly Total | 0 | 0 | 0 | 0 | **0** | 22 | **22** | 4 | 1345 | 0 | 19 | **1368** | 1 | 2026 | 3 | 0 | **2030** | **3420** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 113 | **113** | 49 | 6257 | 0 | 60 | **6366** | 5 | 8118 | 45 | 0 | **8168** | **14647** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,77 | 98,29 | 0,00 | 0,94 | - | 0,06 | 99,39 | 0,55 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,77 | 0,77 | 0,33 | 42,72 | 0,00 | 0,41 | 43,46 | 0,03 | 55,42 | 0,31 | 0,00 | 55,77 | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,54 | **0,54** | 0,67 | 0,92 | 0,00 | 0,78 | **0,92** | 0,25 | 0,93 | 0,69 | 0,00 | **0,93** | **0,96** |

**Suffolk, VA**
Classified Turn Movement Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

Marr Traffic Inc
www.marrtraffic.com

0700 - 0900 (Weekday 2h Session) (14-10-2020)
Bikes

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
Bikes

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1/2 Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | **0** | **0** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |

**Suffolk, VA**
Classified Turn Movement Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

Marr Traffic Inc
www.marrtraffic.com

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0700 - 0900 (Weekday 2h Session) (14-10-2020)
Passenger Vehicles (1-3)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| TIME | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | Right 1.5 | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 695 | 0 | 3 | 701 | 0 | 358 | 1 | 0 | 359 | 1060 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 858 | 0 | 3 | 865 | 0 | 444 | 4 | 0 | 448 | 1313 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 728 | 0 | 7 | 738 | 0 | 534 | 6 | 0 | 540 | 1279 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 6 | 665 | 0 | 1 | 672 | 0 | 636 | 5 | 0 | 641 | 1314 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 2 | **2** | 16 | 2946 | 0 | 14 | **2976** | 0 | 1972 | 16 | 0 | **1988** | **4966** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 569 | 0 | 3 | 576 | 0 | 532 | 3 | 0 | 535 | 1113 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 3 | 536 | 0 | 7 | 546 | 1 | 480 | 4 | 0 | 485 | 1036 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 499 | 0 | 1 | 503 | 0 | 399 | 5 | 0 | 404 | 910 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 429 | 0 | 6 | 435 | 0 | 439 | 5 | 0 | 444 | 882 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 13 | **13** | 10 | 2033 | 0 | 17 | **2060** | 1 | 1850 | 17 | 0 | **1868** | **3941** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 15 | **15** | 26 | 4979 | 0 | 31 | **5036** | 1 | 3822 | 33 | 0 | **3856** | **8907** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,52 | 98,87 | 0,00 | 0,62 | - | 0,03 | 99,12 | 0,86 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,17 | 0,17 | 0,29 | 55,90 | 0,00 | 0,35 | 56,54 | 0,01 | 42,91 | 0,37 | 0,00 | 43,29 | |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
Passenger Vehicles (1-3)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| TIME | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | Right 1.5 | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 469 | 0 | 6 | 480 | 0 | 560 | 7 | 0 | 567 | 1052 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 | 512 | 0 | 2 | 514 | 1 | 525 | 9 | 0 | 535 | 1058 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 11 | 11 | 4 | 477 | 0 | 4 | 485 | 1 | 570 | 4 | 0 | 575 | 1071 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 3 | 498 | 0 | 2 | 503 | 1 | 641 | 2 | 0 | 644 | 1153 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 31 | **31** | 12 | 1956 | 0 | 14 | **1982** | 3 | 2296 | 22 | 0 | **2321** | **4334** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 12 | 12 | 4 | 538 | 0 | 2 | 544 | 1 | 768 | 5 | 0 | 774 | 1330 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 1 | 597 | 0 | 3 | 601 | 0 | 766 | 0 | 0 | 766 | 1375 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 3 | 680 | 0 | 4 | 687 | 0 | 788 | 3 | 0 | 791 | 1484 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 6 | 575 | 0 | 4 | 585 | 0 | 857 | 4 | 0 | 861 | 1451 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 31 | **31** | 14 | 2390 | 0 | 13 | **2417** | 1 | 3179 | 12 | 0 | **3192** | **5640** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 12 | 12 | 3 | 615 | 0 | 9 | 627 | 0 | 934 | 2 | 0 | 936 | 1575 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 604 | 0 | 8 | 613 | 1 | 957 | 1 | 0 | 959 | 1575 |
| 1/2 Hourly Total | 0 | 0 | 0 | 0 | **0** | 15 | **15** | 4 | 1219 | 0 | 17 | **1240** | 1 | 1891 | 3 | 0 | **1895** | **3150** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 77 | **77** | 30 | 5565 | 0 | 44 | **5639** | 5 | 7366 | 37 | 0 | **7408** | **13124** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,53 | 98,69 | 0,00 | 0,78 | - | 0,07 | 99,43 | 0,50 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,59 | 0,59 | 0,23 | 42,40 | 0,00 | 0,34 | 42,97 | 0,04 | 56,13 | 0,28 | 0,00 | 56,45 | |

**Suffolk, VA**
Classified Turn Movement Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

Marr Traffic Inc
www.marrtraffic.com

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0700 - 0900 (Weekday 2h Session) (14-10-2020)
Single Unit Trucks (4-7)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| TIME | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | Right 1.5 | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 20 | 0 | 22 | 0 | 0 | 22 | 42 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 1 | 21 | 0 | 23 | 0 | 0 | 23 | 44 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 21 | 0 | 28 | 2 | 0 | 30 | 51 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 13 | 1 | 35 | 1 | 0 | 37 | 50 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 0 | **0** | 1 | 73 | 0 | 1 | **75** | 1 | 108 | 3 | 0 | **112** | **187** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 3 | 30 | 0 | 16 | 0 | 0 | 16 | 46 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 1 | 26 | 0 | 2 | 29 | 0 | 21 | 3 | 0 | 24 | 58 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 28 | 0 | 4 | 32 | 0 | 28 | 0 | 0 | 28 | 65 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 0 | 4 | 22 | 0 | 20 | 2 | 0 | 22 | 44 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 10 | **10** | 2 | 98 | 0 | 13 | **113** | 0 | 85 | 5 | 0 | **90** | **213** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 10 | **10** | 3 | 171 | 0 | 14 | **188** | 1 | 193 | 8 | 0 | **202** | **400** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 1,60 | 90,96 | 0,00 | 7,45 | - | 0,50 | 95,54 | 3,96 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 2,50 | 2,50 | 0,75 | 42,75 | 0,00 | 3,50 | 47,00 | 0,25 | 48,25 | 2,00 | 0,00 | 50,50 | |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
Single Unit Trucks (4-7)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| TIME | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | Right 1.5 | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 26 | 0 | 1 | 30 | 0 | 18 | 0 | 0 | 18 | 49 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 24 | 0 | 2 | 26 | 0 | 10 | 0 | 0 | 10 | 39 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 26 | 0 | 2 | 30 | 0 | 18 | 0 | 0 | 18 | 50 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 17 | 0 | 1 | 20 | 0 | 16 | 1 | 0 | 17 | 39 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 8 | **8** | 7 | 93 | 0 | 6 | **106** | 0 | 62 | 1 | 0 | **63** | **177** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 3 | 30 | 0 | 2 | 35 | 0 | 18 | 0 | 0 | 18 | 58 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 30 | 0 | 2 | 36 | 0 | 11 | 0 | 0 | 11 | 49 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 2 | 23 | 0 | 3 | 28 | 0 | 15 | 1 | 0 | 16 | 48 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 22 | 0 | 0 | 22 | 0 | 10 | 0 | 0 | 10 | 34 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 13 | **13** | 9 | 105 | 0 | 7 | **121** | 0 | 54 | 1 | 0 | **55** | **189** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 24 | 0 | 1 | 25 | 0 | 12 | 0 | 0 | 12 | 42 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 22 | 0 | 0 | 22 | 0 | 27 | 0 | 0 | 27 | 50 |
| 1/2 Hourly Total | 0 | 0 | 0 | 0 | **0** | 6 | **6** | 0 | 46 | 0 | 1 | **47** | 0 | 39 | 0 | 0 | **39** | **92** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 27 | **27** | 16 | 244 | 0 | 14 | **274** | 0 | 155 | 2 | 0 | **157** | **458** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 5,84 | 89,05 | 0,00 | 5,11 | - | 0,00 | 98,73 | 1,27 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 5,90 | 5,90 | 3,49 | 53,28 | 0,00 | 3,06 | 59,83 | 0,00 | 33,84 | 0,44 | 0,00 | 34,28 | |

**Suffolk, VA**
Classified Turn Movement Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

Marr Traffic Inc
www.marrtraffic.com

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F

0700 - 0900 (Weekday 2h Session) (14-10-2020)
Combination Trucks (8-13)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 0 | 0 | 61 | 0 | 60 | 1 | 0 | 61 | 122 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 0 | 0 | 67 | 0 | 61 | 0 | 0 | 61 | 128 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 51 | 0 | 0 | 51 | 0 | 74 | 1 | 0 | 75 | 127 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 42 | 0 | 0 | 43 | 0 | 74 | 2 | 0 | 76 | 120 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 2 | **2** | 1 | 221 | 0 | 0 | **222** | 0 | 269 | 4 | 0 | **273** | **497** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 63 | 0 | 0 | 63 | 0 | 88 | 1 | 0 | 89 | 153 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 65 | 0 | 0 | 65 | 0 | 73 | 0 | 0 | 73 | 141 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 62 | 0 | 1 | 64 | 0 | 69 | 0 | 0 | 69 | 133 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 0 | 0 | 61 | 0 | 76 | 0 | 0 | 76 | 137 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 4 | **4** | 1 | 251 | 0 | 1 | **253** | 0 | 306 | 1 | 0 | **307** | **564** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 6 | **6** | 2 | 472 | 0 | 1 | **475** | 0 | 575 | 5 | 0 | **580** | **1061** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,42 | 99,37 | 0,00 | 0,21 | - | 0,00 | 99,14 | 0,86 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,57 | 0,57 | 0,19 | 44,49 | 0,00 | 0,09 | 44,77 | 0,00 | 54,19 | 0,47 | 0,00 | 54,67 | |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
Combination Trucks (8-13)

| | Northbound | | | | | Southbound | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left | Thru | Right | U-Turn | App | Right | App | Left | Thru | Right | U-Turn | App | Left | Thru | Right | U-Turn | App | Int |
| TIME | 1.1 | 1.2 | 1.3 | 1.4 | Total | 1.5 | Total | 1.6 | 1.7 | 1.8 | 1.9 | Total | 1.10 | 1.11 | 1.12 | 1.13 | Total | Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 51 | 0 | 0 | 53 | 0 | 57 | 1 | 0 | 58 | 112 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 50 | 0 | 0 | 50 | 0 | 81 | 1 | 0 | 82 | 134 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 60 | 0 | 67 | 0 | 0 | 67 | 127 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 55 | 0 | 0 | 55 | 0 | 59 | 4 | 0 | 63 | 120 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 5 | **5** | 2 | 216 | 0 | 0 | **218** | 0 | 264 | 6 | 0 | **270** | **493** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 46 | 0 | 0 | 46 | 0 | 76 | 0 | 0 | 76 | 125 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 | 63 | 0 | 0 | 63 | 99 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 37 | 0 | 0 | 38 | 0 | 58 | 0 | 0 | 58 | 96 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 1 | 34 | 0 | 40 | 0 | 0 | 40 | 74 |
| Hourly Total | 0 | 0 | 0 | 0 | **0** | 3 | **3** | 1 | 152 | 0 | 1 | **154** | 0 | 237 | 0 | 0 | **237** | **394** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 47 | 0 | 0 | 47 | 0 | 59 | 0 | 0 | 59 | 107 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 1 | 34 | 0 | 37 | 0 | 0 | 37 | 71 |
| 1/2 Hourly Total | 0 | 0 | 0 | 0 | **0** | 1 | **1** | 0 | 80 | 0 | 1 | **81** | 0 | 96 | 0 | 0 | **96** | **178** |
| Grand Total | 0 | 0 | 0 | 0 | **0** | 9 | **9** | 3 | 448 | 0 | 2 | **453** | 0 | 597 | 6 | 0 | **603** | **1065** |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 100,00 | - | 0,66 | 98,90 | 0,00 | 0,44 | - | 0,00 | 99,00 | 1,00 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,85 | 0,85 | 0,28 | 42,07 | 0,00 | 0,19 | 42,54 | 0,00 | 56,06 | 0,56 | 0,00 | 56,62 | |

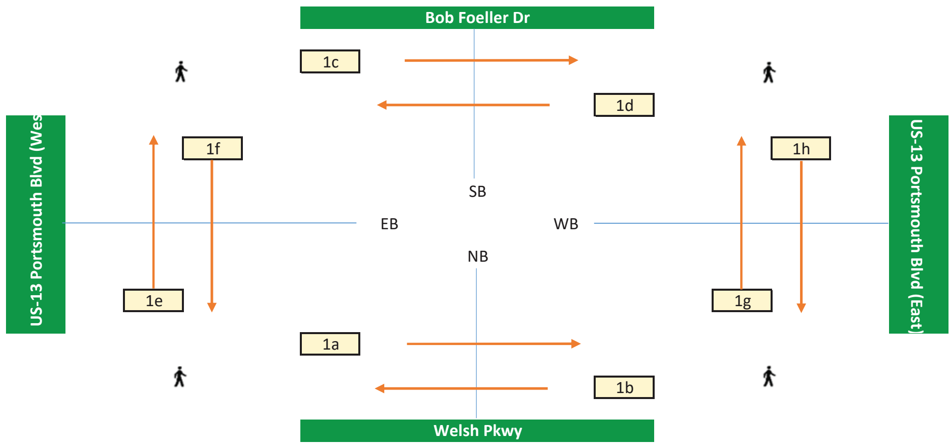
**Suffolk, VA**
Pedestrian Count

**Site 1 of 3**
Welsh Pkwy
Bob Foeller Dr
US-13 Portsmouth Blvd (West)
US-13 Portsmouth Blvd (East)

**Lat/Long**
36,756276°, -76,509065°

**Date**
Wednesday, October 14, 2020

**Weather**
Fair
66°F




Marr Traffic Inc
www.marrtraffic.com

0700 - 0900 (Weekday 2h Session) (14-10-2020)
Pedestrians

| | Northbound Welsh Pkwy | | | Southbound Bob Foeller Dr | | | Eastbound US-13 Portsmouth Blvd (West) | | | Westbound US-13 Portsmouth Blvd (East) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | EB 1a | WB 1b | App Total | EB 1c | WB 1d | App Total | NB 1e | SB 1f | App Total | NB 1g | SB 1h | App Total | Int Total |
| 0700 - 0715 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0815 - 0830 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0830 - 0845 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0845 - 0900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| Grand Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| Approach % | 0,00 | 0,00 | - | 0,00 | 0,00 | - | 0,00 | 0,00 | - | 0,00 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |

1400 - 1630 (Weekday 2.5h Session) (13-10-2020)
Pedestrians

| | Northbound Welsh Pkwy | | | Southbound Bob Foeller Dr | | | Eastbound US-13 Portsmouth Blvd (West) | | | Westbound US-13 Portsmouth Blvd (East) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | EB 1a | WB 1b | App Total | EB 1c | WB 1d | App Total | NB 1e | SB 1f | App Total | NB 1g | SB 1h | App Total | Int Total |
| 1400 - 1415 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1415 - 1430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1430 - 1445 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1445 - 1500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 1500 - 1515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1515 - 1530 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1/2 Hourly Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| Grand Total | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| Approach % | 0,00 | 0,00 | - | 0,00 | 0,00 | - | 0,00 | 0,00 | - | 0,00 | 0,00 | - | |
| Intersection % | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | |

**Suffolk, VA**

Peak Hour Turning Movement Count

Marr Traffic Inc

www.marrtraffic.com

| Wednesday, October 14, 2020 | |
|---|---|
| Period | 0700 - 0900 |
| Peak Hour | 0715 - 0815 |

Session Parameters

(Drop Down Menu)

Total Session

Volume

**Bob Foeller Dr**

Southbound

| | Approach | Exit |
|---|---|---|
| (1-3) | 15 | 59 |
| (4-7) | 10 | 11 |
| (8-13) | 6 | 7 |
| Total | 31 | 77 |

Pedestrians: 0, 0

**US-13 Portsmouth Blvd (West)**

Eastbound

| | (1-3) | (4-7) | (8-13) | Total |
|---|---|---|---|---|
| Exit | 3868 | 217 | 582 | 4667 |
| U-turn | 31 | 14 | 1 | 46 |
| Left | 26 | 3 | 2 | 31 |
| Through | 4979 | 171 | 472 | 5622 |
| Right | 0 | 0 | 0 | 0 |

Pedestrians: 0, 0

| Classes | (1-3) | (4-7) | (8-13) | Total |
|---|---|---|---|---|
| Volume | 8907 | 400 | 1061 | 10368 |
| PHF | | | | 0,966 |

**US-13 Portsmouth Blvd (East)**

Westbound

| | Total | (8-13) | (4-7) | (1-3) |
|---|---|---|---|---|
| Right | 46 | 5 | 8 | 33 |
| Through | 4590 | 575 | 193 | 3822 |
| Left | 2 | 0 | 1 | 1 |
| U-turn | 0 | 0 | 0 | 0 |
| Exit | 5622 | 472 | 171 | 4979 |

Pedestrians: 0, 0

**Welsh Pkwy**

Northbound

| | Exit | U-turn | Left | Through | Right |
|---|---|---|---|---|---|
| Total | 2 | 0 | 0 | 0 | 0 |
| (8-13) | 0 | 0 | 0 | 0 | 0 |
| (4-7) | 1 | 0 | 0 | 0 | 0 |
| (1-3) | 1 | 0 | 0 | 0 | 0 |

Pedestrians: 0, 0

**All vehicles**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 4 | 945 | 0 | 4 | 953 | 0 | 528 | 4 | 0 | 532 | 1485 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | - | - | 2 | - | 2 | 3 | 800 | 0 | 7 | 810 | 0 | 636 | 9 | 0 | 645 | 1457 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | - | - | 2 | - | 2 | 8 | 719 | 0 | 1 | 728 | 1 | 745 | 8 | 0 | 754 | 1484 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | - | - | 3 | - | 3 | 4 | 659 | 0 | 6 | 669 | 0 | 636 | 4 | 0 | 640 | 1312 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 19 | 3123 | 0 | 18 | 3160 | 1 | 2545 | 25 | 0 | 2571 | 5738 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,60 | 98,83 | 0,00 | 0,57 | - | 0,04 | 98,99 | 0,97 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,58 | 0,00 | **0,58** | 0,59 | 0,83 | 0,00 | 0,64 | **0,83** | 0,25 | 0,85 | 0,69 | 0,00 | **0,85** | **0,97** |

**Bikes**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | **0,00** |

**Passenger Vehicles (1-3)**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 4 | 858 | 0 | 3 | 865 | 0 | 444 | 4 | 0 | 448 | 1313 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 3 | 728 | 0 | 7 | 738 | 0 | 534 | 6 | 0 | 540 | 1279 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 6 | 665 | 0 | 1 | 672 | 0 | 636 | 5 | 0 | 641 | 1314 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | - | - | 2 | - | 2 | 4 | 569 | 0 | 3 | 576 | 0 | 532 | 3 | 0 | 535 | 1113 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 17 | 2820 | 0 | 14 | 2851 | 0 | 2146 | 18 | 0 | 2164 | 5019 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,60 | 98,91 | 0,00 | 0,49 | - | 0,00 | 99,17 | 0,83 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,50 | 0,00 | **0,50** | 0,71 | 0,82 | 0,00 | 0,50 | **0,82** | 0,00 | 0,84 | 0,75 | 0,00 | **0,84** | **0,95** |

**Single Unit Trucks (4-7)**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 20 | 0 | 1 | 21 | 0 | 23 | 0 | 0 | 23 | 44 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 21 | 0 | 0 | 21 | 0 | 28 | 2 | 0 | 30 | 51 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 1 | 12 | 0 | 0 | 13 | 1 | 35 | 1 | 0 | 37 | 50 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 27 | 0 | 3 | 30 | 0 | 16 | 0 | 0 | 16 | 46 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 80 | 0 | 4 | 85 | 1 | 102 | 3 | 0 | 106 | 191 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 1,18 | 94,12 | 0,00 | 4,71 | - | 0,94 | 96,23 | 2,83 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,25 | 0,74 | 0,00 | 0,33 | **0,71** | 0,25 | 0,73 | 0,38 | 0,00 | **0,72** | **0,94** |

**Combination Trucks (8-13)**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 67 | 0 | 0 | 67 | 0 | 61 | 0 | 0 | 61 | 128 |
| 0730 - 0745 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 0 | 51 | 0 | 0 | 51 | 0 | 74 | 1 | 0 | 75 | 127 |
| 0745 - 0800 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 1 | 42 | 0 | 0 | 43 | 0 | 74 | 2 | 0 | 76 | 120 |
| 0800 - 0815 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 0 | 63 | 0 | 0 | 63 | 0 | 88 | 1 | 0 | 89 | 153 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | 223 | 0 | 0 | 224 | 0 | 297 | 4 | 0 | 301 | 528 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,45 | 99,55 | 0,00 | 0,00 | - | 0,00 | 98,67 | 1,33 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,75 | 0,00 | **0,75** | 0,25 | 0,83 | 0,00 | 0,00 | **0,84** | 0,00 | 0,84 | 0,50 | 0,00 | **0,85** | **0,86** |

**Pedestrians**

| | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| Time | EB 1a | WB 1b | | | App Total | EB 1c | WB 1d | | | App Total | NB 1e | SB 1f | | | App Total | NB 1g | SB 1h | | | App Total | Int Total |
| 0715 - 0730 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 0730 - 0745 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 0745 - 0800 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 0800 - 0815 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | **0,00** |

**Suffolk, VA**

Peak Hour Turning Movement Count

Marr Traffic Inc

www.marrtraffic.com

| Tuesday, October 13, 2020 | |
|---|---|
| Period | 1400 - 1630 |
| Peak Hour | 1530 - 1630 |

| Session Parameters |
|---|
| (Drop Down Menu) |
| Total Session |
| Volume |

## Bob Foeller Dr

Southbound

| | Southbound (U-turn/right) | Exiting north |
|---|---|---|
| (1-3) | 77 | 67 |
| (4-7) | 27 | 18 |
| (8-13) | 9 | 9 |
| Total | 113 | 94 |

Pedestrians: 0, 0

## US-13 Portsmouth Blvd (West)

Eastbound

| | (1-3) | (4-7) | (8-13) | Total |
|---|---|---|---|---|
| Exiting west | 7487 | 196 | 608 | 8291 |
| U-turn | 44 | 14 | 2 | 60 |
| Left | 30 | 16 | 3 | 49 |
| Through | 5565 | 244 | 448 | 6257 |
| Right | 0 | 0 | 0 | 0 |

Pedestrians: 0, 0

## US-13 Portsmouth Blvd (East)

Westbound

| | Total | (8-13) | (4-7) | (1-3) |
|---|---|---|---|---|
| Right | 45 | 6 | 2 | 37 |
| Through | 8118 | 597 | 155 | 7366 |
| Left | 5 | 0 | 0 | 5 |
| U-turn | 0 | 0 | 0 | 0 |
| Exiting east | 6257 | 448 | 244 | 5565 |

Pedestrians: 0, 0

## Intersection

| Classes | (1-3) | (4-7) | (8-13) | Total |
|---|---|---|---|---|
| Volume | 13124 | 458 | 1065 | 14647 |
| PHF | | | | 0,9581 |

## Welsh Pkwy

Northbound

Pedestrians: 0, 0

| | Exiting south | U-turn | Left | Through | Right |
|---|---|---|---|---|---|
| Total | 5 | 0 | 0 | 0 | 0 |
| (8-13) | 0 | 0 | 0 | 0 | 0 |
| (4-7) | 0 | 0 | 0 | 0 | 0 |
| (1-3) | 5 | 0 | 0 | 0 | 0 |

**All vehicles**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | - | - | 10 | - | 10 | 6 | 740 | 0 | 7 | 753 | 0 | 861 | 4 | 0 | 865 | 1628 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | - | - | 7 | - | 7 | 6 | 630 | 0 | 5 | 641 | 0 | 907 | 4 | 0 | 911 | 1559 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | - | - | 18 | - | 18 | 3 | 686 | 0 | 10 | 699 | 0 | 1005 | 2 | 0 | 1007 | 1724 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | - | - | 4 | - | 4 | 1 | 659 | 0 | 9 | 669 | 1 | 1021 | 1 | 0 | 1023 | 1696 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 39 | 16 | 2715 | 0 | 31 | 2762 | 1 | 3794 | 11 | 0 | 3806 | 6607 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,58 | 98,30 | 0,00 | 1,12 | - | 0,03 | 99,68 | 0,29 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,54 | 0,00 | **0,54** | 0,67 | 0,92 | 0,00 | 0,78 | **0,92** | 0,25 | 0,93 | 0,69 | 0,00 | **0,93** | **0,96** |

**Bikes**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | **0,00** |

**Passenger Vehicles (1-3)**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | - | - | 6 | - | 6 | 3 | 680 | 0 | 4 | 687 | 0 | 788 | 3 | 0 | 791 | 1484 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | - | - | 5 | - | 5 | 6 | 575 | 0 | 4 | 585 | 0 | 857 | 4 | 0 | 861 | 1451 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | - | - | 12 | - | 12 | 3 | 615 | 0 | 9 | 627 | 0 | 934 | 2 | 0 | 936 | 1575 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | - | - | 3 | - | 3 | 1 | 604 | 0 | 8 | 613 | 1 | 957 | 1 | 0 | 959 | 1575 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 26 | 13 | 2474 | 0 | 25 | 2512 | 1 | 3536 | 10 | 0 | 3547 | 6085 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,52 | 98,49 | 0,00 | 1,00 | - | 0,03 | 99,69 | 0,28 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,54 | 0,00 | **0,54** | 0,54 | 0,91 | 0,00 | 0,69 | **0,91** | 0,25 | 0,92 | 0,63 | 0,00 | **0,92** | **0,97** |

**Single Unit Trucks (4-7)**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | - | - | 4 | - | 4 | 2 | 23 | 0 | 3 | 28 | 0 | 15 | 1 | 0 | 16 | 48 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | - | - | 2 | - | 2 | 0 | 22 | 0 | 0 | 22 | 0 | 10 | 0 | 0 | 10 | 34 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | - | - | 5 | - | 5 | 0 | 24 | 0 | 1 | 25 | 0 | 12 | 0 | 0 | 12 | 42 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 0 | 22 | 0 | 0 | 22 | 0 | 27 | 0 | 0 | 27 | 50 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 12 | 2 | 91 | 0 | 4 | 97 | 0 | 64 | 1 | 0 | 65 | 174 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 2,06 | 93,81 | 0,00 | 4,12 | - | 0,00 | 98,46 | 1,54 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,60 | 0,00 | **0,60** | 0,25 | 0,95 | 0,00 | 0,33 | **0,87** | 0,00 | 0,59 | 0,25 | 0,00 | **0,60** | **0,87** |

**Combination Trucks (8-13)**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | Left 1.1 | Thru 1.2 | Right 1.3 | U-Turn 1.4 | App Total | | | Right 1.5 | | App Total | Left 1.6 | Thru 1.7 | Right 1.8 | U-Turn 1.9 | App Total | Left 1.10 | Thru 1.11 | Right 1.12 | U-Turn 1.13 | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 1 | 37 | 0 | 0 | 38 | 0 | 58 | 0 | 0 | 58 | 96 |
| 1545 - 1600 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 33 | 0 | 1 | 34 | 0 | 40 | 0 | 0 | 40 | 74 |
| 1600 - 1615 | 0 | 0 | 0 | 0 | 0 | - | - | 1 | - | 1 | 0 | 47 | 0 | 0 | 47 | 0 | 59 | 0 | 0 | 59 | 107 |
| 1615 - 1630 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | - | 0 | 0 | 33 | 0 | 1 | 34 | 0 | 37 | 0 | 0 | 37 | 71 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 150 | 0 | 2 | 153 | 0 | 194 | 0 | 0 | 194 | 348 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 100,00 | 0,00 | - | 0,65 | 98,04 | 0,00 | 1,31 | - | 0,00 | 100,00 | 0,00 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,25 | 0,00 | **0,25** | 0,25 | 0,80 | 0,00 | 0,50 | **0,81** | 0,00 | 0,82 | 0,00 | 0,00 | **0,82** | **0,81** |

**Pedestrians**

| Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welsh Pkwy | | | | | Bob Foeller Dr | | | | | US-13 Portsmouth Blvd (West) | | | | | US-13 Portsmouth Blvd (East) | | | | | |
| | EB 1a | WB 1b | | | App Total | EB 1c | WB 1d | | | App Total | NB 1e | SB 1f | | | App Total | NB 1g | SB 1h | | | App Total | Int Total |
| 1530 - 1545 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 1545 - 1600 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 1600 - 1615 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| 1615 - 1630 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Approach % | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | 0,00 | 0,00 | 0,00 | 0,00 | - | |
| PHF | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | 0,00 | 0,00 | 0,00 | 0,00 | **0,00** | **0,00** |

# B

## Appendix B – Synchro Reports

2020 No-Build Conditions

# 2020 No-Build Conditions

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 19 | 3123 | 0 | 1 | 2545 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| Future Vol, veh/h | 18 | 19 | 3123 | 0 | 1 | 2545 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | - | None | - | - | Yield | - | - | None | - | - | None |
| Storage Length | - | 330 | - | - | 240 | - | 435 | - | - | - | - | - | - |
| Veh in Median Storage, # | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 16965 | - |
| Grade, % | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 85 | 85 | 85 | 90 | 90 | 90 | 58 | 58 | 58 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 16 | 16 | 16 | 2 | 2 | 2 | 43 | 43 | 43 |
| Mvmt Flow | 22 | 23 | 3763 | 0 | 1 | 2994 | 29 | 0 | 0 | 0 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2186 | 2994 | 0 | 0 | 3763 | 0 | 0 | 5053 | 6849 | 1882 |
| Stage 1 | - | - | - | - | - | - | - | 3853 | 3853 | - |
| Stage 2 | - | - | - | - | - | - | - | 1200 | 2996 | - |
| Critical Hdwy | 5.8 | 5.5 | - | - | 5.62 | - | - | 5.74 | 6.54 | 7.14 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | 6.64 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | 6.04 | 5.54 | - |
| Follow-up Hdwy | 2.4 | 3.2 | - | - | 3.26 | - | - | 3.82 | 4.02 | 3.92 |
| Pot Cap-1 Maneuver | 84 | 33 | - | - | 11 | - | - | 2 | 0 | 52 |
| Stage 1 | - | - | - | - | - | - | - | 3 | 10 | - |
| Stage 2 | - | - | - | - | - | - | - | 223 | 31 | - |
| Platoon blocked, % | | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | 47 | 47 | - | - | 11 | - | - | 0 | 0 | 52 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | 0 | 0 | - |
| Stage 1 | - | - | - | - | - | - | - | 0 | 0 | - |
| Stage 2 | - | - | - | - | - | - | - | 203 | 0 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 3 | 0.1 | 0 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 47 | - | - | 11 | - | - |
| HCM Lane V/C Ratio | - | 0.948 | - | - | 0.107 | - | - |
| HCM Control Delay (s) | 0 | 252.8 | - | - | $ 368.2 | - | - |
| HCM Lane LOS | A | F | - | - | F | - | - |
| HCM 95th %tile Q(veh) | - | 3.9 | - | - | 0.3 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 11.2 |

| Movement | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 16 | 2715 | 0 | 1 | 3794 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Future Vol, veh/h | 31 | 16 | 2715 | 0 | 1 | 3794 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | - | None | - | - | Yield | - | - | None | - | - | None |
| Storage Length | - | 330 | - | - | 240 | - | 435 | - | - | - | - | - | - |
| Veh in Median Storage, # | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 16965 | - |
| Grade, % | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 93 | 93 | 93 | 90 | 90 | 90 | 54 | 54 | 54 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 7 | 7 | 7 | 2 | 2 | 2 | 33 | 33 | 33 |
| Mvmt Flow | 34 | 17 | 2951 | 0 | 1 | 4080 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2978 | 4080 | 0 | 0 | 2951 | 0 | 0 | 4687 | 7135 | 1476 |
| Stage 1 | - | - | - | - | - | - | - | 3053 | 3053 | - |
| Stage 2 | - | - | - | - | - | - | - | 1634 | 4082 | - |
| Critical Hdwy | 5.78 | 5.48 | - | - | 5.44 | - | - | 5.74 | 6.54 | 7.14 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | - | 6.64 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | - | 6.04 | 5.54 | - |
| Follow-up Hdwy | 2.39 | 3.19 | - | - | 3.17 | - | - | 3.82 | 4.02 | 3.92 |
| Pot Cap-1 Maneuver | ~ 29 | ~ 8 | - | - | 37 | - | - | 3 | 0 | 99 |
| Stage 1 | - | - | - | - | - | - | - | 11 | 29 | - |
| Stage 2 | - | - | - | - | - | - | - | 128 | 8 | - |
| Platoon blocked, % | | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | ~ 15 | ~ 15 | - | - | 37 | - | - | 0 | 0 | 99 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | 0 | 0 | - |
| Stage 1 | - | - | - | - | - | - | - | 0 | 0 | - |
| Stage 2 | - | - | - | - | - | - | - | 125 | 0 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 26.5 | 0 | 0 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | ~ 15 | - | - | 37 | - | - |
| HCM Lane V/C Ratio | - | 3.406 | - | - | 0.029 | - | - |
| HCM Control Delay (s) | 0 | $ 1558.8 | - | - | 105.2 | - | - |
| HCM Lane LOS | A | F | - | - | F | - | - |
| HCM 95th %tile Q(veh) | - | 7.2 | - | - | 0.1 | - | - |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

# C

## Appendix C – HCS Reports

2020 No-Build Conditions

2040 Build Conditions

2054 Build Conditions

# 2020 No-Build Conditions

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2020 |
| Jurisdiction | | Time Period Analyzed | AM Peak Hour |
| Project Description | SPSA Landfill Weave onto US 13/58/460 | | |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 625 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 1816 | 5 | 2 | 765 |
| Peak Hour Factor (PHF) | 0.86 | 0.86 | 0.88 | 0.88 |
| Total Trucks, % | 16.00 | 16.00 | 6.00 | 6.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.862 | 0.862 | 0.943 | 0.943 |
| Flow Rate ($v_i$), pc/h | 2450 | 7 | 2 | 922 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 929 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 2452 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2111 |
| Total Flow Rate (v), pc/h | 3381 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 12727 |
| Volume Ratio (VR) | 0.275 | Weaving Segment Capacity ($c_W$), veh/h | 7469 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 14 | Adjusted Weaving Area Capacity, pc/h | 8444 |
| Maximum Weaving Length ($L_{MAX}$), ft | 3751 | Volume-to-Capacity Ratio (v/c) | 0.40 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 26 | Average Weaving Speed ($S_W$),mi/h | 60.6 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 73 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 60.8 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 141 | Average Speed (S), mi/h | 60.7 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 214 | Density (D), pc/mi/ln | 13.9 |
| Weaving Intensity Factor (W) | 0.097 | Level of Service (LOS) | B |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2020 |
| Jurisdiction | | Time Period Analyzed | PM Peak Hour |
| Project Description | SPSA Landfill Weave onto US 13/58/460 | | |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 625 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 2564 | 26 | 13 | 1292 |
| Peak Hour Factor (PHF) | 0.93 | 0.93 | 0.91 | 0.91 |
| Total Trucks, % | 7.00 | 7.00 | 5.00 | 5.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.935 | 0.935 | 0.952 | 0.952 |
| Flow Rate ($v_i$), pc/h | 2949 | 30 | 15 | 1491 |
| Weaving Flow Rate ($v_W$), pc/h | 1521 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 2964 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | | 2058 |
| Total Flow Rate (v), pc/h | 4485 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | | 10324 |
| Volume Ratio (VR) | 0.339 | Weaving Segment Capacity ($c_W$), veh/h | | 7743 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 60 | Adjusted Weaving Area Capacity, pc/h | | 8232 |
| Maximum Weaving Length ($L_{MAX}$), ft | 4440 | Volume-to-Capacity Ratio (v/c) | | 0.54 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 31 | Average Weaving Speed ($S_W$),mi/h | 58.6 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 179 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 59.2 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 187 | Average Speed (S), mi/h | 59.0 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 366 | Density (D), pc/mi/ln | 19.0 |
| Weaving Intensity Factor (W) | 0.148 | Level of Service (LOS) | B |

# 2040 Build Conditions

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2040 |
| Jurisdiction | | Time Period Analyzed | AM Peak Hour |
| Project Description | US 13/58/460 from SPSA Driveway to US 13 Business | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_s$), ft | 3125 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 2956 | 15 | 6 | 1243 |
| Peak Hour Factor (PHF) | 0.86 | 0.86 | 0.88 | 0.88 |
| Total Trucks, % | 16.00 | 16.00 | 6.00 | 6.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.862 | 0.862 | 0.943 | 0.943 |
| Flow Rate ($v_i$), pc/h | 3987 | 20 | 7 | 1498 |
| Weaving Flow Rate ($v_W$), pc/h | 1518 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 3994 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | | 2302 |
| Total Flow Rate (v), pc/h | 5512 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | | 12727 |
| Volume Ratio (VR) | 0.275 | Weaving Segment Capacity ($c_W$), veh/h | | 8144 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 40 | Adjusted Weaving Area Capacity, pc/h | | 9208 |
| Maximum Weaving Length ($L_{MAX}$), ft | 3751 | Volume-to-Capacity Ratio (v/c) | | 0.60 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 208 | Average Weaving Speed ($S_W$), mi/h | 57.8 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 1746 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 58.1 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 415 | Average Speed (S), mi/h | 58.0 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 2161 | Density (D), pc/mi/ln | 23.8 |
| Weaving Intensity Factor (W) | 0.169 | Level of Service (LOS) | C |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2040 |
| Jurisdiction | | Time Period Analyzed | AM Peak Hour |
| Project Description | US 13/58/460 from US 13/58/460 EB Flyover to SPSA Landfill Entrance | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 1500 | Number of Maneuver Lanes ($N_{WL}$), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 4172 | 29 | 23 | 43 |
| Peak Hour Factor (PHF) | 0.85 | 0.85 | 0.58 | 0.58 |
| Total Trucks, % | 16.00 | 16.00 | 43.00 | 43.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.862 | 0.862 | 0.699 | 0.699 |
| Flow Rate ($v_i$), pc/h | 5694 | 40 | 57 | 106 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 146 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 5751 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2248 |
| Total Flow Rate (v), pc/h | 5897 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 96000 |
| Volume Ratio (VR) | 0.025 | Weaving Segment Capacity ($c_W$), veh/h | 7723 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 146 | Adjusted Weaving Area Capacity, pc/h | 8992 |
| Maximum Weaving Length ($L_{MAX}$), ft | 2827 | Volume-to-Capacity Ratio (v/c) | 0.66 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 144 | Average Weaving Speed ($S_W$), mi/h | 55.3 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 1227 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 56.9 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 391 | Average Speed (S), mi/h | 56.9 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 1618 | Density (D), pc/mi/ln | 25.9 |
| Weaving Intensity Factor (W) | 0.240 | Level of Service (LOS) | C |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2040 |
| Jurisdiction | | Time Period Analyzed | PM Peak Hour |
| Project Description | US 13/58/460 from SPSA Driveway to US 13 Business | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 3125 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 4166 | 40 | 20 | 2102 |
| Peak Hour Factor (PHF) | 0.93 | 0.93 | 0.91 | 0.91 |
| Total Trucks, % | 7.00 | 7.00 | 5.00 | 5.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.935 | 0.935 | 0.952 | 0.952 |
| Flow Rate ($v_i$), pc/h | 4791 | 46 | 23 | 2426 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 2472 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 4814 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2249 |
| Total Flow Rate (v), pc/h | 7286 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 10324 |
| Volume Ratio (VR) | 0.339 | Weaving Segment Capacity ($c_W$), veh/h | 8462 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 92 | Adjusted Weaving Area Capacity, pc/h | 8996 |
| Maximum Weaving Length ($L_{MAX}$), ft | 4440 | Volume-to-Capacity Ratio (v/c) | 0.81 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 251 | Average Weaving Speed ($S_W$), mi/h | 57.3 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 1915 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 55.6 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 467 | Average Speed (S), mi/h | 56.2 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 2382 | Density (D), pc/mi/ln | 32.4 |
| Weaving Intensity Factor (W) | 0.182 | Level of Service (LOS) | D |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2040 |
| Jurisdiction | | Time Period Analyzed | PM Peak Hour |
| Project Description | US 13/58/460 from US 13/58/460 EB Flyover to SPSA Landfill Entrance | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 1500 | Number of Maneuver Lanes ($N_{WL}$), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 6219 | 51 | 20 | 25 |
| Peak Hour Factor (PHF) | 0.93 | 0.93 | 0.54 | 0.54 |
| Total Trucks, % | 7.00 | 7.00 | 33.00 | 33.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.935 | 0.935 | 0.752 | 0.752 |
| Flow Rate ($v_i$), pc/h | 7152 | 59 | 49 | 62 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 121 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 7201 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2254 |
| Total Flow Rate (v), pc/h | 7322 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 141176 |
| Volume Ratio (VR) | 0.017 | Weaving Segment Capacity ($c_W$), veh/h | 8415 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 121 | Adjusted Weaving Area Capacity, pc/h | 9016 |
| Maximum Weaving Length ($L_{MAX}$), ft | 2753 | Volume-to-Capacity Ratio (v/c) | 0.81 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 180 | Average Weaving Speed ($S_W$), mi/h | 54.3 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 1526 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 55.3 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 366 | Average Speed (S), mi/h | 55.3 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 1892 | Density (D), pc/mi/ln | 33.1 |
| Weaving Intensity Factor (W) | 0.271 | Level of Service (LOS) | D |

# 2054 Build Conditions

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2054 |
| Jurisdiction | | Time Period Analyzed | AM Peak Hour |
| Project Description | US 13/58/460 from SPSA Driveway to US 13 Business | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 3125 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 4177 | 15 | 7 | 1757 |
| Peak Hour Factor (PHF) | 0.86 | 0.86 | 0.88 | 0.88 |
| Total Trucks, % | 16.00 | 16.00 | 6.00 | 6.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.862 | 0.862 | 0.943 | 0.943 |
| Flow Rate ($v_i$), pc/h | 5635 | 20 | 8 | 2117 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 2137 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 5643 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2302 |
| Total Flow Rate (v), pc/h | 7780 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 12727 |
| Volume Ratio (VR) | 0.275 | Weaving Segment Capacity ($c_W$), veh/h | 8144 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 40 | Adjusted Weaving Area Capacity, pc/h | 9207 |
| Maximum Weaving Length ($L_{MAX}$), ft | 3751 | Volume-to-Capacity Ratio (v/c) | 0.85 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 294 | Average Weaving Speed ($S_W$), mi/h | 57.0 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 2086 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 55.4 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 415 | Average Speed (S), mi/h | 55.8 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 2501 | Density (D), pc/mi/ln | 34.9 |
| Weaving Intensity Factor (W) | 0.190 | Level of Service (LOS) | D |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2054 |
| Jurisdiction | | Time Period Analyzed | AM Peak Hour |
| Project Description | US 13/58/460 from US 13/58/460 EB Flyover to SPSA Landfill Entrance | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 1500 | Number of Maneuver Lanes ($N_{WL}$), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 5894 | 42 | 27 | 47 |
| Peak Hour Factor (PHF) | 0.85 | 0.85 | 0.58 | 0.58 |
| Total Trucks, % | 16.00 | 16.00 | 43.00 | 43.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.862 | 0.862 | 0.699 | 0.699 |
| Flow Rate ($v_i$), pc/h | 8044 | 57 | 67 | 116 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 173 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 8111 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2251 |
| Total Flow Rate (v), pc/h | 8284 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 114286 |
| Volume Ratio (VR) | 0.021 | Weaving Segment Capacity ($c_W$), veh/h | 7739 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 173 | Adjusted Weaving Area Capacity, pc/h | 9004 |
| Maximum Weaving Length ($L_{MAX}$), ft | 2790 | Volume-to-Capacity Ratio (v/c) | 0.92 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | 203 | Average Weaving Speed ($S_W$), mi/h | 53.5 |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | 1713 | Average Non-Weaving Speed ($S_{NW}$), mi/h | 53.8 |
| Weaving Lane Change Rate ($LC_W$), lc/h | 418 | Average Speed (S), mi/h | 53.8 |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | 2131 | Density (D), pc/mi/ln | 38.5 |
| Weaving Intensity Factor (W) | 0.298 | Level of Service (LOS) | E |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2054 |
| Jurisdiction | | Time Period Analyzed | PM Peak Hour |
| Project Description | US 13/58/460 from SPSA Driveway to US 13 Business | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 3125 | Number of Maneuver Lanes ($N_{WL}$), ln | 3 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 2 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 0 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 5881 | 44 | 23 | 2975 |
| Peak Hour Factor (PHF) | 0.93 | 0.93 | 0.91 | 0.91 |
| Total Trucks, % | 7.00 | 7.00 | 5.00 | 5.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.935 | 0.935 | 0.952 | 0.952 |
| Flow Rate ($v_i$), pc/h | 6763 | 51 | 27 | 3434 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 3485 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 6790 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2249 |
| Total Flow Rate (v), pc/h | 10275 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 10324 |
| Volume Ratio (VR) | 0.339 | Weaving Segment Capacity ($c_W$), veh/h | 8462 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 0 | Adjusted Weaving Area Capacity, pc/h | 8996 |
| Maximum Weaving Length ($L_{MAX}$), ft | 4440 | Volume-to-Capacity Ratio (v/c) | 1.14 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | - | Average Weaving Speed ($S_W$), mi/h | - |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | - | Average Non-Weaving Speed ($S_{NW}$), mi/h | - |
| Weaving Lane Change Rate ($LC_W$), lc/h | - | Average Speed (S), mi/h | - |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | - | Density (D), pc/mi/ln | - |
| Weaving Intensity Factor (W) | - | Level of Service (LOS) | F |

# HCS7 Freeway Weaving Report

## Project Information

| | | | |
|---|---|---|---|
| Analyst | HDR | Date | 10/30/2020 |
| Agency | | Analysis Year | 2054 |
| Jurisdiction | | Time Period Analyzed | PM Peak Hour |
| Project Description | US 13/58/460 from US 13/58/460 EB Flyover to SPSA Landfill Entrance | Unit | United States Customary |

## Geometric Data

| | | | |
|---|---|---|---|
| Number of Lanes (N), ln | 4 | Segment Type | Freeway |
| Segment Length ($L_S$), ft | 1500 | Number of Maneuver Lanes ($N_{WL}$), ln | 2 |
| Weaving Configuration | One-Sided | Ramp-to-Freeway Lane Changes ($LC_{RF}$), lc | 1 |
| Terrain Type | Level | Freeway-to-Ramp Lane Changes ($LC_{FR}$), lc | 1 |
| Percent Grade, % | - | Ramp-to-Ramp Lane Changes ($LC_{RR}$), lc | 0 |
| Interchange Density (ID), int/mi | 0.17 | Cross Weaving Managed Lane | No |

## Adjustment Factors

| | | | |
|---|---|---|---|
| Driver Population | All Familiar | Final Speed Adjustment Factor (SAF) | 1.000 |
| Weather Type | Non-Severe Weather | Final Capacity Adjustment Factor (CAF) | 1.000 |
| Incident Type | No Incident | Demand Adjustment Factor (DAF) | 1.000 |

## Demand and Capacity

| | FF | RF | RR | FR |
|---|---|---|---|---|
| Demand Volume ($V_i$), veh/h | 8786 | 72 | 22 | 27 |
| Peak Hour Factor (PHF) | 0.93 | 0.93 | 0.54 | 0.54 |
| Total Trucks, % | 7.00 | 7.00 | 33.00 | 33.00 |
| Heavy Vehicle Adjustment Factor ($f_{HV}$) | 0.935 | 0.935 | 0.752 | 0.752 |
| Flow Rate ($v_i$), pc/h | 10104 | 83 | 54 | 66 |

| | | | |
|---|---|---|---|
| Weaving Flow Rate ($v_W$), pc/h | 149 | Freeway Max Capacity ($c_{IFL}$), pc/h/ln | 2350 |
| Non-Weaving Flow Rate ($v_{NW}$), pc/h | 10158 | Density-Based Capacity ($c_{IWL}$), pc/h/ln | 2256 |
| Total Flow Rate (v), pc/h | 10307 | Demand Flow-Based Capacity ($c_{IW}$), pc/h | 171429 |
| Volume Ratio (VR) | 0.014 | Weaving Segment Capacity ($c_W$), veh/h | 8426 |
| Minimum Lane Change Rate ($LC_{MIN}$), lc/h | 0 | Adjusted Weaving Area Capacity, pc/h | 9024 |
| Maximum Weaving Length ($L_{MAX}$), ft | 2725 | Volume-to-Capacity Ratio (v/c) | 1.14 |

## Speed and Density

| | | | |
|---|---|---|---|
| Non-Weaving Vehicle Index ($I_{NW}$) | - | Average Weaving Speed ($S_W$), mi/h | - |
| Non-Weaving Lane Change Rate ($LC_{NW}$), lc/h | - | Average Non-Weaving Speed ($S_{NW}$), mi/h | - |
| Weaving Lane Change Rate ($LC_W$), lc/h | - | Average Speed (S), mi/h | - |
| Weaving Lane Change Rate ($LC_{All}$), lc/h | - | Density (D), pc/mi/ln | - |
| Weaving Intensity Factor (W) | - | Level of Service (LOS) | F |

# D

## Appendix D – SPSA Growth Projections

**Southeastern Public Service Authority**
**Regional Landfill**
**Material and Traffic Summary**

| | | |
|---|---|---|
| **Annual Waste Growth** | **0.8%** | Latest Demonstration of Need Assumption |
| **Projected 2040 Total MSW Tonnage[8]** | **527,744** | |
| **Total 2040 Estimated Tonnage[11]** | **573,591** | |
| **Projected 2040 MSW Tonnage Through Transfer Stations[9]** | **477,527** | |
| **Total 2020 Estimated Trip Count (excluding employees/visitors)** | **76,567** | |
| **Total 2020 Estimated Tonnage[11]** | **308,772** | |

| | 2020 Conditions | | | 2040 | | |
|---|---|---|---|---|---|---|
| | Estimated Total Yearly Count | Estimated Total Tons to LF | Estimated Trips/Day[6] | Estimated Total Yearly Count | Estimated Total Tons to LF | Estimated Trips/Day[6] |
| **SPSA Employees/Visitors[3]** | 6,240 | 0 | 20 | 9,360 | 0 | 30 |
| **Transfer Station** | | | | | | |
| Residential Vehicles[5] | 36,326 | 3,633 | 127.0 | 42,602 | 4,260 | 149.0 |
| Suffolk Curbside Packers[5] | 7,221 | 42,820 | 34.7 | 8,468 | 50,217 | 40.7 |
| **Landfill and Processing Facilities** | | | | | | |
| Ash Roll Offs[5 7] | 7,093 | 152,486 | 24.8 | 0 | 0 | 0 |
| 100 CY MSW Trailers[1] | 1,794 | 35,873 | 6.3 | 23,876 | 477,527 | 83.5 |
| Small Trucks/Trailers - Tires, White Goods, HHW[10] | 8,929 | N/A | 31.2 | 10,471 | N/A | 36.6 |
| Clearfield MMG[4] | 5,040 | N/A | 17.6 | 5,911 | N/A | 20.7 |
| Clean Fill Dump Trucks/Trailers[2,5] | 233 | 2,848 | 0.8 | 273 | 3,340 | 1.0 |
| Other Roll-off/Dump Truck Waste[12 13] | 9,933 | 73,960 | 34.7 | 5,136 | 38,247 | 18.0 |
| **TOTAL** | **82,807** | **311,620** | **297** | **106,097** | **573,591** | **379** |

1. Assumes 20 ton/100 CY trailer on average
2. Most soil required for landfill construction/operations assumed to be obtained from on-site borrow areas. Quantity assumed to be constant and not dependent on population increase.
3. Assumes that with larger MSW LF operation, additional operators are required in 2040.
4. Clearfield MMG traffic includes soil delivered to facility and not landfilled as waste.
5. Based on historical data for average tons per load.
6. Assumes 6 days per week LF operation. Suffolk collection is 4 days/week. Suffolk TS is operated 5.5 days/week.
7. All WTE ash assumed to be converted to 100 CY MSW trailers in June 2027. Ash residue from Wheelabrator disposed at alternate location.
8. Assumes WTE stops operation in June 2027 and 0.8% annual growth rate for MSW generation (from Demonstration of Need).
9. Projected 2040 tonnage through transfer stations assumed to be total projected 2040 MSW tonnage - tonnage from Suffolk via direct haul using packer trucks.
10. Household hazardous waste tonnage information not available.
11. From Demonstration of Need
12. For 2020, assumed to be the remainder between Total 2020 estimated Tonnage of Ash and MSW and sum of Total Tons listed above.
13. For 2040, number of trips projected based on 0.8% annual growth rate from 2020.

# Appendix G: SPSA Compensatory Mitigation Plan



# Compensatory Mitigation Plan Part 1

Southeastern Public Service Authority

Cells VIII and IX Development

Suffolk, Virginia

November 11, 2024

## Contents

## Appendices

Appendix A – Location Maps

Appendix B – Chesapeake Mitigation Bank

Appendix C – Davis Mitigation Bank

Appendix D – Preliminary Jurisdictional Determination Cells VIII and IX

Appendix E – Preliminary Jurisdictional Determination Cells X, XI, and XII

Appendix F – Preliminary Jurisdictional Determination Nahra Property

Appendix G – Wetland Delineation Report Magnolia Farms Property

Appendix H – Preliminary Jurisdictional Determination Application Cypress Swamp

Appendix I - Comparison of Functions and Values for Proposed SPSA Landfill Expansion Cells VIII & IX and Preservation Areas

Appendix J – HGM Functional Assessment for Cells VIII and IX

## Objectives

Southeastern Public Service Authority (SPSA) is proposing the expansion of their existing Regional Landfill in Suffolk, Virginia, with the addition of Cells VIII and IX, hereafter referred to as The Project. The development of Cells VIII and IX will total 111.67 acres of disturbance, including impacts to 109.64 acres of palustrine forested wetland (PFO) within the Hampton Roads Watershed (HUC 02080208). This mitigation plan has been developed to ensure no net loss of wetlands, adequate replacement of functions and values, and water quality benefits. In order to offset unavoidable losses to wetlands, SPSA plans to compensate for permanent impacts to 109.64 total acres of nontidal vegetated wetlands (PFO) at a 2:1 ratio for a total of 219.28 credits (see Table 1).

Table 1. Wetland Compensation Requirement

| Classification | Impact Acreage | Compensation Ratio | Mitigation Credit Requirement |
|---|---|---|---|
| PFO | 109.64 | 2:1 | 219.28 |

## Determination of Credits

In accordance with hierarchical preference as defined in the 2008 Final Rule for Compensatory Mitigation Losses of Aquatic Resources (USACE – 33 CFR Parts 325 and 332 and EPA – 40 CFR Part 230) as well as the Compensation Section in the Virginia Administrative Code (9 VAC 25-210-116), SPSA first purchased all credits available from established mitigation banks within the primary service area totaling 159 credits (Figure 1). Per communications with the banks (Appendices B & C), the purchase of credits satisfies the no net loss requirement with a total of 114 acres of wetlands generated by creation or restoration (Table 2).

*Chesapeake Mitigation Bank*

SPSA has purchased 83 credits from the Chesapeake Mitigation Bank, which is located within the same watershed (HUC 02080208). Of the 83 credits obtained, approximately 72.21 credits (87%) are from the creation/restoration of wetlands. This bank is contiguous to the Great Dismal Swamp and was comprised of previously drained forest, pasture, and crop land. The goal of the bank is to re-establish wetland condition and functions through restoration, enhancement, and preservation. Bank information including proof of purchase is included in Appendix B.

*Davis Mitigation Bank*

SPSA has purchased a total of 76 credits from the Davis Mitigation Bank, which is located in the adjacent watershed (HUC 03010205). According to the US Army Corps of Engineers (USACE) Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS), the Project is within Davis Mitigation Bank’s primary service area. Of the 76 credits obtained, approximately 41.8 credits (55%) are from the creation/restoration of wetlands. This bank consists of prior-converted cropland, previously forested wetlands, and farmed wetland pasture to be restored forested wetlands. This bank is contiguous to the Northwest River which is connected to the Great Dismal Swamp. Bank information including proof of purchase is included in Appendix C.

Figure 1. Mitigation Bank Locations

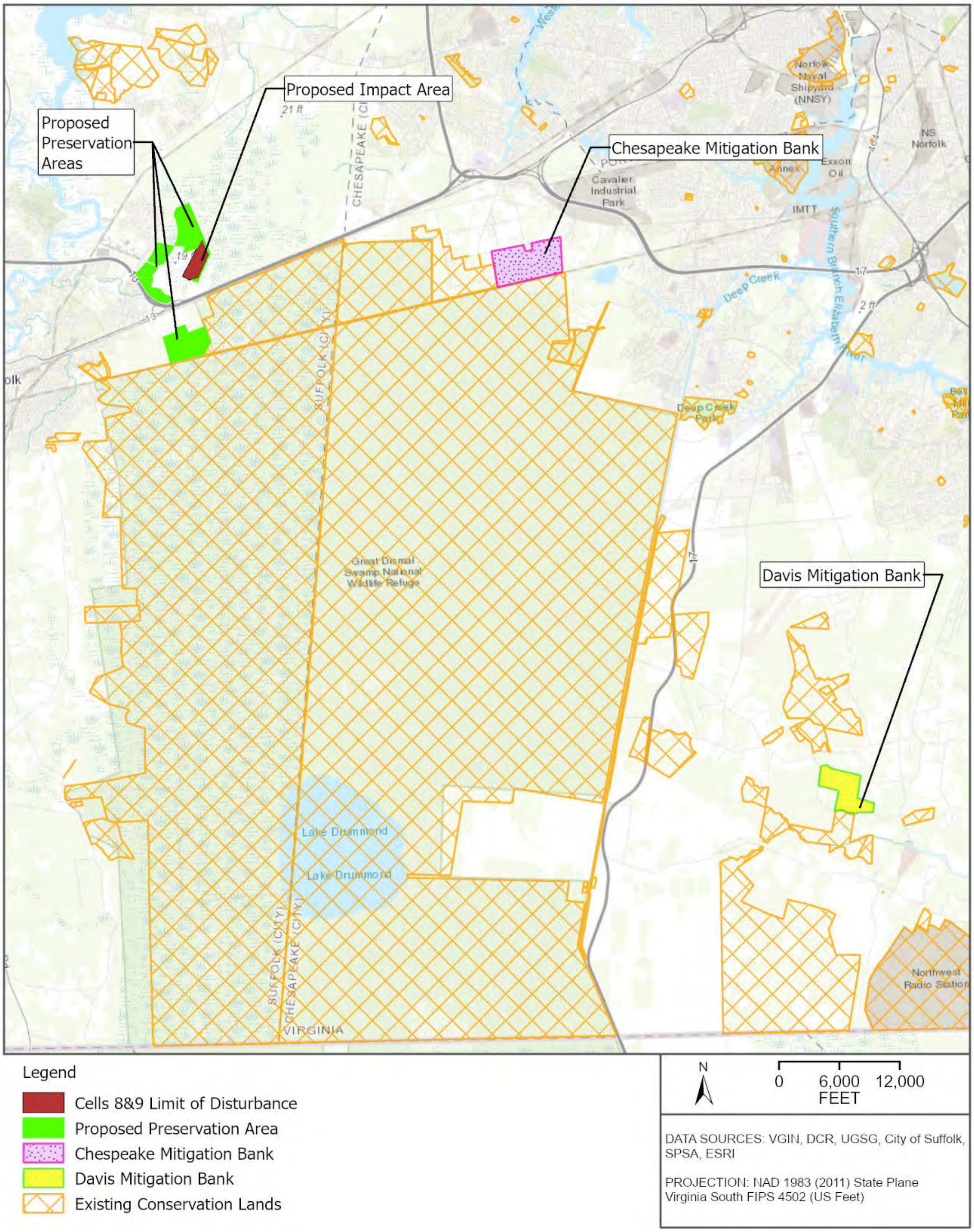


Table 2. Purchased Credits and Demonstration of No Net Loss

| Source | HUC | Impact Acreage | Mitigation Ratio | Purchased Credits | Percent from Creation/ Restoration | Credits (Acres) from Creation/ Restoration |
|---|---|---|---|---|---|---|
| Chesapeake Mitigation Bank (1) | 02080208 | 41.5 | 2:1 | 83 | 87% | 72.2 |
| Davis Mitigation Bank (2) | 03010205 | 38 | 2:1 | 76 | 55% | 41.8 |
| **Total** | | **79.5** | **2:1** | **159** | **--** | **114.0** |

After SPSA obtained all available mitigation credits in its primary service area, they explored alternative options to compensate for the remaining 30.14 acres of wetland impact. The Virginia Aquatic Resources Trust Fund (VARTF) was contacted multiple times throughout the permit application process for availability of in-lieu fee credits, however no credits were available for nontidal forested wetlands within this watershed. SPSA then evaluated permittee-responsible mitigation (PRM) under a watershed approach. The creation/restoration options for PRM within this watershed were limited as most of the available remaining land near the project consists of wetlands. Any upland/developable areas were extremely expensive to purchase and convert into wetlands. SPSA saw an opportunity to preserve existing wetlands that have been routinely logged on-site and near the Great Dismal Swamp. SPSA placed these existing wetlands under a protective easement which would allow these forests to mature and eventually provide higher habitat quality and increased functions and values to the watershed.

Therefore, the proposed compensation for the 109.64 acres of forested wetland impact will be accomplished through the application of 159 purchased credits from established mitigation banks (2:1 ratio) and preserving at least 602.80 acres of forested wetland (10:1 ratio) to obtain the remaining 60.28 credits (Table 3).

Table 3. Required Minimum Wetland Compensation by Type

| Type | Compensation Ratio | Mitigation Credits |
|---|---|---|
| Mitigation Bank Credits | 2:1 | 159 |
| Permittee Responsible Mitigation-Preservation | 10:1 | 60.28 |
| Total | -- | 219.28 |

The 111.67-acre project area is considered canebrake rattlesnake habitat. Per conversations with the Virginia Department of Environmental Quality (DEQ) and Department of Wildlife Resources (DWR), SPSA plans to compensate for the total disturbed area in addition to the aforementioned forested wetland impact. DWR suggested on April 25, 2024, that the area of disturbance may be preserved onsite at a 1:1 ratio if the adjacent preservation area (Cells X, XI, and XII) would be preserved as well to ensure

contiguous habitat for the species. DWR also insisted the canebrake mitigation credit would not overlap, or "double-dip" with wetland mitigation acreage. SPSA has designated 112.89 acres of the adjacent preservation areas for canebrake habitat preservation, bringing the total acreage for preservation to 742.56 acres. The entire preservation area will be under DWR covenants and restrictions to protect canebrake rattlesnake habitat throughout the wetland preservation areas as well as the designated habitat preservation.

SPSA will forego further development of additional cells at the Regional Landfill beyond the currently proposed Cells VIII and IX expansion and use all available remaining on-site land for preservation. SPSA has also purchased the Nahra Property adjacent to the landfill and is in the process of purchasing the Magnolia Farms property across Route 58 from the landfill for the purposes of wetland preservation. A total of 742.56 acres is proposed for preservation, with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for canebrake rattlesnake habitat. A breakdown of the preservation areas by type is shown in Table 4.

Table 4. Preservation Areas by Classification

| Classification | Wetland Preservation | Canebrake Habitat Preservation |
|---|---|---|
| Palustrine Forested Wetlands (PFO) | 621.46 ac | 57.34 ac |
| Palustrine Emergent Wetlands (PEM) | 1.89 ac | 0.11 ac |
| Palustrine Unconsolidated Bottom (PUB) | 0.90 ac | 11.75 ac |
| Upper Perennial Stream (R3) | 1,491 lf (0.60 ac) | 42 lf (0.03 ac) |
| Ditch | 273 lf (0.08 ac) | 830 lf (0.20 ac) |
| Upland | 4.74 ac | 43.46 ac |
| **Total** | **629.67 ac** | **112.89 ac** |
| **Combined Total** | **742.56 ac** | |

*On-Site Avoided Area of Cells VIII and IX*

There are 23.81 acres of wetlands surrounding the limit of disturbance for the development of Cells VIII and IX. This area was included in the study limits but will not be disturbed as a result of this project. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII. SPSA proposes to include this acreage as a part of the on-site PRM preservation for canebrake rattlesnake mitigation. This portion would contribute 23.81 canebrake rattlesnake credits at a 1:1 mitigation ratio. The preliminary jurisdictional determination (PJD) (NAO-2016-00765 is included in Appendix D).

Table 5. Proposed Preservation for Avoided Area of Cells VIII and IX

| Classification | Canebrake Habitat Preservation |
|---|---|
| PFO | 23.81 ac |
| **Total** | **23.81 ac** |

*On-Site Previously Proposed Cells X, XI, and XII*

There are 217.21 acres within the previously proposed Cells X, XI, and XII. This land will no longer be developed as part of the landfill and will be preserved in perpetuity. This habitat is adjacent to and quite similar to the impact area for the expansion. An 8.40-acre buffer directly adjacent to Cells 8 & 9 will be designated as canebrake rattlesnake habitat. The remaining 208.81 acres will count towards the wetland preservation. The PJD (NAO-2020-0225) is included in Appendix E.

Table 4. Proposed Preservation for Cells X, XI, and XII

| Classification | Wetland Preservation | Canebrake Habitat Preservation |
|---|---|---|
| PFO | 206.13 ac | 8.40 ac |
| PEM | 1.89 ac | |
| PUB | 0.18 ac | |
| Upland | 0.61 ac | |
| **Total** | **208.81 ac** | **8.40 ac** |
| **Site Total** | **217.21 ac** | |

*On-Site Nahra Property*

SPSA has also acquired the Nahra Property on the northwestern perimeter of the Regional Landfill. The Nahra Property is in the primary HUC of the Regional landfill and contains approximately 205.75 acres of preservable area outside of existing maintained easements. An 80.68-acre buffer directly adjacent to the active landfill will be designated as canebrake rattlesnake habitat. The remaining 125.07 acres will count towards the wetland preservation. The PJD (NAO-2007-02194) is included in Appendix F.

Table 5. Proposed Preservation for Nahra Property

| Classification | Wetland Preservation | Canebrake Habitat Preservation |
|---|---|---|
| PFO | 122.20 | 25.13 ac |
| PEM | -- | 0.11 ac |
| PUB | -- | 11.75 ac |
| R3 (Burnetts Mill Creek) | -- | 42 lf (0.03 ac) |
| Ditch | 273 lf (0.08 ac) | 830 lf (0.20 ac) |
| Upland | 2.79 ac | 43.46 ac |
| **Total** | **125.07 ac** | **80.68 ac** |
| **Site Total** | **205.75 ac** | |

*On-Site Cypress Swamp*

There are 12.87 acres of bald cypress swamp habitat located between the Nahra property and SPSA property in the southwest corner of the site. This area encompasses parts of Burnetts Mill Creek and is located between the Nahra Property and the SPSA property. This is considered high-quality habitat and will be included in the wetland preservation area. HDR scientists conducted a formal delineation of this area in October 2024 and the PJD request can be found in Appendix H.

Table 6. Proposed Preservation for Cypress Swamp

| Classification | Wetland Preservation |
|---|---|
| PFO | 12.27 ac |
| R3 (Burnetts Mill Creek) | 1,491 lf (0.60 ac) |
| **Total** | **12.87 ac** |

*Off-Site Magnolia Farms Property*

SPSA is in the process of purchasing a 282.92-acre property south of the SPSA property called Magnolia Farms. The Magnolia Farms property is within the same HUC as the SPSA property. The wetland delineation report and signatory page of the PJD request are included in Appendix G.

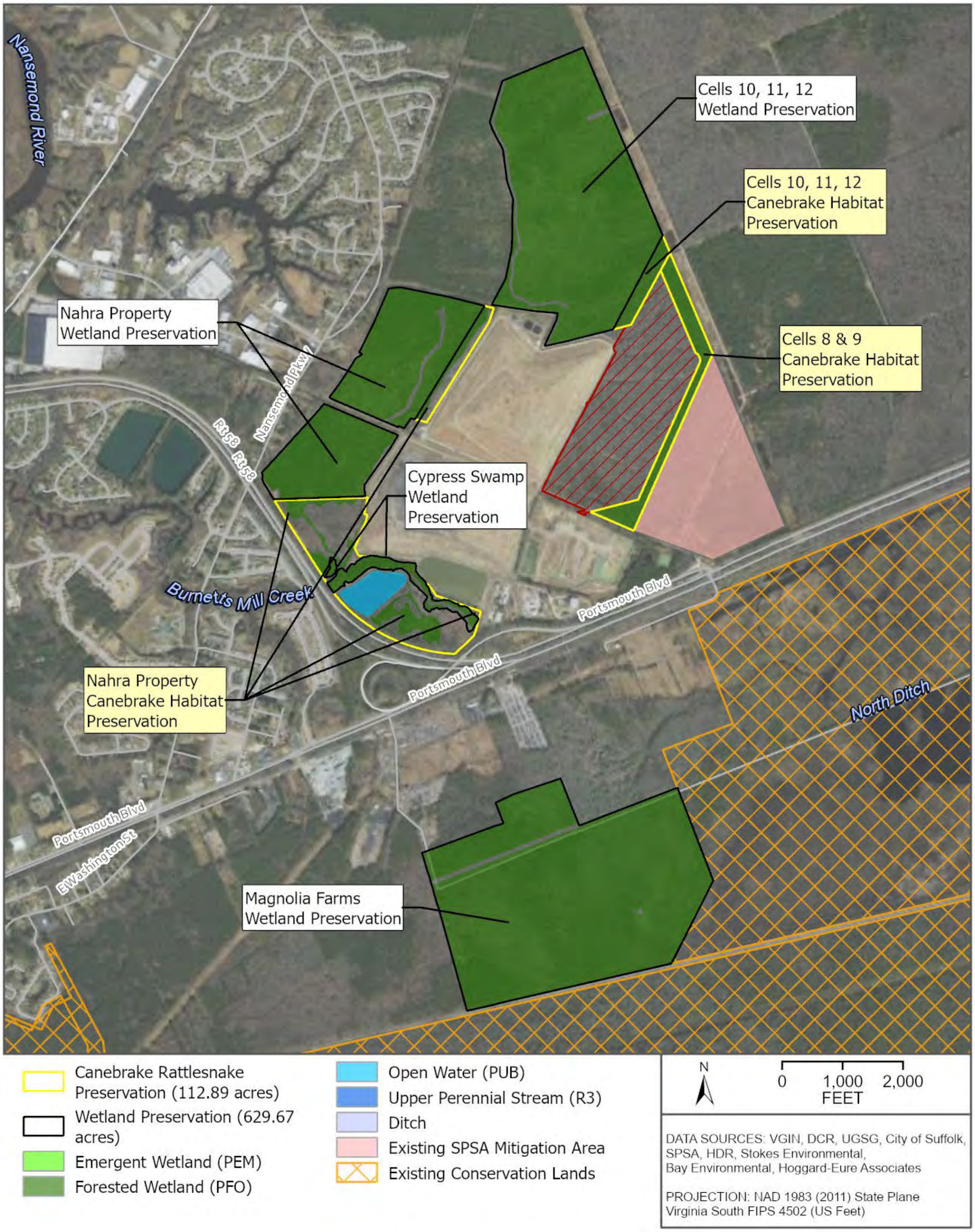
Table 7. Proposed Preservation for Magnolia Farms

| Classification | Wetland Preservation |
|---|---|
| PFO | 280.87 ac |
| PUB | 0.71 ac |
| Upland | 1.34 ac |
| **Total** | **282.92 ac** |

## Site Selection

SPSA proposes to conserve 742.56 acre of primarily forested wetland habitat within the sub watershed (020802080105- Nansemond River-Cedar Lake). These properties were selected due to their proximity to the impact area, similar history, and ecological characteristics to compensate for impacts associated with Cells VIII and IX (Figure 2).

Figure 2. Proposed Wetland Preservation



All preservation sites were historically part of the Great Dismal Swamp and are within one mile of the impact area. Each site has been logged previously, except for the cypress swamp which was spared from the most recent iteration, which is described below:

- Cells VIII and IX impact area and Cells X, XI, and XII were last logged in two phases (1985 & 1990) approximately 39-44 years ago.
- Magnolia Farms was logged approximately 37-38 years ago (1987/1988)
- The northern half of the Nahra Property was most recently logged 7-18 years ago (2006/2007). The southern half contains more mature forests, including the cypress swamp (Figure 3)

Figure 3. Recent logging of Nahra Property

Google Earth Pro April 2007

The impact area and proposed preservation sites are in various stages of succession due to continuous logging cycles historically prevalent in the unprotected lands of the Great Dismal Swamp. They have not had the chance to fully mature. If these areas are not placed under a conservation easement for preservation, there is a strong likelihood that they will be commercially logged again or developed to accommodate the growing population in this area. The development of impervious surface area downstream of this property is vast, making the SPSA property one of the last natural wetland areas before Burnetts Mill Creek flows into the Nansemond River. If these disturbances occur, the downstream water quality could be adversely affected due to these wetlands' loss of function. The cypress swamp on the southwestern portion of the property is a mature, high-functioning that is providing function for its immediate area and those downstream. This swamp also provides a connection between the Burnetts Mill Creek and the Great Dismal Swamp confined by Route 58. The importance of the protection of these wetland areas is explored more in the Baseline Information section below.

## Site Protection Instrument for Preservation Areas

A legal agreement is being crafted to place the proposed preservation areas under a conservation easement for it to be maintained by a third-party entity to ensure long-term protection of the site. It is anticipated that all the preservation areas will be managed by the Virginia Outdoors Foundation (VOF) with SPSA serving as the long-term steward. DWR-recommended covenants and restrictions will be in place, inclusive of DEQ's requirements. The third-party entity will have the right to enforce site protections and SPSA will provide the resources necessary to monitor and enforce these site protections. The third-party holder must also notify the USACE and other appropriate entities of any non-compliance in accordance with the terms of the real estate instrument. The USACE will then determine if enforcement action is necessary to ensure compliance.

The Property shall be preserved in perpetuity in its natural state, by prohibiting the following activities unless approved in writing by DWR:

1. Destruction or alteration of the preservation area other than those alterations recommended by DWR) for the purpose of habitat improvement;
2. Construction, maintenance or placement of any structures or fills including but not limited to buildings, mobile homes, fences, and signs other than those which currently exist;
3. Ditching, draining, diking, damming, filling, excavating, grading, plowing, flooding/ponding, mining, drilling, placing of trash and yard debris or removing/adding topsoil, sand, or other material;
4. Permitting livestock to graze, inhabit or otherwise enter the preservation area;
5. Cultivating, harvesting, cutting, logging, planting, and pruning of trees and plants, or using fertilizers and spraying with biocides;
6. Utilizing a non-reporting Nationwide Permit or State Program General Permit under Section 404 of the Clean Water Act or state general permits under VWPP regulations to impact any Water of the U. S., or any State Waters on the Property. Notification shall be required for the use of any Nationwide Permit, State Program General Permit, Regional Permit, or state general permit under VWPP regulations.

Exceptions to the above covenants and restrictions.

1. Routine maintenance, but not widening or improvement, of existing roads and trails is permitted provided the work is done in accordance with applicable laws. Any road or trail maintenance that is performed must not alter wetland hydrology on the property outside the roads and trails. Such maintenance shall only be conducted between November 1 and April 31 of any year.
2. Hunting, wildlife watching (including flora), and hiking. VDWR personnel may access the property, after notification to the owner, to perform monitoring or research on the preservation area.

Up to 1 deer hunting stand per 10 acres may be erected on the property for use in recreational hunting. Pruning of vegetation with hand-held equipment is permitted. Any pruning must be the minimum necessary to provide reasonable site and shooting lanes.

## Baseline Information

The Preliminary Jurisdictional Determinations (PJDs) for Cells VIII and IX, Cells X, XI, and XII, and the Nahra Property are included in Appendix D, E, and F, respectively. The wetland delineation report for the Magnolia Farms property and the signatory page for the PJD application are located in Appendix G. The PJD application for the cypress swamp area is located in Appendix H. Existing maintenance corridors and easements were georeferenced into ArcGIS Pro using available resources including VGIN parcels, aerial imagery, and pdfs of the survey data.

The proposed impact and preservation areas can be categorized into two ecological classes within the palustrine system and three ecological community groups according to The Natural Communities of Virginia (DCR 2021) (Table 8). Natureserve classifies non-riverine flatwoods and swamps as globally vulnerable or imperiled, which Virginia classifies them as critically imperiled (Natureserve 2022). The bald-cypress tupelo swamps are both global and state vulnerable or apparently secure, likely due to their range.

Table 8. Natural Wetland Communities by Habitat Type and Subtype

| **Natural Communities** | **Alluvial Floodplain Communities** | **Non-Alluvial Wetlands of the Coastal Plain and Piedmont** | |
|---|---|---|---|
| **Ecological Classes** | **Bald Cypress – Tupelo Swamps** | **Non-Riverine Flatwoods and Swamps** | |
| Community Groups | *Bald Cypress - Mixed Tupelo Intermediate Swamp* | *Non-Riverine Swamp Forest (Mixed Evergreen Type)* | *Non-Riverine Wet Hardwood Forest (Embayed Region Type)* |
| Characteristics | Includes very wet forests that are flooded by river overbank flow for long periods and are dominated by *Taxodium distichum, Nyssa aquatica*, and *Nyssa biflora.* Other bottomland species often found in this community include Acer rubrum, Liquidambar styraciflua, and Quercus laurifolia. Soils are semipermanently flooded, and probability of annual flooding is 100% (NatureServe 2024b). | This type includes nonriverine swamps of the Outer Coastal Plain (embayed or tidewater region) and is Critically Imperilled in Virginia, occurring on very large flats with a high water table. Many examples are dominated by *Nyssa biflora*, with *Taxodium* (of ambiguous species) and *Pinus taeda* as substantial minorities in the | Hydrology is seasonally to nearly permanently saturated, with occasional ponding, and is maintained by a high water table rather than riverine or estuarine flooding. This community generally occurs in association with large peatlands, for example in the Great Dismal Swamp of the Atlantic Coastal Plain. (NatureServe 2024d). |

| | | | |
|---|---|---|---|
| | | best examples. *Acer rubrum* is common in logged examples (NatureServe 2024c). | |
| Global/State Ranks* | G3G4/S3S4 | G2G3/S1 | G2/S1 |

*Global Conservation Rank: G2- Imperiled, G3-Vulnerable, G4- Apparently secure, State Conservation Rank: S1- Critically imperiled, S3- Vulnerable, S4-Apparently secure

Cells VIII and IX, Cells X, XI, and XII, the Nahra Property, and the Magnolia Farms property are examples of the non-riverine flatwoods and swamps community, also referred to as mineral flat wetlands. The other natural community present is the bald cypress-tupelo swamp located in the cypress swamp portion of the preservation area. The bald cypress-tupelo swamp is an alluvial wetland because it sits on the floodplain of a stream, in this case Burnett's Mill Creek (Table 9).

Table 9. Wetland Community Communities by Area

| | Impact Area | Avoided Cells VIII & IX | Cells X, XI, XII | Nahra Property | Cypress Swamp | Magnolia Farms |
|---|---|---|---|---|---|---|
| Bald Cypress - Mixed Tupelo Intermediate Swamp | -- | -- | -- | -- | 100% | -- |
| Non-Riverine Swamp Forest (Mixed Evergreen Type) | 6% | 100% | 15.5% | 32.75% | -- | 23.39% |
| Non-Riverine Wet Hardwood Forest (Embayed Region Type) | 94% | -- | 84.5% | 67.35% | -- | 76.61% |

A Hydrogeomorphic (HGM) Approach to assessing mineral flat wetland functions on the proposed impact area compared to a reference site in the Great Dismal Swamp was conducted by HDR in July 2023 (Appendix J). The impact area exhibited consistent wetland characteristics throughout; however, the boundaries near ROW and disturbed areas from geotechnical boring paths, which were cut in the last 5 years, contained more Japanese stilt grass than the interior. Wetland hydrology was predominantly met through secondary indicators due to the fact that mineral flats are driven by precipitation and these systems typically have a season drawdown of the water table from late summer through fall. The plant community was dominated by oaks with a smaller percentage of pine. Based on the results of this study the overall wetlands within the impact area have slightly lower functional conditions than surrounding reference wetlands. The biggest difference between the impact area and the reference site is primarily the presence of invasive species and greater than 40% herbaceous cover, which is likely due to recent disturbance.

## Compensation for Lost Functions and Values

In August 2024, the EPA requested an HGM assessment for the preservation areas proposed to offset impacts from Cells VII and IX. Based on the findings from the HGM model for Cells VIII and IX, it was concluded, with concurrence from the EPA, that conducting this assessment for the preservation areas will not yield additional insights beyond what is already established. The HGM model has indicated that Cells VIII and IX are less mature compared to the reference site in the Dismal Swamp, a conclusion that is expected given the recent logging and proximity to development and easements. The existing data, derived from detailed wetland delineations and site visits, sufficiently demonstrates that the functions and values of the preservation areas are comparable to those of the impact area.

In addition to the HGM assessment, The Norfolk District of the Army Corps of Engineer's Wetland Attribute guidance was used as a guideline to evaluate the functions and values of the wetland areas proposed for impact and preservation. The following section details how the mitigation plan will adequately compensate for lost functions and values associated with the Project.

### Groundwater Recharge/Discharge

A typical mineral flat wetland is a groundwater recharge system. The influx of water into these wetlands is primarily precipitation-driven, with water exiting the system by way of groundwater seepage and evapotranspiration (WRTC 2022). The majority of the soils throughout the impact and preservation areas are characterized by the NRCS as being poorly to very poorly drained, which leads to an accumulation of mucky organic matter as seen on the Magnolia Farms property. The Nahra property is the most recently disturbed and is still functioning like a mineral flat wetland hydrologically, proven by the minimal presence of drainage patterns in combination with hydric soils documented during the delineation. Drainage patterns show lateral water movement through the system due to the soil's poor drainage, but the hydric soils show the water is infiltrating through the soil enough to create this wetland type. The cypress swamp is hydrologically fueled by Burnetts Mill Creek and remains inundated the majority of the year. The wetland naturally floods due to the depressional landform and its relation to a stream or river and then recharges the groundwater via filtration through the soil. The soil texture in this area is a clay loam texture with sandy alluvial deposits in the top 4 inches according to the delineation data and USDA's Web Soil Survey. There may be minimal groundwater discharge associated with Burnett's Mill Creek, the pond on Nahra property, and the small open water features on Cells X, XI, XII and Manolia Farms. The proposed preservation areas serve to recharge the aquifer similar to the impact area. Both mitigation banks propose to regrade previously converted cropland and ditches to restore maximum groundwater recharge.

### Floodflow Alteration

Floodflow alteration is another metric on which wetland functionality can be measured. Mineral flat wetlands are prone to ponding due to poor soil drainage and lack of change in elevation throughout the system. The Nahra Property and Cells X, XI, and XII have PUB systems that allow for an increased storage capacity for flood flow and the lack of topography surrounding these open water systems will encourage slow lateral water movement that is associated with non-riverine flatwood/mineral flat and earl successional pine flat systems. Man-made ditches are present in the preservation areas, the Magnolia

Farms property has a ditch that runs through the northern end of the property additionally, Cells X, XI, and XII, Cells VIII and IX, and the Nahra Property have a ditch that runs along the edge of the landfill. These ditches affect less than 10% of the properties and are due to the proximity of these wetlands to developed land. The bottomland hardwood wetland system has a high potential for floodflow mitigation due to its depressional landform, its proximity to a watercourse with Burnetts Mill Creek flowing through the system, ponded water present, culverts discharging into the system from off-site, and the defined outlet associated with Burnett's Mill Creek flowing through a culvert off-site. Bottomland hardwood wetlands, like the bald cypress-tupelo swamp, are characteristically exceptional at "soaking up" flood waters like a sponge due to the high amounts of organic matter in the system present from the permanent/semipermanent surface water. Both mitigation banks propose to restore man-made ditches to minimize floodflow alteration.

## Fish and Shellfish Habitat

Mineral flat wetlands typically have seasonal ponding; however, stable habitats for fish species and most shellfish are not present. The open water system in the Cells X, XI, and XII area is a linear ponded water area north of an upland berm that continues off-site to the east and, according to the NWI wetland mapper, is part of a ditching system that drains to the ditch along Route 58. A standing water system is not conducive to most fish and shellfish. The Nahra Property has an approximately 11-acre pond that has the potential to hold fish and some shellfish species. It should also be noted that throughout the wetlands within the cypress swamp area, there were crayfish burrows indicating that species of shellfish are present. Burnetts Mill Creek runs through that section of the preservation area and is considered a perennial stream, which can support the presence of fish and shellfish species. The area surrounding the pond and stream systems on-site are boarded by woods with a thick canopy, allowing for shade over these water courses. The proposed impact area has no evidence of fish or shellfish.

## Sediment/Toxicant/Pathogen Retention

The non-riverine flatwood/mineral flat wetlands that are present in the impact and preservation areas have a relatively low capacity for water storage and sediment retention when compared to other wetland types. The water source for this subclass of wetlands is precipitation and their lack of slope makes the majority of the water flow vertical as opposed to horizontal. Off-site water is unlikely to enter into these systems via runoff, and in turn, the water that is fed into the system from rains will likely stay onsite and slowly filter through the soil into the groundwater (Weber). The Nahra Property is adjacent to developed suburban areas and has the highest possibility of hydrological inputs from impervious surfaces. There is a ditch system that runs along Cells VIII and IX, Cells X, XI, and XII, Nahra Property, and part of the Burnetts Mill Creek to act as a barrier between these systems and the landfill. The ditch systems act as a way to collect and redirect water from the mineral flat wetlands onsite to the cypress swamp area where the water can be stored more effectively in terms of sediment, toxicant, and pathogen retention. Bottomland hardwood systems, like the cypress swamp, are excellent in water and sediment retention (EPA 2024). The depressional geomorphology acts as a bowl for the sediment and nutrients to settle before flowing offsite via Burnetts Mill Creek. The soil in bottomland hardwoods is rich in organic matter, which acts like a sponge to hold onto water and sediment, allowing cleaner water to discharge downstream. This process is also helpful in nutrient removal, retention, and transformation. Restoration of wetlands in the mitigation banks will allow for retention and filtration of sediment, toxicants, and pathogens that would have otherwise run off-site through ditches and unnatural drainage.

## Nutrient Cycling

Nutrient cycling is impacted by a range of qualifiers in a system including soil texture and the presence of open water (USACEND 2020). The soil textures in the mineral flat wetlands throughout the impact area and the preservation areas are analogous. The hydric soils in these systems range in texture from loam, silty clay loam, and fine sandy loam. Most of these soils are very poorly drained, making them effective in nutrient cycling since water is retained in place longer. The Magnolia Farms property was found to have a consistent surface layer of a dark mucky loam with high organic matter. The proposed impact area does not include any PUB wetland systems, but the Nahra property and Cells X, XI, and XII have that added benefit for nutrient cycling. The cypress swamp wetland is a rich environment for nutrient cycling due to its standing water allowing for diffusion and buildup of organic matter, which ensures more nitrogen is converted to organic forms. The preserved systems have elements that play a part in the process of turning inorganic nitrogen into organic, which controls the release of nitrogen out of the system, bettering the water quality downstream (DeBusk 1999). The 114 acres of wetlands being created/restored through the wetland credits will adequately account for any current loss of this function in the area because the mitigation banks the Project used are developed and regulated in accordance with laws and regulations and are operating under a signed mitigation banking instrument.

## Carbon Sequestration

The preservation areas are mostly forested, and trees are known to effectively sequester carbon. Mineral flat wetlands contain unique carbon storage characteristics due to being periodically inundated instead of permanently inundated. These wetlands can act as both a carbon sink and a source. Small amounts of decomposition do occur during the dry season, but for most of the year, organic matter buildup without decomposition takes place leading to the accumulation of carbon and the wetlands truly acting as a carbon storage system. The Conservation Fund found that wetlands, depending on their type and location, can store up to 81-216 metric tons of carbon per acre (TAMAE 2024). The preservation area containing the cypress swamp offers highly effective carbon sequestration. Due to the year-round inundation of the wetland, the decomposition of organic matter is slow enough to the point where the carbon just becomes stored within the soil. The preservation area that is located on the Magnolia Farms property contains a mucky top layer of soil. These are ideal conditions for carbon sequestration due to the constant saturation of the top layer. Similarly, mitigation banks will become forested wetlands and sequester carbon similar to the impact area.

## Production Export

The vegetation in the proposed impact area is very similar to the vegetation present in the proposed preservation areas. Each site has at least 20 valuable food plant species present. The wetlands proposed for preservation also have a variety of vegetation in all 5 strata (tree, shrub, sapling, herb, and woody vine) with varying degrees of abundance, which can be seen in the datasheets for the delineated areas in their respective appendices. Crayfish burrows were observed in the cypress swamp area of the site, providing another food source for small mammals and reptiles. In addition to the crayfish, there are open water systems in Cells X, XI, and XII and the Nahra property that can support various types of wildlife such as fish and amphibians. Burnett's Mill Creek runs through the southwestern section of the on-site preservation areas providing a unique habitat for amphibians and insects to reside. The cypress swamp system supports hardwood trees, like bald cypress, that have historically been harvested for their timber. The mitigation banks contain and have planted a variety of endemic species that are valuable for organisms.

### Streambank Erosion/Shoreline Stabilization

The non-riverine flatwood wetlands proposed for preservation are large in size and have little to no slope associated with them, which ensures the velocity of lateral water movement is low and therefore erosion is scarce. Drainage patterns were only documented on the Nahra Property and the cypress swamp section of the preservation areas. The Nahra Property is the most recently impacted by logging (logged in 2006/2007), the logging operation left this section of land without a canopy for a few years, which explains the evidence of minor erosion. The Nahra property is in the process of returning to the quality of wetland that the surrounding areas are, which is evident by the hydrologic identifiers seen in the property's datasheets and the amount of oak and maple species in the sapling and herb layers of this wetland. The drainage patterns in the cypress swamp area of the property are present due to the water flow associated with the cypress swamp and the creek that feeds into that swamp system. There are no stream systems in the preservation areas other than Burnett's Mill Creek and this creek is bordered by the bald cypress-tupelo swamp/bottomland hardwood wetland type. Bottomland hardwood wetlands allow for a natural pooling of water, decreasing the flow rate in and out of the swampy system. Before converting into the swamp, the creek has a defined bed and bank and moderate sinuosity with documented plants and roots within the streambed. The creek is also flanked by trees in the PFO system it flows through. Trees and herbaceous vegetation are also present along the borders of the PUB systems present in the preservation areas, further stabilizing the banks. The removal of ditches and planting of trees in the mitigation banks have allowed for stronger stabilization and less erosion since water flow has been reduced. Additionally, the Davis Mitigation Bank is providing additional flood protection due to it's proximity to the Northwest River.

### Downstream Water Quality

The easements placed on the preservation areas will ensure that those areas will not be impacted or degraded by development, thus protecting the long-term downstream water quality. The Project proposes to preserve a portion of Burnetts Mill Creek the land surrounding it (Nahra Property), which will protect the immediate area around this named watercourse. The preservation of the wetland habitat and stream in this area is important as its location acts as a gateway between the undeveloped part of the immediate watershed and the developed section that continues until Burnett's Mill Creek enters the Nansemond River. The cypress swamp is currently acting as a catch basin for the water that enters in from the ditches of Route 58 on the southern side, before it flows into the developed suburban area on the other side of Route 58 to the west of the SPSA property. The runoff collected in these ditches from the roadway and the current construction of VDOT's SPSA Flyover project currently have the ability to be filtered and settled out in the cypress swamp before flowing further downstream to the

Nansemond River and eventually the Chesapeake Bay. Regrading and replanting of the mitigation banks will allow for water filtration and prevent runoff from carrying pollutants downstream.

## Wildlife Habitat

Cypress-tupelo swamps are known habitats for many threatened and endangered endemic species, including the globally uncommon, state-rare eastern big-eared bat (*Corynorhinus rafinesquii macrotis*) and southeastern myotis (*Myotis austroriparius*), which both find nesting habitat in these mature forests. They are also an important habitat for many species of waterfowl, such as wood duck, mallards, heron species, warblers, and other songbirds—all of which use cypress swamps as habitat during their breeding season. Additionally, cypress swamps are also known to contain abundant crayfish, beavers, muskrats, and numerous other animal species (DCR 2024).

The cypress swamp in the proposed preservation area is directly connected to the Nahra Property. This allows the abundance of wildlife which is known to thrive within cypress swamps to traverse through the corridor, finding food and a variety of ecological niches throughout the preservation areas. As a breeding ground for many species, these preservation areas will cause a net increase in the total biodiversity of the area.

Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The presence of wildlife food resources mentioned above acts as evidence for the preservation area's ability to sustain a wide range of wildlife. Tree snags were documented throughout the preservation areas among the hardwoods and pines, making it a suitable habitat for bat species such as the northern long-eared bat and the tri-colored bat. Switch cane (*Arundinaria tecta*) and/or giant cane (*Arundinaria gigantea*) were documented in every property included in the proposed preservation area, these areas include cane thickets that are prime habitat for the canebrake rattlesnake. The cane thickets provide cover allowing them to avoid predators and hunt grey squirrels, which is their main source of food (Kleopfer 2011). The area being preserved specifically for the canebrake rattlesnake, is connected to the on-site wetland preservation areas, which enable wildlife to freely move throughout the habitats without having to cross through urbanized areas. The swamp provides ridges and glades and during the fall months a significant amount of leaf litter. These are all prime habitat conditions for the canebrake rattlesnake (Kleopfer 2011). Swamps are known to contain high amounts of fallen logs, hollow trees, and stumps due to the anoxic conditions of the soil. These features provide areas for the canebrake rattlesnake to overwinter during the colder months of the year. The canebrake rattlesnake is also known to be found in disturbed areas such as farm fields and cutovers (Kleopfer 2011).

The seasonal ponding that creates the PUB system in Cells X, XI, and XII serves as the ideal habitat and breeding ground for amphibians. The Magnolia Farms property is adjacent to the Great Dismal Swamp National Wildlife Refuge, allowing an extension and connectivity of wetland habitat and the wildlife that is protected in the refuge.

Throughout the preservation areas, in particular the cypress swamp, there are downed trees and decaying logs that provide habitat for a variety of insects and nesting areas for birds and other wildlife.

The open water pond located on the Nahra Property is surrounded by mature hardwood trees that can provide a suitable habitat for bald eagles to nest.

In conjunction with the preservation areas, the restored and preserved forested wetlands of the mitigation banks will provide additional wildlife habitat contiguous to the Great Dismal Swamp and reduce population fragmentation.

### Vegetative Communities

The similarity of the vegetative communities of the impact area and potential preservation areas suggests that the overall biodiversity of the systems is similar, with the exception of the cypress swamp included in the preservation area having a higher level of biodiversity and ecosystem value. Historically, bald cypress-tupelo swamps have been logged for their old-growth, hardwood timber in similarly unprotected systems along the Blackwater River (DCR 2024). On a community level, processes that increase resource availability (e.g., water, light, nutrients) such as logging and human development have been found to make a community more open to invasion (Meyer et al, 2021). Currently, less than two percent of the herb layer within the swamp is covered by the invasive Chinese privet (Ligustrum sinense). If this system were to be developed, increased light levels would cause this population to begin to spread to surrounding areas, likely reducing the native biodiversity in the process.

There are approximately 12.87 acres of Bald Cypress-Tupelo Swamp within the Burnett's Mill Creek section of the proposed preservation area, which are considered rare natural communities according to the DCR Natural Heritage Program. The Bald Cypress-Tupelo Swamp in question has an overstory dominated primarily by Red Maple (*Acer rubrum*) and Bald Cypress *(Taxodium distichum*) trees. The herb layer was dominated by Switchcane (*Arundinaria tecta*) and Lizards-tail *(Saururus cernuus)*, which are also characteristic species of Cypress-Tupelo Swamps. At present, high-quality examples of old-growth Bald Cypress Tupelo Swamp are scarce, yet all stands of this community type provide critical wildlife habitat and resources. Preserving this resource in perpetuity would entail safeguarding not only the forests themselves but also the diverse wildlife that inhabit them. Bald Cypress-Tupelo Swamps are known to provide nesting habitats for the globally uncommon, state-listed eastern big-eared bat (*Corynorhinus rafinesquii macrotis*) and southeastern myotis (*Myotis austroriparius*) (VDCR 2021a).

The remainder of the sites consist of non-riverine flatwoods and swamps in various stages of succession. Late-successional stands of non-riverine saturated forests contain mixtures of hydrophytic oaks (*Quercus* spp.). The dominant species within the impact site and preservation areas include swamp chestnut oak (*Quercus michauxii*), willow oak (*Quercus phellos*), water tupelo (*Nyssa aquatica*), water oak (*Quercus nigra*), and white oak (*Quercus alba*). The areas of the site with more resent disturbance are documented having higher proportions of sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and loblolly pine (*Pinus taeda*). The shrub layer are dominated by American hornbeam (*Carpinus caroliniana*), switch cane (*Arundinaria tecta*), American holly (*Ilex opaca*), sweetbay magnolia (*Magnolia virginiana*), and saplings of sweetgum and swamp chestnut oak. The herb layer is generally scarce, but usually contain switch cane (*Arundinaria tecta*), sensitive fern (*Onoclea sensibilis*) and common pawpaw (*Asimina triloba*). Late-successional non-riverine flatwoods and swamps have been reduced due to commercial development, agricultural use including logging, and hydrologic alterations such as ditching and draining. The oak-dominated community types in the preservation areas are now globally rare. Associated rare species in southeastern Virginia include the state-listed canebrake rattlesnake (*Crotalus horridus atricaudatus*), which will be protected under this conservation easement (VDCR 2021b).

The early-successional non-riverine flatwoods on this site are dominated by mixtures of loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). The early successional subtype of this ecological community is more common than its mature counterpart located throughout the remainer of the mineral flat areas. In this part of Virginia, switch cane (*Arundinaria tecta*) is a key species in the shrub layer of non-riverine pine-hardwood forests, a dominance that has increased following the near-total loss of fire in the region. Although these altered communities are not primary conservation concerns, they offer potential for the restoration of the once-abundant canebrake vegetation. Furthermore, non-riverine pine-hardwood forests are important habitats for large populations of Swainson's warbler (*Limnothlypis swainsonii*), a bird species that is rare in the state. Switch cane is also considered a crucial host plant for a number of state and globally rare insect species (Natureserve 2022).

The functions and values memo attached in Appendix I shows a vegetative breakdown of all the proposed impact and preservation areas in each stratum. The Nahra Property, the most recently disturbed of all the sites, has the lowest canopy cover of oak species, which generally indicates a lower value/more disturbed system. Disturbance also provides a pathway for invasives to enter an ecosystem and outcompete native species for resources. As such, the Nahra Property shows minor populations of the invasive including Chinese privet (*Ligustrum sinense*), mimosa (*Albizia julibrissin*), Sericea lespedeza (*Lespedeza cuneata*), Japanese honeysuckle (*Lonicera japonica*) and Japanese stiltgrass (*Microstegium vimineum*). In the areas of early succession, pine dominates the tree layer, but oak was found in the sapling and herb layers which indicates these areas are well on their way to becoming the higher-value hardwood dominated subtype of the non-riverine flatwood community type.

The lands in the mitigation banks consisted of monoculture crops with little diversity. Restoration of the forested wetlands provides increased biodiversity, functional communities, and resistance to diseases.

## Secondary Impacts

Secondary impacts on the surrounding wetland areas due to the dewatering of the wetlands in Cells VIII and IX are not anticipated. The dewatering operation will be facilitated by a pump that will move locations around the Project Area numerous times, to prevent leachate from the cell to enter into the groundwater. Once the dewatering is complete, cut will begin and once the liner is placed within the footprint of the cell, no edge effects from dewatering will occur. After the liner is implemented, the pump will be tuned off, allowing the groundwater to return to normal levels, and creating a pressure seal for the liner so no leachate escapes. The groundwater pump will then be used as needed. To better understand the potential impacts on an adjacent wetland system during the dewatering of a system, we can look to another area on the SPSA property. Future Cell 7, located SSW of proposed Cells VIII and IX, has been actively dewatering for five (5) years and the most recent wetland delineations and site visits have confirmed the area adjacent to this dewatering operation is still considered a functioning PFO wetland system. The potential impact on these wetlands is expected to be temporary due to these mineral flat wetland systems being largely precipitation-fed, making any impact to groundwater of minimal consequence.

Secondary impacts to the proposed preservation areas will also be mitigated by the ditch system that separates the active landfill from Cells X, XI, and XII, the Nahra Property, and the Burnetts Mill Creek area. The ditch divide will ensure a hydrologic boundary between the landfill and the areas proposed for preservation. The effectiveness of this method is exemplified by how Cells X, XI, and XII have been bordering active landfill cells for years now, but the property up to the ditch on the property edge is a delineated mineral flat wetland. The concern over future edge effects from adjacent development is nonexistent due to the right-of-way easements that border the SPSA property. There is a gas line easement that runs along the eastern side of the property and a powerline easement that runs along the northern side of the Nahra Property. These utility easements will ensure no future development will take place in those areas.

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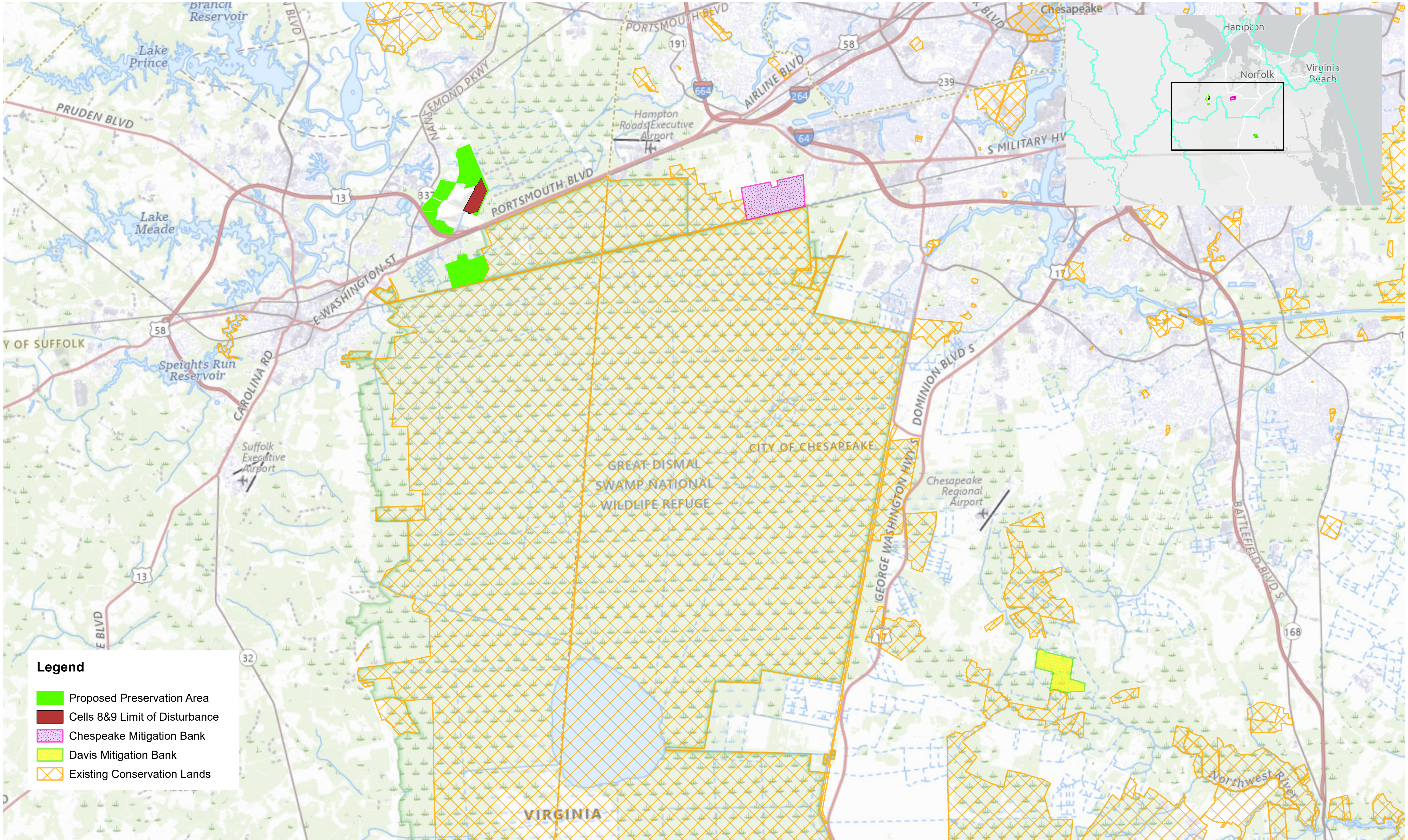
# A

Compensatory Mitigation Map




**VICINITY MAP**

SPSA Landfill Expansion

Figure 1

X:\GIS\PROJECTS\3062_SPSA\103450004_CELL_VIII_AND_IX_MITIGATION\7.2_WORK_IN_PROGRESS\MAP_DOCS\APRX\230327_SPSA_CELLSVIII_IX\230327_SPSA_CELLSVIII_IX_RJW.APRX DATE: 11/11/2024

# B

Chesapeake Mitigation Bank

*EXECUTION VERSION*

# WETLAND MITIGATION CREDIT SUPPLY AGREEMENT

THIS WETLAND MITIGATION CREDIT SUPPLY AGREEMENT (this "Agreement") made as of February 23rd, 2023 (the "Effective Date") by and between **CHESAPEAKE WETLAND MITIGATION BANK, LLC**, a Delaware limited liability company ("Bank Sponsor"), and the **SOUTHEASTERN PUBLIC SERVICE AUTHORITY**, a political subdivision of the Commonwealth of Virginia ("Purchaser").

RECITALS:

WHEREAS, Bank Sponsor has established a mitigation bank known as the Chesapeake Wetland Mitigation Bank (the "Bank") on property located in the City of Chesapeake, Virginia ("Bank Property"), as authorized by the United States Army Corps of Engineers ("USACE") and the Virginia Department of Environmental Quality ("DEQ") (together, the "Permitting Agencies") and other governmental agencies pursuant to a mitigation banking instrument dated April 22, 2009 (as amended or modified from time to time, the "Bank Instrument"); and

WHEREAS, Bank Sponsor has been authorized pursuant to the Bank Instrument to operate the Bank and to sell mitigation credits and/or acres to compensate for unavoidable impacts to "waters of the United States" and "state waters," including such impacts to wetlands, caused by projects approved pursuant to permits or authorizations granted by the USACE and DEQ in accordance with Sections 401 and 404 of the Clean Water Act ("CWA") and the Virginia State Water Control Law ("Mitigation Credits"); and

WHEREAS, comprising or among the Mitigation Credits are those to compensate for impacts to forested wetlands that are "waters of the United States" and/or "state waters" ("Wetland Credits"); and

WHEREAS, Purchaser is or will be pursuing permits as required from the Permitting Agencies (together, "Permits") authorizing Purchaser to unavoidably impact certain wetlands that are jurisdictional waters of the United States and/or state waters in connection with Purchaser's proposed expansion of the Purchaser regional landfill on a parcel of land designated as City of Suffolk Tax Map Parcel No. 27-28A ("Project Property") and located within the Hampton Roads Watershed and Hydrologic Unit Code Area ("HUC") 02080208, which Permits are anticipated to include a condition that Purchaser compensates for such impacts in accordance with conditions of the Permits (the "Wetland Mitigation Need"); and

WHEREAS, Purchaser seeks to fulfill, in part, its Wetland Mitigation Need, as is anticipated to be established by the Permits, by purchasing 83.0 Wetland Credits from Bank Sponsor, and Bank Sponsor desires to sell such 83.0 Wetland Credits to Purchaser for such purpose.

NOW, THEREFORE, for and in consideration of the mutual premises and valuable consideration set forth herein, the receipt and sufficiency of which are hereby acknowledged, Bank Sponsor and Purchaser mutually agree as follows:

AGREEMENT:

1. **Recitals.** The foregoing Recitals are hereby incorporated into this Agreement as a matter of contract and not mere recital.

2. **Purchase of Mitigation Credits**.

a. Purchase. Subject to the terms and conditions of this Section 2 and elsewhere in this Agreement, Bank Sponsor hereby agrees to sell to Purchaser, and Purchaser hereby agrees to buy from Bank Sponsor, **83.00 Wetland Credits** (the "Purchased Credits").

b. Allocation of Stream Mitigation Credits Pending Closing. Between the Effective Date and the Settlement Date (as defined below), Bank Sponsor shall reserve and allocate from the Bank 83.00 Wetland Credits for Purchaser to meet its Wetland Mitigation Need, and Purchaser shall have the exclusive right to acquire such Purchased Credits to meet its Stream Mitigation Obligation.

c. Purchase Price. Purchaser agrees to pay Bank Sponsor by the Settlement Date (as defined below) **$35,000.00** per Wetland Credit for the 83.00 Purchased Credits for a total of **$2,905,000.00** (the "Purchase Price").

d. Settlement; Documentation of Transfer of Purchased Credits.

(i) Purchaser agrees to pay Bank Sponsor the total Purchase Price no later than thirty (30) business days after the Effective Date (such date of payment being the "Settlement Date"), which payment shall be by wire transfer in accordance with Exhibit A or as directed by Bank Sponsor.

(ii) Except as otherwise provided in this Agreement, all amounts paid under this Agreement shall, when paid, be deemed to be fully earned by Bank Sponsor and non-refundable.

(iii) Within three (3) business days of the Settlement Date, Bank Sponsor shall provide to Purchaser its bill of sale and affidavit of sale for the conveyance and transfer of the Purchased Credits and a copy of its transmittal of same to the Permitting Agencies.

3. **Default.**

a. If Bank Sponsor is unable to provide Purchaser with all or a portion of the Purchased Credits as contemplated in this Agreement, Purchaser shall have the option to provide Bank Sponsor with written notice within ten (10) days after a final determination has been made by the Permitting Agencies as to the number of Wetland Credits that will constitute the Purchased Credits to either (i) terminate this Agreement, or (ii) acquire such Wetland Credits as Bank Sponsor has available at the Bank toward fulfilling the Wetland Mitigation Need; provided, however, that nothing in this subsection shall affect Purchaser's rights or remedies as otherwise set forth in this Agreement.

b. If Purchaser has not paid the Purchase Price to Bank Sponsor by within thirty (30) days of the Effective Data, Bank Sponsor may terminate this Agreement upon written notice of same to Purchaser, at which point neither Bank Sponsor nor Purchaser shall have any further obligations to the other hereunder except as otherwise provided in this Agreement.

4. **Documentation of Transfer of Purchased Credits.** Within three (3) business days of Bank Sponsor's receipt of the total Purchase Price pursuant to Section 2 above, Bank Sponsor shall (i) provide to Purchaser its bill of sale and certificate or affidavit for the conveyance and transfer of the Purchased Credits to Purchaser and a copy of Bank Sponsor's transmittal of same to the Permitting Agencies, and (ii) otherwise notify the Corps and DEQ (and other agencies as required) of Bank Sponsor having debiting of the Purchased Credits in favor of the Purchaser.

5. **Application of Purchased Credits.**

a. At any point after the Effective Date, Purchaser may request that Bank Sponsor apply the Purchased Credits to a Permit by delivering a notice containing the information on Exhibit B to this Agreement (the "Application Notice"). If Exhibit B has been completed and delivered to Bank Sponsor on or before the Effective Date, Purchaser shall be deemed to have provided the Application Notice on the Effective Date. Upon receipt of the Application Notice and payment of the Purchase Price, Bank Sponsor shall promptly provide the Permitting Agencies with the documentation required by the Bank Instrument to apply the Purchased Credits to the Permit(s) specified by Purchaser.

b. Purchaser is solely responsible for the accuracy of the information provided to Bank Sponsor in the Application Notice. Bank Sponsor shall have neither the duty to confirm the accuracy of the information provided by Purchaser nor any liability for inaccurate information provided by Purchaser.

6. **Bank Sponsor's Representations, Warranties and Covenants.** Bank Sponsor hereby represents, warrants and covenants that:

a. This Agreement has been duly authorized, executed and delivered by all necessary action on the part of Bank Sponsor, constitutes the binding agreement of Bank Sponsor, and is enforceable in accordance with its terms;

b. The Bank's service area includes the Hampton Roads Watershed and HUC 02080208, which, to Bank Sponsor's knowledge, is the same watershed and HUC in which the Project Property is located;

c. The Purchased Credits subject to this Agreement are Mitigation Credits as described in the Bank Instrument;

d. Bank Sponsor agrees to assume all responsibility and liability for meeting the USACE and/or DEQ reporting requirements for the sale of the Purchased Credits in and from the Bank, and Bank Sponsor shall timely report the sale of the Purchased Credits to the Permitting Agencies as required by the Permitting Agencies in order to allocate to Purchaser the Purchased Credits;

e. As of the execution of this Agreement and as of the issuance of the bill of sale for and certifications of the conveyance and transfer of the Purchased Credits, the Bank has been and shall remain lawfully approved by the USACE and DEQ, and the Bank shall possess at each such time sufficient Wetland Credits to be allocated to Purchaser for the Purchased Credits;

f. Bank Sponsor has no knowledge of any facts, circumstances, events, or conditions that would have resulted in, or would be reasonably expected to result in, any full or partial loss of authority of the Bank or any full or partial invalidation of any Wetland Credits;

g. Bank Sponsor shall ensure that the Bank is properly monitored and maintained and otherwise complies with applicable laws and the Banking Instrument so that the Purchased Credits remain valid for satisfaction toward the Wetland Mitigation Need;

h. Bank Sponsor agrees to indemnify and hold Purchaser harmless from and against any claims, liabilities, damages, fines or penalties, losses or additional expense (including without limitation attorney's fees) incurred by Purchaser and arising from or caused by Bank Sponsor's material breach of representation or warranty or default of any material obligation under this Agreement, including any default that results in the invalidation of the Purchased Credits following their application to a Permit; provided, however, that Bank Sponsor shall not be responsible (i) and shall have no duty to indemnify Purchaser if the Permitting Agencies do not allow the Purchased Credits to be applied to a Permit except to the degree such Permitting Agency refusal is the direct result of a breach of this Agreement by Bank Sponsor; (ii) for determining the nature or amount of mitigation required of Purchaser for any project or Permit or by applicable law; or (iii) for compliance with the terms and conditions of any Permit issued to Purchaser in connection with any project or otherwise, except to the degree any noncompliance results directly from a breach by Bank Sponsor of Subsections 6.d, 6.e, or 6.g of this Agreement; and

i. Subsections 6.a through and including 6.h of this Agreement shall survive the Settlement Date and the issuance of the bill of sale and certifications for the Purchased Credits.

**7. Purchaser's Representations and Warranties.** Purchaser hereby warrants and represents that this Agreement has been duly authorized, executed and delivered by all necessary action on its part, constitutes its valid and binding agreement and is enforceable in accordance with the terms hereof.

**8. Notices.** Each notice, request, demand or other communication hereunder will be in writing and will be deemed to have been duly given (i) when delivered by hand, or (ii) three (3) business days after deposit in United States certified or registered mail, postage pre-paid, return receipt requested, or (iii) one (1) business day after delivery by a recognized overnight courier service, in each case addressed to the parties at the following addresses:

If to Bank Sponsor:

Jason Murnock
Chesapeake Wetland Mitigation Bank, LLC
5367 Telephone Road
Warrenton, VA 20187
E-mail: jmurnock@res.us

| | |
|---|---|
| If to Purchaser: | Southeastern Public Service Authority<br>723 Woodlake Drive<br>Chesapeake, VA 23320<br>ATTN: Tressa Preston<br>E-mail: tpreston@spsa.com |
| With copy to: | Henry R. Pollard, V, Esq.<br>Williams Mullen<br>200 South 10th Street, Suite 1600<br>Richmond, Virginia 23219<br>E-mail: hpollard@williamsmullen.com |

Each party shall have the right to change its address by providing the other party with at least ten (10) days prior written notice of the change.

**9. Miscellaneous.**

a. Confidentiality. Neither this Agreement nor the terms hereof may be furnished to any third party without the written consent of all parties, except as may otherwise be required by law or a court of competent jurisdiction; provided, that the foregoing shall not prohibit the parties from providing this Agreement or the terms hereof to their attorneys, consultants, professional advisors, and current and prospective investors and primary lenders. Purchaser acknowledges and agrees that Bank Sponsor may, as part of the process for transferring the Purchased Credits, disclose the information provided by Purchaser in the Application Notice to the Permitting Agencies. This subsection shall survive any termination of this Agreement.

b. Governing Law and WAIVER OF JURY TRIAL. This Agreement and all matters arising out of or relating to this Agreement are governed by the laws of the Commonwealth of Virginia, without giving effect to any conflict of laws provisions thereof. Any and all disputes, claims, and causes of action arising out of or in any way connected with this Agreement or its performance must be brought in the applicable court of the City of Chesapeake, Virginia, or in the United States District Court for the Eastern District of Virginia, Norfolk Division. EACH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY: (A) CONSENTS AND SUBMITS TO THE EXCLUSIVE JURISDICTION OF THE AFOREMENTIONED COURTS; (B) WAIVES ANY OBJECTION TO THAT CHOICE OF FORUM BASED ON VENUE OR TO THE EFFECT THAT THE FORUM IS NOT CONVENIENT; AND (C) WAIVES ANY RIGHT TO TRIAL BY JURY.

c. Counterparts. This Agreement may be signed by facsimile or electronic PDF signature, which signature shall be deemed to constitute an original signature and be binding as such. This Agreement may be executed in identical counterparts, each of which when so executed and delivered will constitute an original, but all of which taken together will constitute one and the same instrument.

d. Force Majeure. No party shall be liable or responsible to the other party, or deemed to have breached this Agreement, for any failure or delay in satisfying its obligations hereunder if such failure or delay is attributable to any of the following: strikes, riots, acts of God, shortages of labor or materials, war, terrorist acts or activities, orders, laws, regulations, or restrictions, adverse determinations from the Permitting Agency or any other governmental authority, or any other causes which are beyond the reasonable control of the responsible party.

e. Consequential Damages. Notwithstanding any provision of this Agreement to the contrary, no party shall be liable for any lost or prospective profits or any other indirect, consequential, special, incidental, punitive, or other exemplary losses or damages, whether based in contract, warranty, indemnity, negligence, strict liability or other tort or otherwise, regardless of the foreseeability or the cause thereof. Each party expressly agrees that the affiliates, members, partners and shareholders of any defaulting or breaching party hereunder are not jointly, solidarily or severally liable for any costs, expenses, losses or damages arising from such party's breach or default under this Agreement.

f. Wetland Credits Not Real Estate. Sale and conveyance of the Purchased Credits to Purchaser in accordance with this Agreement shall not constitute the conveyance or transfer of any right, interest or ownership in the Bank, the Bank Property or any other real property, nor shall such sale and conveyance impose upon Purchaser any obligation, duty or liability arising from or incident to ownership of or interest in the Bank, the Bank Property, or any other real property.

g. Other. Permittee's entering into this Agreement does not give the Permittee rights to monies generated by the Bank, and further, Permittee does not obtain any rights of ownership or use of the real property associated with the Bank or any other property interests of Bank Sponsor or its affiliates. Bank Sponsor may, in its discretion and in lieu of supplying the Purchased Credits, obtain mitigation credits from other mitigation banks and provide those credits to Permittee as long as doing so would not adversely impact Permittee. Paragraphs 3.a and 3.e shall survive the termination of this Agreement.

h. General. Except as otherwise provided in this Agreement, Purchaser's rights under this Agreement shall not be assigned or apportioned, either voluntarily or by operation of law, without the prior written consent of Bank Sponsor, which shall not be unreasonably withheld, conditioned or delayed. This Agreement constitutes the entire agreement and understanding between the parties with respect to the purchase and sale of the Purchased Credits, and it supersedes and replaces any prior agreements and understandings, whether oral or written, between them with respect to such matters. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of either party. This Agreement may not be changed, amended or modified except by an instrument in writing signed by both parties. The unenforceability, invalidity, or illegality of any provision hereof shall not render any other provision unenforceable, invalid, or illegal. This Agreement is not intended to create, and it shall not create, any partnership, joint venture, or similar arrangement between Purchaser and Bank Sponsor. No party's failure or delay in exercising any of its rights hereunder will constitute a waiver of such rights unless expressly waived in writing.

[*REMAINDER OF PAGE LEFT BLANK; SIGNATURE PAGE FOLLOWS*]

The parties have executed this Agreement as of the Effective Date.

**BANK SPONSOR:**

ENVIRONMENTAL BANC & EXCHANGE, LLC,

By: ____________________

Name: Ben Eubanks

Title: VP, East Region & GM, Mid-Atlantic

**PURCHASER:**

SOUTHEASTERN PUBLIC SERVICE AUTHORITY,

By: Dennis L. Bagley

Name: Dennis L. Bagley

Title: Executive Director

102096253.7

**EXHIBIT A**

**Environmental Banc and Exchange**
**Wire & ACH Instructions**

| | |
|---|---|
| Bank: | JP Morgan Chase<br>165 Madison Ave.<br>Memphis, TN 38103 |
| Routing No.: | 071000013 |
| Account No.: | 59385380056789243 |
| SWIFT: | CHASUS33XXX |
| Account Type: | Environmental Banc and Exchange, LLC Checking Account |

## EXHIBIT B

| | |
|---|---|
| Purchaser Information: | Southeastern Public Service Authority<br>723 Woodlake Drive<br>Chesapeake, VA 23320 |
| Permitting Agency: | United States Corps of Engineers ("USACE")<br>Virginia Department of Environmental Quality ("DEQ") |
| Permit (Application) Numbers: | USACE: TBD<br>DEQ: TBD |
| Project Name & Location: | Southeastern Public Service Authority of Virginia ("SPSA") Landfill Expansion |
| Brief Description of Impacts to be Mitigated by the Credits: | Impacts to wetlands at SPSA Project Property |
| Mitigation Credits to be Applied to Permits per this Agreement: | 83.00 Wetland Mitigation Credits |

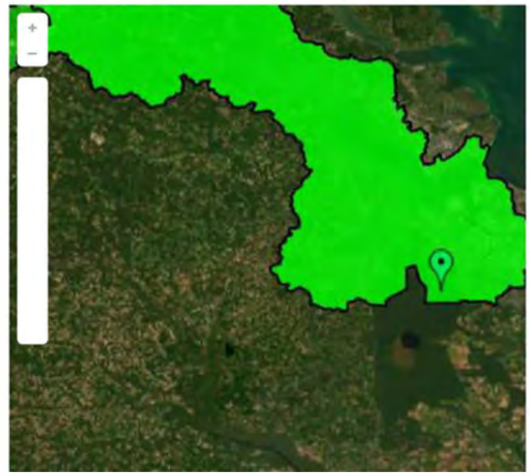
# RIBITS
Regulatory In-lieu Fee and Bank Information Tracking System



## Chesapeake Mitigation Bank

| | |
|---|---|
| **Chair:** | USACE |
| **Instrument signed by:** | |
| **USACE District:** | Norfolk |
| **FWS Field Office:** | Virginia |
| **NMFS Region:** | Northeast |
| **BLM State Office:** | Eastern States |
| **BLM District Office:** | Southeastern States District Office |
| **State:** | Virginia |
| **County:** | Chesapeake city [VA] |
| **USACE Permit/Tracking No.:** | NAO-2006-06644 |
| **Total Acres:** | 544.46 |
| **Status/Date:** | Approved 05/20/2009 |
| **Establishment Date:** | 05/20/2009 |
| **Type:** | Private Commercial |
| **Comments:** | Wetland mitigation bank( Formerly known as the Compaz property) in the City of Chesapeake |
| **On Public Lands:** | No |

OpenLayers Map



Show Service Area Footprint

Rank Primary Secondary

## Bank Credit Classifications

Wetland
- Wetlands

## Contact Information

**Bank Sponsor**
**Chesapeake Wetland Mitigation Bank, LLC**
5367 Telephone Road
Warrenton, VA 20187
Phone: (919) 209-1055

**Bank Sponsor POC**
**Amy Staley - Consultant**
1408 Roseneath Rd. Suite B
Richmond, VA 23230
Email: vacreditsales@res.us
Phone: (919) 209-1055

**Regulatory Bank Manager**
**Vincent Pero**
CENAO-REG
920 Gardens Blvd. Suite 103-B
Charlottesville, VA 22901
Email: vincent.d.pero@usace.army.mil
Phone: (434) 973-0568

**Sarah Woodford**
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, VA 23219
Email: sarah.woodford@deq.virginia.gov
Phone: (804) 659-2672
Fax: (804) 698-6984 X 069

## Credit Ledger Summary

Last Transaction: Sep 29, 2023

***ATTENTION***
Credit reservations and pending transactions are **NOT** reflected in the Available Credits total. Potential purchasers **MUST** contact the Sponsor to verify credit availability.

| Credit Classification | Available Credits | Withdrawn Credits | Released Credits | Potential Credits |
|---|---|---|---|---|
| **Wetland** | | | | |
| Wetlands | 9.264 | 472.946 | 482.21 | 482.21 |

| | |
|---|---|
| **From:** | Robin Bedenbaugh |
| **To:** | Wilk, Becky; Irvin, Jake |
| **Subject:** | FW: Potential PRM Sites for SPSA |
| **Date:** | Thursday, April 11, 2024 8:59:55 AM |

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning, Becky and Jake.
Please see the table below regarding the credit generation ratios at CWMB. 87% of the bank's credits were generated from restoration. If need be, we can provide more detailed information per the MBI Modification No. 7 which was approved in December 2022, but the table below summarizes the breakdown per the 2022 MBI modification.

---

**From:** Kelsey Gray <kgray@res.us>
**Sent:** Thursday, April 11, 2024 8:15 AM
**To:** Rick Atkinson Jr <ratkinson@res.us>; Robin Bedenbaugh <rbedenbaugh@res.us>
**Cc:** Peter Stutts <pstutts@res.us>; Brian Wagner <bwagner@res.us>
**Subject:** RE: Potential PRM Sites for SPSA

Hi Robin, for CWMB:

| | **Credits** | **Ratio** |
|---|---|---|
| Wetland Restoration | 419.14 | 87% |
| Other | 63.08 | 13% |
| Total | 482.22 | |

**Kelsey Gray**, PWS
D: 540.905.4389 | M: 419.410.3089

---

# C

Davis Mitigation Bank

**WETLAND MITIGATION CREDIT PURCHASE AGREEMENT**

***EXECUTION VERSION***

THIS WETLAND MITIGATION CREDIT PURCHASE AGREEMENT ("Agreement"), made and entered into this 23rd day of February, 2023 ("Effective Date"), by and between **DAVIS WETLANDS BANK, LLC** a Virginia limited liability company ("SELLER") and the **SOUTHEASTERN PUBLIC SERVICE AUTHORITY**, a political subdivision of the Commonwealth of Virginia ("BUYER").

**RECITALS:**

A. SELLER is the owner and sponsor of the Davis Mitigation Bank ("Bank") consisting of 407 acres, more or less, comprised of parcels located in southeastern Virginia, including the Davis Mitigation Area (collectively, "Bank Property").

B. SELLER has been authorized by the U.S. Army Corps of Engineers ("Corps") (NAO-1998-02107) and the Virginia Department of Environmental Quality ("DEQ") (together, the "Agencies") to sell mitigation credits to compensate for unavoidable impacts to "waters of the United States" and "state waters," including such impacts to wetlands caused by projects approved pursuant to permits or authorizations granted by the Corps and VDEQ ("Mitigation Credits") in accordance with Sections 401 and 404 of the Clean Water Act ("CWA") and the Virginia State Water Control Law.

C. Operation, management and maintenance of the Bank are subject to the requirements of the "Umbrella Memorandum of Agreement Between Bank Sponsor, U.S. Army Corps of Engineers, et al.," for the Bank dated November 4, 1998, as amended ("Umbrella MOA") and to the statutes, regulations and policies cited therein. Among the Mitigation Credits authorized through the Umbrella MOA are those to compensate for impacts to forested wetlands that are "waters of the United States" and/or "state waters" ("Wetland Credits").

D. BUYER is or will be pursuing permits as required from the Corps and DEQ (together, "Permits") authorizing BUYER to unavoidably impact certain wetlands that are jurisdictional waters of the United States and/or state waters in connection with BUYER's proposed expansion of the BUYER's regional landfill situated in the City of Suffolk, Virginia ("Project") on a parcel of land designated as City of Suffolk Tax Map Parcel No. 27-28A ("Project Property"), and located within the Hampton Roads Watershed and Hydrologic Unit Code Area ("HUC") 02080208, upon the condition that BUYER compensates for such impacts in accordance with conditions of the Permits (the "Wetland Mitigation Need").

E. BUYER seeks to fulfill, in part, its Wetland Mitigation Need, as is anticipated to be established by the Permits, by purchasing 76.0 Wetland Credits from SELLER, and SELLER desires to sell such 76.0 Wetland Credits to BUYER for such purpose.

**NOW, THEREFORE,** for and in consideration of the mutual premises and agreements contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, SELLER and BUYER mutually agree as follows:

1. **Recitals.** The foregoing Recitals are hereby incorporated into this Agreement as a matter of contract and not mere recital.

2. **Sale and Purchase of Wetland Credits.** Subject to the other terms and conditions of this Agreement, SELLER agrees to reserve, sell, convey and transfer to BUYER, and BUYER agrees to purchase from SELLER, 76.0 Wetland Credits for BUYER to fulfill in part its Wetland Mitigation Need ("Purchased Credits").

3. **Purchase Price.** Subject to the other terms and conditions of this Agreement, BUYER hereby agrees to pay for the Purchased Credits at the rate of FORTY- TWO THOUSAND DOLLARS ($42,000.00) per Wetland Credit for each of the 76.0 Purchased Credits, for a total purchase price of THREE MILLION ONE HUNDRED NINETY-TWO THOUSAND DOLLARS ($3,192,000.00) ("Purchase Price").

4. **Payment Schedule.** Subject to the other terms of this Agreement, the Purchase Price shall be paid by BUYER pursuant to the following payment schedule and subject to the following terms:

a. An initial deposit of THREE HUNDRED NINETEEN THOUSAND TWO HUNDRED DOLLARS ($319,200.00) ("Deposit"), being 10% of the total Purchase Price, shall be due to SELLER within five (5) business days of the Effective Date to reserve and hold 76.0 Wetland Credits at the agreed upon per Wetland Credit cost of $42,000.00 and total Purchase Price for a period of 180 days following the Effective Date ("Reserve Period"). Subject to Paragraph 8 below, the Deposit shall be non-refundable.

b. Payment of the Purchase Price, less the Deposit, shall be paid to SELLER no later than the last day of the Reserve Period.

c. BUYER may, in its sole discretion, make any of the above payments sooner than scheduled.

5. **Documentation of Transfer of Purchased Credits.** Subject to the BUYER

having filed a joint permit application for required Permits for the Project, and within three (3) business days of SELLER's receipt of the total Purchase Price pursuant to Paragraph 4 above in immediately negotiable funds, SELLER shall (i) provide to BUYER its bill of sale and certificate or affidavit for the conveyance and transfer of the Purchased Credits to BUYER and a copy of SELLER's transmittal of same to the Permitting Agencies, and (ii) otherwise notify the Corps and DEQ (and other agencies as required) of SELLER having debiting of the Purchased Credits in favor of the BUYER.

**6. SELLER's Representations, Warranties and Covenants.** SELLER hereby represents, warrants and covenants that:

a. This Agreement has been duly authorized, executed and delivered by all necessary action on the part of SELLER, constitutes the binding agreement of SELLER, and is enforceable in accordance with its terms;

b. To the best of SELLER's knowledge, the Project Property is located within the authorized service area of the Bank as described in the Instrument, such that the Purchased Credits are eligible for use to satisfy the Wetland Mitigation Need;

c. The Purchased Credits are Wetland Credits as described in the Bank Instrument, available for use on a case-by-case basis for projects where on-site avoidance and minimization has been demonstrated and mitigation for on-site impacts is required.

d. SELLER shall sell and convey the Purchased Credits to BUYER under the terms of this Agreement;

e. SELLER agrees to recognize the sale of all Purchased Credits at upon execution of this Agreement, payment of the Deposit, and payment of the Purchase Price (as hereinafter defined), except that all Purchased Credits will remain the property of the SELLER until payment of the Purchase Price is made;

f. SELLER agrees to assume all responsibility and liability for meeting the Corps and/or DEQ reporting requirements for the sale and transfer of the Purchased Credits in and from the Bank, and SELLER shall timely report the sale of the Purchased Credits to the Agencies as required by the Agencies in order to allocate to BUYER the Purchased Credits;

g. As of the execution of this Agreement and as of the issuance of the bill of sale for and certifications of the transfer of the Purchased Credits, the Bank has been and shall remain lawfully approved by the Corps and DEQ and in compliance with the Umbrella MOA, and the Bank shall possess at each such time sufficient Wetland Credits to be allocated to BUYER for the Purchased Credits to satisfy the Wetland Mitigation Need;

h. SELLER has no knowledge of any facts, circumstances, events, or conditions that would have resulted in, or would be reasonably expected to result in, any full or partial loss of authority of the Bank or any full or partial invalidation of any Wetland Credits;

i. SELLER shall ensure that the Bank is properly monitored and maintained and otherwise complies with applicable laws and the Umbrella MOA so that the Purchased Credits remain valid for satisfaction of the Wetland Mitigation Need;

j. SELLER agrees to indemnify and hold BUYER harmless from and against any claims, liabilities, damages, fines or penalties, losses or additional expense (including without limitation reasonable attorney's and consultant's fees) incurred by BUYER and arising from or caused by SELLER's breach of representation or warranty or failure to fulfill its obligations under this Agreement or from any invalidation of the Purchased Credits; and

k. The provisions of Paragraph 6.a through and including Paragraph 6.j of this Agreement shall survive settlement on the purchase of the Purchased Credits and certifications of the Purchased Credits.

**7. BUYER's Representations and Warranties.** BUYER hereby warrants and represents that this Agreement has been duly authorized, executed and delivered by all necessary action on his part, constitutes its valid and binding agreement and is enforceable in accordance with the terms hereof.

**8. Default.**

a. If either or both of the Agencies determine that the Wetland Credits are not eligible for use in HUC 02080208 or are otherwise not available in whole or in part to be applied toward the Wetland Mitigation Need, or if SELLER is otherwise unable to provide BUYER with all or a portion of the Purchased Credits as contemplated in this Agreement, BUYER shall have the option to either (i) terminate this Agreement, in which case SELLER shall immediately refund to BUYER the Deposit and any other payments made toward the Purchase Price, or (ii) acquire such Wetland Credits as SELLER has available at the Bank toward fulfilling the Wetland Mitigation Need at the rate of FORTY-TWO THOUSAND DOLLARS ($42,000.00) per Wetland Credit. BUYER shall provide SELLER with written notice its election herein within ten (10) days after any determination has been made by the Agencies as to the number or availability of Wetland Credits that could constitute the Purchased Credits. Notwithstanding any other provision of this Paragraph 8, nothing in this Paragraph 8.a shall affect BUYER's rights or remedies as otherwise set forth in this Agreement.

b. If BUYER has not paid the Purchase Price to SELLER by the last day of the Reserve Period, SELLER may elect to terminate this Agreement by written notice of such termination to BUYER, upon which neither SELLER nor BUYER shall have any further obligations to the other hereunder except as otherwise provided in this Agreement.

9. **Notices.** Each notice, request, demand or other communication hereunder will be in writing and will be deemed to have been duly given (i) when delivered by hand, or (ii) three (3) business days after deposit in United States certified or registered mail, postage pre-paid, return receipt requested, or (iii) one (1) business day after delivery by a recognized overnight courier service, in each case addressed to the parties at the following addresses:

| | |
|---|---|
| If to SELLER: | Davis Wetlands Bank, LLC<br>c/o Douglas S. Davis<br>P.O. Box 6186<br>Chesapeake, VA 23323<br>davisenvironmental@verizon.net |
| With copy to: | Whitney Saunders<br>Saunders & Ojeda, PC<br>705 West Washington Street<br>Suffolk, Virginia 23434<br>E-mail: wsaunders@suffolkvalaw.com |
| If to BUYER: | Southeastern Public Service Authority<br>723 Woodlake Drive<br>Chesapeake, VA 23320<br>ATTN: Tressa Preston<br>E-mail: tpreston@spsa.com |
| With copy to: | Henry R. Pollard, V, Esq.<br>Williams Mullen<br>200 South 10th Street, Suite 1600<br>Richmond, Virginia 23219<br>E-mail: hpollard@williamsmullen.com |

Each party shall have the right to change its address by providing the other party with at least ten (10) days prior written notice of the change.

**10. Miscellaneous.**

a. Confidentiality. Neither this Agreement nor the terms hereof may be furnished to any third party without the written consent of all parties, except as may otherwise be required by law, the Agencies, or a court of competent jurisdiction or as part of any required notice to the Agencies and affidavit or certificate of the sale and transfer of the Purchased Credits; provided, however, that the foregoing shall not prohibit the parties from providing this Agreement or the terms hereof to their attorneys, consultants, professional advisors, investors and lenders. This paragraph shall survive any termination of this Agreement.

b. Governing Law and WAIVER OF JURY TRIAL. This Agreement and all matters arising out of or relating to this Agreement are governed by the laws of the Commonwealth of Virginia, without giving effect to any conflict of laws provisions thereof. Any and all disputes, claims, and causes of action arising out of or in any way connected with this Agreement or its performance must be brought in the applicable court of the City of Chesapeake, Virginia, or in the United States District Court for the Eastern District of Virginia, Norfolk Division. EACH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY: (I) CONSENTS AND SUBMITS TO THE EXCLUSIVE JURISDICTION OF THE AFOREMENTIONED COURTS; (II) WAIVES ANY OBJECTION TO THAT CHOICE OF FORUM BASED ON VENUE OR TO THE EFFECT THAT THE FORUM IS NOT CONVENIENT; AND (III) WAIVES ANY RIGHT TO TRIAL BY JURY.

c. Counterparts. This Agreement may be signed by facsimile or electronic PDF signature, which signature shall be deemed to constitute an original signature and be binding as such. This Agreement may be executed in identical counterparts, each of which when so executed and delivered will constitute an original, but all of which taken together will constitute one and the same instrument.

d. Force Majeure. No party shall be liable or responsible to the other party, or deemed to have breached this Agreement, for any failure or delay in satisfying its obligations hereunder if such failure or delay is attributable to any of the following: strikes, riots, acts of God, shortages of labor or materials, war, terrorist acts or activities, orders, laws, regulations, or restrictions, adverse determinations from an Agency or any other governmental authority, or any other causes which are beyond the reasonable control of the responsible party.

e. Consequential Damages. Notwithstanding any provision of this Agreement to the contrary, no party shall be liable for any lost or prospective profits or any other indirect, consequential, special, incidental, punitive, or other exemplary losses or damages, whether based in contract, warranty, indemnity, negligence, strict liability or other tort or otherwise, regardless of the foreseeability or the cause thereof. Each party expressly agrees that the affiliates, members, partners and shareholders of any defaulting or breaching party hereunder are not jointly, solidarily or severally liable for any costs, expenses, losses or damages arising from such party's breach or default under this Agreement.

f. Wetland Credits Not Real Estate. Sale and conveyance of the Purchased Credits to BUYER in accordance with this Agreement shall not constitute the conveyance or transfer of any right, interest or ownership in real property or in the Bank, nor shall such sale and conveyance impose upon BUYER any obligation, duty or liability arising from or incident to ownership of or interest in real property.

g. General. BUYER's rights under this Agreement shall not be assigned or apportioned, either voluntarily or by operation of law, without the prior written consent of SELLER. This Agreement constitutes the entire agreement and understanding between the parties with respect to the purchase and sale of the Purchased Credits, and supersedes and replaces any prior agreements and understandings, whether oral or written, between them with respect to such matters. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of either party. This Agreement may not be changed, amended or modified except by an instrument in writing signed by both parties. The unenforceability, invalidity, or illegality of any provision hereof shall not render any other provision unenforceable, invalid, or illegal. This Agreement is not intended to create, and it shall not create, any partnership, joint venture, or similar arrangement between BUYER and SELLER. No party's failure or delay in exercising any of its rights hereunder will constitute a waiver of such rights unless expressly waived in writing.

*[REMAINDER OF PAGE LEFT BLANK; SIGNATURE PAGE FOLLOWS]*

IN WITNESS WHEREOF, **SELLER** and **BUYER** have executed this Agreement as of the Effective Date.

**SELLER:**

**DAVIS WETLANDS BANK, LLC**,

a Virginia limited liability company

By: Douglas S Davis

Douglas S. Davis, Manager

**BUYER:**

**SOUTHEASTERN PUBLIC SERVICE AUTHORITY**,

a political subdivision of the Commonwealth of Virginia

By: ______________________________

Dennis L. Bagley, Executive Director

102004649.6

IN WITNESS WHEREOF, **SELLER** and **BUYER** have executed this Agreement as of the Effective Date.

**SELLER:**

**DAVIS WETLANDS BANK, LLC,**

a Virginia limited liability company

By: ______________________________

Douglas S. Davis, Manager

**BUYER:**

**SOUTHEASTERN PUBLIC SERVICE AUTHORITY**,

a political subdivision of the Commonwealth of Virginia

By: Dennis L. Bagley

Dennis L. Bagley, Executive Director

102004649.6

« Collapse

TRACKING

- Mitigation
- NPS
- Both

MENU

**Mitigation**
Banks & Sites
ILF Programs
Umbrella Instruments
NRDA Projects
BLM Projects
Public Notices
**Knowledge**
Related Resources
Credit Classifications
Bank & ILF Establishment
Mitigation Concepts
**Tools**
Reports
Assessment Tools
Find Credits
**Training**
Help / User Guides

FILTER

- USACE District
- State
- FWS Field Office
- NMFS Region
- BLM State Office
- BLM District Office

Virginia

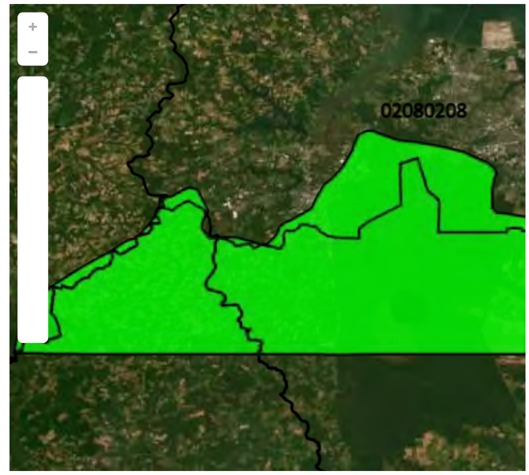
[Terms Of Use]

[Ledger] [Credit Release Schedule] [Bank Contact Sheet] [Cyber Repository] [Annual Inspections] [Photo Gallery]

## Davis Mitigation Bank

| | |
|---|---|
| **Chair:** | USACE |
| **Instrument signed by:** | |
| **USACE District:** | Norfolk |
| **FWS Field Office:** | Virginia |
| **NMFS Region:** | Northeast |
| **BLM State Office:** | Eastern States |
| **BLM District Office:** | Southeastern States District Office |
| **State:** | Virginia |
| **County:** | Chesapeake city [VA] |
| **USACE Permit/Tracking No.:** | NAO-1998-02107 |
| **Total Acres:** | 407.00 |
| **Status/Date:** | Approved 09/08/2009 |
| **Establishment Date:** | 09/08/2009 |
| **Type:** | Private Commercial |
| **Website:** | www.greatdismalswamprestorationbank.com |
| **Comments:** | Wetland Mitigation Bank. Credits assessed using Mitigation Ratio Method |
| **On Public Lands:** | No |

OpenLayers Map




**Show** Service Area Footprint

**Rank** Primary

## Bank Credit Classifications

Wetland
- Wetlands

## Contact Information

**Bank Sponsor POC**
**Whitney Saunders - Sponsor**
**Bank Manager**
Saunders & Ojeda, PC
705 West Washington Street
Suffolk, VA 23434
Email: wsaunders@suffolkvalaw.com
Phone: (757) 942-7070

**Beverly White - Sales POC**
P.O. Box 6186
Chesapeake, VA 23323
Email: gdsrb2@gmail.com
Phone: (757) 487-3441
Fax: (757) 487-8680

**Doug Davis - Consultant**
412 Oakmears Crescent, Suite 201
Virginia Beach, VA 23462-4232
Phone: (757) 456-9331
Fax: (757) 456-2736

**Regulatory Bank Manager**
**Jeanne Richardson**
**Environmental Scientist**
Lynchburg Field Office USACE
PO Box 3100
Lynchburg, VA 24503
Email: jeanne.c.richardson@usace.army.mil
Phone: (434) 384-0182

**Sarah Woodford**
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, VA 23219
Email: sarah.woodford@deq.virginia.gov
Phone: (804) 659-2672
Fax: (804) 698-6984 X 069

## Credit Ledger Summary

Last Transaction: Mar 13, 2023

***ATTENTION***
Credit reservations and pending transactions are **NOT** reflected in the Available Credits total. Potential purchasers **MUST** contact the Sponsor to verify credit availability.

| Credit Classification | Available Credits | Withdrawn Credits | Released Credits | Potential Credits |
|---|---|---|---|---|
| **Wetland** | | | | |
| Wetlands | .6778 | 395.0222 | 395.7 | 389.9 |

| | |
|---|---|
| **From:** | Hues, Lindsey |
| **To:** | Wilk, Becky |
| **Subject:** | FW: Mitigation Credits - SPSA Landfill |
| **Date:** | Monday, April 1, 2024 8:23:30 AM |

---

**From:** Doug Davis <davisenvironmental@verizon.net>
**Sent:** Saturday, March 30, 2024 7:44 AM
**To:** Hues, Lindsey <lindsey.hues@hdrinc.com>
**Subject:** Re: Mitigation Credits - SPSA Landfill

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I think the 55% is accurate. Also, we have the potential for many premiere rattlesnake credits that can be delivered very quickly and a $ rate much better than todays going rate.

Douglas S. Davis

(757)646-1734 cell

On Tuesday, March 26, 2024 at 04:49:55 PM EDT, Hues, Lindsey <lindsey.hues@hdrinc.com> wrote:

Good Afternoon,

I am an environmental scientist working with the SPSA Landfill Expansion project and I am reaching back out to you in hopes you can assist me in satisfying an inquiry by the agencies regarding our no net loss requirement.

According to the Bank's monitoring report from 2009, approximately 55% (249 acres) of the bank was considered restored wetland, whereas the remainder was preserved. Is this ratio accurate concerning the credits obtained by the Southeastern Public Service Authority? If not, would you mind sharing the percentage of creation/restoration that makes up the credits?

Any other information regarding the wetland functionality and composition of the Davis Bank would be helpful.

Thank you so much and I hope you have a wonderful rest of your week.

Best-

Lindsey Hues

**D** 804.718.6040

hdrinc.com/follow-us

---

**From:** Doug Davis <davisenvironmental@verizon.net>
**Sent:** Wednesday, September 27, 2023 9:09 AM
**To:** Hues, Lindsey <Lindsey.Hues@hdrinc.com>
**Subject:** Re: Mitigation Credits - SPSA Landfill



Sorry about the delayed response.

Davis Bank was created on a portion of an approx. 863 acre assemblage of connected properties located in southern Chesapeake south of Benefit Rd. This area is part of what was called "The Green Sea" and is part of the historic Dismal Swamp. 407 acres of these properties generated 395 wetland credits. The approx. center of the land that generated these credits (76 of which were purchased by SPSA ) is --- 36 degrees 36' 51.47" N by 76 degrees 17' 38.83" W. I hope this is the info. you need.

Regards.

Douglas S. Davis

(757)646-1734 cell

On Friday, September 22, 2023 at 03:26:01 PM EDT, Hues, Lindsey <lindsey.hues@hdrinc.com> wrote:

Good Afternoon and Happy Friday,

I am an environmental scientist working with the SPSA Landfill Expansion project and I am reaching out with a quick question.

I was hoping you would be able to send over information regarding the location of the 76.0 credits bought by SPSA for their landfill expansion.

We are putting together some mapping to show the project site's location in relation to the land being created/preserved through the credits we purchased from you all.

Thank you so much and please let me know if you have any questions.

I hope you have a great weekend.

Best-


Lindsey Hues, ENV SP

*Environmental Scientist I*

HDR

4880 Sadler Rd
Ste 100
Glen Allen, VA 23060
**D** 804.718.6040 **M** 804.759.1918
Lindsey.Hues@hdrinc.com

hdrinc.com/follow-us

# D

Preliminary Jurisdictional Determination

Cells VIII & IX

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 24, 2022

**PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)**

Eastern Virginia Regulatory Section
NAO-2016-00765 (Burnetts Mill Creek)

Dennis Bagley
Executive Director
Southeastern Public Service Authority
723 Woodlake Drive
Chesapeake, VA 23320

Dear Mr. Bagley:

This letter is in regard to your request for a preliminary jurisdictional determination of the aquatic resources for the137.8-acre Cells VIII and IX located at the SPSA Regional Landfill on Bob Foeller Drive in Suffolk, Virginia.

Figure 3 entitled "Wetland and Waterway Delineation, SPSA Regional Landfill Cells VIII and IX" dated 7-5-2022 by HDR (copy enclosed) provides the locations of the aquatic resources on the property referenced above. The 137.8-acre parcel contains approximately 133.79 acres of wetlands and 0.93 acres of ditch, as shown on the attached PJD Form.

These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. This site also contains aquatic resources with an ordinary high water mark (or high tide line). This preliminary jurisdictional determination and associated aquatic resource delineation map may be submitted with a permit application. This letter is not confirming the Cowardin classifications of these aquatic resources.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email (Melissa.a.nash@usace.army.mil) or by standard mail to 803 Front Street Norfolk, VA 23510

If you have any questions, please contact me either by telephone at (757) 201-7489 or by email at melissa.a.nash@usace.army.mil .

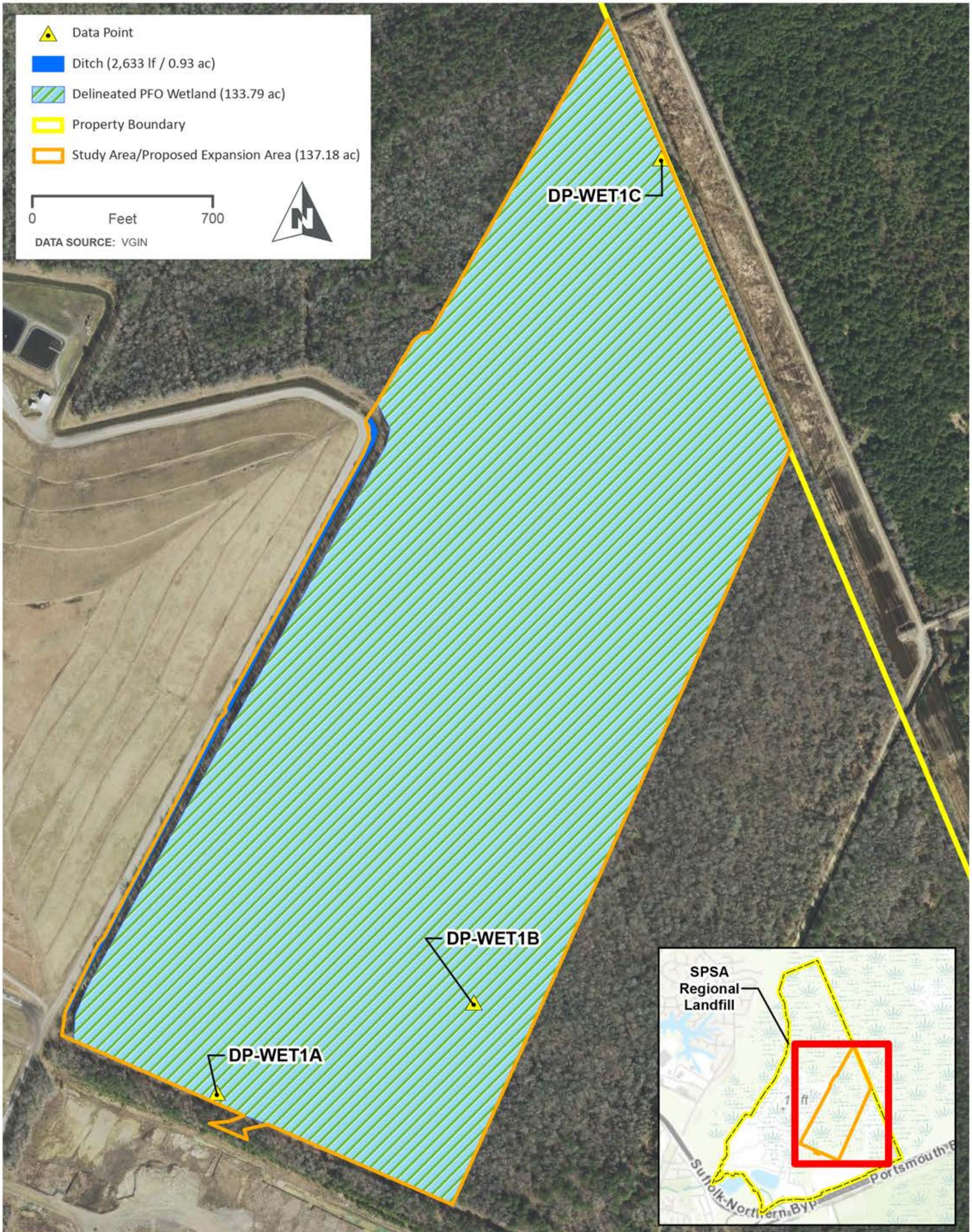
Sincerely,

Melissa Nash
Eastern Virginia
Regulatory Section

Enclosure(s):

cc:

Josh Mace, HDR
Justin Brown, HDR
Jeff Murrey, HDR
Kim Blossom, VHB




HDR

## WETLAND AND WATERWAY DELINEATION

### SPSA REGIONAL LANDFILL CELLS VIII AND IX

FIGURE 3

## BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR PJD:** 8-24-2022

B. **NAME AND ADDRESS OF PERSON REQUESTING PJD:**
Dennis Bagley
Southeastern Public Service Authority
723 Woodlake Drive
Chesapeake, VA 23320

C. **DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO, Southeastern Public Service Authority PJD - Regional Landfill Cell VIII and IX / Suffolk, NAO-2016-00765

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**
**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: VA County/parish/borough: Suffolk city City: Suffolk
Center coordinates of site (lat/long in degree decimal format):
Lat.: 36.759186° Long.: -76.496412°
Universal Transverse Mercator: 18
Name of nearest waterbody: Burnetts Mill Creek

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s): 12-7-2021, 6-3-2022

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

| Site Number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| Ditch cells 8 and 9 | 36.76349 | -76.516303 | 0.93 acres | Non-wetland waters | Section 404 |
| PFO | 36.764136 | -76.513195 | 133.79 acres | Wetland | Section 404 |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the.JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there “may be” waters of the U.S. and/or that there “may be” navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

_X__ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: Figure 3 entitled "Wetland and Waterway Delineation, SPSA Regional Landfill Cells VIII and IX" dated 7-5-2022 by HDR.
_X__ Data sheets prepared/submitted by or on behalf of the PJD requestor.
  _X__ Office concurs with data sheets/delineation report.
  ___ Office does not concur with data sheets/delineation report. Rationale: ________________.
___ Data sheets prepared by the Corps: ______________________________.
___ Corps navigable waters' study: ______________________________.
___ U.S. Geological Survey Hydrologic Atlas: ______________________________.
  ___ USGS NHD data.
  ___ USGS 8 and 12 digit HUC maps.
_X__ U.S. Geological Survey map(s). Cite scale & quad name: __1:24,000-scale, Chuckatuck Quad___.
_X__ Natural Resources Conservation Service Soil Survey. Citation: NRCS Online Soil Survey_____.
_X_ National wetlands inventory map(s). Cite name: __NWI online__________.
___ State/local wetland inventory map(s): ______________________________.
___ FEMA/FIRM maps: ______________________________

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

___ 100-year Floodplain Elevation is: ______________. (National Geodetic Vertical Datum of 1929)
_X__ Photographs: _X__ Aerial (Name & Date): _GoogleEarth___.
___ or _X__ Other (Name & Date): _Onsite photos 1-26-2022___.
_X__ Previous determination(s). File no. and date of response letter: _PJD dated Dec 2, 2016_______.
___ Other information (please specify): ___________________________.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

8-24-2022
_______________________________
Signature and date of Regulatory staff member completing PJD

_______________________________
Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL**

| Applicant: SPSA | | File Number: NAO-2016-00765 | Date: 8-24-2022 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| | APPROVED JURISDICTIONAL DETERMINATION | | D |
| X | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

## POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact:<br>Ms. Amanda Regan<br>Regulatory Appeals Review Officer<br>U.S. Army Corps of Engineers<br>Fort Hamilton Military Community<br>301 General Lee Avenue<br>Brooklyn, New York 11252-6700<br>Telephone number: 917-831-9105<br>Amanda.M.Regan@usace.army.mil |
|---|---|

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| ______________________<br>Signature of appellant or agent. | Date: | Telephone number: |
|---|---|---|

# E

Preliminary Jurisdictional Determination

Cells X, XI, and XII

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

February 7, 2020

**PRELIMINARY JURISDICTIONAL DETERMINATION**

Eastern Virginia Regulatory Section
NAO-2020-0225 (Bennett Creek/ Dismal Swamp)

Southeastern Public Service Authority
c/o Liesl R. DeVary
723 Woodlake Drive
Chesapeake, Virginia 23320

Dear Ms. DeVary:

This letter is in regard to your request for a preliminary jurisdictional determination for waters of the U.S. (including wetlands) on property known as Southeastern Public Service Authority (SPSA) Cells VIII and IX, located to the north of closed cells I-IV of the existing SPSA landfill, on a 217.49-acre parcel at 1 Bob Foeller Drive, in Suffolk, Virginia (tax map parcel #27*28A).

The map entitled "SPSA Master Plan, Sheet 00C-01", by HDR Engineering, Inc. dated 09/2016 and Corps date stamped as received 4/16/2019 and the map entitled SPSA Cell VIII & IX Delineation Map, sheets 1-3" dated April 4, 2019 (*copies enclosed)* provide the location(s) of waters and/or wetlands on the property listed above. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual (*and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*) and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation. This letter is not confirming the Cowardin classifications of these aquatic resources.

Discharges of dredged or fill material, including those associated with mechanized landclearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination.

Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to me, either via email (george.a.janek@usace.army.mil) or by standard mail to US Army Corps of Engineers, Regulatory Office, and ATTN: George Janek, 803 Front Street Norfolk, Virginia 23510 within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands can be relied upon for no more than five years from the date of this letter. New information may warrant revision.

If you have any questions, please contact me by calling me at (757) 201-7135 or by emailing me at george.a.janek@usace.army.mil

Sincerely,

George Janek

George Janek
Project Manager, Eastern Virginia
Regulatory Section

Enclosure(s):
Appeals Form
Delineation Map
Preliminary Jurisdictional Determination Form

Cc: Agent
Virginia Department of Environmental Quality
City of Suffolk, Kevin Wyne

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL**

| Applicant: SPSA Cells 8&9 | | File Number: NAO-2020-0225 | Date: February 7, 2020 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| | APPROVED JURISDICTIONAL DETERMINATION | | D |
| X | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

## POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact: |
|---|---|
| George Janek<br>Regulatory Project Manager<br>Corps of Engineers, Norfolk District<br>WR-RE, 803 Front Street<br>Norfolk, VA 23510-1011<br>Telephone: 757-201-7135 | Mr. James W. Haggerty<br>Regulatory Program Manager (CENAD-PD-OR)<br>U.S. Army Corps of Engineers<br>Fort Hamilton Military Community<br>301 General Lee Avenue<br>Brooklyn, New York 11252-6700<br>Telephone number: 347-370-4650 |

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| | | |
|---|---|---|
| ______________________<br>Signature of appellant or agent. | Date: | Telephone number: |

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

**BACKGROUND INFORMATION**

A. REPORT COMPLETION DATE FOR PJD: February 7, 2020

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:
SPSA, c/o Liesl R. DeVary, 723 Woodlake Drive, Chesapeake, VA 23320

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
NAO-2020-0225; SPSA landfill cells 8&9

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Virginia County/parish/borough: Chuckatuc City: Suffolk

Center coordinates of site (lat/long in degree decimal format): 36.7614, -76.5192

Lat.: xx.xxx° Long.: yy.yyy°

Universal Transverse Mercator:

Name of nearest waterbody: Bennett Creek/ Great Dismal Swamp

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: February 7, 2020

☑ Field Determination. Date(s): May 22, 2019

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.**

| Site number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| 1 | 36.77352 | -76.51621 | 214.50 ac. | PFO | 404 |
| 2 | 36.77325 | -76.51926 | 1.89 ac. | PEM | 404 |
| 3 | 36.7774 | -76.5149 | 0.18 ac. | PUB | 404 |
| | | | | | |
| | | | | | |
| | | | | | |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

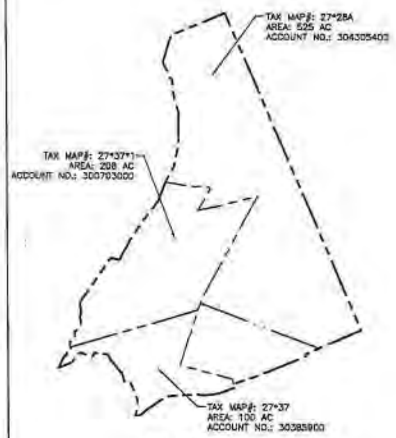
- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Map: SPSA Cell VIII & IX delineation map.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _______.
- [ ] Data sheets prepared by the Corps: ________.
- [ ] Corps navigable waters' study: ____________.
- [x] U.S. Geological Survey Hydrologic Atlas: 02080208.
  - [ ] USGS NHD data.
  - [x] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: Chuckatuck quad; 1990
- [x] Natural Resources Conservation Service Soil Survey. Citation: Desktop Review, sheets 1-3
- [x] National wetlands inventory map(s). Cite name: Desktop Review
- [ ] State/local wetland inventory map(s): ____________.
- [ ] FEMA/FIRM maps: ________________.
- [ ] 100-year Floodplain Elevation is: ____. (National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): Google Earth Pro
  or [x] Other (Name & Date): SPSA ground-level photos dated May 22, 2019
- [ ] Previous determination(s). File no. and date of response letter: __________.
- [ ] Other information (please specify): ________________.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

| | |
|---|---|
| Signature and date of Regulatory staff member completing PJD | Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1] |

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

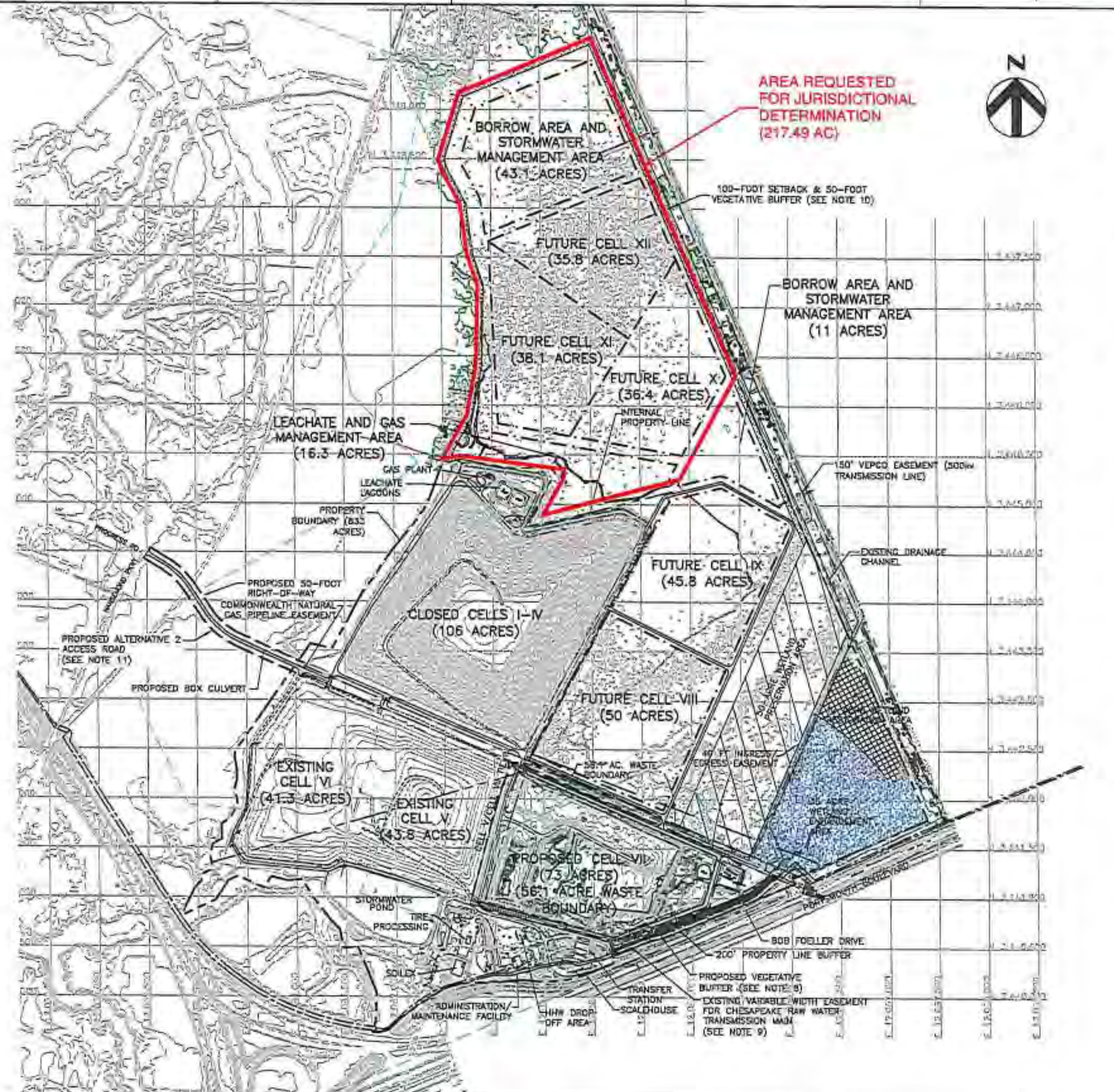
RECD by CENAO-REG
gj on 4/16/2019




TAX MAP KEY

LEGEND

- PROPOSED DRAINAGE CHANNEL
- EXISTING DRAINAGE CHANNEL
- CHESAPEAKE BAY PRESERVATION AREA
- STREAMS
- PROPERTY LINE
- INTERNAL PROPERTY LINE
- FACILITY BOUNDARY (APPROXIMATE)
- EASEMENT
- WETLAND PRESERVATION AREA
- WETLAND RESTORATION AREA
- WETLAND ENHANCEMENT AREA
- PROPOSED VEGETATIVE BUFFER
- PROPOSED ROAD




NOTES:

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3. PROPERTY LINE BOUNDARY FROM VANASSE HANGEN BRUSTLIN DATED FEBRUARY 29, 2000.
4. WETLAND PRESERVATION, RESTORATION AND ENHANCEMENT AREAS FROM THE US ARMY CORP OF ENGINEERS, SECTION 404 WETLAND PERMIT (86-0707-12) ISSUED NOVEMBER 20, 2002 AND VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY SECTION 401 WETLAND PERMIT (86-0707) ISSUED JUNE 3, 2002, FOR THE PROPOSED 12 ACRES OF WETLAND DISTURBANCE REQUIRED FOR THE CELL VI EXPANSION OF THE REGIONAL LANDFILL. PERMIT APPLICATIONS WERE PREPARED BY TELLUS ENVIRONMENTAL ASSOCIATES, INC. AND DAVIS ENVIRONMENTAL CONSULTANTS, INC.
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10. PROPOSED 100-FOOT SETBACK (INCLUDING 50-FOOT VEGETATIVE BUFFER) IS PROVIDED BETWEEN THE PROPERTY LINE AND THE LIMITS OF WASTE BOUNDARY AND LIMITS OF BORROW AND STORMWATER MANAGEMENT AREAS. 50-FOOT VEGETATIVE BUFFER CONSISTING OF EXISTING VEGETATION AND TREES WILL BE RETAINED ALONG THE EASTERN AND NORTHERN PROPERTY LINES ADJACENT TO FUTURE CELLS IX, X, XI, XII, AND THE BORROW AND STORMWATER MANAGEMENT AREAS. PRIOR TO THE CLEARING AND GRUBBING FOR DEVELOPMENT IN ANY OF THESE AREAS, THE EXISTING 50-FOOT BUFFER ADJACENT TO THE DEVELOPMENT AREA SHALL BE SUPPLEMENTED WITH ADDITIONAL PLANTINGS IN ACCORDANCE WITH THE BUFFER PLANTING PLAN DOL-01.01&.02 IN ORDER TO PROVIDE AN EFFECTIVE VISUAL BUFFER FROM ADJACENT PROPERTIES.
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HDR

HDR Engineering, Inc.
555 Fayetteville Street, Suite 900
Raleigh, NC 27601
919.232.6600

| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| A | 09/2016 | REVISED IN RESPONSE TO CITY COMMENTS |

| | |
|---|---|
| PROJECT MANAGER | J. MURRAY, P.E. |
| PROJECT ENGINEER | T. PREDDY, E.I. |
| DRAWN BY | L. CHAVEZ |
| PROJECT NUMBER | 107091-279011-018 |

SPSA

Southeastern Public Service Authority

Conditional Use Permit Application

SUFFOLK VIRGINIA

MASTER PLAN

FILENAME 00C-01.DWG
SCALE 1"=600'

SHEET 00C-01


HDR

LEGEND
- PFO Wetland
- PEM Wetland
- PUB Wetland
- Data Point
- Delineation Area (217.49 ac)
- Property Boundary
- LIDAR 1-ft Contour

0 Feet 200

DATA SOURCE: VGIN Aerial Imagery, VGIN LIDAR

SPSA CELL VIII & IX

DELINEATION MAP

SHEET 1 OF 3

APRIL 4, 2019 | SUFFOLK, VIRGINIA


SPSA CELL VIII & IX

DELINEATION MAP

SHEET 2 OF 3

APRIL 4, 2019 | SUFFOLK, VIRGINIA




SPSA CELL VIII & IX
DELINEATION MAP
SHEET 3 OF 3
APRIL 4, 2019 | SUFFOLK, VIRGINIA

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

February 7, 2020

**Supplemental Preapplication Information**

Project Number: NAO-2020-0225
Applicant: SPSA, Liesl DeVary
Project Location: Cells 8 and 9, Suffolk, VA

1. A search of the Virginia Department of Historic Resources data revealed the following:

☐ No known historic properties are located on the property.

☒ Tribal consultation may be required. Tribal interests may include Nansemond Tribe, Delaware Nation, and Pamunkey Tribe.

☐ American Battlefield Protection Program (ABPP) consultation may be required.

☐ The following known architectural resources are located on the property:

☐ The following known archaeological resources are located on the property:

☐ The following known historic resources are located in the vicinity of the property (potential for effects to these resources from future development):

*NOTE:*

1) *The information above is for planning purposes only. In most cases, the property has not been surveyed for historic resources. Undiscovered historic resources may be located on the subject property or adjacent properties and this supplemental information is not intended to satisfy the Corps' requirements under Section 106 of the National Historic Preservation Act (NHPA).*
2) *Prospective permittees should be aware that Section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant.*

2. A search of the data supplied by the U.S. Fish & Wildlife Service, the Virginia Department of Conservation and Recreation and the Virginia Department of Game and Inland Fisheries revealed the following:

☐ No known populations of threatened or endangered species are located on or within the vicinity of the subject property.

☒ The following federally-listed species may occur within the vicinity of the subject property: Northern long-eared bat, Red cockaded woodpecker.

☒ The following state-listed (or other) species may occur within the vicinity of the subject property: Canebrake rattlesnake.

***Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data.***

# Preliminary Jurisdictional Determination Request

SPSA Regional Landfill Cell VIII & IX

217.49 Acres at SPSA Regional Landfill in Suffolk, Virginia

April 16, 2019

The Southeastern Public Service Authority (SPSA) intends to submit a Part A Application to modify its existing Solid Waste Permit #417, to incorporate Cells VIII and IX into the existing solid waste boundary at the Regional Landfill site located off Bob Foeller Drive in Suffolk, Virginia. The proposed Cell VIII and IX areas include the waste cell boundaries, and ancillary support systems for access roadways and stormwater management. The boundaries for Cell VIII (50.1 acres) and IX (45.8 acres) were defined in the Master Plan that was approved by the City of Suffolk as part of the Rezoning and Conditional Use Permit applications by SPSA in 2017.

**Delineation Methods**

HDR performed the delineation pursuant to the Army Corps of Engineers Wetland Delineation Manual (1987) and subsequent guidance included in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic Gulf and Coastal Plain Region (Version 2.0) (2010). The proposed wetland boundaries and Data Sampling Point locations are depicted on the plan entitled “Delineation Map” prepared by HDR on April 4, 2019.

**On-Site Investigation Date**

Wetland boundary delineation and site data collection conducted on March 13-14, 2019. Mapping of the boundaries can be found in Appendix A.

**Wetlands:** A total of 216.56 acres of non-tidal wetlands were identified within the 217.49 acre delineation area during this investigation. Of the total proposed wetland area, 214.50 acres are palustrine forested (PFO) wetlands, 1.89 aces are palustrine emergent (PEM) wetlands, and 0.18 acres are palustrine unconsolidated bottom (PUB). These wetlands are described by data points and photos provided in Appendix C. A summary of each wetland is provided in Table 1.

**Stream Channels:** There are no stream channels within the delineation area. Streams depicted on the NWI appear to be PEM wetlands in the field.

**Water bodies onsite identified as Section 10**: None

**Uplands:** Approximately 0.93 acres of the subject parcel were classified as uplands. Data points and photos are provided in Appendix C.

**100-Year Floodplains**

As depicted on the Federal Emergency Management Agency’s (FEMA) on-line Flood Insurance Rate Map # 51093C0300E, effective date December 2, 2015 (Appendix B) the delineation area lies within the 100-Year Flood Zone (Zone A).

**National Wetlands Inventory**

The on-line National Wetland Inventory (Appendix B) identifies palustrine forested wetlands (PFO1Cd, PFO4/1Cd, PFO4Cd, PFO1Ed, and PFO1/4Cd) within the majority of the delineation area. There is a palustrine scrub/shrub wetland (PSS4Cd) identified in the northwest corner. A palustrine emergent wetland (PEM1Ed) runs along the western side of the delineation area converging with a stream (R5UBH). A second stream feature (R4SBCx) is located on the southeastern corner.

**USDA Soil Survey**

The on-line USDA Natural Resource Conservation Service Soil Survey (Appendix B) identifies poorly drained hydric Deloss mucky loam in the center of the delineation area with hydric Torhunta loam in the remaining portion.

**Hydrologic Unit Code (HUC)**

8-Digit HUC – 02080208 Hampton Roads

**USGS Topographic Sheet**

Chuckatuck Quadrangle

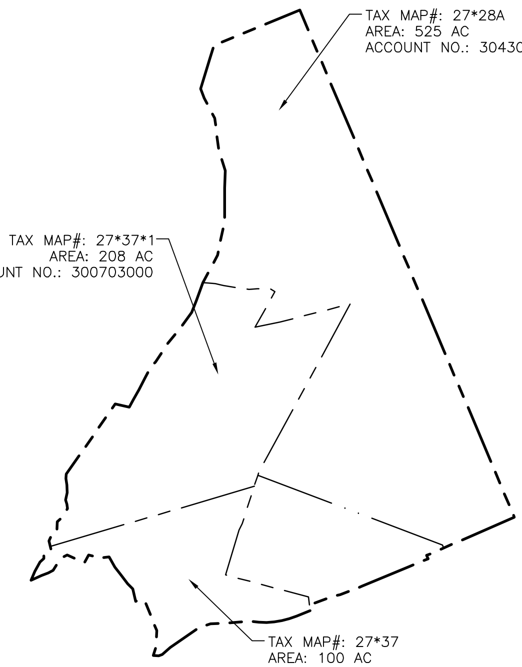
**Table 1. Delineated Wetlands/Waters**

| Wetland/ Water | Latitude | Longitude | Cowardin Class | Area (Acres) | Class of aquatic resource (Tidal/Non-tidal, Section 10/404) |
|---|---|---|---|---|---|
| W1 | 36.77352 | -76.51621 | PFO | 214.50 ac | Section 404 |
| W1 | 36.77325 | -76.51926 | PEM | 1.89 ac | Section 404 |
| W1 | 36.7774 | -76.5149 | PUB | 0.18 ac | Section 404 |

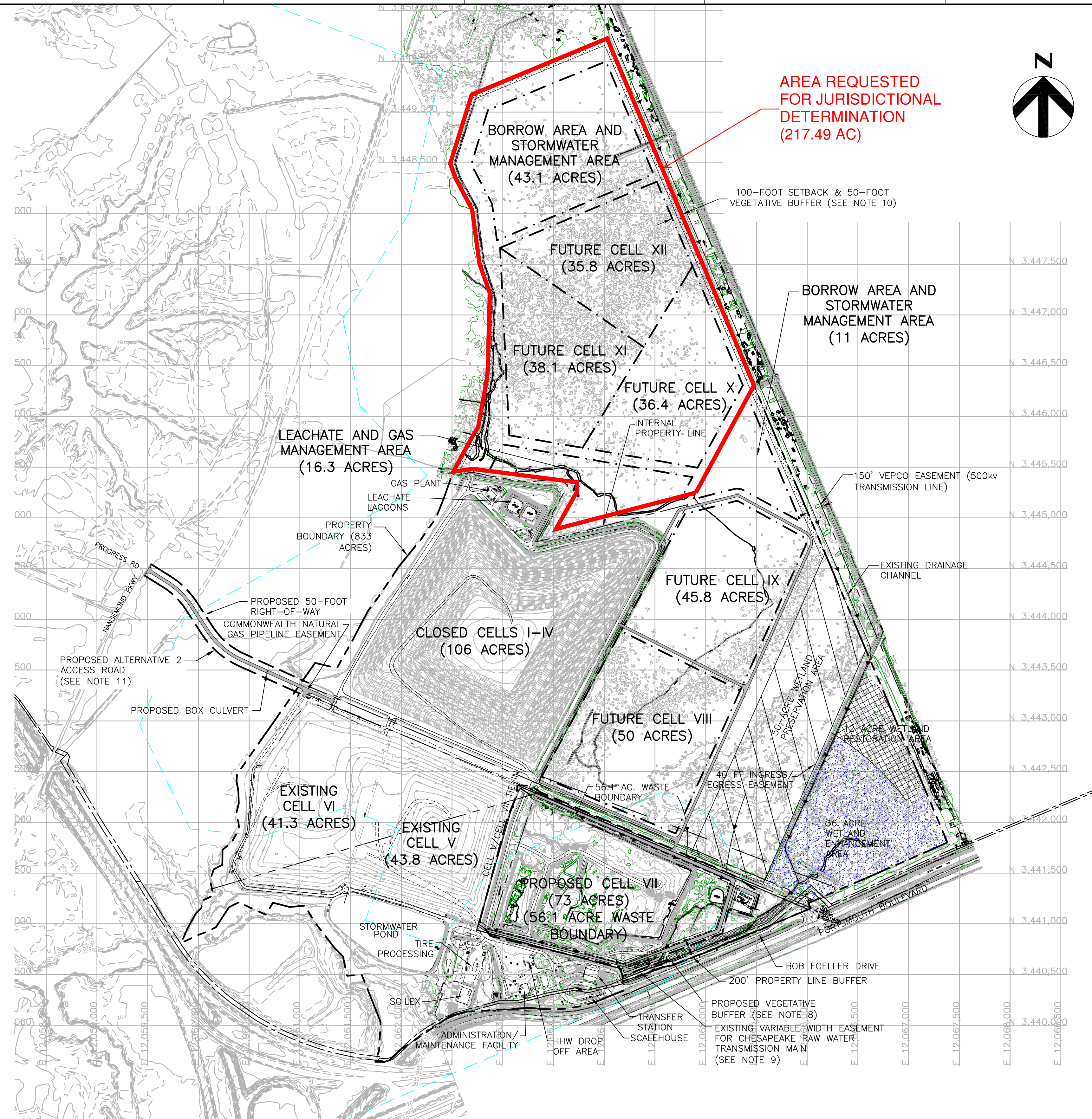
Please contact me at Rebecca.Wilk@hdrinc.com or 252-229-6045 to discuss the project or schedule a site visit at your earliest convenience.

Sincerely,

Rebecca Wilk, PWS
Environmental Scientist
HDR, Inc.




TAX MAP KEY

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- EXISTING DRAINAGE CHANNEL
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HDR

HDR Engineering, Inc.
555 Fayetteville Street, Suite 900
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919.232.6600

| ISSUE | DATE | DESCRIPTION |
| --- | --- | --- |
| A | 09/2016 | REVISED IN RESPONSE TO CITY COMMENTS |

| | |
| --- | --- |
| PROJECT MANAGER | J. MURRAY, P.E. |
| PROJECT ENGINEER | T. PREDDY, E.I. |
| DRAWN BY | L. CHAVEZ |
| PROJECT NUMBER | 107091-279011-018 |

SPSA

Southeastern Public Service Authority

Conditional Use Permit Application

SUFFOLK VIRGINIA

**MASTER PLAN**

0 1" 2"

FILENAME 00C-01.DWG

SCALE 1"=600'

SHEET 00C-01

# NORFOLK DISTRICT REGULATORY OFFICE
# PRE-APPLICATION AND/OR JURISDICTIONAL WATERS DETERMINATION REQUEST FORM

This form is used when you want to determine if areas on your property fall under regulatory requirements of the U.S. Army Corps of Engineers (USACE). Please supply the following information and supporting documents described below. This form can be filled out online and/or printed and then mailed, faxed, or e-mailed to the Norfolk District. Submitting this request authorizes the US Army Corps of Engineers to field inspect the property site, if necessary, to help in the determination process. **THIS FORM MUST BE SIGNED BY THE PROPERTY OWNER TO BE CONSIDERED A FORMAL REQUEST.**

The printed form and supporting documents should be mailed to:

U.S. Army Corps of Engineers, Norfolk District
Regulatory Office
803 Front Street
Norfolk, Virginia 23510-1096

Or faxed to (757) 201-7678

Or sent via e-mail to: CENAO.REG_ROD@usace.army.mil

Additional information on the Regulatory Program is available on our website at:
http://www.nao.usace.army.mil/
Please contact us at 757-201-7652 if you need any assistance with filling out this form.

---

**<u>Location and Information about Property to be subject to a Jurisdictional Determination</u>:**

1. Date of Request: 04/16/2019
2. Project Name: SPSA Regional Landfill Cell VIII & IX
3. City or County where property located: Suffolk
4. Address of property and directions (attach a map of the property location and a copy of the property plat): 1 Bob Foeller Drive, Suffolk, VA 23434
5. Coordinates of property (if known): 36.761363, -76.519181
6. Size of property in acres: 217.49 acres
7. Tax Parcel Number / GPIN (if available): 27*28A
8. Name of Nearest Waterway: Burnetts Mill Creek

7. Brief Description of Proposed Activity, Reason for Preapplication Request, and/or Reason for Jurisdictional Waters Determination Request:
The Southeastern Public Service Authority (SPSA) intends to submit a Part A Application to modify its existing Solid Waste Permit #417, to incorporate Cells VIII and IX into the existing solid waste boundary at the Regional Landfill

8. Has a wetland delineation/determination been completed by a consultant or the Corps on the property previously? ☐ YES ☐ NO ☒ UNKNOWN

   If yes, please provide the name of the consultant and/or Corps staff and Corps permit number, if available:

**Property Owner Contact Information:**

Property Owner Name: Southeastern Public Service Authority
Mailing Address: 723 Woodlake Drive
City: State: Zip: Chesapeake, VA 23320
Daytime Telephone: 757.961.3402
E-mail Address: ldevary@spsa.com

If the person requesting the Jurisdictional Determination is **NOT** the Property Owner, please also supply the Requestor's contact information here:

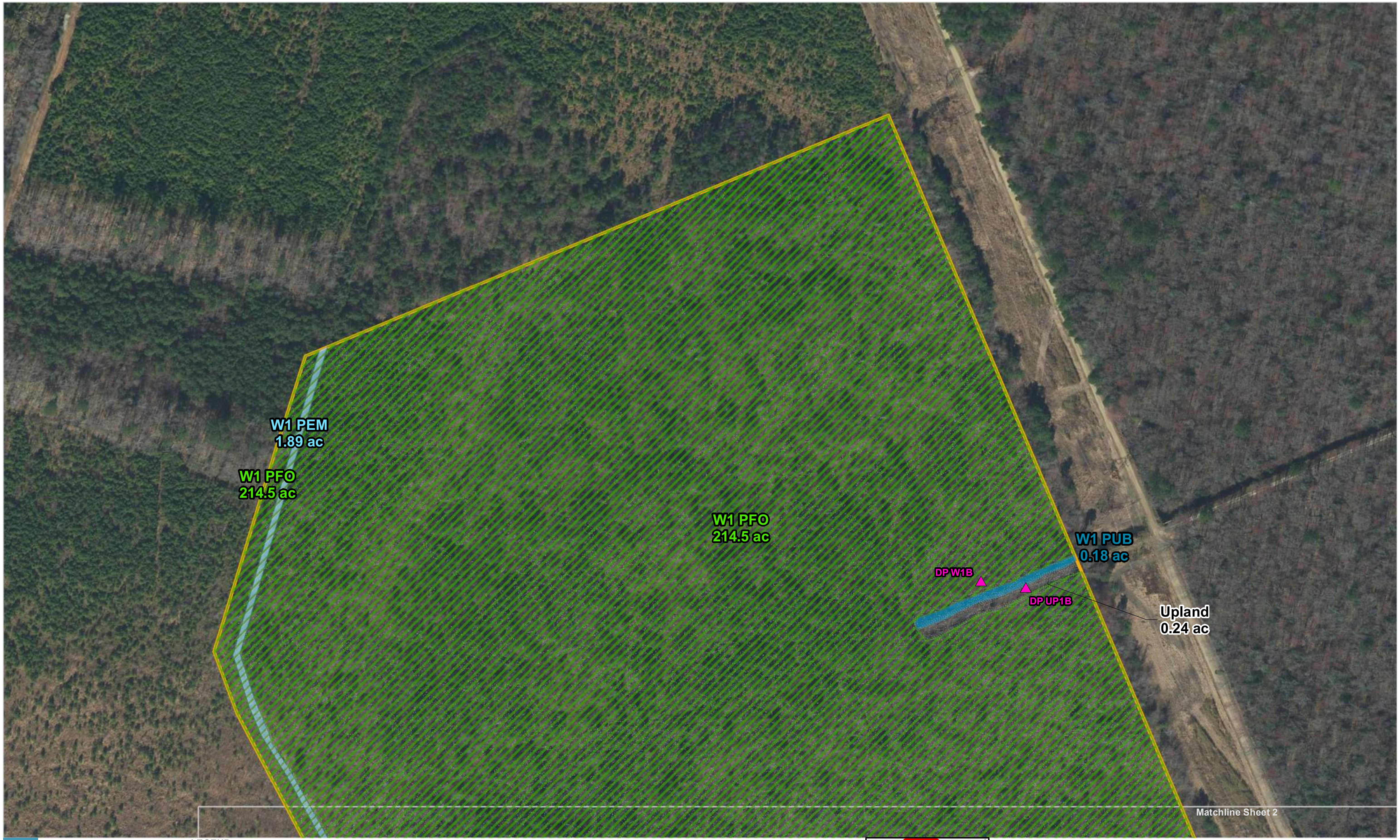
Requestor Name:
Mailing Address:
City: State: Zip:
Daytime Telephone:
E-mail Address:

Additionally, if you have any of the following information, please include it with your request: wetland delineation map, other relevant maps, drain tile survey, topographic survey, and/or site photographs.

CERTIFICATION: I am hereby requesting a preapplication consultation or jurisdictional waters and/or wetlands determination from the U.S. Army Corps of Engineers, for the property(ies) I have described herein. I agree to allow the duly authorized representatives of the Norfolk District Corps of Engineers and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supercedes and waives that prohibition and grants permission to enter the property despite such posting. I hereby certify that the information contained in the Request for a Jurisdictional Determination is accurate and complete:

Liesl R DeVary
Property Owner's Signature

4/16/2019
Date




LEGEND

- PFO Wetland
- PEM Wetland
- PUB Wetland
- Data Point
- Delineation Area (217.49 ac)
- Property Boundary
- LiDAR 1-ft Contour

0 Feet 200

DATA SOURCE: VGIN Aerial Imagery, VGIN LiDAR

1
2
3

**SPSA CELL VIII & IX**

**DELINEATION MAP**

SHEET 1 OF 3

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLVIII_XI\7.2_WORK_IN_PROGRESS\MAP_DOCS\MXD\WORKING\20190404_SPSA_PJD_DELINEATIONMAP.MXD - USER: RWILK - DATE: 4/4/2019

APRIL 4, 2019 | SUFFOLK, VIRGINIA


LEGEND
PFO Wetland
PEM Wetland
PUB Wetland
Data Point
Delineation Area (217.49 ac)
Property Boundary
LiDAR 1-ft Contour

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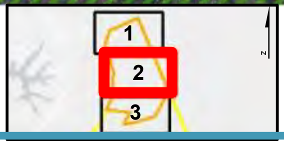
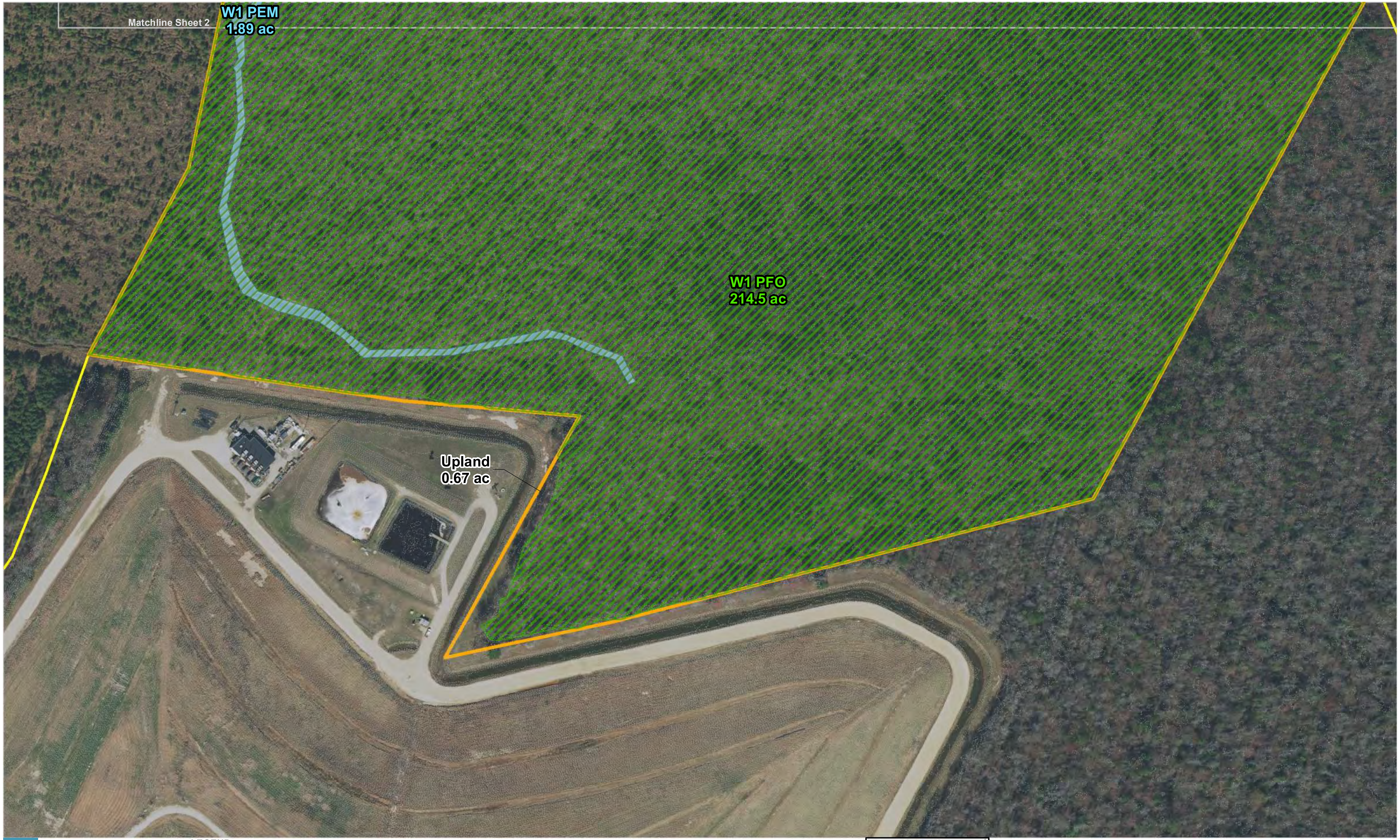
DATA SOURCE: VGIN Aerial Imagery, VGIN LiDAR




**SPSA CELL VIII & IX**
**DELINEATION MAP**
SHEET 2 OF 3

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLVIII_XI\7.2_WORK_IN_PROGRESS\MAP_DOCS\MXD\WORKING\20190404_SPSA_PJD_DELINEATIONMAP.MXD - USER: RWILK - DATE: 4/4/2019

APRIL 4, 2019 | SUFFOLK, VIRGINIA




**LEGEND**

- PFO Wetland
- PEM Wetland
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- Data Point
- Delineation Area (217.49 ac)
- Property Boundary
- LiDAR 1-ft Contour

0 Feet 200

**DATA SOURCE:** VGIN Aerial Imagery, VGIN LiDAR

1
2
3

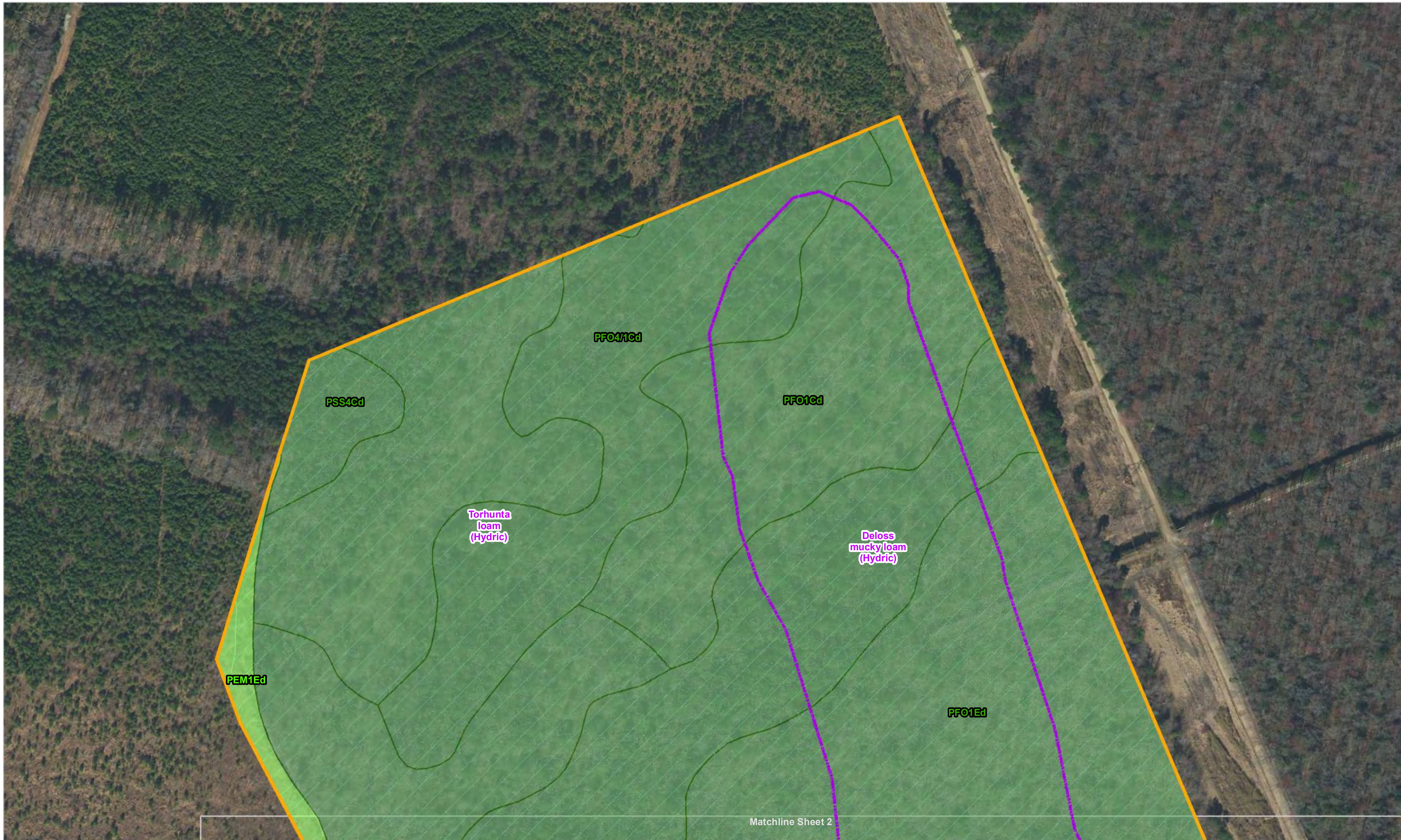
# SPSA CELL VIII & IX

## DELINEATION MAP

SHEET 3 OF 3

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLVIII_XI\7.2_WORK_IN_PROGRESS\MAP_DOCS\MXD\WORKING\20190404_SPSA_PJD_DELINEATIONMAP.MXD - USER: RWILK - DATE: 4/4/2019

APRIL 4, 2019 | SUFFOLK, VIRGINIA




LEGEND

- Delineation Area (217.49 ac)
- Property Boundary
- LiDAR 1-ft Contour
- NHD Flowline
- USDA-NRCS Soil
- 100-Year FEMA Flood Zone

National Wetland Inventory

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

0 Feet 200

DATA SOURCE: VGIN Aerial Imagery, VGIN LiDAR, FWS, USDA-NRCS, FEMA, USGS

SPSA CELL VII & IX

DESKTOP REVIEW

SHEET 1 OF 3

APRIL 4, 2019 | SUFFOLK, VIRGINIA

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLVIII_XI\7.2_WORK_IN_PROGRESS\MAP_DOCS\MXD\WORKING\20190404_SPSA_PJD_DESKTOPREVIEW.MXD - USER: RWILK - DATE: 4/4/2019


**LEGEND**

- Delineation Area (217.49 ac)
- Property Boundary
- LiDAR 1-ft Contour
- NHD Flowline
- USDA-NRCS Soil
- 100-Year FEMA Flood Zone

**National Wetland Inventory**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

0 Feet 200

**DATA SOURCE:** VGIN Aerial Imagery, VGIN LiDAR, FWS, USDA-NRCS, FEMA, USGS

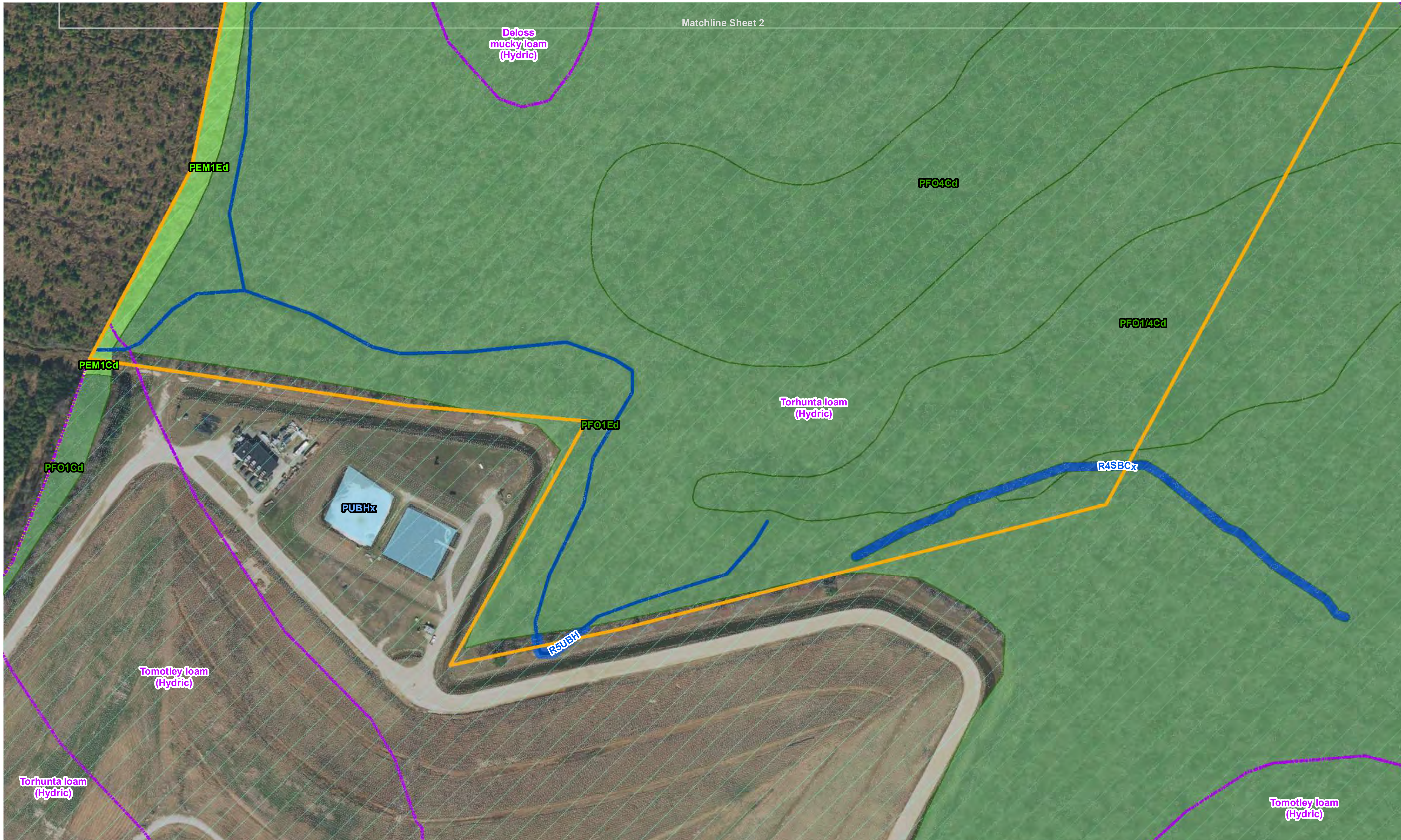
# SPSA CELL VII & IX

## DESKTOP REVIEW

SHEET 2 OF 3

APRIL 4, 2019 | SUFFOLK, VIRGINIA

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLVIII_XI\7.2_WORK_IN_PROGRESS\MAP_DOCS\MXD\WORKING\20190404_SPSA_PJD_DESKTOPREVIEW.MXD - USER: RWILK - DATE: 4/4/2019




**LEGEND**

- Delineation Area (217.49 ac)
- Property Boundary
- LiDAR 1-ft Contour
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**National Wetland Inventory**

- Freshwater Emergent Wetland
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- Freshwater Pond
- Riverine

0 Feet 200

**DATA SOURCE:** VGIN Aerial Imagery, VGIN LiDAR, FWS, USDA-NRCS, FEMA, USGS

# SPSA CELL VII & IX

## DESKTOP REVIEW

SHEET 3 OF 3

APRIL 4, 2019 | SUFFOLK, VIRGINIA

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Cell VIII/IX Permitting City/County: Suffolk Sampling Date: 3/14/2019

Applicant/Owner: SPSA Landfill State: VA Sampling Point: DP UPL1 (wet)

Investigator(s): RJW & KCS Section, Township, Range: ______

Landform (hillside, terrace, etc.): bottomland Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR T Lat: 36.7775 Long: -76.5150 Datum: NAD 83

Soil Map Unit Name: Torhunta Loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |
| Hydric Soil Present? | Yes X No ___ | |
| Wetland Hydrology Present? | Yes X No ___ | |

Remarks:
Most seemingly "upland" area encountered in the wetland

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | X Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ___ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes X | No ___ | Depth (inches): 17 |
| Saturation Present? (includes capillary fringe) | Yes X | No ___ | Depth (inches): 15 |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology present

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP UPL1 (wet)

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 40 | Yes | FAC |
| 2. *Quercus michauxii* | 35 | Yes | FACW |
| 3. *Pinus taeda* | 20 | Yes | FAC |
| 4. *Quercus lyrata* | 5 | No | OBL |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100 | =Total Cover | |
| 50% of total cover: 50 | | 20% of total cover: | 20 |

| Sapling/Shrub Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Vaccinium corymbosum* | 30 | Yes | FACW |
| 2. *Ilex opaca* | 15 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 45 | =Total Cover | |
| 50% of total cover: 23 | | 20% of total cover: | 9 |

| Herb Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Arundinaria tecta* | 40 | Yes | FACW |
| 2. *Smilax rotundifolia* | 20 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 60 | =Total Cover | |
| 50% of total cover: 30 | | 20% of total cover: | 12 |

| Woody Vine Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Vitis rotundifolia* | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | =Total Cover | |
| 50% of total cover: 3 | | 20% of total cover: | 1 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 5 | x 1 = | 5 |
| FACW species | 105 | x 2 = | 210 |
| FAC species | 100 | x 3 = | 300 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 210 (A) | | 515 (B) |

Prevalence Index = B/A = 2.45

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)
dominant hydrophytic vegetation present

## SOIL

Sampling Point: DP UPL1 (wet)

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | Silty Loam |
| 12-24 | 10YR 4/1 | 95 | 10YR 4/4 | 5 | C | M | Loamy/Clayey | Silty Loam |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
X Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ___

Depth (inches): ___

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:
slight hydrogen sulfide odor, hydric soil indicators present

| **U.S. Army Corps of Engineers**<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | ***Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)*** |
|---|---|

Project/Site: SPSA Cell XIII/IX Permitting City/County: Suffolk Sampling Date: 3/14/2019

Applicant/Owner: SPSA Landfill State: VA Sampling Point: DP UP1B

Investigator(s): RJW & KCS Section, Township, Range: ____

Landform (hillside, terrace, etc.): Maintained berm Local relief (concave, convex, none): Convex Slope (%): 0-20

Subregion (LRR or MLRA): LRR T Lat: 36.7774 Long: -76.5147 Datum: NAD 83

Soil Map Unit Name: Torhunta Loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ___ | **Is the Sampled Area within a Wetland?** **Yes** ___ **No** X |
| Hydric Soil Present? | Yes ___ | No X | |
| Wetland Hydrology Present? | Yes ___ | No X | |

Remarks:
Maintained berm adjacent to open water.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ___ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology present

## VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP UP1B

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liriodendron tulipifera* | 40 | Yes | FACU |
| 2. *Liquidambar styraciflua* | 30 | Yes | FAC |
| 3. *Acer rubrum* | 20 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | =Total Cover | |
| 50% of total cover: 45 | | 20% of total cover: | 18 |

| Sapling/Shrub Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Ilex opaca* | 10 | Yes | FAC |
| 2. *Liquidambar styraciflua* | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 20 | =Total Cover | |
| 50% of total cover: 10 | | 20% of total cover: | 4 |

| Herb Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Urochloa platyphylla* | 25 | Yes | FAC |
| 2. *Arundinaria tecta* | 10 | Yes | FACW |
| 3. *Lamium amplexicaule* | 10 | Yes | UPL |
| 4. *Smilax rotundifolia* | 5 | No | FAC |
| 5. *Allium vineale* | 5 | No | FACU |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 55 | =Total Cover | |
| 50% of total cover: 28 | | 20% of total cover: | 11 |

| Woody Vine Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Smilax rotundifolia* | 10 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 10 | =Total Cover | |
| 50% of total cover: 5 | | 20% of total cover: | 2 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 10 | x 2 = | 20 |
| FAC species | 110 | x 3 = | 330 |
| FACU species | 45 | x 4 = | 180 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 165 (A) | | 530 (B) |
| Prevalence Index = B/A = | | | 3.21 |

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP UP1B

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR 3/2 | 100 | | | | | Loamy/Clayey | Fine Sandy Loam |
| 4-12 | 10YR 4/3 | 80 | 10YR 5/8 | 20 | C | M | Loamy/Clayey | Fine Sandy Loam |
| 12-20 | 10YR 4/3 | 40 | 10YR 5/8 | 20 | C | M | Loamy/Clayey | 10YR 4/2 40% dual matrix |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR, P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- ___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- ___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ________
Depth (inches): ________

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:
fill material on berm, likely dug from adjacent ponded area. No hydric soils present

**DEPARTMENT OF THE ARMY**
**US ARMY CORPS OF ENGINEERS**
**NORFOLK DISTRICT**
**FORT NORFOLK**
**803 FRONT STREET**
**NORFOLK VA 23510-1011**

25 January 2023

**PRELIMINARY JURISDICTIONAL DETERMINATION**

Eastern Virginia Regulatory Section
NAO-2007-02194 (Burnetts Mill Creek, Great Dismal Swamp)

Mr. Ralph Nahra
3720 Redwood Farm Road
Virginia Beach, VA 23452

Mr. David Balsley
Stokes Environmental Associates, Ltd.
4101 Granby Street, Suite 404
Norfolk, VA 23504

Dear Mr. Nahra and Mr, Balsley:

This letter is in regard to your request for a preliminary jurisdictional determination (PJD) of the aquatic resources (e.g., wetlands, streams, and ponds), on an approximately 212-acre property generally situated in the northeast corner of the intersection of Nansemond Parkway and Route 58 in Suffolk, Virginia (tax map parcels 27*39A, *44A, 27B*W20, *20 and *21).

The attached map entitled “WETLAND DELINEATION MAP, RALPH NAHRA PROPERTY, SUFFOLK VIRGINIA” dated April 2022 and received by the U.S. Army Corps of Engineers (Corps) on 06 May 2022, provides the approximate locations of the aquatic resources within the project area referenced above. This letter does not confirm the Cowardin classifications of these aquatic resources.

These aquatic resources exhibit wetland criteria as defined in the Corps of Engineers Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 (2010)**.** This site also contains aquatic resources with an ordinary high-water mark. This PJD and associated aquatic resource delineation map may be submitted with a permit application.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This delineation and PJD may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. Therefore, if you or your tenant are US Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

The Norfolk District has relied on the information and data provided by the agent to make this PJD. If it is determined such information and data are materially false or materially incomplete, a new PJD would be necessary.

This is a PJD and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

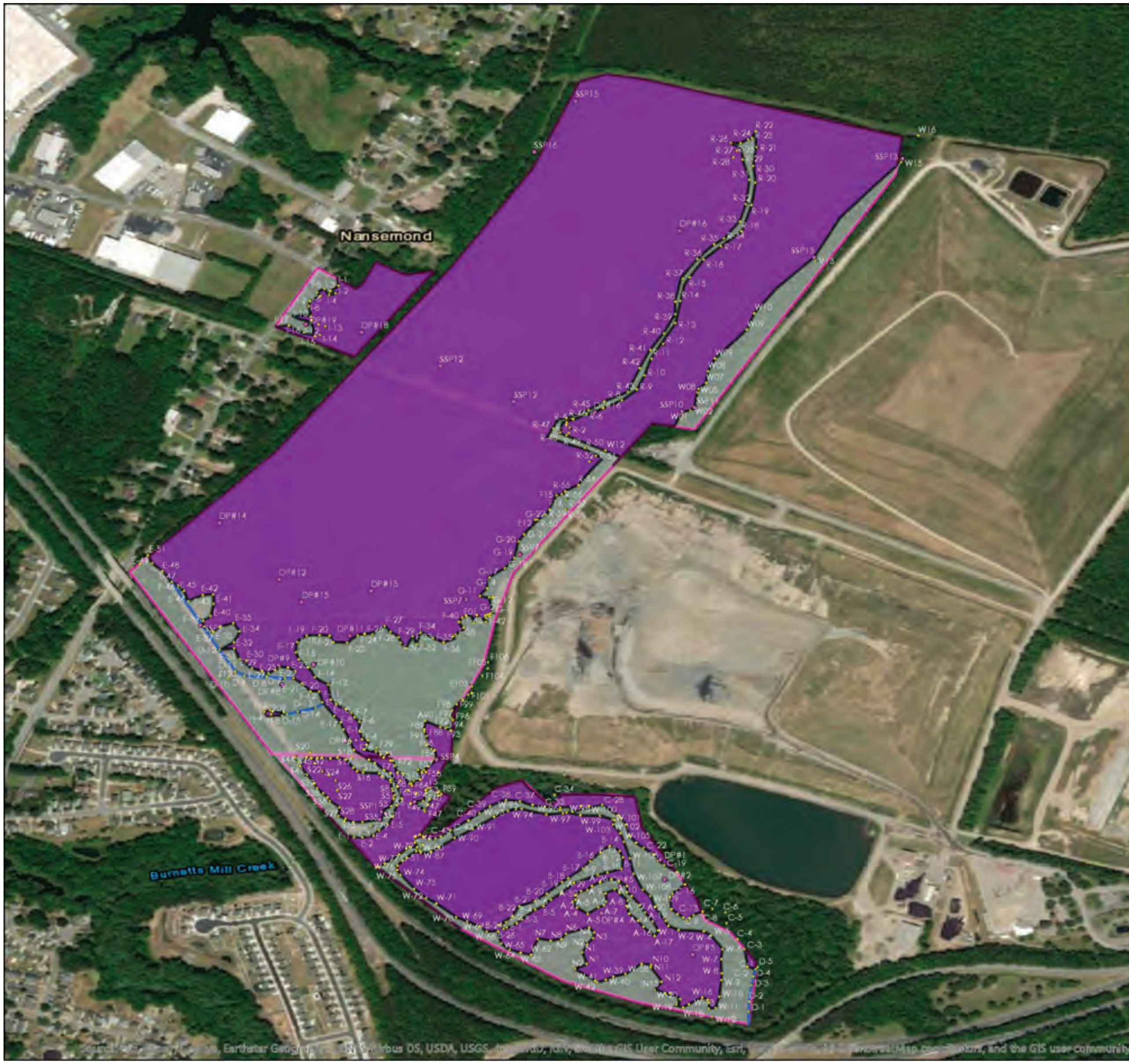
This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to me.

If you have any questions, please contact me either by telephone at (757) 201-7488 or by email at david.a.knepper@usace.army.mil.

Sincerely,

David A. Knepper
Environmental Scientist
Eastern Virginia Regulatory Section

Enclosure(s):




# STOKES ENVIRONMENTAL ASSOCIATES, LTD.

## WETLAND DELINEATION MAP

RALPH NAHRA PROPERTY
SUFFOLK VIRIGINIA
APRIL 2022
SEA21-5545
SCALE:

0 0.14 0.28 0.56 Miles

- Data points
- Boundaries
- Ditches
- Uplands
- parcel

TOTAL PARCEL AREA: 211.54 ACRES
TOTAL WETLAND AREA: 175.41 ACRES
TOTAL UPLAND AREA: 36.13 ACRES

US Army Corps of Engineers
Norfolk District Regulatory Branch
Received by DAK
Date: 06 May 2022

= wetlands

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL**

| Applicant: Mr. Ralph Nahra | | File Number: NAO-2007-02194 | Date: 25 Jan 2023 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| | APPROVED JURISDICTIONAL DETERMINATION | | D |
| X | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| If you have questions regarding this decision and/or the appeal process, you may contact: | If you only have questions regarding the appeal process, you may also contact: |
|---|---|
| Mr. David Knepper<br>U.S. Army Corps of Engineers<br>Eastern Virginia Regulatory Section<br>803 Front Street<br>Norfolk, VA 23510-1011<br>Telephone number: (757) 201-7488<br>david.a.knepper@usace.army.mil | Mr. Andrew Dangler<br>Regulatory Appeals Review Officer<br>U.S. Army Corps of Engineers<br>North Atlantic Division – Fort Hamilton<br>301 John Warren Avenue – First Floor<br>Brooklyn, New York 11252-6700<br>Mobile: (518) 487-0215 |

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| | | |
|---|---|---|
| ___________________________<br>Signature of appellant or agent. | Date: | Telephone number: |

**Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PJD:** 25 January 2023

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:**
Mr. Ralph Nahra, 3720 Redwood Farm Road, Virginia Beach, VA 23452

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO-2007-02194

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**
**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: Virginia County/parish/borough: N/A City: Suffolk

Center coordinates of site (lat/long in degree decimal format): 36.762179° / -76.529966°

Lat.: xx.xxx° Long.: yy.yyy°

Universal Transverse Mercator:

Name of nearest waterbody: Burnetts Mill Creek, Great Dismal Swamp

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

☑ Office (Desk) Determination. Date: 25 January 2023

☑ Field Determination. Date(s): 18 March and 07 April 2022

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.**

| Site number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| see PJD | | | 175.41 acres | non-tidal wetlands | 404 |
| see PJD | | | not quantified | non-tidal waters | 404 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Map: see cited in PJD.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: & additional info, revisions.
- [ ] Data sheets prepared by the Corps: ________.
- [ ] Corps navigable waters' study: ____________.
- [ ] U.S. Geological Survey Hydrologic Atlas: ________.
  - [ ] USGS NHD data.
  - [ ] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: accessed via Google Earth Pro
- [x] Natural Resources Conservation Service Soil Survey. Citation: accessed via Google Earth Pro
- [x] National wetlands inventory map(s). Cite name: accessed via Google Earth Pro
- [ ] State/local wetland inventory map(s): ____________.
- [ ] FEMA/FIRM maps: ________________.
- [ ] 100-year Floodplain Elevation is: ____. (National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): Google Earth Pro, Bing, Digital Globe, ArcGIS Pro, etc.
  or [x] Other (Name & Date): various dates
- [x] Previous determination(s). File no. and date of response letter: Same project number, 05 May 2008
- [x] Other information (please specify): LiDAR, AGCP Regional Supplement, USGS National Map, historic USGS quads, etc.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

KNEPPER.DAVID.A.1229503576 Digitally signed by KNEPPER.DAVID.A.1229503576 Date: 2023.01.25 16:21:04 -05'00'

| | |
|---|---|
| Signature and date of Regulatory staff member completing PJD | Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1] |

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

# WETLAND DELINEATION REPORT

**Magnolia Springs Tract**
City of Suffolk Tax Parcel Numbers: 27D*28 and 36*27
Suffolk, VA 23434

For

Southeastern Public Service Authority
1 Bob Foleller Drive
Suffolk, Virginia 23434

By

BAY ENVIRONMENTAL, INC.
Environmental Consulting Services

Bay Environmental, Inc.
648 Independence Parkway, Suite 100
Chesapeake, Virginia 23320

June 25, 2024

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## LIST OF PHOTOGRAPHS



## LIST OF FIGURES

## Introduction

On behalf of the SPSA, Bay Environmental conducted a wetland delineation at a site located south of Route 58 Suffolk, Virginia (Suffolk Tax Map Parcel Numbers: 36*27 and 27D*28). The study area consisted of approximately 291.48 acres of forested land. Representatives of Bay Environmental, Inc. conducted site visits on June 12, 13, and 14, 2024. Figure 1 is a USGS topographical map that depicts the approximate location of the site and its general vicinity. The wetland delineation involved both desktop data analysis and interpretation as well as a site investigation to field verify the available information and identify the location of wetlands. Prior to conducting the site investigation, scientists reviewed United States Geological Survey (USGS) topographical information, aerial photography, National Wetland Inventory Maps (NWI), and the available soil survey for the subject site. A site investigation was conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the *Atlantic and Gulf Coastal Plain Regional Supplement to the Corps of Engineers Wetland Delineation Manual,* which both examine the three criteria necessary for an area to be considered a wetland. These three criteria are the presence of wetland hydrology, hydric soils, and hydrophytic vegetation.

## Resource Mapping

*The ESRI Online USA Topo Maps USGS Suffolk, VA Topographic Quadrangle Map* (Figure 1) shows the study area at an elevation of approximately 20 to 25 feet above sea level. The study area is depicted as forested. The site appears to drain north towards a tributary Nansemond River Cedar Lake. The tributary of Nansemond River-Cedar Lake drains northwest into Nansemond River which drains the Hampton Roads Watershed. The study area is located in the Hampton Roads Watershed (HUC 02080208).

The National Wetlands Inventory Map, prepared by the U.S. Fish and Wildlife Service (USFWS), identifies ten wetland classes within the study area (Figure 3). PSS1Cd is a palustrine scrub-shrub wetland with broad-leaved deciduous vegetation that is seasonally flooded and partly drained/ditched. R5UBFx is a riverine system with unknown perenniality and an unconsolidated bottom that is semipermanently flooded and has been excavated. PFO1Ed is a palustrine forested wetland with broad-leaved deciduous vegetation that is seasonally flooded/saturated and has been partly drained/ditched; PFO1Cd is the same wetland system with the exception of being seasonally flooded. PFO4Ed is a palustrine forested wetland with needle-leaved evergreen vegetation that is seasonally flooded/saturated and has been partly drained/ditched; PFO4Cd is the same wetland system with the exception of being seasonally flooded. PFO4/1Ed and PFO4/1Cd wetlands are the same as stated above but have a mix of needle-leaved evergreen (4) and broad-leaved deciduous (1) vegetation. PFO1/2E is a palustrine forested wetland with broad-leaved deciduous and needle-leaved deciduous vegetation that is seasonally flooded/saturated. PFO1/SS3Ed is a palustrine forested wetland with broad-leaved deciduous vegetation combined with scrub-shrub broad-leaved evergreen vegetation that is seasonally flooded/saturated and has been partly drained/ditched. It is important to note that the USFWS issues a disclaimer with this data recognizing that these maps are prepared from the analysis of high-altitude aerial photography and, consequently, "a margin of error is inherent in the use of the imagery".

The National Resource Conservation Service soil survey for Suffolk, VA has listed four soil series within the study area (Figure 4). Deloss mucky loam (4) is 0 to 2 percent sloped, very deep and very poorly drained soil found in marine terraces. Rains fine sandy loam (19) is 0 to 2 percent sloped, very deep and poorly drained soil found in swamps. Torhunta loam (25) is 0 to 2 percent sloped, very deep and very poorly drained soil found in swamps. Wahee silt loam (28) is 0 to 2 percent sloped, very deep, and somewhat poorly drained soil found in stream terraces.

The USGS LiDAR (Light Detection and Ranging) map depicts the changes in elevation on the site. LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure distances to the Earth. The light pulses along with other data recorded by the airborne system generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. This information has been manipulated to show small changes in elevation. The lowest areas are in blue. Green has a mid-range elevation. The highest areas are yellow and then red. The mapping for this site depicts the areas of highest elevation (shown in red) as a straight line crossing west to east through the property, as well as a few very slight high spots in the southern portion of the property. The mid-elevation areas are located in the eastern side and southwest pocket (depicted in orange) and some small spots in the middle of the study area. The lowest areas reside in the southwest corner and northern area of the property (shown in green). This study area is relatively flat and the changes in elevation are minute throughout the map.

## Findings

The entire property, with the exception of a small isolated upland patch and an old rail line berm bordering a canal, was identified as wetlands (Figure 2). The wetlands consist of palustrine forested (PFO) wetlands, approximately 290.03 acres, and are represented by Data Point A, B, D, E, F, G, H, I, J, K, and L (DPA, DPB, DPD, DPE, DPF, DPG, DPH, DPI, DPJ, DPK, and DPL). The vegetation in the wetlands remained consistent throughout the property. The dominant vegetation that represents all wetland data points include red maple (*Acer rubrum*), sweet-gum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), water oak (*Quercus nigra*), swamp chestnut oak (*Quercus michauxii*), tuliptree (*Liriodendron tulipifera*), American holly (*Ilex opaca*), highbush blueberry (*Vaccinium corymbosum*), common paw-paw (*Asimina triloba*), cinnamon fern (*Osmundastrum cinnamomeum*), netted chain fern (*Woodwardia areolata*), sweet-bay (*Magnolia virginiana*), red bay (*Persea borbonia*), switch cane (*Arundinaria tecta*), sweet-pepperbush (*Clethra alnifolia*), highland doghobble (*Leucothoe fontanesiana*), Japanese stilt grass (*Microstegium vimineum*), sawbrier (*Smilax glauca*), horesebrier (*Smilax rotundifolia*), fringed greenbrier (*Smilax bona-nox*), muscadine (*Vitis rotundifolia*), and crossvine (*Bignonia capreolata*). The vegetation is hydrophytic throughout the wetlands.

Every wetland data point collected contained hydric soil, however the indicator met varied. Data Point A, B, E, F, I, and L met hydric soil indicator depleted matrix (F3). Data Point H, J, and K met hydric soil indicator redox dark surface (F6). Data Point D met indicator hydrogen sulfide (A4) and Data Point G met thick dark surface (A12). Most of the soil in the wetlands contained silty surface layers underlain by clay loam. Hydric soil was present throughout the wetlands.

Wetland hydrology was found throughout the wetlands with every data point containing secondary indicators geomorphic position (D2), and FAC-Neutral Test (D5). Additionally, secondary hydrology indicator sphagnum moss was found at DPB, DPE, DPF, DPI, and DPL; secondary indicator shallow aquitard (D3) was observed at DPA. Primary hydrology indicator water stained leaves was present at multiple data points which include DPB, DPD, DPE, DPF, DPH, and DPI. Other primary indicators observed include saturation (A3) at DPD, DPE, and DPI, oxidized rhizospheres (C3) at DPI, and morphological adaptations (other) of shallow rooting at DPH. According to the USAE Antecedent Precipitation Tool (APT) (Version 1.0), the site visits in June were conducted during the dry season, within a period of "Mild Wetness" (PDSI). The APT found the site within "Normal Conditions" with a precipitation normalcy index of 14 on June 12, and 13 on June 13 and 14.

The uplands within the property were confined to a small isolated patch and an old railine berm that runs west to east through the property totaling approximately 1.44 acres of uplands. The uplands are represented by Data Point C (DPC). The Dominant vegetation includes swamp chesnut oak (*Quercus michauxii*), common paw-paw (*Asimina triloba*), partridge-berry (*Mitchella repens*), muscadine (*Vitis rotundifolia*), poison ivy (*Toxicodendron radicans*), and Virginia-creeper (*Parthenocissus quinquefolia*). Hydrophytic vegetation was present within the uplands. The soil was non-hydric and contained bright, high chroma loamy soils with no redox features. No wetland hydrology indicators were observed in the uplands.

## Conclusion

In summary, while the U.S. Army Corps of Engineers ultimately determines the jurisdictional status of land, Bay Environmental's professional opinion of wetland limits is depicted on Figure 2. We recommend having the U.S. Army Corps of Engineers and/or the Virginia Department of Environmental Quality confirm the extent of the wetlands with a jurisdictional determination. Please note that the limits of wetlands and waters of the U.S. are subject to change pending their review and approval. Wetlands are regulated under Section 404 and 401 of the Clean Water Act, and impacting these areas requires a permit from the U.S. Army Corps of Engineers and/or the Virginia Department of the Environmental Quality.

## Photographs

*Figure 1. Representative view of Data Point A*

*Figure 2. Representative view of wetlands at Data Point B*

*Figure 3. Representative view of wetlands at Data Point D*

*Figure 4.Representative view of wetlands at Data Point E*

*Figure 5. Representative view of wetlands at Data Point F*

*Figure 6. Representative view of wetlands at Data Point G*

*Figure 7. Representative view of wetlands at Data Point H*

*Figure 8. Representative view of wetlands at Data Point I*

*Figure 9. Representative view of wetlands at Data Point J*

*Figure 10. Representative view of wetlands at Data Point K*

*Figure 11. Representative view of wetlands at Data Point L*

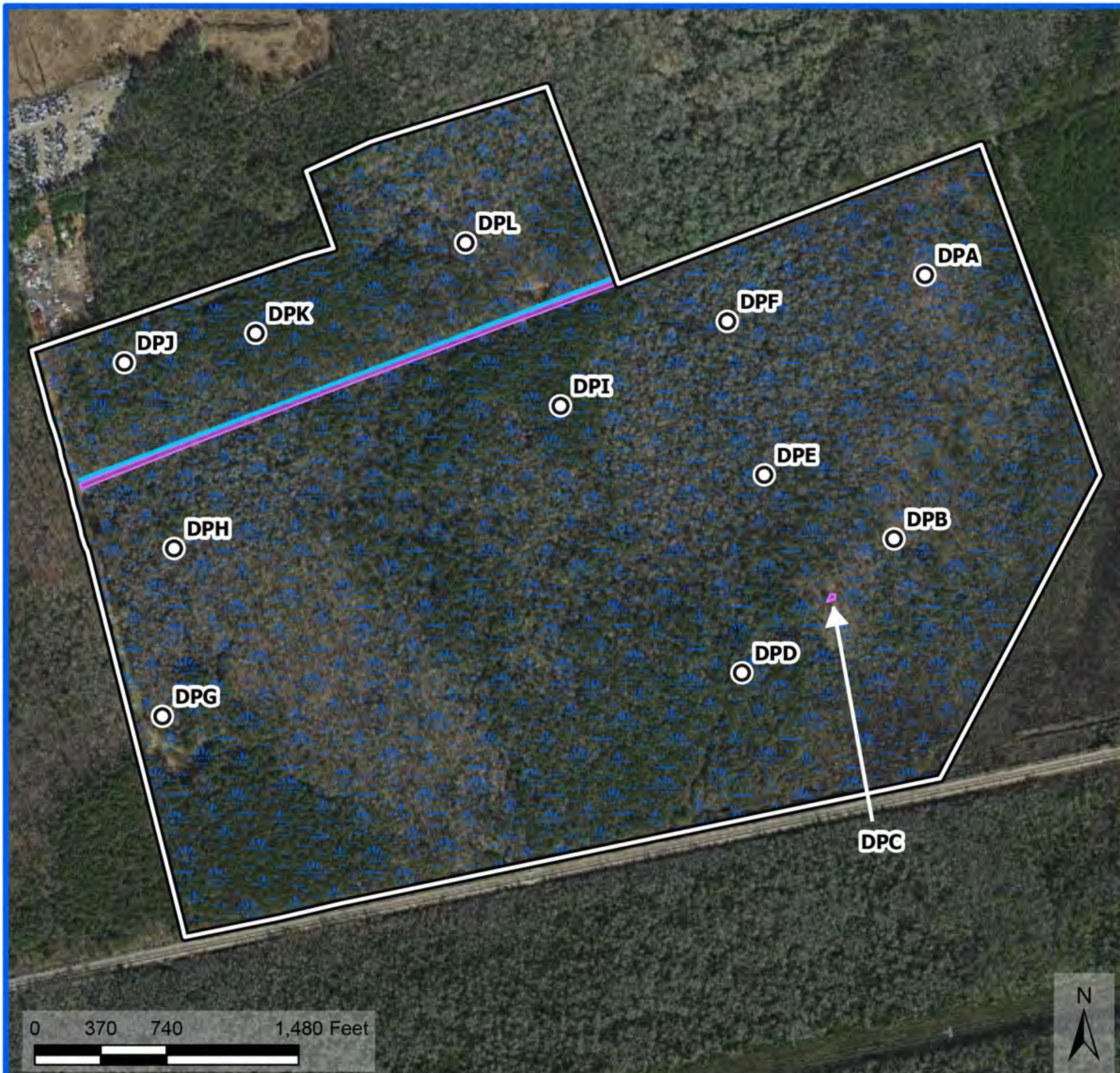
*Figure 12. Representative view of uplands at Data Point C*

*Figure 13. Representative view of old rail line berm uplands*


Study Area ~283.92 acres

Source: ESRI Online USA Topo Maps USGS Suffolk, VA Topographic Quadrangle

| | | |
|---|---|---|
| Bay #:24-248-01<br>Date: 6/7/2024<br>Prepared by: KEP | Figure 1: Topographic Vicinity Map<br>Wetland Delineation<br>Magnolia Springs Route 58 Tracts<br>Suffolk, Virginia<br>TPINS: 36*27 and 27D*28 | BAY ENVIRONMENTAL, INC.<br>Environmental Consulting Services |




Study Area ~291.48 acres

Data Point

PUB Wetlands ~0.71 acres (~2,581.70ft)

PFO Wetlands ~290.03 acres

Uplands ~1.44 acres

NOTE: This map is preliminary and has not been reviewed by the U.S. Army Corps of Engineers
Source: State of Virginia 2021 Orthophotographs; Data collected using Trimble R1 GPS

Bay #:24-248-01
Date: 6/19/2024
Prepared by: KEP
Reviewed by: CJC
PWD #: 3402000100

Figure 2: Site Conditions Map
Wetland Delineation
Magnolia Springs Route 58 Tracts
Suffolk, Virginia
TPINS: 36*27 and 27D*28

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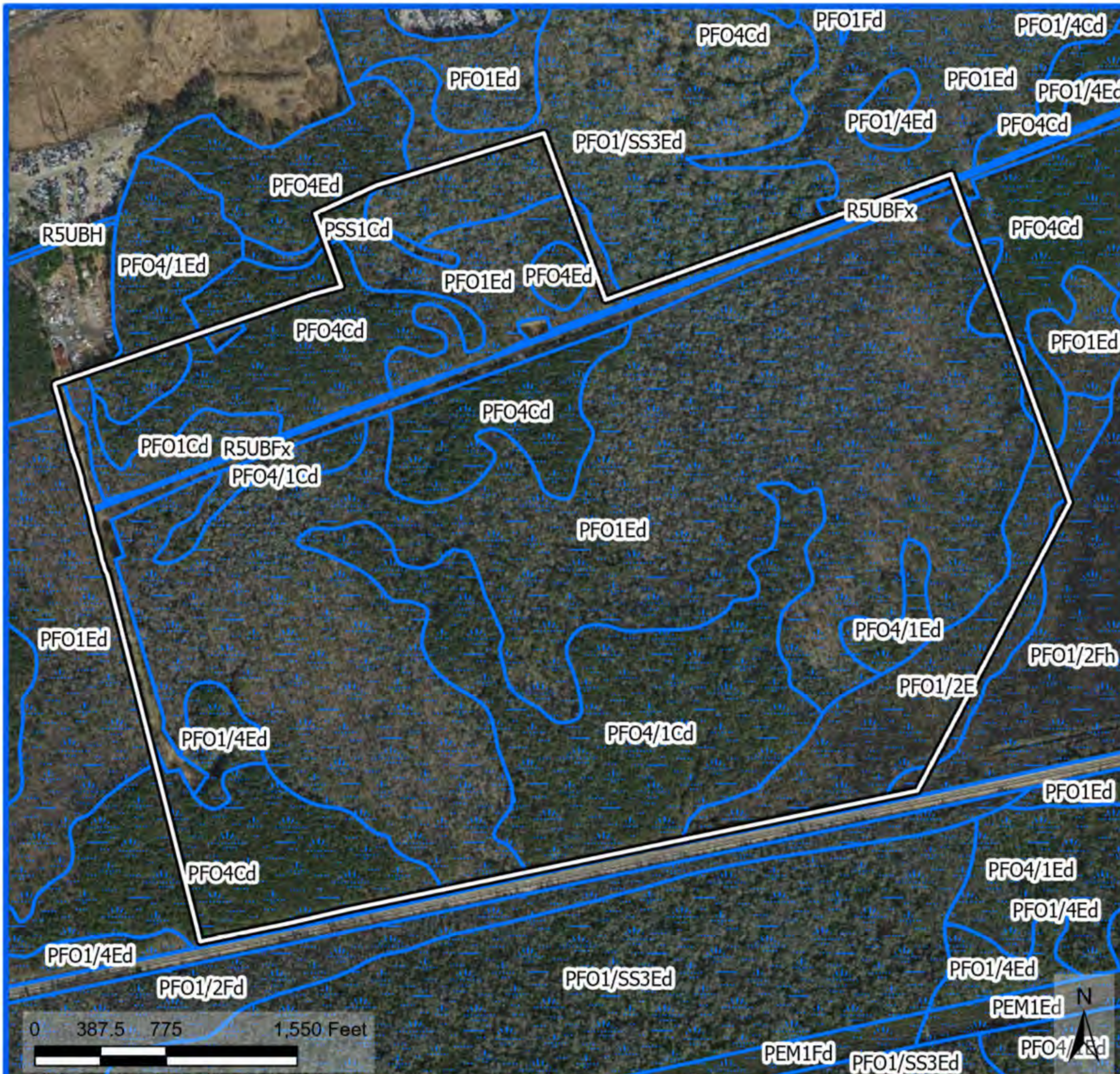
Environmental Consulting Services




Study Area ~283.92 acres

National Wetlands Inventory

Source: State of Virginia 2021 Orthophotographs; USFWS National Wetlands Inventory

| | | |
|---|---|---|
| Bay #:24-248-01<br>Date: 6/7/2024<br>Prepared by: KEP | Figure 3: National Wetlands Map<br>Wetland Delineation<br>Magnolia Springs Route 58 Tracts<br>Suffolk, Virginia<br>TPINS: 36*27 and 27D*28 | BAY ENVIRONMENTAL, INC.<br>Environmental Consulting Services |


Study Area ~283.92 acres

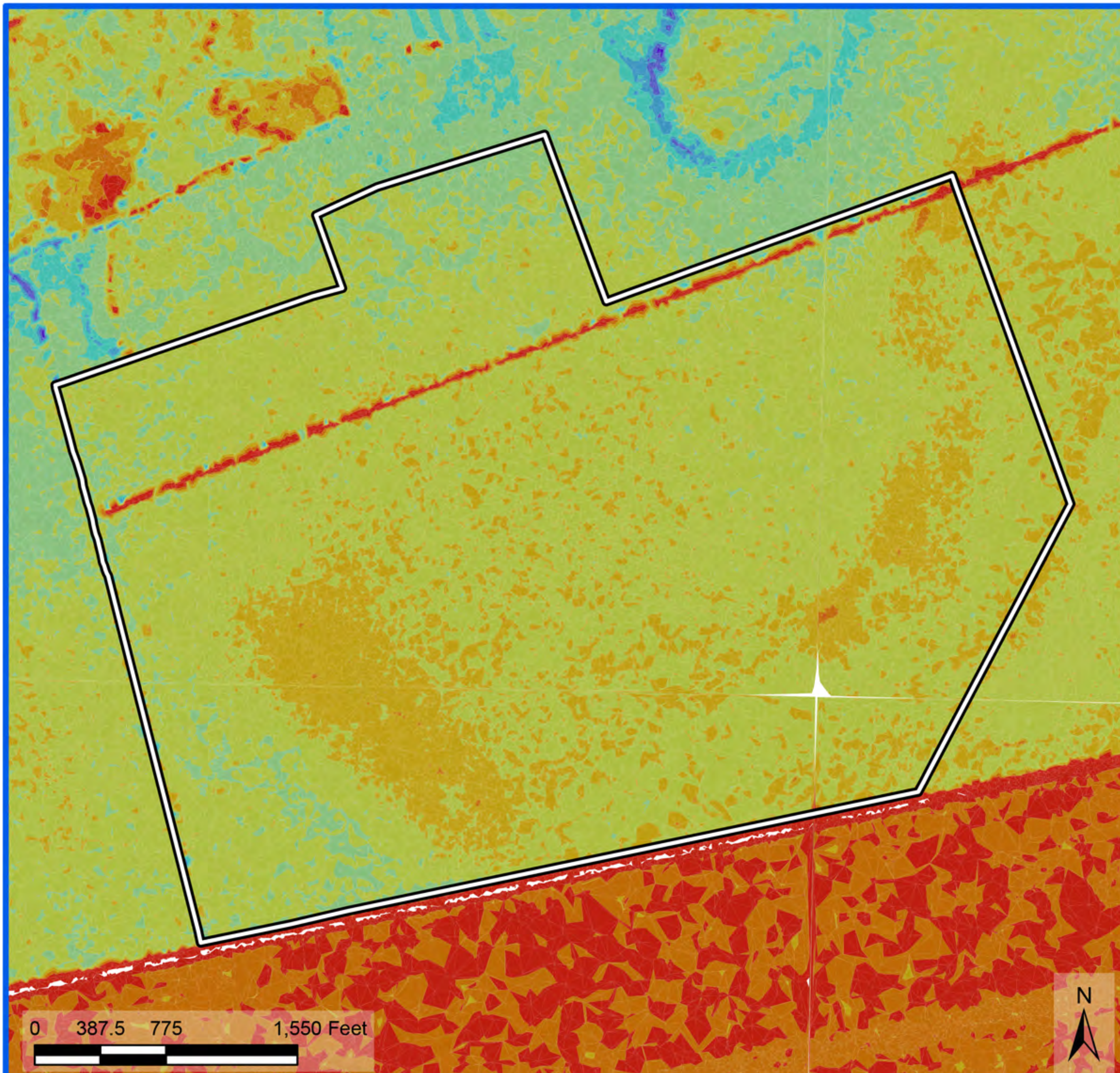
Soils:
4 - Deloss mucky loam
19 - Weston fine sandy loam
25 - Torhunta loam
28 - Wahee silt loam

Source: State of Virginia 2021 Orthophotographs; NRCS Soil Survey Shapefile for Suffolk, VA

Bay #:24-248-01
Date: 6/7/2024
Prepared by: KEP

Figure 4: Soils Map
Wetland Delineation
Magnolia Springs Route 58 Tracts
Suffolk, Virginia
TPINS: 36*27 and 27D*28

BAY ENVIRONMENTAL, INC.
Environmental Consulting Services




Study Area ~283.92 acres

LiDAR Elevation

Lower

Higher

Source: 2010 LAS Dataset from USGS Lidar Explorer Map Downloads

Bay #:24-248-01
Date: 6/7/2024
Prepared by: KEP

Figure 5: LiDAR Map
Wetland Delineation
Magnolia Springs Route 58 Tracts
Suffolk, Virginia
TPINS: 36*27 and 27D*28

BAY ENVIRONMENTAL, INC.
Environmental Consulting Services

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPA

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.744902°N Long: 76.511979°W Datum: ______

Soil Map Unit Name: 19-Rains fine sandy loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** | **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | | |
| Wetland Hydrology Present? | Yes ✓ No ___ | | |

Remarks:

Hydrophytic vegetation, hydric soil, and wetland hydrology is present at DPA. DPA is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

**Wetland Hydrology Present? Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Secondary wetland hydrology indicators geomorphic position, shallow aquitard, and FAC-Neutral Test were observed at DPA. Hydrology is present at DPA.

**VEGETATION (Five Strata) –** Use scientific names of plants. Sampling Point: DPA

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus nigra | 25 | Yes | FAC |
| 2. Ilex opaca | 10 | No | FAC |
| 3. Acer rubrum | 40 | Yes | FAC |
| 4. Liquidambar styraciflua | 35 | Yes | FAC |
| 5. | | | |
| 6. | | | |
| | 110 = Total Cover | | |
| 50% of total cover: 55 | 20% of total cover: 22 | | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus nigra | 10 | Yes | FAC |
| 2. Acer rubrum | 20 | Yes | FAC |
| 3. Ilex opaca | 10 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 40 = Total Cover | | |
| 50% of total cover: 20 | 20% of total cover: 8 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vaccinium corymbosum | 15 | Yes | FACW |
| 2. Ilex opaca | 5 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 20 = Total Cover | | |
| 50% of total cover: 10 | 20% of total cover: 4 | | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Asimina triloba | 5 | Yes | FAC |
| 2. Osmundastrum cinnamomeum | 5 | Yes | FACW |
| 3. Persea borbonia | 10 | Yes | FACW |
| 4. Arundinaria tecta | 5 | Yes | FACW |
| 5. Woodwardia areolata | 2 | No | OBL |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 27 = Total Cover | | |
| 50% of total cover: 13.5 | 20% of total cover: 5.4 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Smilax glauca | 5 | Yes | FAC |
| 2. Smilax rotundifolia | 5 | Yes | FAC |
| 3. Vitis rotundifolia | 5 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| | 15 = Total Cover | | |
| 50% of total cover: 7.5 | 20% of total cover: 3 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 15 (A)

Total Number of Dominant Species Across All Strata: 15 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominace test is met. There is hydrophytic vegetation present at DPA.

## SOIL

Sampling Point: DPA

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | silt loam | |
| 6-12 | 10YR 5/2 | 96 | 10YR 6/6 | 4 | | | Loamy clay | |
| 12-18 | 10YR 5/2 | 90 | 10YR 5/8 | 10 | | | Loamy clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks: Hydric soil indicator depleted matrix met. Hydric soil is present at DPA.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPB

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.741653°N Long: 76.512454°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** | **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | | |
| Wetland Hydrology Present? | Yes ✓ No ___ | | |

Remarks:

There is hydrophytic vegetation, hydric soil, and wetland hydrology present at point DPB. DPB is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ✓ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ No ___ | Depth (inches): ______ | |
| Water Table Present? | Yes ___ No ___ | Depth (inches): ______ | |
| Saturation Present? (includes capillary fringe) | Yes ___ No ___ | Depth (inches): ______ | **Wetland Hydrology Present? Yes** ✓ **No** ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicators water stained leaves, secondary indicators geomorphic position, FAC-Neutral Test, and sphagnum moss were observed at DPB. Wetland hydrology is present at DPB.

## VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: DPB

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liquidambar styraciflua | 25 | Yes | FAC |
| 2. Acer rubrum | 40 | Yes | FAC |
| 3. Nyssa sylvatica | 10 | No | FAC |
| 4. Quercus nigra | 25 | Yes | FAC |
| 5. | | | |
| 6. | | | |
| | 100 | = Total Cover | |
| 50% of total cover: 50 | 20% of total cover: 20 | | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Magnolia virginiana | 3 | No | FACW |
| 2. Acer rubrum | 30 | Yes | FAC |
| 3. Ilex opaca | 10 | Yes | FAC |
| 4. Liriodendron tulipifera | 2 | No | FACU |
| 5. | | | |
| 6. | | | |
| | 45 | = Total Cover | |
| 50% of total cover: 22.5 | 20% of total cover: 9 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 5 | Yes | FAC |
| 2. Vaccinium corymbosum | 15 | Yes | FACW |
| 3. Persea borbonia | 2 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 22 | = Total Cover | |
| 50% of total cover: 11 | 20% of total cover: 4.4 | | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Arundinaria tecta | 30 | Yes | FACW |
| 2. Vaccinium corymbosum | 2 | No | FACW |
| 3. Magnolia virginiana | 5 | No | FACW |
| 4. Persea borbonia | 5 | No | FACW |
| 5. Ilex opaca | 2 | No | FAC |
| 6. Osmundastrum cinnamomeum | 2 | No | FACW |
| 7. Woodwardia areolata | 5 | No | OBL |
| 8. Leersia virginica | 3 | No | FACW |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 54 | = Total Cover | |
| 50% of total cover: 27 | 20% of total cover: 10.8 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Smilax rotundifolia | 10 | Yes | FAC |
| 2. Vitis rotundifolia | 2 | No | FAC |
| 3. Bignonia capreolata | 2 | No | FAC |
| 4. Smilax bona-nox | 10 | Yes | FAC |
| 5. | | | |
| | 24 | = Total Cover | |
| 50% of total cover: 12 | 20% of total cover: 4.8 | | |

**Dominance Test worksheet:**

| | | |
|---|---|---|
| Number of Dominant Species That Are OBL, FACW, or FAC: | 10 | (A) |
| Total Number of Dominant Species Across All Strata: | 10 | (B) |
| Percent of Dominant Species That Are OBL, FACW, or FAC: | 100% | (A/B) |

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominance test is met. Hydrophytic vegetation is present at DPB.

## SOIL

Sampling Point: DPB

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | Silt Loam | |
| 6-12 | 10YR 5/2 | 96 | 10YR 6/6 | 4 | | | loamy clay | |
| 12-18 | 10YR 5/2 | 90 | 10YR 5/8 | 10 | | | loamy clay | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator depleted matrix is met. Hydric soil is present at point DPB.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPC

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): costal flat Local relief (concave, convex, none): micro convex Slope (%): 1-2

Subregion (LRR or MLRA): LLR-T Lat: 36.740908°N Long: 76.513421°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓ |
| Hydric Soil Present? | Yes ___ | No ✓ | |
| Wetland Hydrology Present? | Yes ___ | No ✓ | |

Remarks:

Hydrophytic vegetation is present. Hydric soil and wetland hydrology are not present at DPC. DPC is not sampled in a wetland. The area is a relatively small upland hummock.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ___ | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No ___ | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ___ | Depth (inches): ___ |

**Wetland Hydrology Present? Yes** ___ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is no wetland hydrology present at DPC.

**VEGETATION (Five Strata) –** Use scientific names of plants.

Sampling Point: DPC

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus michauxii | 70 | Yes | FACW |
| 2. Acer rubrum | 15 | No | FAC |
| 3. Pinus taeda | 10 | No | FAC |
| 4. Quercus bicolor | 5 | No | FACW |
| 5. | | | |
| 6. | | | |
| | 100 = Total Cover | | |
| 50% of total cover: 50 | 20% of total cover: 20 | | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | | | |
|---|---|---|---|
| 1. Quercus michauxii | 5 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 5 = Total Cover | | |
| 50% of total cover: 2.5 | 20% of total cover: 1 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 0 = Total Cover | | |
| 50% of total cover: | 20% of total cover: | | |

| Herb Stratum (Plot size: App. 30ft radius) | | | |
|---|---|---|---|
| 1. Asimina triloba | 20 | Yes | FAC |
| 2. Arundinaria tecta | 2 | No | FACW |
| 3. Mitchella repens | 10 | Yes | FACU |
| 4. Persea borbonia | 1 | No | FACW |
| 5. Dichanthelium clandestinum | 1 | No | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 34 = Total Cover | | |
| 50% of total cover: 17 | 20% of total cover: 6.8 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | | | |
|---|---|---|---|
| 1. Toxicodendron radicans | 5 | Yes | FAC |
| 2. Parthenocissus quinquefolia | 5 | Yes | FACU |
| 3. Vitis rotundifolia | 10 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| | 20 = Total Cover | | |
| 50% of total cover: 10 | 20% of total cover: 4 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.43% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominance test is met, hydrophytic vegetation is present at DPC.

## SOIL

Sampling Point: DPC

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR 4/2 | 100 | | | | | silt loam | |
| 4-18+ | 10YR 5/4 | 100 | | | | | clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** **Yes** ☐ **No** ☑

Remarks:

No hydric soil indicators are met; DPC does not have hydric soil.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPD

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.740004°N Long: 76.514789°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO4/1Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | Is the Sampled Area within a Wetland? | Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ No ___ | | |
| Wetland Hydrology Present? | Yes ✓ No ___ | | |

Remarks:

There is hydrophytic vegetation, hydric soil, and wetland hydrology present at DPD. DPD is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

**Wetland Hydrology Present? Yes ✓ No ___**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicators saturation and water stained leaves, secondary geomorphic position and FAC-Neutral test are met. Wetland hydrology is present at DPD.

## VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: DPD

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Pinus taeda | 35 | Yes | FAC |
| 2. Acer rubrum | 20 | Yes | FAC |
| 3. Liquidambar styraciflua | 15 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 70 | = Total Cover | |
| 50% of total cover: 35 | | 20% of total cover: 14 | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 25 | Yes | FAC |
| 2. Acer rubrum | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 35 | = Total Cover | |
| 50% of total cover: 17.5 | | 20% of total cover: 7 | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vaccinium corymbosum | 20 | Yes | FACW |
| 2. Persea borbonia | 5 | No | FACW |
| 3. Ilex opaca | 5 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 30 | = Total Cover | |
| 50% of total cover: 15 | | 20% of total cover: 6 | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Woodwardia areolata | 5 | Yes | OBL |
| 2. Vaccinium corymbosum | 5 | Yes | FACW |
| 3. Sceptridium dissectum | 2 | No | FAC |
| 4. Chasmanthium laxum | 5 | Yes | FACW |
| 5. Persea borbonia | 5 | Yes | FACW |
| 6. Osmundastrum cinnamomeum | 3 | No | FACW |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 25 | = Total Cover | |
| 50% of total cover: 12.5 | | 20% of total cover: 5 | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vitis rotundifolia | 8 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 8 | = Total Cover | |
| 50% of total cover: 4 | | 20% of total cover: 1.6 | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 11 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominance test is met. Hydrophytic vegetation is present at DPD.

## SOIL

Sampling Point: DPD

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | mucky loam | sulfidic odor |
| 6-12+ | 10YR 3/2 | 100 | | | | | mucky clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator hydrogen sulfide and depleted below dark surface are met. Hydric soil is present at DPD.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPE

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.7424414°N Long: 76.514446°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? Yes ✓ No ___ | Is the Sampled Area within a Wetland? | Yes ✓ No ___ |
| Hydric Soil Present? Yes ✓ No ___ | | |
| Wetland Hydrology Present? Yes ✓ No ___ | | |

Remarks:
There is hydrophytic vegetation, hydric soil, and wetland hydrology present at DPE. DPE is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ✓ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres along Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ✓ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ✓ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ No ___ | Depth (inches): ___ | |
| Water Table Present? | Yes ✓ No ___ | Depth (inches): -11 | |
| Saturation Present? (includes capillary fringe) | Yes ✓ No ___ | Depth (inches): -3 | **Wetland Hydrology Present? Yes ✓ No ___** |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicators saturation and water stained leaves, as well as secondary indicators geomorphic position, FAC-Neutral test, and sphagnum moss present at DPE. There is wetland hydrology present at DPE.

**VEGETATION (Five Strata) –** Use scientific names of plants.

Sampling Point: DPE

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus nigra | 35 | Yes | FAC |
| 2. Pinus taeda | 10 | No | FAC |
| 3. Quercus michauxii | 15 | Yes | FACW |
| 4. Quercus laurifolia | 10 | No | FACW |
| 5. Acer rubrum | 10 | No | FAC |
| 6. Ilex opaca | 15 | Yes | FAC |
| | 95 | = Total Cover | |
| 50% of total cover: 47.5 | | 20% of total cover: 19 | |
| **Sapling Stratum (Plot size: Appr 30 ft radius)** | | | |
| 1. Liquidambar styraciflua | 5 | No | FAC |
| 2. Nyssa sylvatica | 3 | No | FAC |
| 3. Magnolia virginiana | 25 | Yes | FACW |
| 4. Persea borbonia | 20 | Yes | FACW |
| 5. Quercus nigra | 10 | No | FAC |
| 6. Vaccinium corymbosum | 15 | No | FACW |
| | 78 | = Total Cover | |
| 50% of total cover: 39 | | 20% of total cover: 15.6 | |
| **Shrub Stratum (Plot size: App. 30ft radius)** | | | |
| 1. Clethra alnifolia | 40 | Yes | FACW |
| 2. Persea borbonia | 10 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 50 | = Total Cover | |
| 50% of total cover: 25 | | 20% of total cover: 10 | |
| **Herb Stratum (Plot size: App. 30ft radius)** | | | |
| 1. Osmundastrum cinnamomeum | 20 | Yes | FACW |
| 2. Persea borbonia | 5 | No | FACW |
| 3. Clethra alnifolia | 10 | Yes | FACW |
| 4. Woodwardia areolata | 5 | No | OBL |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 40 | = Total Cover | |
| 50% of total cover: 20 | | 20% of total cover: 8 | |
| **Woody Vine Stratum (Plot size: App. 30ft radius)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 | = Total Cover | |
| 50% of total cover: | | 20% of total cover: | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 = | |
| FACW species | | x 2 = | |
| FAC species | | x 3 = | |
| FACU species | | x 4 = | |
| UPL species | | x 5 = | |
| Column Totals: | 0 (A) | | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominance test is met. Hydrophytic vegetation is present at DPE.

## SOIL

Sampling Point: DPE

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1-5 | 10YR 2/1 | 100 | | | | | mucky loam | |
| 5-12 | 10YR 4/2 | 98 | 10YR 5/4 | 2 | | | clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator depleted matrix is met. Hydric soil is present at DPE.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/12/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPF

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.744332°N Long: 76.515014°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | |
| Wetland Hydrology Present? | Yes ✓ No ___ | |

Remarks:

Hydrophytic vegetation, hydric soil, and wetland hydrology is present at DPF. DPF is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ✓ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ___ No ___ | Depth (inches): ______ | | |
| Water Table Present? | Yes ✓ No ___ | Depth (inches): -10 | | |
| Saturation Present? (includes capillary fringe) | Yes ✓ No ___ | Depth (inches): -4 | **Wetland Hydrology Present?** | **Yes** ✓ **No** ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicator water-stained leaves, and secondary indicators geomorphic position, FAC-Neutral test, and sphagnum moss are present at DPF. Wetland hydrology is present at DPF.

## VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: DPF

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 25 | Yes | FAC |
| 2. Acer rubrum | 30 | Yes | FAC |
| 3. Magnolia virginiana | 10 | No | FACW |
| 4. Quercus falcata | 5 | No | FACU |
| 5. Quercus nigra | 10 | No | FAC |
| 6. | | | |
| | 80 = Total Cover | | |
| 50% of total cover: 40 | 20% of total cover: 16 | | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 5 | Yes | FAC |
| 2. Magnolia virginiana | 5 | Yes | FACW |
| 3. Quercus michauxii | 5 | Yes | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 15 = Total Cover | | |
| 50% of total cover: 7.5 | 20% of total cover: 3 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Clethra alnifolia | 30 | Yes | FACW |
| 2. Magnolia virginiana | 2 | No | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 32 = Total Cover | | |
| 50% of total cover: 16 | 20% of total cover: 6.4 | | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Osmundastrum cinnamomeum | 60 | Yes | FACW |
| 2. Woodwardia areolata | 10 | No | OBL |
| 3. Arundinaria tecta | 25 | Yes | FACW |
| 4. Persea borbonia | 2 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 97 = Total Cover | | |
| 50% of total cover: 48.5 | 20% of total cover: 19.4 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Smilax laurifolia | 2 | No | FACW |
| 2. Bignonia capreolata | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 12 = Total Cover | | |
| 50% of total cover: 6 | 20% of total cover: 2.4 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 = | |
| FACW species | | x 2 = | |
| FAC species | | x 3 = | |
| FACU species | | x 4 = | |
| UPL species | | x 5 = | |
| Column Totals: | 0 (A) | | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. Hydrophytic vegetation is present at DPF.

## SOIL

Sampling Point: DPF

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 3/1 | 100 | | | | | silt loam | |
| 8-12 | 10YR 4/2 | 98 | 10YR 5/4 | 2 | C | M | clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator depleted matrix is met. Hydric soil is present at DPF.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/13/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPG

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): costal flat Local relief (concave, convex, none): ______ Slope (%): 0-1

Subregion (LRR or MLRA): LLR-T Lat: 36.739469°N Long: 76.523689°W Datum: ______

Soil Map Unit Name: 19-Rains fine sandy loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✓, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | |
| Wetland Hydrology Present? | Yes ✓ No ___ | |

Remarks:

Hydrophytic vegetation, wetland hydrology, and hydric soil are present at DPG. DPG is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ No ___ | Depth (inches): ______ | |
| Water Table Present? | Yes ___ No ___ | Depth (inches): <18 | |
| Saturation Present? (includes capillary fringe) | Yes ___ No ___ | Depth (inches): <18 | **Wetland Hydrology Present? Yes** ✓ **No** ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Secondary indicators geomorphic position and FAC-Neutral test are present at DPG. Wetland hydrology is present at DPG.

**VEGETATION (Five Strata) –** Use scientific names of plants.

Sampling Point: DPG

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liquidambar styraciflua | 25 | Yes | FAC |
| 2. Liriodendron tulipifera | 5 | No | FACU |
| 3. Quercus falcata | 5 | No | FACU |
| 4. Quercus michauxii | 25 | Yes | FACW |
| 5. Acer rubrum | 30 | Yes | FAC |
| 6. Pinus taeda | 10 | No | UPL |
| | 100 = Total Cover | | |
| 50% of total cover: 50 | 20% of total cover: 20 | | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 10 | Yes | FAC |
| 2. Liriodendron tulipifera | 3 | No | FACU |
| 3. Liquidambar styraciflua | 10 | Yes | FAC |
| 4. Nyssa sylvatica | 5 | No | FAC |
| 5. | | | |
| 6. | | | |
| | 28 = Total Cover | | |
| 50% of total cover: 14 | 20% of total cover: 5.6 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 3 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 3 = Total Cover | | |
| 50% of total cover: 1.5 | 20% of total cover: 0.6 | | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Arundinaria tecta | 30 | Yes | FACW |
| 2. Clethra alnifolia | 15 | No | FACW |
| 3. Microstegium vimineum | 40 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 85 = Total Cover | | |
| 50% of total cover: 42.5 | 20% of total cover: 17 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vitis rotundifolia | 20 | Yes | FAC |
| 2. Toxicodendron radicans | 5 | No | FAC |
| 3. Bignonia capreolata | 5 | No | FAC |
| 4. Lonicera japonica | 2 | No | FACU |
| 5. Parthenocissus quinquefolia | 5 | No | FACU |
| | 37 = Total Cover | | |
| 50% of total cover: 18.5 | 20% of total cover: 7.4 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | | x 1 = | |
| FACW species | | x 2 = | |
| FAC species | | x 3 = | |
| FACU species | | x 4 = | |
| UPL species | | x 5 = | |
| Column Totals: | 0 (A) | | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. Hydrophytic vegetation is prsent at DPG.

**SOIL**

Sampling Point: DPG

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | silt loam | |
| 6-10 | 10YR 3/2 | 100 | | | | | clay loam | |
| 10-18 | 10YR 3/2 | 97 | 10YR4 4/4 | 3 | | | clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ✓ Depleted Below Dark Surface (A11)
- ✓ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ____________

Depth (inches): ____________

**Hydric Soil Present?** **Yes** ☑ **No** ☐

Remarks: Hydric soil indicator thick dark surface met. Hydric soil is present at DPG.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/13/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPH

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Coastal flat Local relief (concave, convex, none): ______ Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.741535°N Long: 76.523510°W Datum: ______

Soil Map Unit Name: 19-Rains fine sandy loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ No ___ | |
| Wetland Hydrology Present? | Yes ✓ No ___ | |

Remarks:

There is hydrophytic vegetation, hydric soil, and wetland hydrology present at DPH. DPH is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ✓ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ___ | No ___ | Depth (inches): ______ | |
| Water Table Present? | Yes ___ | No ___ | Depth (inches): <18 | |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ___ | Depth (inches): <18 | **Wetland Hydrology Present?** Yes ✓ No ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicators water-stained leaves and morphological adaptions of shallow rooting was observed, as well as secondary indicators geomorphic position and FAC-Neutral test. Wetland hydrology is present at DPH.

**VEGETATION (Five Strata) –** Use scientific names of plants.

Sampling Point: DPH

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 80 | Yes | FAC |
| 2. Quercus michauxii | 10 | No | FACW |
| 3. Liquidambar styraciflua | 25 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 115 = Total Cover | | |
| 50% of total cover: 57.5 | 20% of total cover: 23 | | |

| Sapling Stratum (Plot size: appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 30 | Yes | FAC |
| 2. Quercus laurifolia | 4 | No | FACW |
| 3. Liquidambar styraciflua | 15 | Yes | FAC |
| 4. Magnolia virginiana | 6 | No | FACW |
| 5. | | | |
| 6. | | | |
| | 55 = Total Cover | | |
| 50% of total cover: 27.5 | 20% of total cover: 11 | | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 3 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 3 = Total Cover | | |
| 50% of total cover: 1.5 | 20% of total cover: 0.6 | | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Arundinaria tecta | 20 | Yes | FACW |
| 2. Boehmeria cylindrica | 1 | No | FACW |
| 3. Rubus hispidus | 3 | No | FACW |
| 4. Carex spp | 10 | Yes | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 34 = Total Cover | | |
| 50% of total cover: 17 | 20% of total cover: 6.8 | | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vitis rotundifolia | 20 | Yes | FAC |
| 2. Toxicodendron radicans | 3 | No | FAC |
| 3. Smilax rotundifolia | 25 | Yes | FAC |
| 4. Bignonia capreolata | 3 | No | FAC |
| 5. Parthenocissus quinquefolia | 2 | No | FACU |
| | 53 = Total Cover | | |
| 50% of total cover: 26.5 | 20% of total cover: 10.6 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominance test is met. Hydrophytic vegetation is present at DPH.

## SOIL

Sampling Point: DPH

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | Silt loam | |
| 6-18 | 10YR 3/2 | 98 | 10YR 5/6 | 2 | | | clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ___

Depth (inches): ___

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator redox dark surface is met. Hydric soil is present at DPH.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/13/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPI

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): ______ Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.743291°N Long: 76.517575°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** | **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | | |
| Wetland Hydrology Present? | Yes ✓ No ___ | | |

Remarks:

Hydric soil, hydrophytic vegetation, and wetland hydrology are present at DPI. DPI is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ✓ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ___ | No ___ | Depth (inches): ___ | |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): -10 | |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): -6 | **Wetland Hydrology Present? Yes** ✓ **No** ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary indicators saturation, water-stained leaves, and oxidized rhizospheres are present at DPI. Secondary indicators geomorphic position, FAC-Neutral test, and sphagnum moss are present at DPI. Wetland hydrology is present at DPI.

**VEGETATION (Five Strata) –** Use scientific names of plants. Sampling Point: DPI

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Pinus taeda | 40 | Yes | FAC |
| 2. Liquidambar styraciflua | 10 | No | FAC |
| 3. Acer rubrum | 40 | Yes | FAC |
| 4. Nyssa sylvatica | 5 | No | FAC |
| 5. Magnolia virginiana | 10 | No | FACW |
| 6. | | | |
| | 105 | = Total Cover | |

50% of total cover: 52.5 20% of total cover: 21

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 15 | Yes | FAC |
| 2. Nyssa sylvatica | 2 | No | FAC |
| 3. Liquidambar styraciflua | 10 | Yes | FAC |
| 4. Liriodendron tulipifera | 3 | No | FACU |
| 5. | | | |
| 6. | | | |
| | 30 | = Total Cover | |

50% of total cover: 15 20% of total cover: 6

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vaccinium corymbosum | 10 | Yes | FACW |
| 2. Ilex opaca | 2 | No | FAC |
| 3. Magnolia virginiana | 2 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 14 | = Total Cover | |

50% of total cover: 7 20% of total cover: 2.8

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Clethra alnifolia | 3 | No | FACW |
| 2. Osmundastrum cinnamomeum | 30 | Yes | FACW |
| 3. Asimina triloba | 5 | No | FAC |
| 4. Acer rubrum | 3 | No | FAC |
| 5. Woodwardia areolata | 5 | No | OBL |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 46 | = Total Cover | |

50% of total cover: 23 20% of total cover: 9.2

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Smilax rotundifolia | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | = Total Cover | |

50% of total cover: 2.5 20% of total cover: 1

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. Hydrophytic vegetaion is present at DPI.

## SOIL

Sampling Point: DPI

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 3/1 | | | | | | silt loam | oxidized rhizospheres |
| 10+ | 10YR 5/1 | | | | | | clay loam | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ___

Depth (inches): ___

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:
Hydric soil indicator depleted matrix is present, hydric soil is present at DPI.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/14/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPJ

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): ______ Slope (%): 0-2

Subregion (LRR or MLRA): LLR-T Lat: 36.743822°N Long: 76.524273°W Datum: ______

Soil Map Unit Name: 19-Rains fine sandy loam NWI classification: PFO4/1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ___ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ No ___ | |
| Wetland Hydrology Present? | Yes ✓ No ___ | |

Remarks:

Hydrophytic vegetation, wetland hyrology, and hydric soil are present at DPJ. DPJ is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ___ | No ___ | Depth (inches): ______ | |
| Water Table Present? | Yes ___ | No ___ | Depth (inches): <18 | |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ___ | Depth (inches): <18 | **Wetland Hydrology Present? Yes** ✓ **No** ___ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Secondary hydrology indicators geomorphic position and FAC-Neutral test are present at DPJ. Wetland hydrology is present at DPJ.

**VEGETATION (Five Strata) –** Use scientific names of plants. Sampling Point: DPJ

**Tree Stratum** (Plot size: App. 30ft radius)

| | Species | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | Quercus michauxii | 25 | Yes | FACW |
| 2. | Quercus nigra | 25 | Yes | FAC |
| 3. | Liquidambar styraciflua | 10 | No | FAC |
| 4. | Acer rubrum | 10 | No | FAC |
| 5. | Pinus taeda | 15 | No | FAC |
| 6. | Liriodendron tulipifera | 15 | No | FACU |
| | = Total Cover | 100 | | |

50% of total cover: 50 20% of total cover: 20

**Sapling Stratum** (Plot size: Appr 30 ft radius)

| | Species | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | Ilex opaca | 10 | Yes | FAC |
| 2. | Magnolia virginiana | 10 | Yes | FACW |
| 3. | Quercus michauxii | 3 | No | FACW |
| 4. | Liquidambar styraciflua | 10 | Yes | FAC |
| 5. | | | | |
| 6. | | | | |
| | = Total Cover | 33 | | |

50% of total cover: 16.5 20% of total cover: 6.6

**Shrub Stratum** (Plot size: App. 30ft radius)

| | Species | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| | = Total Cover | 0 | | |

50% of total cover: ______ 20% of total cover: ______

**Herb Stratum** (Plot size: App. 30ft radius)

| | Species | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | Asimina triloba | 5 | No | FAC |
| 2. | Leucothoe fontanesiana | 40 | Yes | FACW |
| 3. | Magnolia virginiana | 2 | No | FACW |
| 4. | Ilex opaca | 2 | No | FAC |
| 5. | Osmundastrum cinnamomeum | 2 | No | FACW |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| | = Total Cover | 51 | | |

50% of total cover: 25.5 20% of total cover: 10.2

**Woody Vine Stratum** (Plot size: App. 30ft radius)

| | Species | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | Bignonia capreolata | 5 | Yes | FAC |
| 2. | Smilax rotundifolia | 5 | Yes | FAC |
| 3. | Vitis rotundifolia | 10 | Yes | FAC |
| 4. | | | | |
| 5. | | | | |
| | = Total Cover | 20 | | |

50% of total cover: 10 20% of total cover: 4

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A = ______

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominance test is met. Hydrophytic vegetation is present at DPJ.

## SOIL

Sampling Point: DPJ

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-5 | 10YR 3/1 | 98 | 10YR 4/3 | 2 | C | M | silt loam | |
| 5-12 | 10YR 3/2 | 98 | 10YR 4/3 | 2 | C | M | silt loam | |
| 12-18 | 10YR 4/1 | 98 | 10YR 4/4 | 2 | C | M | sandy clay loam | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
✓ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** **Yes** ☑ **No** ☐

Remarks:

Hydric soil indicator redox dark surface is met. Hydric soil is present at DPJ.

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/14/2024

Applicant/Owner: SPSA State: VA Sampling Point: DPK

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ______

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): ______ Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.744185°N Long: 76.522257°W Datum: ______

Soil Map Unit Name: 25-Torhunta loam NWI classification: PFO4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ______ | **Is the Sampled Area within a Wetland?** | **Yes** ✓ **No** ______ |
| Hydric Soil Present? | Yes ✓ No ______ | | |
| Wetland Hydrology Present? | Yes ✓ No ______ | | |

Remarks:

Hydrophytic vegetation, wetland hydrology, and hydric soil are present at DPK. DPK is measured within a wetland.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ______ No ______ | Depth (inches): ______ | |
| Water Table Present? | Yes ______ No ______ | Depth (inches): <18 | |
| Saturation Present? (includes capillary fringe) | Yes ______ No ______ | Depth (inches): <18 | **Wetland Hydrology Present? Yes** ✓ **No** ______ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Secondary hydrology indicators geomorphic position and FAC-Neutral test are present at DPK. Wetland hydrology is present at DPK.

**VEGETATION (Five Strata) –** Use scientific names of plants.

Sampling Point: DPK

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 40 | Yes | FAC |
| 2. Liquidambar styraciflua | 10 | No | FAC |
| 3. Ilex opaca | 15 | No | FAC |
| 4. Pinus taeda | 50 | Yes | FAC |
| 5. | | | |
| 6. | | | |
| | 115 | = Total Cover | |
| 50% of total cover: 57.5 | | 20% of total cover: 23 | |

| Sapling Stratum (Plot size: Appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus michauxii | 5 | No | FACW |
| 2. Ilex opaca | 15 | Yes | FAC |
| 3. Liquidambar styraciflua | 15 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 35 | = Total Cover | |
| 50% of total cover: 17.5 | | 20% of total cover: 7 | |

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 10 | Yes | FAC |
| 2. Vaccinium corymbosum | 10 | Yes | FACW |
| 3. Liquidambar styraciflua | 5 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 25 | = Total Cover | |
| 50% of total cover: 12.5 | | 20% of total cover: 5 | |

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Leucothoe fontanesiana | 25 | Yes | FACW |
| 2. Asimina triloba | 2 | No | FAC |
| 3. Osmundastrum cinnamomeum | 5 | No | FACW |
| 4. Clethra alnifolia | 5 | No | FACW |
| 5. Magnolia virginiana | 2 | No | FACW |
| 6. Persea borbonia | 2 | No | FACW |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 41 | = Total Cover | |
| 50% of total cover: 20.5 | | 20% of total cover: 8.2 | |

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Bignonia capreolata | 5 | Yes | FAC |
| 2. Vitis rotundifolia | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 15 | = Total Cover | |
| 50% of total cover: 7.5 | | 20% of total cover: 3 | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 10 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

The dominance test is met. Hydrophytic vegatation is present at DPK.

## SOIL

Sampling Point: DPK

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-5 | 10YR 3/1 | 98 | 10YR 4/3 | 2 | | | silt loam | |
| 5-12 | 10YR 3/2 | 98 | 10YR 4/3 | 2 | | | silt loam | |
| 12-18 | 10YR 4/1 | 98 | 10YR 4/4 | 2 | | | sandy clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

Hydric soil indicator redox dark surface is met. Hydric soil present at DPK.

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Magnoila Springs City/County: Suffolk Sampling Date: 6/14

Applicant/Owner: SPSA State: VA Sampling Point: DPL

Investigator(s): Bay Environmental, Inc.; CJC and KP Section, Township, Range: ____

Landform (hillslope, terrace, etc.): coastal flat Local relief (concave, convex, none): ____ Slope (%): 0

Subregion (LRR or MLRA): LLR-T Lat: 36.745299°N Long: 76.519034°W Datum: ____

Soil Map Unit Name: 19-Rains fine sandy loam NWI classification: PFO1ED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ____ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ____ |
| Hydric Soil Present? | Yes ✓ No ____ | |
| Wetland Hydrology Present? | Yes ✓ No ____ | |

Remarks:

Hydrophytic vegetation, wetland hydrology, and hydric soil are present at DPL. DPL is sampled within a wetland.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres along Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ___ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ✓ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ No ____ | Depth (inches): ____ | |
| Water Table Present? | Yes ____ No ____ | Depth (inches): <18 | |
| Saturation Present? (includes capillary fringe) | Yes ____ No ____ | Depth (inches): <18 | **Wetland Hydrology Present? Yes** ✓ **No** ____ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Secondary hydrology indicators geomorphic position, sphagnum moss, and FAC-Neutral test are present at DPL. Wetland hydrology is present at DPL.

## VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: DPL

| Tree Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus laurifolia | 15 | No | FACW |
| 2. Liriodendron tulipifera | 36 | Yes | FACU |
| 3. Acer rubrum | 30 | Yes | FAC |
| 4. Pinus taeda | 20 | No | FAC |
| 5. Liquidambar styraciflua | 10 | No | FAC |
| 6. | | | |
| | 111 | = Total Cover | |

50% of total cover: 55.5 20% of total cover: 22.2

| Sapling Stratum (Plot size: appr 30 ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 30 | Yes | FAC |
| 2. Quercus nigra | 2 | No | FAC |
| 3. Magnolia virginiana | 10 | Yes | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 42 | = Total Cover | |

50% of total cover: 21 20% of total cover: 8.4

| Shrub Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ilex opaca | 2 | No | FAC |
| 2. Clethra alnifolia | 30 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| | 32 | = Total Cover | |

50% of total cover: 16 20% of total cover: 6.4

| Herb Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Clethra alnifolia | 30 | Yes | FACW |
| 2. Osmunda spectabilis | 2 | No | OBL |
| 3. Arundinaria tecta | 15 | Yes | FACW |
| 4. Osmundastrum cinnamomeum | 2 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 49 | = Total Cover | |

50% of total cover: 24.5 20% of total cover: 9.8

| Woody Vine Stratum (Plot size: App. 30ft radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Smilax rotundifolia | 10 | Yes | FAC |
| 2. Vitis rotundifolia | 10 | Yes | FAC |
| 3. Smilax laurifolia | 5 | Yes | FACW |
| 4. | | | |
| 5. | | | |
| | 25 | = Total Cover | |

50% of total cover: 12.5 20% of total cover: 5

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 10 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | | x 1 = |
| FACW species | | x 2 = |
| FAC species | | x 3 = |
| FACU species | | x 4 = |
| UPL species | | x 5 = |
| Column Totals: | 0 (A) | 0 (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Dominace test is met. Hydrophytic vegetation is present at DPL.

**SOIL**

Sampling Point: DPL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 3/1 | 100 | | | | | silt loam | |
| 8-18 | 10YR 5/1 | 95 | 10YR 5/6 | 5 | C | M | sandy loam | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ✓ No ☐

Remarks:
Hydric soil indicator depleted matrix is met at DPL. Hydric soil is present at DPL.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

December 17, 2024

**PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)**

Special Projects Regulatory Section
NAO-2024-01854 (North Ditch)

Chester Ehrenzeller
Magnolia Springs Inc.
1710 Dey Cove Road
Virginia Beach, VA 23454

Dear Mr. Ehrenzeller:

This letter is in regard to your request for a preliminary jurisdictional determination of the aquatic resources for 291.48 acres known as Magnolia Springs, south of Route 58 in Suffolk, VA (Tax Parcel Numbers: 27D*28 and 36*27).

The map entitled "Figure 2: Site Conditions Map Wetland Delineation Magnolia Springs Route 58 Tracts Suffolk, Virginia TPINS: 36*27 and 27D*28" dated 6/19/2024 by Bay Environmental, Inc. (copy enclosed) provides the locations of the aquatic resources on the property referenced above. The 291.48-acre study area contains approximately 290.03 acres of nontidal wetlands and 0.71 acres of open water ditch.

These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. This site also contains aquatic resources with an ordinary high water mark (or high tide line). This preliminary jurisdictional determination and associated aquatic resource delineation map may be submitted with a permit application. This letter is not confirming the Cowardin classifications of these aquatic resources.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email (Melissa.a.nash@usace.army.mil) or by standard mail to 803 Front Street Norfolk, VA 23510

If you have any questions, please contact me either by telephone at (757) 201-7489 or by email at melissa.a.nash@usace.army.mil .

Sincerely,

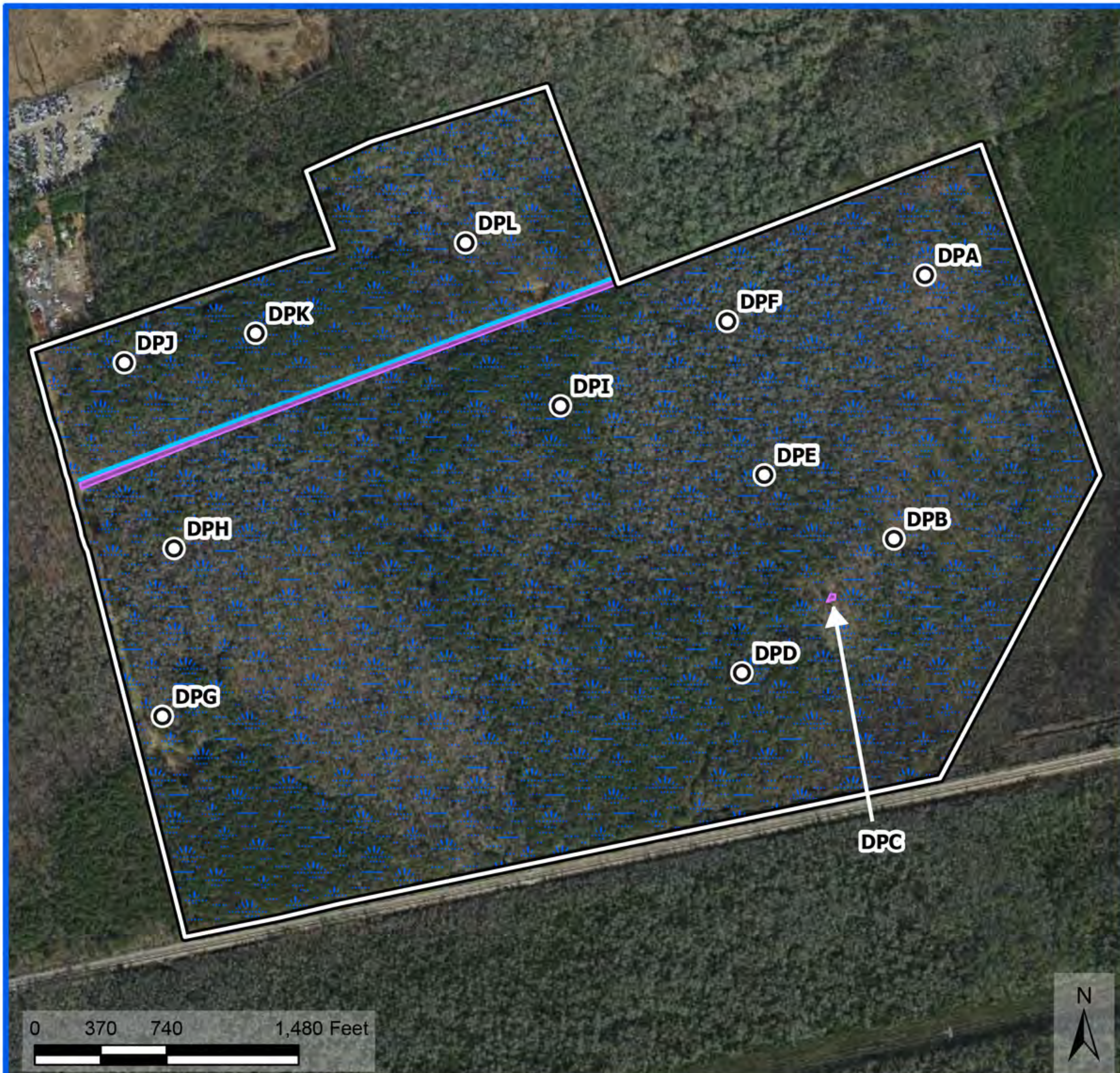
Melissa A Nash

Melissa Nash
Special Projects
Regulatory Section

Enclosure(s):

cc:

Jim Cahoon, Bay Environmental, Inc.
Dennis Bagley, SPSA




Study Area ~291.48 acres

Data Point

PUB Wetlands ~0.71 acres (~2,581.70ft)

PFO Wetlands ~290.03 acres

Uplands ~1.44 acres

NOTE: This map is preliminary and has not been reviewed by the U.S. Army Corps of Engineers
Source: State of Virginia 2021 Orthophotographs; Data collected using Trimble R1 GPS

Bay #:24-248-01
Date: 6/19/2024
Prepared by: KEP
Reviewed by: CJC
PWD #: 3402000100

Figure 2: Site Conditions Map
Wetland Delineation
Magnolia Springs Route 58 Tracts
Suffolk, Virginia
TPINS: 36*27 and 27D*28

BAY ENVIRONMENTAL, INC.
Environmental Consulting Services

## BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR PJD:** 12-17-2024.

B. **NAME AND ADDRESS OF PERSON REQUESTING PJD:**
Chester Ehrenzeller
Magnolia Springs, Inc.
1710 Dey Cove Road
Virginia Beach, VA 23454

Dennis Bagley
SPSA
1 Bob Foeller Drive
Suffolk, Virginia 23434

C. **DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO, Magnolia Springs Suffolk, NAO-2024-01854

**D. PROJECT LOCATION AND BACKGROUND INFORMATION:**
**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: VA County/Parish/Borough: Suffolk city City:
Center coordinates of site (lat/long in degree decimal format):
Lat.: 36.744902° Long.: -76.511979°
Universal Transverse Mercator: 18
Name of nearest waterbody: Shingle Creek

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s): 6-26-2024

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

| Site Number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| Magnolia wetlands | 36.74442 | -76.514234 | 290.03 acres | Wetland | Section 404 |
| North Ditch | 36.745399 | -76.514809 | 0.71 acres | Non-wetland waters | Section 404 |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD or no JD whatsoever, which do not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the USACE has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD or reliance on no JD whatsoever; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of USACE permit authorization based on a PJD or no JD whatsoever constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the.JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the USACE will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (*check all that apply*)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

_X__ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _"Figure 2: Site Conditions Map Wetland Delineation Magnolia Springs Route 58 Tracts Suffolk, Virginia TPINS: 36*27 and 27D*28" dated 6/19/2024 by Bay Environmental, Inc. _.
_X__ Data sheets prepared/submitted by or on behalf of the PJD requestor.
__X_ Office concurs with data sheets/delineation report.
___ Office does not concur with data sheets/delineation report. Rationale: ____________________.
___ Data sheets prepared by the Corps: ____________________________.
___ Corps navigable waters' study: ____________________________.
___ U.S. Geological Survey Hydrologic Atlas: ____________________________.

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

___ USGS NHD data.
___ USGS 8 and 12 digit HUC maps.

_X__ U.S. Geological Survey map(s). Cite scale & quad name: ESRI Online USA Topo Maps USGS Suffolk, VA Topographic Quadrangle _.

_X__ USDA Natural Resources Conservation Service Soil Survey. Citation: _NRCS Soil Survey Shapefile for Suffolk, VA.

_X__ National wetlands inventory map(s). Cite name: _2021 USFWS Online NWI ____.

___ State/Local Wetland Inventory map(s): ______________________________.

___ FEMA/FIRM maps: ______________________________

___ 100-year Floodplain Elevation is: ________________. (National Geodetic Vertical Datum of 1929)

_X__ Photographs: _X__ Aerial (*Name & Date*): _Google Earth____.
___ or _X__ Other (*Name & Date*): __LiDAR____________.

___ Previous determination(s). File no. and date of response letter: ____________________________.

_X__ Other information (*please specify*): _Photos in report from June 2024 ___.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the USACE and should not be relied upon for later jurisdictional determinations.**

| Name of Regulatory Staff Member Completing PJD | Date 12-17-2024 | Signature of Regulatory Staff Member Completing PJD |
|---|---|---|
| | | |
| Name of Person Requesting PJD | Date | Signature of Person Requesting PJD (*REQUIRED, unless obtaining the Signature is Impracticable* |

Melissa A Nash
_______________________________
Signature of Regulatory Staff Member Completing PJD

_______________________________
Signature of Person Requesting PJD (*REQUIRED, unless obtaining the signature is impracticable*)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL**

| Applicant: Magnolia Springs Inc. | | File Number: NAO-2024-01854 | Date: 12-17-2024 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| | APPROVED JURISDICTIONAL DETERMINATION | | D |
| X | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

| SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT | | |
|---|---|---|
| REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.) | | |
| ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record. | | |
| POINT OF CONTACT FOR QUESTIONS OR INFORMATION: | | |
| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact:<br>Mr. Andrew Dangler<br>Regulatory Appeals Review Officer<br>U.S. Army Corps of Engineers<br>North Atlantic Division – Fort Hamilton<br>301 John Warren Avenue – First Floor<br>Brooklyn, New York 11252-6700<br>Mobile: (518) 487-0215 | |
| RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations. | | |
| Signature of appellant or agent. | Date: | Telephone number: |

# H

Preliminary Jurisdictional Determination Application

Additional Preservation Area

November 15, 2024

Melissa Nash
US Army Corps of Engineers
Norfolk District Regulatory Office
801 Front Street
Norfolk, Virginia 23510

Re: Preliminary Jurisdictional Determination Request for SPSA- Additional Preservation Area

Dear Ms. Nash,

Southeastern Public Service Authority (SPSA) is proposing to preserve an additional 18.4 acres into their mitigation plan for the impacts associated with the Regional Landfill Expansion in Suffolk, Virginia. HDR performed a desktop review and field reconnaissance for the Study Area and described the findings in the narrative as follows.

# Desktop Analysis

HDR conducted a desktop review of publicly available data from federal and state agencies prior to engaging in field reconnaissance surveys. The following sources were consulted as part of this analysis

- Federal Emergency Management Agency (FEMA) Map Service Center (https://msc.fema.gov/portal)
- Natural Resources Conservation Service (NRCS) National Hydric Soils List (https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/)
- U.S. Geological Survey (USGS) National Hydrography Dataset (http://nhd.usgs.gov/)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (https://fws.gov/wetlands)
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey for City of Suffolk (https://websoilsurvey.nrcs.usda.gov/app/)
- U.S. Geological Service (USGS) Topographic Quadrangles (https://ngmdb.usgs.gov/topoview/viewer/#4/39.98/-100.02)

## USDA-NRCS Soils

The soil investigation and observations for the Study Area involved auguring to at least 12 inches or refusal. The following reference documents were used to identify soils within the Study Area: Munsell Soil Color Charts (2009), USDA-NRCS on-line web soil survey (USDA-NRCS, 2019), and the hydric soils lists for City of Suffolk (USDA-NRCS, 2019).



4880 Sadler Rd Suite 100
Glen Allen, VA 23060

The NRCS Web Soil Survey identified five (5) soil units within the Study Area (Appendix A, Figure 2). The NRCS's National Hydric Soils List classified three (3) of the soils as hydric and two (2) as non-hydric. A summary of the soil types located within the Study Area is provided in Table 1.

**Table 1. NRCS Soil Types Located within the Cypress Swamp Preservation Area**

| Map Unit Symbol | Map Unit Name | Drainage Class | Hydric Rating | Acres in Study Area |
|---|---|---|---|---|
| **City of Suffolk** | | | | |
| 10B | Kalmia fine sandy loam, wet substratum, 2 to 6 percent slopes | Well drained | Non-hydric | 0.3 |
| 13 | Levy silty clay loam | Very poorly drained | Hydric | 13.5 |
| 23B | Tetotum fine sandy loam, 2 to 6 percent slopes | Moderately well drained | Non-hydric | 1.1 |
| 24 | Tomotley loam | Poorly drained | Hydric | 2.4 |
| 26 | Udorthents, loamy | Somewhat excessively to well-drained | Hydric | 1.1 |
| | | | Total | 18.4 |

## National Wetland Inventory

Wetland types were classified using the Cowardin System nomenclature outlined in Wetlands and Deep-Water Habitats of the United States (Cowardin et al., 1979). The National Wetland Inventory (NWI) identifies palustrine forested wetlands (PFO1Cd and PFO1Ed) within the majority of the Study Area NWI also shows one riverine habitat (R5UBH) within the Study Area (Appendix A, Figure 2). Table 2 lists the Cowardin subclasses identified within the Study Area.

**Table 2: Potential NWI Wetlands within Cypress Swamp Preservation Area**

| Subclass | Definition | Count in Study Area |
|---|---|---|
| **PFO1Ed** | (P) Palustrine, (FO) Forested, (1) Broad-Leaved Deciduous, (E) Seasonally Flooded/Saturated, (d) Partially Drained/Ditched | **1** |
| **PFO1Cd** | (P) Palustrine, (FO) Forested, (1) Broad-Leaved Deciduous, (C) Seasonally Flooded, (d) Partially Drained/Ditched | **1** |
| **R5UBH** | (R) Riverine, (5) Unknown Perennial, (UB) Unconsolidated Bottom, (H) Permanently Flooded | **1** |

## Climatic Data

Weather data for the Study Area was obtained from the Norfolk International Airport Station located approximately 17 miles northeast of the Study Area (Weather Underground 2022). Overall daily temperatures were higher compared to the historic monthly averages of 72.3º F for the high and 55.1º F for the low. The weather at the time of the investigation on Oct 21st was warmer than normal in the afternoon with a high of 77º F. On October 24th the high was 73º F, which was slightly warmer than normal. Conditions on both days were mostly sunny. The site was very dry during both visits. Climatic conditions for this location could not be obtained through the Antecedent Precipitation Tool due to the impacts of Hurricane Helene. According to NOAA's National Integrated Drought Information System, Suffolk County was considered to be in an abnormally dry period

## FEMA Floodplains

HDR reviewed the FEMA Map Service Center National Flood Hazard Layer (NFHL) and found that the majority of the Study Area falls within the 100-Year Flood Zone (Zone AE). The exception is the downstream portion of Burnett's Mill Creek and a small section of the northeast corner of the Study Area (Zone X) (Flood Insurance Rate Map # 5101560119E, effective date August 3, 2015). The FEMA flood hazard areas are depicted in Appendix A, Figure 2.

## HUC Watersheds

The Study Area is located within the Hampton Roads Sub-basin (HUC 02080208), Nansemond River Watershed (HUC 0208020801) and Nansemond River-Cedar Lake Sub watershed (HUC 020802080105) (USGS 2018c).

# Field Reconnaissance

On October 21st and 24th, 2024, HDR environmental scientists surveyed the Study Area for wetlands and waterways regulated under Sections 404/401 of the Clean Water Act. This field investigation was conducted according to the methodologies and guidance described in the US Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual (Manual) (USACE 1987), USACE Post-Rapanos guidance, and the Atlantic Gulf and Coastal Plain Regional Supplement (Version 2.0) (USACE 2010). Jurisdictional features were delineated (flagged in the field) and collected using Field Maps for ArcGIS utilizing Trimble Catalyst handheld GPS receivers capable of sub-meter accuracy. Collected points were uploaded and overlaid on the aerial photography utilizing ESRI ArcGIS Online and ArcGIS Pro mapping products to produce the wetland maps provided within Appendix A. Site information was recorded and photographs included in Appendices B and C, respectively. The following section describes the site conditions, and the presence of wetlands and waterways encountered within the Study Area.

## Jurisdictional Waterways

One perennial stream, Burnett's Mill Creek (BMC1) was identified within the Study Area during the delineation. BMC1 flows through a floodplain cypress swamp. As it flows through the swamp, the stream forms a mosaic of braided channels, ponds, and shallow depressions, which are interspersed with dense stands of bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) in the tree stratum. At the time of the delineation BMC1 was approximately 2-3 ft deep on average and had an average width of 18 ft. Table 3 describes the delineated waterway within the Study Area.

**Table 3. Summary of Delineated Waterway within the Study Area**

| REACH ID | COWARDIAN CLASSIFICATION | LATITUDE (decimal degrees) | LONGITUDE (decimal degrees) | WIDTH (feet) | LENGTH (linear feet) |
|---|---|---|---|---|---|
| BMC1 | R3 | 36.7544 | -76.5229 | 18 | 1,533 |

## Jurisdictional Wetlands

Two jurisdictional wetland systems were identified within the Study Area. The larger wetland system consisted of two wetland types: bald cypress-tupelo swamp and non-riverine flatwood. This system extends outside of the Study area into the previously delineate site west of the Study Area. Three data points were taken throughout the bald cypress-tupelo swamp and non-riverine flatwood system to represent the varying characteristics of vegetation, soils, and hydrology within the Study Area. Datapoints CS1 and CS2 were palustrine forested (PFO) wetland datapoints taken in the bald cypress – tupelo swamp portion. The portion of this wetland runs adjacent to Burnett's Mill Creek was relatively dry due to the climatic conditions. Drift deposits, drainage patterns and crayfish burrows were observed as hydrology indicators for CS1 during the time of the survey. Vegetation for CS1 consisted of red maple (*Acer rubrum*), bald cypress, and water tupelo in both the tree and sapling/shrub strata, while lizard's tail (*Saururus cernuus*) and switch cane (*Arundinaria tecta*) were preset in the herb stratum. Soils for CS1 were dark (10YR 4/1, 10YR 5/1) with fine sandy alluvial deposits and displayed a depleted matrix. Datapoint CS2 was taken at the most upstream portion of the bald cypress tupelo swamp near the southeastern boundary of the Study Area. CS2 contained gray-dark gray hydric soils (10YR 6/1, 7.5YR 3/1) with redox concentrations in the matrix. Like CS1, CS2 was dominated by red maple (*Acer rubrum*) and bald cypress (*Taxodium distichum*) in the tree layer, with switch cane and lizard's tail observed in the herb layer. Hydrology at CS2 consisted of water marks and water-stained leaves, as well as moss trim lines and crayfish burrows. Datapoint W1, the third datapoint in this wetland system and also PFO, was characteristic of the non-riverine flatwood system. Hydrology for W1 consisted of drainage patterns, crayfish burrows, and geomorphic position. American sycamore (*Platanus occidentalis*) was the dominant species in the tree and shrub strata, while red maple and sweet gum (*Liquidambar styraciflua)* were also present. Soils for W1 were dark (10YR 4/2, 10YR 4/1, 10YR 5/2) and the matrix was depleted.

The second and smaller jurisdictional wetland system was adjacent to the larger bald cypress-tupelo swamp and non-riverine flatwood system, however no hydrological connection between the two was evident with the Study Area. Wetland JW1 exhibited non-riverine flatwood characteristics and consisted of both PFO and palustrine emergent (PEM) wetland. JW1 had loblolly pine (*Pinus taeda*) and sweet gum in the tree and shrub strata, and the invasive Japanese stitlgrass (*Microstegium vimineum*) was dominant in the herb stratum. Soils for JW1 were gray clay loam and had high redox concentrations.

**Table 4. Summary of Delineated Wetlands within the Study Area**

| WETLAND ID | COWARDIAN CLASSIFICATION | LATITUDE (decimal degrees) | LONGITUDE (decimal degrees) | AREA (acres) |
|---|---|---|---|---|
| CS1 | PFO | 36.7644 | -76.5132 | |
| CS2 | PFO | 36.7543 | -76.5226 | 9.67 |
| W1 | PFO | 36.7574 | -76.5297 | |
| JW1 | PEM | 36.7538 | -76.5238 | 0.11 |
| JW1 | PFO | 36.75292 | -76.5230 | 0.07 |

# Conclusion

During the October 21st and 24th delineation of the 18.4-acre Study Area, 9.74 acres of PFO, 0.11 acres of PEM, 3,217 linear feet of waterways, and 8.55 acres of uplands were determined to be present. On the southeast boundary of the site, HDR environmental scientists observed additional areas that did not meet all three of the wetland indicators. Vegetation in these upland areas was hydrophytic, but hydric soils and/or wetland hydrology were absent.

Sincerely,

**HDR, Inc**.

Jake Irvin

*Environmental Scientist*

Enclosures: Pre-Application Request Form
Appendix A: Figures
Appendix B: Datasheets
Appendix C: Photographs

# NORFOLK DISTRICT REGULATORY OFFICE
# PRE-APPLICATION AND/OR JURISDICTIONAL WATERS DETERMINATION REQUEST FORM

This form is used when you want to determine if areas on your property fall under regulatory requirements of the U.S. Army Corps of Engineers (USACE). Please supply the following information and supporting documents described below. This form can be filled out online and/or printed and then mailed, faxed, or e-mailed to the Norfolk District. Submitting this request authorizes the US Army Corps of Engineers to field inspect the property site, if necessary, to help in the determination process. **THIS FORM MUST BE SIGNED BY THE PROPERTY OWNER TO BE CONSIDERED A FORMAL REQUEST.**

The printed form and supporting documents should be mailed to:

U.S. Army Corps of Engineers, Norfolk District
Regulatory Branch
803 Front Street
Norfolk, Virginia 23510-1096

Or faxed to (757) 201-7678

Or sent via e-mail to: CENAO.REG_ROD@usace.army.mil

Additional information on the Regulatory Program is available on our website at:
http://www.nao.usace.army.mil/
Please contact us at 757-201-7652 if you need any assistance with filling out this form.

---

**Location and Information about Property to be subject to a Jurisdictional Determination:**

1. Date of Request: 04/16/2019
2. Project Name: SPSA Regional Landfill Cell VIII & IX
3. City or County where property located: Suffolk
4. Address of property and directions (attach a map of the property location and a copy of the property plat): 1 Bob Foeller Drive, Suffolk, VA 23434
5. Coordinates of property (if known): 36.761363, -76.519181
6. Size of property in acres: 217.49 acres
7. Tax Parcel Number / GPIN (if available): 27*28A
8. Name of Nearest Waterway: Burnetts Mill Creek

9. Brief Description of Proposed Activity, Reason for Preapplication Request, and/or Reason for Jurisdictional Waters Determination Request:
The 18.4 acres of cypress swamp and associated wetlands and uplands located adjacent to the SPSA Regional Landfill are being used as preservation area for mitigation in relation to the expansion of said landfill.

10. Has a wetland delineation/determination been completed by a consultant or the Corps on the property previously? ☐ YES ☐ NO ☒ UNKNOWN

If yes, please provide the name of the consultant and/or Corps staff and Corps permit number, if available: N/A

**Property Owner Contact Information:**

Property Owner Name: Henry Strickland
Mailing Address: 723 Woodlake Drive
City: State: Zip: Chesapeake, Virginia, 23320
Daytime Telephone: 757-374-4548
E-mail Address: hstrickland@spsa.com

If the person requesting the Jurisdictional Determination is **NOT** the Property Owner, please also supply the Requestor's contact information here:

Requestor Name: Jake Irvin
Mailing Address: 5228 Valleypointe Pkwy
City: State: Zip: Roanoke, Virginia, 24019
Daytime Telephone: 804-316-7817
E-mail Address: Jake.Irvin@hdrinc.com

Additionally, if you have any of the following information, please include it with your request: wetland delineation map, other relevant maps, drain tile survey, topographic survey, and/or site photographs.

CERTIFICATION: I am hereby requesting a preapplication consultation or jurisdictional waters and/or wetlands determination from the U.S. Army Corps of Engineers, for the property(ies) I have described herein. I agree to allow the duly authorized representatives of the Norfolk District Corps of Engineers and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supercedes and waives that prohibition and grants permission to enter the property despite such posting. I hereby certify that the information contained in the Request for a Jurisdictional Determination is accurate and complete:

Property Owner's Signature

11-18-2024
Date

# A

Figures


HDR

DATA SOURCES: VGIN, DCR, UGSG, City of Suffolk, SPSA, ESRI

PROJECTION: NAD 1983 (2011) State Plane Virginia South FIPS 4502 (US Feet)

NOTE: Boundaries were collected using sub-meter capable Trimble Catalyst and ESRI Field Maps

**DELINEATION MAP**

**SPSA-Potential Preservation Area**

**November 2024**

X:\GIS\PROJECTS\3062_SPSA\103450004_CELL_VIII_AND_IX_MITIGATION\7.2_WORK_IN_PROGRESS\MAP_DOCS\APRX\230327_SPSA_CELLSVIII_IX\230327_SPSA_CELLSVIII_IX_RJW.APRX DATE: 11/11/2024

# National Flood Hazard Layer FIRMette

FEMA

76°32'2"W 36°45'40"N


76°31'24"W 36°45'11"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

*Basemap Imagery Source: USGS National Map 2023*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/6/2024 at 6:25 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

U.S. Fish and Wildlife Service

# National Wetlands Inventory

# Wetlands


November 6, 2024

**Wetlands**

| | | |
|---|---|---|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland | Lake |
| Estuarine and Marine Wetland | Freshwater Forested/Shrub Wetland | Other |
| | Freshwater Pond | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—City of Suffolk, Virginia
(Preservation Area: Cypress Swamp )


Map Scale: 1:5,360 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 250, 500, 1000, 1500

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

**Special Point Features**

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: City of Suffolk, Virginia
Survey Area Data: Version 19, Aug 28, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 18, 2022—May 31, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

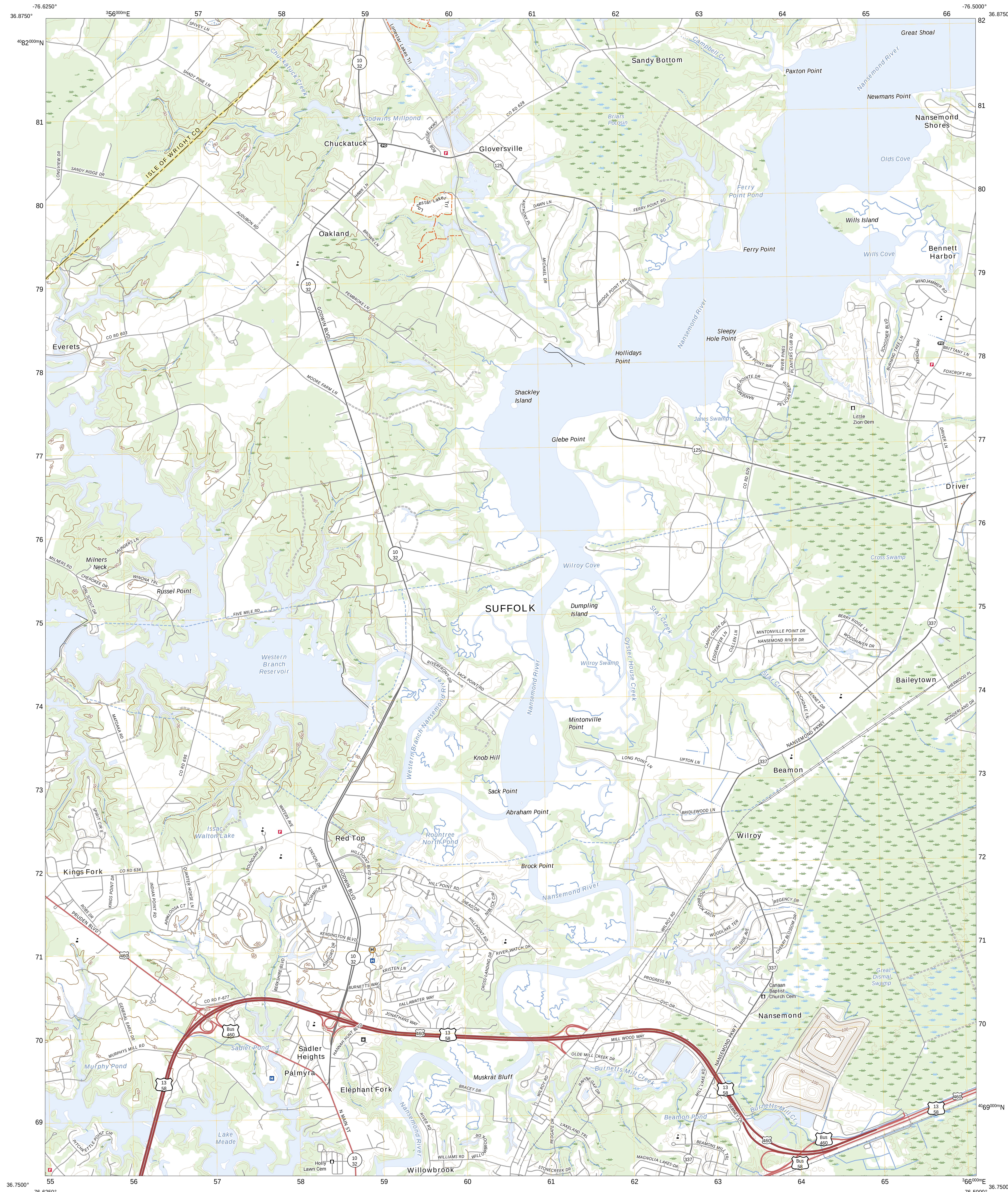
# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 10B | Kalmia fine sandy loam, wet substratum, 2 to 6 percent slopes | 0.3 | 1.6% |
| 13 | Levy silty clay loam | 13.5 | 73.3% |
| 23B | Tetotum fine sandy loam, 2 to 6 percent slopes | 1.1 | 5.8% |
| 24 | Tomotley loam | 2.4 | 13.3% |
| 26 | Udorthents, loamy | 1.1 | 6.0% |
| **Totals for Area of Interest** | | **18.4** | **100.0%** |

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

# CHUCKATUCK QUADRANGLE
VIRGINIA
7.5-MINUTE SERIES




Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 18S

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery........NAIP, August 2018 - August 2018
Roads........U.S. Census Bureau, 2016 - 2016
Names........GNIS, 1979 - 2022
Hydrography........National Hydrography Dataset, 2005 - 2021
Contours........National Elevation Dataset, 2021
Boundaries........Multiple sources; see metadata file 2019 - 2021
Wetlands........FWS National Wetlands Inventory 1989 - 2009

MN
GN
10°37´
189 MILS
0°56´
17 MILS

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
UF
Grid Zone Designation
18S

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard.

VIRGINIA
QUADRANGLE LOCATION

| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | | 5 |
| 6 | 7 | 8 |

1 Smithfield
2 Benns Church
3 Newport News South
4 Windsor
5 Bowers Hill
6 Buckhorn
7 Suffolk
8 Lake Drummond NW

ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

CHUCKATUCK, VA
2022

NSN. 7643016400619
NGA REF NO. USGSX24K8698

# B

Data Sheets

## NC DWQ Stream Identification Form Version 4.11

**BMC1**

| | | |
|---|---|---|
| **Date:** 2024-10-24 | **Project/Site:** SPSA | **Latitude:** 36.755216 |
| **Evaluator:** Dickinson S, Austin E. | **County:** Suffolk County | **Longitude:** -76.524139 |
| **Total Points:** 31.25<br>*Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** | **Stream Determination (circle one)**<br>**Ephemeral Intermittent Perennial** | **Other**<br>*e.g. Quad Name:* |

| A. Geomorphology (Subtotal = 11 ) | Absent | Weak | Moderate | Strong |
|---|---|---|---|---|
| 1[a] Continuity of channel bed and bank | 0 | 1 | 2 | 3 |
| 2. Sinuosity of channel along thalweg | 0 | 1 | 2 | 3 |
| 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence | 0 | 1 | 2 | 3 |
| 4. Particle size of stream substrate | 0 | 1 | 2 | 3 |
| 5. Active/relict floodplain | 0 | 1 | 2 | 3 |
| 6. Depositional bars or benches | 0 | 1 | 2 | 3 |
| 7. Recent alluvial deposits | 0 | 1 | 2 | 3 |
| 8. Headcuts | 0 | 1 | 2 | 3 |
| 9. Grade control | 0 | 0.5 | 1 | 1.5 |
| 10. Natural valley | 0 | 0.5 | 1 | 1.5 |
| 11. Second or greater order channel | No = 0 | | Yes = 3 | |

[a] artificial ditches are not rated; see discussions in manual

| B. Hydrology (Subtotal = 8.5 ) | Absent | Weak | Moderate | Strong |
|---|---|---|---|---|
| 12. Presence of Baseflow | 0 | 1 | 2 | 3 |
| 13. Iron oxidizing bacteria | 0 | 1 | 2 | 3 |
| 14. Leaf litter | 1.5 | 1 | 0.5 | 0 |
| 15. Sediment on plants or debris | 0 | 0.5 | 1 | 1.5 |
| 16. Organic debris lines or piles | 0 | 0.5 | 1 | 1.5 |
| 17. Soil-based evidence of high water table? | No = 0 | | Yes = 3 | |

| C. Biology (Subtotal = 11.75 ) | Absent | Weak | Moderate | Strong |
|---|---|---|---|---|
| 18. Fibrous roots in streambed | 3 | 2 | 1 | 0 |
| 19. Rooted upland plants in streambed | 3 | 2 | 1 | 0 |
| 20. Macrobenthos (note diversity and abundance) | 0 | 1 | 2 | 3 |
| 21. Aquatic Mollusks | 0 | 1 | 2 | 3 |
| 22. Fish | 0 | 0.5 | 1 | 1.5 |
| 23. Crayfish | 0 | 0.5 | 1 | 1.5 |
| 24. Amphibians | 0 | 0.5 | 1 | 1.5 |
| 25. Algae | 0 | 0.5 | 1 | 1.5 |
| 26. Wetland plants in streambed | FACW = 0.75 | OBL = 1.5 | Other = 0 | |

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Spsa-cypress swamp City/County: Suffolk County Sampling Date: 2024-10-21

Applicant/Owner: Spsa State: Virginia Sampling Point: Dp-cs-wet

Investigator(s): L. Hues, B.Wilk Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): T 153B Lat: 36.7566304 Long: -76.5297859 Datum: WGS 84

Soil Map Unit Name: 13 - Levy silty clay loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✔ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✔ No ______ | **Is the Sampled Area within a Wetland?** **Yes** ✔ **No** ______ |
| Hydric Soil Present? | Yes ✔ No ______ | |
| Wetland Hydrology Present? | Yes ✔ No ______ | |

Remarks:

This point was taken within the cypress swamp area of the PFO system. When the sample was taken, it was considered an abnormally dry period in Suffolk County by NOAA's National Integrated Drought Information System.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☑ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ______ | No ✔ | Depth (inches): ______ |
| Water Table Present? | Yes ______ | No ✔ | Depth (inches): ______ |
| Saturation Present? (includes capillary fringe) | Yes ______ | No ✔ | Depth (inches): ______ |

**Wetland Hydrology Present? Yes** ✔ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

adjacent to Burnett's Mill Creek

**VEGETATION (Four Strata) –** Use scientific names of plants.

Sampling Point: Dp-cs-wet

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 60 | ✔ | FAC |
| 2. Taxodium distichum | 30 | ✔ | OBL |
| 3. Magnolia virginiana | 15 | | FACW |
| 4. Nyssa aquatica | 15 | | OBL |
| 5. Platanus occidentalis | 15 | | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 135 | = Total Cover | |
| 50% of total cover: 67.50 | 20% of total cover: 27.00 | | |

| Sapling/Shrub Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. Acer rubrum | 30 | ✔ | FAC |
| 2. Platanus occidentalis | 20 | ✔ | FACW |
| 3. Taxodium distichum | 20 | ✔ | OBL |
| 4. Nyssa aquatica | 5 | | OBL |
| 5. Asimina triloba | 2 | | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 77 | = Total Cover | |
| 50% of total cover: 38.50 | 20% of total cover: 15.40 | | |

| Herb Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. Saururus cernuus | 20 | ✔ | OBL |
| 2. Arundinaria tecta | 10 | ✔ | FACW |
| 3. Berchemia scandens | 2 | | FAC |
| 4. Boehmeria cylindrica | 2 | | FACW |
| 5. Campsis radicans | 2 | | FAC |
| 6. Ligustrum sinense | 2 | | FAC |
| 7. Parthenocissus quinquefolia | 2 | | FACU |
| 8. Fraxinus americana | 1 | | FACU |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 41 | = Total Cover | |
| 50% of total cover: 20.50 | 20% of total cover: 8.20 | | |

| Woody Vine Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. Campsis radicans | 3 | | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 3 | = Total Cover | |
| 50% of total cover: 1.50 | 20% of total cover: 0.60 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 90 | x 1 = 90 |
| FACW species | 62 | x 2 = 124 |
| FAC species | 101 | x 3 = 303 |
| FACU species | 3 | x 4 = 12 |
| UPL species | 0 | x 5 = 0 |
| Column Totals: | 256 (A) | 529 (B) |

Prevalence Index = B/A = 2.06

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ✔ No ___

Remarks: (If observed, list morphological adaptations below).

**SOIL** Sampling Point: Dp-cs-wet

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 4 | 10YR 4/1 | 90 | 10YR 5/6 | 10 | C | M | Sandy Loam | fine Sandy alluvial deposits |
| 4 - 12 | 10YR 5/1 | 80 | 7.5YR 4/6 | 15 | C | PL | Silt Loam | |
| 4 - 12 | | | 10YR 6/4 | 5 | C | M | Silt Loam | |
| 12 - 18 | 10YR 4/1 | 90 | 10YR 5/6 | 10 | C | | Clay Loam | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ✔ No ______

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Spsa-cypress swamp City/County: Suffolk County Sampling Date: 2024-10-24

Applicant/Owner: Spsa State: Virginia Sampling Point: Dp-cs2

Investigator(s): L. Hues, B.Wilk Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): T 153B Lat: 36.75433069 Long: -76.52269675 Datum: WGS 84

Soil Map Unit Name: 13 - Levy silty clay loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✔ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✔ No ______ | **Is the Sampled Area within a Wetland?** | **Yes** ✔ **No** ______ |
| Hydric Soil Present? | Yes ✔ No ______ | | |
| Wetland Hydrology Present? | Yes ✔ No ______ | | |

Remarks:

This point was taken at the most upstream portion of bald cypress swamp near the bridge. When the sample was taken, it was considered an abnormally dry period in Suffolk County by NOAA's National Integrated Drought Information System.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☑ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ______ | No ✔ | Depth (inches): ______ | |
| Water Table Present? | Yes ______ | No ✔ | Depth (inches): ______ | |
| Saturation Present? (includes capillary fringe) | Yes ______ | No ✔ | Depth (inches): ______ | **Wetland Hydrology Present? Yes** ✔ **No** ______ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata) –** Use scientific names of plants. Sampling Point: Dp-cs2

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 50 | ✔ | FAC |
| 2. Taxodium distichum | 40 | ✔ | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | = Total Cover | |
| 50% of total cover: 45.00 | 20% of total cover: 18.00 | | |

| Sapling/Shrub Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liquidambar styraciflua | 15 | ✔ | FAC |
| 2. Acer rubrum | 5 | ✔ | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 20 | = Total Cover | |
| 50% of total cover: 10.00 | 20% of total cover: 4.00 | | |

| Herb Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Arundinaria tecta | 30 | ✔ | FACW |
| 2. Boehmeria cylindrica | 5 | | FACW |
| 3. Saururus cernuus | 2 | | OBL |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 37 | = Total Cover | |
| 50% of total cover: 18.50 | 20% of total cover: 7.40 | | |

| Woody Vine Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Vitis rotundifolia | 5 | ✔ | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | = Total Cover | |
| 50% of total cover: 2.50 | 20% of total cover: 1.00 | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 42 | x 1 = 42 |
| FACW species | 35 | x 2 = 70 |
| FAC species | 75 | x 3 = 225 |
| FACU species | 0 | x 4 = 0 |
| UPL species | 0 | x 5 = 0 |
| Column Totals: | 152 (A) | 337 (B) |

Prevalence Index = B/A = 2.21

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✔ **No** ___

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: Dp-cs2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 1 | 10YR 6/1 | 100 | | | | | Sandy Loam | |
| 1 - 20 | 7.5YR 3/1 | 95 | 7.5YR 4/6 | 5 | C | M | Silty Clay | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ____________

Depth (inches): ____________

**Hydric Soil Present?** Yes ✔ No ______

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Spsa-cypress swamp  City/County: Suffolk County  Sampling Date: 2024-10-21

Applicant/Owner: Spsa  State: Virginia  Sampling Point: DPW1

Investigator(s): L. Hues, B.Wilk  Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Floodplain  Local relief (concave, convex, none): Concave  Slope (%): 1

Subregion (LRR or MLRA): T 153B  Lat: 36.75743243  Long: -76.52971666  Datum: WGS 84

Soil Map Unit Name: 13 - Levy silty clay loam  NWI classification: PFO1Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✓ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ______ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ______ |
| Hydric Soil Present? | Yes ✓ No ______ | |
| Wetland Hydrology Present? | Yes ✓ No ______ | |

Remarks:

This point was taken in the forested wetland to the northwest of the cypress swamp. When the sample was taken, it was considered an abnormally dry period in Suffolk County by NOAA's National Integrated Drought Information System.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

**Wetland Hydrology Present? Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DPW1

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Platanus occidentalis | 50 | ✓ | FACW |
| 2. Acer rubrum | 20 | ✓ | FAC |
| 3. Liquidambar styraciflua | 10 | | FAC |
| 4. Fagus grandifolia | 5 | | FACU |
| 5. Quercus nigra | 5 | | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 = Total Cover | | |

50% of total cover: 45.00 20% of total cover: 18.00

| Sapling/Shrub Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. Platanus occidentalis | 30 | ✓ | FACW |
| 2. Liquidambar styraciflua | 25 | ✓ | FAC |
| 3. Ligustrum sinense | 20 | ✓ | FAC |
| 4. Acer rubrum | 15 | | FAC |
| 5. Carpinus caroliniana | 5 | | FAC |
| 6. Morus rubra | 2 | | FACU |
| 7. | | | |
| 8. | | | |
| | 97 = Total Cover | | |

50% of total cover: 48.50 20% of total cover: 19.40

| Herb Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. Persicaria virginiana | 40 | ✓ | FAC |
| 2. Ligustrum sinense | 30 | ✓ | FAC |
| 3. Saururus cernuus | 25 | ✓ | OBL |
| 4. Geum canadense | 5 | | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 100 = Total Cover | | |

50% of total cover: 50.00 20% of total cover: 20.00

| Woody Vine Stratum (Plot size: 30 ft r) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |

50% of total cover: ______ 20% of total cover: ______

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 25 | x 1 = 25 |
| FACW species | 80 | x 2 = 160 |
| FAC species | 175 | x 3 = 525 |
| FACU species | 7 | x 4 = 28 |
| UPL species | 0 | x 5 = 0 |
| Column Totals: | 287 (A) | 738 (B) |

Prevalence Index = B/A = 2.57

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree –** Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub –** Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb –** All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine –** All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ______

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: DPW1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 3 | 10R 4/2 | 95 | 10R 4/6 | 5 | C | M | Sandy Clay Loam | sand alluvial deposits |
| 3 - 15 | 10R 4/1 | 80 | 7.5R 4/6 | 20 | C | M | Clay Loam | |
| 15 - 18 | 10R 5/2 | 80 | 7.5R 4/6 | 20 | C | M | Sandy Clay Loam | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ✓ No ______

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Spsa-cypress swamp  City/County: Suffolk County  Sampling Date: 2024-10-24

Applicant/Owner: Spsa  State: Virginia  Sampling Point: DP-UPL1

Investigator(s): J. Irvin, B.Wilk  Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope  Local relief (concave, convex, none): Concave  Slope (%): 3

Subregion (LRR or MLRA): T 153B  Lat: 36.75463972  Long: -76.52407823  Datum: WGS 84

Soil Map Unit Name: 24 - Tomotley loam  NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✓ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ______ No ✓ | **Is the Sampled Area within a Wetland?** | **Yes** ______ **No** ✓ |
| Hydric Soil Present? | Yes ______ No ✓ | | |
| Wetland Hydrology Present? | Yes ______ No ✓ | | |

Remarks:

This point was taken on the upland adjacent to the cypress swamp. When the sample was taken, it was considered an abnormally dry period in Suffolk County by NOAA's National Integrated Drought Information System.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ______ No ✓ | Depth (inches): ______ | |
| Water Table Present? | Yes ______ No ✓ | Depth (inches): ______ | |
| Saturation Present? (includes capillary fringe) | Yes ______ No ✓ | Depth (inches): ______ | **Wetland Hydrology Present? Yes** ______ **No** ✓ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata) –** Use scientific names of plants. Sampling Point: DP-UPL1

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus laevis | 30 | ✓ | |
| 2. Liriodendron tulipifera | 25 | ✓ | FACU |
| 3. Quercus alba | 20 | ✓ | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 75 = Total Cover | | |
| 50% of total cover: 37.50 | 20% of total cover: 15.00 | | |

| Sapling/Shrub Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Ostrya virginiana | 40 | ✓ | FACU |
| 2. Asimina triloba | 30 | ✓ | FAC |
| 3. Fagus grandifolia | 20 | ✓ | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 = Total Cover | | |
| 50% of total cover: 45.00 | 20% of total cover: 18.00 | | |

| Herb Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | = Total Cover | | |
| 50% of total cover: | 20% of total cover: | | |

| Woody Vine Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | = Total Cover | | |
| 50% of total cover: | 20% of total cover: | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 0 | x 1 = 0 |
| FACW species | 0 | x 2 = 0 |
| FAC species | 30 | x 3 = 90 |
| FACU species | 105 | x 4 = 420 |
| UPL species | 0 | x 5 = 0 |
| Column Totals: | 135 (A) | 510 (B) |

Prevalence Index = B/A = 3.77

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree –** Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub –** Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb –** All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine –** All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: DP-UPL1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 1 | 5Y 4/1 | 100 | | | | | Silt Loam | |
| 1 - 8 | 2.5Y 5/2 | 100 | | | | | Silt | |
| 8 - 10 | 2.5Y 6/2 | 100 | | | | | Silt | |
| 8 - 20 | 2.5Y 5/2 | 100 | | | | | Silt | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** Yes ______ No ✓

Remarks:

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Spsa-cypress swamp City/County: Suffolk County Sampling Date: 2024-10-24

Applicant/Owner: Spsa State: Virginia Sampling Point: JW1-PEM

Investigator(s): L. Hues, B.Wilk Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): T 153B Lat: 36.75383701 Long: -76.52381595 Datum: WGS 84

Soil Map Unit Name: 24 - Tomotley loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✓ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ✓

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ No ______ | **Is the Sampled Area within a Wetland?** | **Yes** ✓ **No** ______ |
| Hydric Soil Present? | Yes ✓ No ______ | | |
| Wetland Hydrology Present? | Yes ✓ No ______ | | |

Remarks:

This point was taken in a patch of microstegium in the forested PFO area. This patch of invasives is likely due to the disturbance of the adjacent landfill. When the sample was taken, it was considered an abnormally dry period in Suffolk County by NOAA's National Integrated Drought Information System.

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

**Field Observations:**

Yes ______ No ✓ Depth (inches): ______

Yes ______ No ✓ Depth (in

**VEGETATION (Four Strata) – Use scientific names of plants.** Sampling Point: JW1-PEM

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liquidambar styraciflua | 10 | ✓ | FAC |
| 2. Quercus alba | 10 | ✓ | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 20 | = Total Cover | |
| 50% of total cover: 10.00 | 20% of total cover: 4.00 | | |
| **Sapling/Shrub Stratum** (Plot size: 30 ft r) | | | |
| 1. Taxodium distichum | 5 | ✓ | OBL |
| 2. Liquidambar styraciflua | 2 | ✓ | FAC |
| 3. Platanus occidentalis | 2 | ✓ | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 9 | = Total Cover | |
| 50% of total cover: 4.50 | 20% of total cover: 1.80 | | |
| **Herb Stratum** (Plot size: 30 ft r) | | | |
| 1. Microstegium vimineum | 90 | ✓ | FAC |
| 2. Boehmeria cylindrica | 15 | | FACW |
| 3. Persicaria pensylvanica | 2 | | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 107 | = Total Cover | |
| 50% of total cover: 53.50 | 20% of total cover: 21.40 | | |
| **Woody Vine Stratum** (Plot size: 30 ft r) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | = Total Cover | |
| 50% of total cover: | 20% of total cover: | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 5 | x 1 = | 5 |
| FACW species | 19 | x 2 = | 38 |
| FAC species | 102 | x 3 = | 306 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 136 (A) | | 389 (B) |

Prevalence Index = B/A = 2.86

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree –** Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub –** Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb –** All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine –** All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: JW1-PEM

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 6 | 2.5Y 3/1 | 70 | 7.5YR 4/6 | 10 | C | M | Clay Loam | |
| 0 - 6 | 5Y 6/1 | 20 | | | | | Clay Loam | |
| 6 - 20 | 2.5Y 3/1 | 80 | 5Y 4/1 | 10 | C | M | Clay Loam | |
| 6 - 20 | 5Y 4/1 | 10 | | | | | Clay Loam | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present? Yes** ✓ **No** ______

Remarks:

Rocks at 18"

## WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: SPSA-cypress swamp City/County: Suffolk County Sampling Date: 2024-10-24

Applicant/Owner: SPSA State: Virginia Sampling Point: JW1-UPL

Investigator(s): Irvin, Dickinson Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): T 153B Lat: 36.75358906 Long: -76.52399123 Datum: WGS 84

Soil Map Unit Name: 24 - Tomotley loam NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ✔ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ______ No ✔ | Is the Sampled Area within a Wetland? | Yes ______ No ✔ |
| Hydric Soil Present? | Yes ✔ No ______ | | |
| Wetland Hydrology Present? | Yes ______ No ✔ | | |

Remarks:

man made ditch feature

### HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

**Field Observations:**

Surface Water Present? Yes ______ No ✔ Depth (inches): ______

Water Table Present? Yes ______ No ✔ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✔ Depth (inches): ______

**Wetland Hydrology Present? Yes ______ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata) –** Use scientific names of plants.

Sampling Point: JW1-UPL

| Tree Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Quercus alba | 50 | ✔ | FACU |
| 2. Quercus laevis | 25 | ✔ | FACU |
| 3. Platanus occidentalis | 20 | ✔ | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 95 | = Total Cover | |
| 50% of total cover: 47.50 | 20% of total cover: 19.00 | | |

| Sapling/Shrub Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liquidambar styraciflua | 35 | ✔ | FAC |
| 2. Fagus grandifolia | 20 | ✔ | FACU |
| 3. Ostrya virginiana | 15 | | FACU |
| 4. Ilex opaca | 5 | | FAC |
| 5. Kalmia latifolia | 5 | | FACU |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 80 | = Total Cover | |
| 50% of total cover: 40.00 | 20% of total cover: 16.00 | | |

| Herb Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | | = Total Cover | |
| 50% of total cover: | 20% of total cover: | | |

| Woody Vine Stratum (Plot size: 30 ft r) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | = Total Cover | |
| 50% of total cover: | 20% of total cover: | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 0 | x 1 = 0 |
| FACW species | 20 | x 2 = 40 |
| FAC species | 40 | x 3 = 120 |
| FACU species | 115 | x 4 = 460 |
| UPL species | 0 | x 5 = 0 |
| Column Totals: | 175 (A) | 620 (B) |

Prevalence Index = B/A = 3.54

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ____ **No** ✔

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: JW1-UPL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0 - 5 | 10YR 4/2 | 100 | | | | | Silt Loam | |
| 5 - 12 | 10YR 5/1 | 100 | | | | | Silt Loam | |
| 12 - 18 | 10YR 6/1 | 90 | 10YR 6/8 | 10 | C | M | Silt | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |
| - | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ____________

Depth (inches): ____________

**Hydric Soil Present? Yes** ✔ **No** ______

Remarks:

# C

Photographs


Photograph 1 - Burnetts Mill Creek - Downstream


Photograph 2 - Burnetts Mill Creek - Upstream

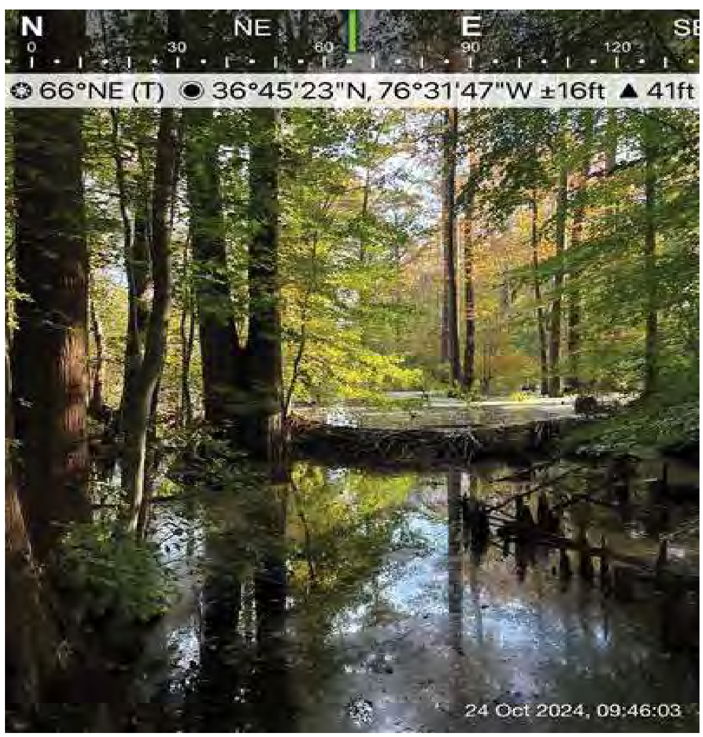
Photograph 3 - Burnetts Mill Creek - Upstream

Photograph 4 - Burnetts Mill Creek - Downstream

Photograph 5 - Bald cypress pneumatophores

Photograph 6 - Beaver dam located in cypress swamp

Photograph 7 – Beaver dam located in cypress swamp




Photograph 8 - Downstream from the beaver dam

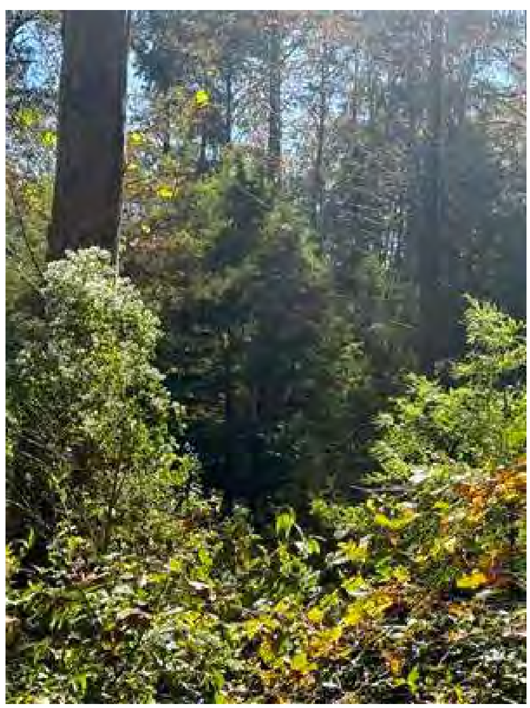
Photograph 9 - Western edge of the cypress swamp - facing West

Photograph 10 - Western edge of the cypress swamp - facing Northeast

Photograph 11 - Western edge of the cypress swamp - facing East


Photograph 12 - 153cm DBH Bald Cypress

Photograph 13 - Bald Cypress



Photograph 14 - Bald Cypress

Photograph 15 - Bald Cypress

Photograph 16 - Bridge over cypress swamp

Photograph 17 - Taken from natural berm between swamp and open water

Photograph 18 - Palustrine forested wetland

**DEPARTMENT OF THE ARMY**
**US ARMY CORPS OF ENGINEERS**
**NORFOLK DISTRICT**
**FORT NORFOLK**
**803 FRONT STREET**
**NORFOLK VA 23510-1011**

December 31, 2024

**PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)**

Special Projects Regulatory Section
NAO-1988-00021 (Burnetts Mill Creek)

Dennis Bagley
Executive Director
Southeastern Public Service Authority
723 Woodlake Drive
Chesapeake, VA 23320

Dear Mr. Bagley:

This letter is in regard to your request for a preliminary jurisdictional determination of the aquatic resources for an 18.4-acre study area proposed for inclusion in SPSA's mitigation plan for impacts associated with the Regional Landfill expansion. The area is located south of the existing Regional Landfill on property owned by SPSA on Bob Foeller in Suffolk, Virginia.

The map entitled "Delineation Map SPSA-Potential Preservation Area" dated November 2024 by HDR (copy enclosed) provides the locations of the aquatic resources on the property referenced above. The 18.4-acre study area contains approximately 9.67 acres of cypress swamp, 0.07 acres of forested wetlands, 0.11 acres of emergent wetlands, and 3,217 linear feet of stream.

These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. This site also contains aquatic resources with an ordinary high water mark (or high tide line). This preliminary jurisdictional determination and associated aquatic resource delineation map may be submitted with a permit application. This letter is not confirming the Cowardin classifications of these aquatic resources.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email (Melissa.a.nash@usace.army.mil) or by standard mail to 803 Front Street Norfolk, VA 23510

If you have any questions, please contact me either by telephone at (757) 201-7489 or by email at melissa.a.nash@usace.army.mil .

Sincerely,

Melissa A Nash

Melissa Nash
Special Projects
Regulatory Section

Enclosure(s):

cc:

Becky Wilk, HDR
Henry Strickland, SPSA


HDR

DATA SOURCES: VGIN, DCR, UGSG, City of Suffolk, SPSA, ESRI

PROJECTION: NAD 1983 (2011) State Plane Virginia South FIPS 4502 (US Feet)

NOTE: Boundaries were collected using sub-meter capable Trimble Catalyst and ESRI Field Maps

**DELINEATION MAP**

**SPSA-Potential Preservation Area**

**November 2024**

## BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR PJD:** 12-31-2024.

B. **NAME AND ADDRESS OF PERSON REQUESTING PJD:**
Dennis Bagley
Southeastern Public Service Authority
723 Woodlake Drive
Chesapeake, VA 23320

C. **DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO, Southeastern Public Service Authority / Additional Preservation Area / 1 Bob Foeller Drive / Suffolk, NAO-1988-00021

**D. PROJECT LOCATION AND BACKGROUND INFORMATION:**
**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: VA County/Parish/Borough: City: Suffolk
Center coordinates of site (lat/long in degree decimal format):
Lat.: 36.75518° Long.: -76.51687°
Universal Transverse Mercator: 18
Name of nearest waterbody: Burnetts Mill Creek, Nansemond River

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s): 6-26-2024

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

| Site Number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| Cypress swamp | 36.757016 | -76.528863 | 9.67 acres | Wetland | Section 404 |
| SPSA Burnetts MillCreek | 36.754857 | -76.523428 | 3217 feet | Non-wetland waters | Section 404 |
| SPSA PEM preservation | 36.754083 | -76.523787 | 0.11 acres | Wetland | Section 404 |
| SPSA PFO preservation | 36.758253 | -76.528996 | 0.07 acres | Wetland | Section 404 |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD or no JD whatsoever, which do not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the USACE has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD or reliance on no JD whatsoever; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of USACE permit authorization based on a PJD or no JD whatsoever constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the.JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the USACE will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (*check all that apply*)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

_X__ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _"Delineation Map SPSA-Potential Preservation Area" dated November 2024 by HDR.
__X_ Data sheets prepared/submitted by or on behalf of the PJD requestor.
_X__ Office concurs with data sheets/delineation report.
___ Office does not concur with data sheets/delineation report. Rationale: ____________________.
___ Data sheets prepared by the Corps: ____________________________.
___ Corps navigable waters' study: ____________________________.
___ U.S. Geological Survey Hydrologic Atlas: ____________________________.
___ USGS NHD data.
___ USGS 8 and 12 digit HUC maps.
_X__ U.S. Geological Survey map(s). Cite scale & quad name: __Chuckatuck Quad____.

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

_X__ USDA Natural Resources Conservation Service Soil Survey. Citation: __ NRCS Web Soil Survey _.
_X__ National wetlands inventory map(s). Cite name: ___NWI Online______.
___ State/Local Wetland Inventory map(s): ____________________________.
___ FEMA/FIRM maps: ____________________________
___ 100-year Floodplain Elevation is: _______________. (National Geodetic Vertical Datum of 1929)
_X__ Photographs: _X__ Aerial (*Name & Date*): ____Google Earth____.
___ or _X__ Other (*Name & Date*): ___Site visit photos _________________.
_X__ Previous determination(s). File no. and date of response letter: _ NAO-2007-02194 1-25-2023 __.
___ Other information (*please specify*): ____________________________.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the USACE and should not be relied upon for later jurisdictional determinations.**

| Name of Regulatory Staff Member Completing PJD | Date | Signature of Regulatory Staff Member Completing PJD |
|---|---|---|
| Melissa Nash | 12-31-2024 | |
| Name of Person Requesting PJD | Date | Signature of Person Requesting PJD (*REQUIRED, unless obtaining the Signature is Impracticable* |

Melissa A Nash
______________________________
Signature of Regulatory Staff Member Completing PJD

______________________________
Signature of Person Requesting PJD (*REQUIRED, unless obtaining the signature is impracticable*)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL**

| Applicant: SPSA | | File Number: NAO-1988-00021 | Date: 12-31-2024 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| | APPROVED JURISDICTIONAL DETERMINATION | | D |
| X | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

| SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT | | |
|---|---|---|
| REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.) | | |
| ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record. | | |
| POINT OF CONTACT FOR QUESTIONS OR INFORMATION: | | |
| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact:<br>Mr. Andrew Dangler<br>Regulatory Appeals Review Officer<br>U.S. Army Corps of Engineers<br>North Atlantic Division – Fort Hamilton<br>301 John Warren Avenue – First Floor<br>Brooklyn, New York 11252-6700<br>Mobile: (518) 487-0215 | |
| RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations. | | |
| Signature of appellant or agent. | Date: | Telephone number: |

# Memo

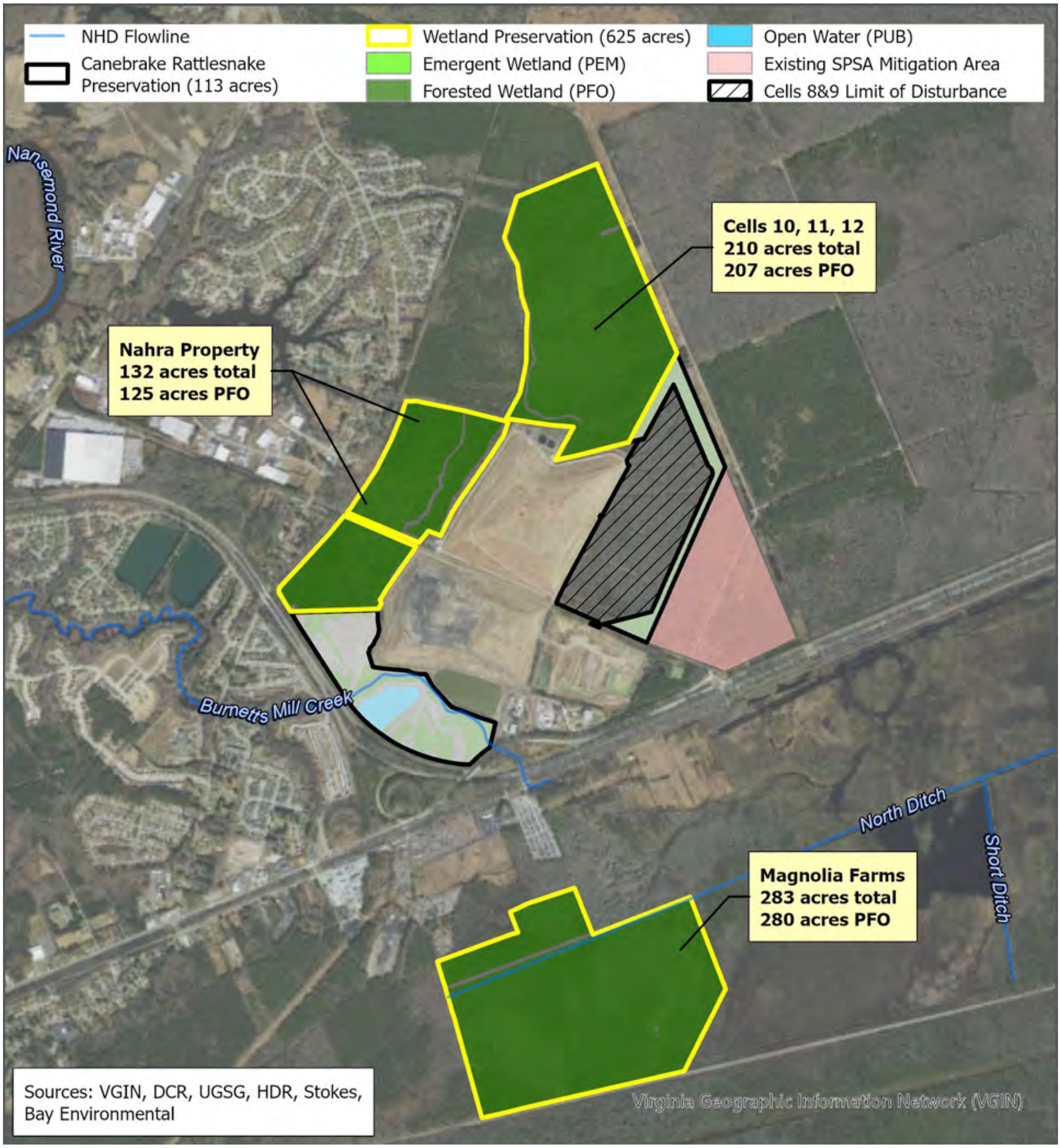
| | |
|---|---|
| Date: | Friday, September 13, 2024 |
| Project: | SPSA Landfill Expansion |
| To: | Carrie Traver, EPA; Melissa Nash, EPA |
| From: | Becky Wilk, HDR |
| Subject: | Comparison of Functions and Values for Proposed SPSA Landfill Expansion Cells 8 & 9 and Preservation Areas |

## Introduction

To compensate for the 109.64 acres of palustrine forested (PFO) wetland impact associated with the Regional Landfill Expansion (Cells 8&9), SPSA purchased 159 credits from mitigation banks serving the watershed. At a 2:1 ratio, the credits cover 79.5 acres of impact. In order to compensate for the remaining 30.14 acres of impact, SPSA is proposing to conserve 612 acres of PFO wetlands within the subwatershed (020802080105- Nansemond River-Cedar Lake), which is essentially a 20:1 ratio. SPSA is selecting properties, or portions of properties, that are similar in location, history, and species composition to compensate for impacts associated with Cells 8 & 9. The following properties have been delineated and are being proposed for wetland preservation (Figure 1):

- Nahra Property (132 acres total) – 125 acres PFO (Preliminary Jurisdictional Determination [PJD] NAO-2007-02194, issued 2023, Stokes Environmental)
- Cells 10, 11, 12 (210 acres total) – 207 acres PFO (PJD NAO-2020-0225, issued 2020, HDR)
- Magnolia Farms (283 acres total) – 280 acres PFO (PJD requested July 9, 2024, Bay Environmental)

**Figure 1. Proposed Wetland Preservation Areas**




## Property Comparison

The proposed impact area and all three preservation sites have similar functions and values based on the following aspects:

- Soils
  - The soils across all sites are uniform, comprising very poorly drained and poorly drained hydric soils. These soils include loam, silt loam, silty clay loam, and/or fine

sandy loam, characterized by a depleted matrix with prominent concentrations and/or poor linings.

- Hydrology
    - All four sites are classified as mineral soil flats within the hydrogeomorphic wetland category. Their primary water source is precipitation and the retention of water due to poor soil drainage. According to the HGM Regional Guidebook, these sites receive minimal groundwater discharge; however, groundwater may contribute to soil saturation during late winter and early spring, differentiating them from depressions and slopes. The dominant hydrodynamics involve vertical fluctuations.
- Vegetation
    - Regionally, these sites are identified as wet hardwood flats, typically supporting vegetative communities dominated by oak species and loblolly pine. Each site has a high diversity of hardwood trees as seen in Tables 1 and 2. The herbaceous layer, woody vine species, and invasive species are in Tables 3-5, respectively. The asterisk (*) indicates plant species considered particularly valuable to wildlife as food for the HGM assessment. The differences in species composition between the properties, particularly in the herbaceous layer, may be due to the time of year surveyed (ie the wetland delineation for Cells 10, 11, 12 was conducted in winter whereas Magnolia was in the summer).

**Table 1. Tree Species List by Property**

| Tree Species | Cells 8 & 9 | Cells 10, 11, 12 | Nahra Property | Magnolia Farms |
|---|---|---|---|---|
| Acer rubrum* | X | X | X | X |
| Fagus grandifolia | X | X | X | |
| Ilex opaca* | X | X | X | X |
| Liquidambar styraciflua* | X | X | X | X |
| Liriodendron tulipifera* | X | X | X | X |
| Magnolia virginiana* | X | X | X | X |
| Nyssa sylvatica* | X | X | | X |
| Pinus taeda* | X | X | X | X |
| Quercus alba* | | | X | |
| Quercus falcata* | | | X | X |
| Quercus laurifolia* | X | X | | X |
| Quercus lyrata* | | X | | |
| Quercus michauxii* | X | X | X | X |
| Quercus nigra* | X | X | X | X |
| Quercus pagoda* | | | X | |
| Quercus phellos* | X | X | X | |
| Taxodium distichium | X | X | X | |

### Table 2. Sapling/Shrub Species by Property

| Sapling/Shrub Species | Cells 8 & 9 | Cells 10, 11, 12 | Nahra Property | Magnolia Farms |
|---|---|---|---|---|
| Acer rubrum* | X | X | X | X |
| Asminia triloba* | | X | X | |
| Baccharis neglecta | | | X | |
| Carpinus caroliniana* | | X | X | |
| Clethra alnifolia | X | X | | X |
| Fagus grandifolia* | | | X | |
| Ilex opaca* | X | X | X | X |
| Liquidambar styraciflua* | X | X | X | X |
| Liriodendron tulipifera* | X | X | X | X |
| Magnolia tripetala* | X | | | |
| Magnolia virginiana* | X | X | X | X |
| Morella cerifera* | | | X | |
| Nyssa sylvatica* | X | X | | X |
| Persea barbonia* | X | | | X |
| Pinus taeda* | X | X | X | X |
| Platanus occidentalis | | X | X | |
| Quercus falcata* | | | X | |
| Quercus laurifolia* | X | X | | X |
| Quercus michauxii* | X | X | X | X |
| Quercus nigra* | | | X | X |
| Quercus pagoda* | | | X | |
| Quercus phellos* | X | X | X | |
| Vaccinium corymbosum* | X | X | X | X |

### Table 3. Herbaceous species

| Herb Species | Cells 8 & 9 | Cells 10, 11, 12 | Nahra Property | Magnolia Farms |
|---|---|---|---|---|
| Andropogon glomeratus | | | X | |
| Arundinaria spp. | X | X | X | X |
| Athrium asplenoides | | | X | |
| Athyrium filix-femina | X | | | |
| Boehmeria cylindrica | | | | X |
| Carex spp.* | X | X | X | X |
| Chasmanthium laxum | | | X | X |
| Clethra alnifolia* | X | | | X |
| Coleataenia anceps | | | X | |
| Eupatorium capillifolium | | | X | |
| Euphorbia sp. | | | X | |
| Juncus effusus | | X | X | |
| Leersia virginica | | | | X |
| Leucothoe fontanesiana* | | | | X |
| Mitchella repens | X | | | |
| Onoclea sensibilis | X | | | |
| Osmunda spectabilis | | | X | X |
| Osmundastrum cinnamomeum | | | | X |
| Parthenocissus quinquefolia* | X | X | | X |
| Potentilla indica | X | | | |
| Rubus hispidus* | | | | X |
| Saururus cernuus | X | | | |
| Sceptridium dissectum | | | | X |
| Scirpus cyperinus | | | X | |
| Woodwardia areolata | | | | X |

**Table 4. Woody Vine Species**

| Woody Vine Species | Cells 8 & 9 | Cells 10, 11, 12 | Nahra Property | Magnolia Farms |
|---|---|---|---|---|
| Berchemia scandens | X | | | |
| Bigonia capreolata | | | | X |
| Gelsemium sempervirens | | | X | |
| Smilax spp.* | X | X | X | |
| Toxicodendron radicans* | X | X | X | X |
| Vitus rotundifolia | X | X | X | X |

**Table 5. Invasive Species**

| Invasive Species | Cells 8 & 9 | Cells 10, 11, 12 | Nahra Property | Magnolia Farms |
|---|---|---|---|---|
| Lonicera japonica* | X | X | X | X |
| Microstegium vimineum | X | X | X | X |

- Disturbance Regime
  - All four sites were historically part of the Great Dismal Swamp and are within one mile of the impact area. Each site has been logged previously, with the most recent logging shown below:

**Figure 2. Cells 8 & 9 Impact Area (orange) and Cells 10, 11, 12 (green)**
**2 phases 1985 & 1990 (~39-44 years ago)**


Google Earth Pro April 1994

**Figure 3. Magnolia Farms (blue)**
**1987/1988 (~37-38 years ago)**

Google Earth Pro April 1990

**Figure 4. Nahra Property (pink)**
**2006/2007 (~18-19 years ago)**

Google Earth Pro April 2007

## HGM Comparison

EPA requested a hydrogeomorphic (HGM) assessment be performed for the proposed impact area of Cells 8 & 9 to determine the functions and values of the wetlands. This was completed by HDR in July of 2023. Three (3) wetland assessment areas (WAAs) consisting of 8 data points total were established within the project area and one reference WAA consisting of two data points were evaluated for comparison. Among the WAAs, three of the four parameters (habitat, water level regime, and carbon cycle processes) were fairly consistent throughout the site. The fourth parameter, plant community characteristics, was the most variable--largely due to recent disturbance for borings and proximity to the boundaries.

In August 2024, the EPA requested an HGM assessment for the preservation areas proposed to offset impacts from Cells 8 & 9. However, based on the findings from the HGM model for Cells 8 & 9, we believe that conducting this assessment for the preservation areas will not yield additional insights beyond what is already established. The HGM model has indicated that Cells 8 & 9 are less mature compared to the reference site in the Dismal Swamp, a conclusion that is expected given the recent logging and proximity to development and easements. We are confident that the existing data, derived from detailed wetland delineations and site visits, sufficiently demonstrates that the functions and values of the preservation areas are comparable to those of the impact area.

We have described how the impact area and each of the preservation areas differ with regards to the HGM variables based on information from the wetland delineation, photographs, and subsequent site visits. The number of PFO data sheets completed for each proposed preservation area during the delineation are listed and shown below:

**Figure 5. Nahra Property- 8 data points**


**Figure 6. Magnolia Farms- 11 data points**

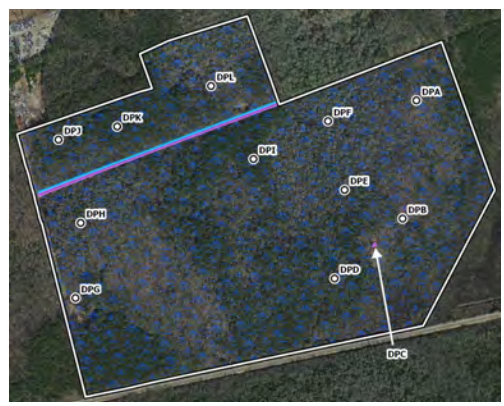



**Figure 7. Cells 10, 11, 12- 1 data point and ~257 photo points (45 transects,100 feet apart)**

**Function 1. Maintain Characteristic Habitat**

“This function reflects the capacity of a wetland to maintain the characteristic attributes of plant and animal communities normally associated with natural Hardwood Mineral Flat ecosystems. Community attributes include presence of woody debris, tree density, component plant species such as those important as a food resource, and amount of natural area (water, forest, wetland) surrounding the site (HGM Guidebook for Wet Hardwood Flats).”

The assessment of woody debris is based on diameter at breast height (DBH) for trees, estimated using tree age and species growth factors. The Nahra Property is expected to have a slightly lower score, with the largest trees ranging from 35 to 40 cm DBH. Additionally, Nahra Property exhibits a higher tree density per acre. This is due to its younger stage of succession resulting from logging activities in 2006/2007. If left undisturbed, all sites can be expected to develop hardwood communities with DBHs exceeding 40 cm, as observed during multiple site visits of the more mature forest communities.

In Tables 1-5, an asterisk (*) Is placed next to the plant species considered particularly valuable to wildlife as food (HGM Guidebook Appendix D). There are at least 20 valuable food plant species for each property.

The extent of natural area at each property is influenced by its surroundings: Nahra Property is bordered by residential development to the west and Route 58 to the south; Cells 8 & 9 and Cells 10, 11, and 12 are adjacent to a landfill to the south; Magnolia Farms is bordered by a railroad track to the south and has a ditch/berm through the middle, but retains over 80% natural area overall.

**Function 2. Maintain Characteristic Plant Community**

“This function reflects the capacity of a WAA to maintain the characteristic attributes of plant communities normally associated with natural Hardwood Mineral Flat ecosystems. Attributes include relative importance of component species (including percent target species, density) and the effects that alterations have on plant communities in Hardwood Mineral Flats (HGM Guidebook for Wet Hardwood Flats).”

Each of the properties exhibits florisitic quality similar to that of the reference site. The tree canopies are primarily >50% hardwoods, >25% pine, >10% oak or >50% hardwoods, though there are a few areas within each that are dominated by pine. There are several oak species within each property and they all contain >3% Quercus in the sapling layer. The invasive species Japanese stiltgrass and Japanese honeysuckle are found at every parcel with a percent cover of up to 20%.

**Function 3. Maintain Characteristic Water Level Regime**

“This function reflects the capacity of a Hardwood Mineral Flat to maintain variations in water level characteristic of the ecosystem, including variations in depth, duration, frequency, and season of flooding or ponding. The function models the effects that alterations to hydrologic regime have on fluctuations in water level (HGM Guidebook for Wet Hardwood Flats).”

The Northern ditch runs through Magnolia Farm property and ditches run along borders facing landfill for Nahra, Cells 8&9 and Cells 10,11,12, not none appear to impact the hydrology of the wetlands. Nahra has an access road and all four properties have upland berms adjacent the ditches, but they affect less than 10% of the properties. Again, as mentioned in Function 1, the percentage of natural area is largely due to proximity to boundary, with Nahra surrounded by the most altered land and Magnolia Farms having the least altered surrounding land.

**Function 4. Maintain Characteristic Carbon Cycling Processes**

"This function reflects the capacity of a Hardwood Mineral Flat to maintain carbon cycling processes at the rate, magnitude, and timing characteristic of the ecosystem, including export of dissolved organic constituents. This function models the effects that alterations have on biogeochemical processes and assumes that Hardwood Mineral Flats will maintain characteristic carbon cycling processes if not altered (HGM Guidebook for Wet Hardwood Flats)."
As mentioned for Function 1, the Nahra property would likely score slightly lower with the largest trees ranging from about 35 dbh to 40 dbh. The largest trees in the other properties are greater than 40cm dbh. As mentioned in Function 2, each of the properties exhibits florisitic quality similar to that of the reference site. Herbaceous cover for each property is greater than that of the reference site due to the prevalence of cane and ferns. There is up to 70% herbaceous cover in some area, though about half of the data points for each property contain less than 40% coverage. This Function also includes the results of Function 3 for Water Level Regime. Though there are minor differences in the variables, they do not appear to have much of an effect of the water level for each of the properties.

**Rank of Functions and Values**

The differences in functions between the four properties are slight, with the most variability in natural land cover and on woody debris. The natural landcover is the least in the Nahra property as it is bound by residential development to the west, a utility easement to the north and south, and the landfill and ditch to the east. Magnolia Farms has the greatest amount of natural landcover as it is surrounded by forested wetlands. The woody debris is dependent on the dbh of the tree species, which directly relates to the age of the forest. Since Nahra property was logged most recently, the dbh of the tree species are smaller than the other three properties.

When compared to reference site in the Great Dismal Swamp, these properties all contain less mature trees, invasive species, and closer proximity to disturbances. Based on a comparison of HGM variables and observations, we believe that of the four properties can be ranked as follows:

1. Magnolia Farms
2. Cells 10, 11, 12 & Cells 8 & 9
3. Nahra Property

## Discussion

Though these three proposed wetland preservation areas are not as high quality as the reference site, they are about the same quality as the impact area and have the ability to become mature hardwood forests if left undisturbed. They are also at a high risk of destruction due to their proximity to developed areas and history of logging. With appropriate conservation measures, all of these areas have the potential to attain ecological value comparable to the reference site. They possess the requisite soil types, hydrologic features, and plant communities to develop into diverse hardwood forests and support robust wildlife populations.

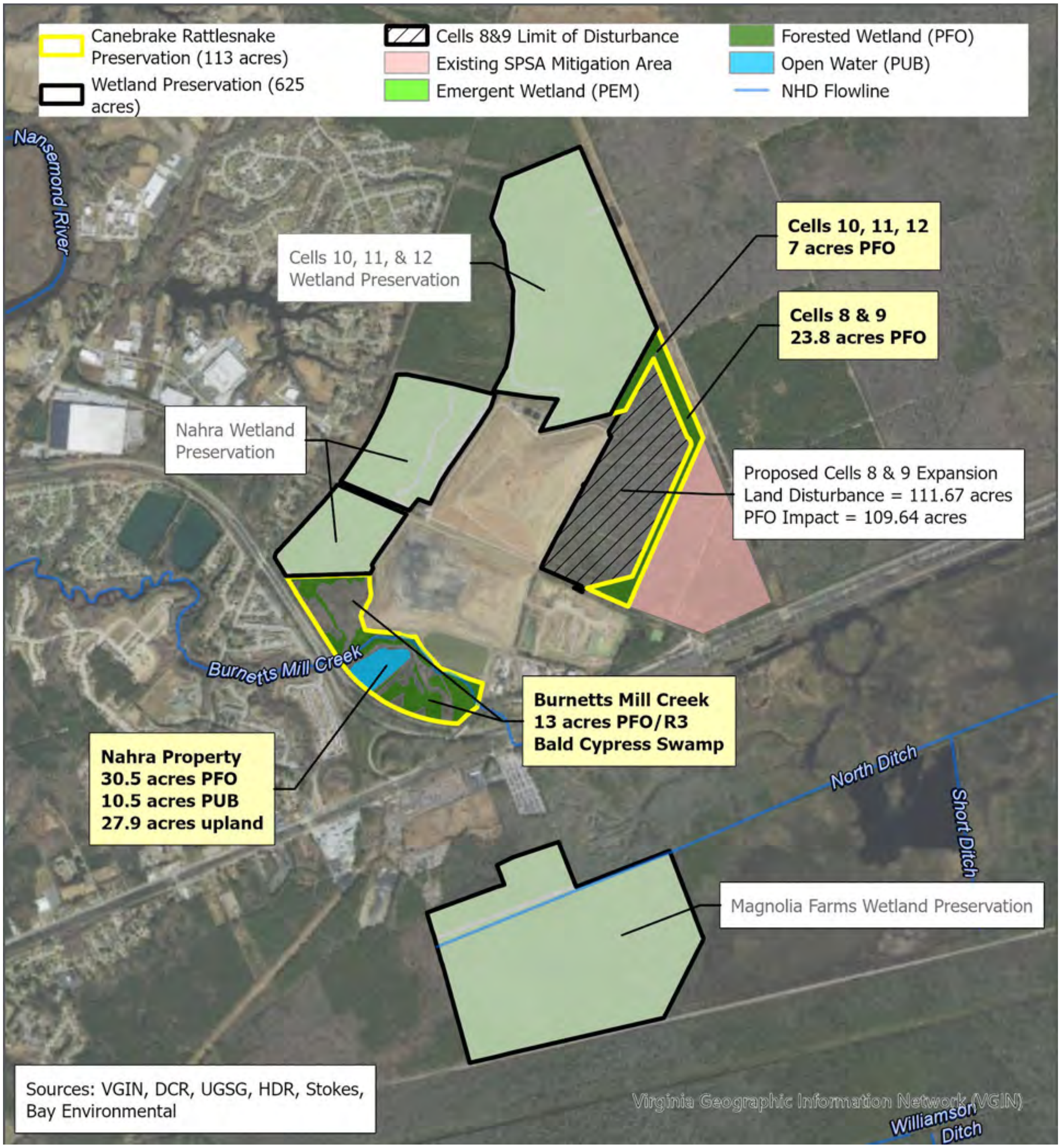
The minimum ratio for preservation of wetlands is 10:1; however, even though the impact area and preservation areas are similar, SPSA is proposing a 20:1 ratio.

In addition, SPSA will be preserving approximately 112.7 acres of adjacent canebrake rattlesnake habitat to compensate for the 111.67 land disturbance associated with the project (Figure 2):

- Avoided area of Cells 8 & 9 - 23.8 acres PFO (PJD-2016-00765, issued 2022, HDR)
- 200-foot buffer around Cells 8&9 into Cells 10, 11,12- 7 acres PFO (PJD NAO-2020-0225, issued 2020, HDR)
- Southern-most Nahra parcel (68.9 acres total)- 30.5 acres PFO, 10.5 acres palustrine unconsolidated bottom (PUB), 27.9 acres upland (PJD NAO-2007-02194, issued 2023, Stokes Environmental). This area was not included in the 2007 logging.
- Burnetts Mill Creek north of Nahra parcel- 13 acres PFO/ upper perennial riverine (R3) (A delineation has not yet been conducted for this area, but preliminary on-site observations indicate that this is a healthy bald cypress swamp spared from previous logging.

The total preservation area for both wetland mitigation and canebrake rattlesnake habitat will be approximately 724.7 acres.

**Figure 8. Canebrake Rattlesnake Preservation Areas**



# Memo

| | |
|---|---|
| Date: | Friday, November 10, 2023 |
| Project: | SPSA Regional Landfill Expansion |
| To: | Dennis Bagley |
| From: | Josh Mace |
| Subject: | HGM Study |

The US Environmental Protection Agency (EPA) provided comments in response to the Joint Permit Application (JPA) submitted for the expansion of the Southeastern Public Service Authority (SPSA) Regional Landfill Cell VIII and Cell IX. The response stated "*EPA continues to support supplementing the findings with a detailed functional assessment of the physical, chemical, and biological characteristics using the 2012 HGM methodology. The narrative provided should include a description of the methodology undertaken and photos, measurements, and other supporting information that confirm the findings. EPA recommends providing assessment documentation and results to the agencies and continuing coordination to determine appropriate compensatory mitigation to fully offset functions that will be lost from the onsite expansion. EPA recommends clarifying when the last timbering of wetlands to be impacted occurred, as well as relative age and diameter at breast height (DBH) of the trees.*" This report was prepared to address EPA's comment by providing a Hydrogeomorphic (HGM) Approach to assessing wetland functions.

**Methodology**

HDR used the HGM approach to assess the functional condition (Smith 1995) of the wetlands within the proposed project area using functional indices. The HGM characterizes wetlands into seven different classes based on geomorphic position and hydrologic characteristics (Brinson 1993). Regional Guidebooks have been created for each of the subclasses based on geographic regions. The wetlands in the project area are mineral soil flats where precipitation is the dominant water source that moves vertically from top to bottom. The vegetation is predominantly mixed hardwood; therefore, the HGM Guidebook for Wet Hardwood Flats in the Mid Atlantic Coastal Plain was referenced for this study (Havens et al. 2012).

The HGM approach incorporates data collected from reference wetlands and provides an index from 0.0 to 1.0 to represent the level of wetland condition for each function, with 1.0 being the most functional. The HGM approach specific to wet hardwood flats on mineral soils quantifies four functions: habitat, plant community, water level regime, and carbon cycle processes (Havens et al. 2012).

Three (3) transects within the project area and one (1) reference transect were selected and confirmed by EPA on June 27, 2023 prior to the field studies conducted in July 2023. A map showing these locations is located in Appendix A. The transects ran southwest to northeast (parallel to the project boundary) approximately 410 feet apart. Each of the transects contained one (1) wetland assessment area (WAA) which was used for the HGM analysis and two (2) or three (3) additional wetland data point locations to show habitat consistency throughout the site. Each WAA consisted of a 40 meter circle with three (3) 8.92 meter subplots (a,b,c) randomly spaced in accordance with the guidance manual (Havens et al. 2012). The wetland data points were collected using data forms and methods as described in the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (version 2.0)" (USACE 2010).

A description of each transect is as follows:

- Transect 1 contained three (3) data points (DP1-1, DP1-2, DP1-3) and one (1) WAA (T1WAA) spaced equidistant along the transect about 815 feet apart. T1WAA was located towards the northern section of the project area. Data for Transect 1 is located in Appendix B.
- Transect 2 contained three (3) data points (DP2-1, DP2-2, DP2-3) and one (1) WAA (T2WAA) spaced equidistant approximately 740 feet apart. T2WAA was located close to the southern boundary near the gas line right-of-way (ROW). Data for Transect 2 is located in Appendix C.
- Transect 3 contained two (2) data points (DP3-1, DP3-2) and one (1) WAA (T3WAA) spaced equidistant along the transect about 850 feet apart. T3WAA was placed towards the interior/ middle of the project area. Data for Transect 3 is located in Appendix D.
- A reference transect was identified east of the project area in wetlands that were conserved as part of mitigation for previous landfill activities. Two (2) data points (RTDP-1 & RTDP-2) and one (1) WAA (RWAA) were spaced equidistance along the transect about 705 feet apart. Data for the reference transect is located in Appendix E.

The reference standard (RS) location was selected in the Great Dismal Swamp. The RS location had soil types that were also in the project area, including Deloss mucky loam (4) and Torhunta loam (25). The project area also included an additional soil series, Tomotley loam (24). The Reference Standard location was within the same 12-digit HUC as the project area (020802080105). The project area was once part of the Dismal Swamp but was cut-off by the construction of Rt. 58. It should be noted that the overall hydrology in this area has been manipulated greatly over the years, from ditching the Dismal Swamp in colonial times to more recent roadway projects and general development. There have even been discrepancies in the HUC boundaries in this area (DEQ 2001). Regarding local hydrological regimes for the sites, the dominate soil types within project area and at the Reference Standard had similar depths to ground water (from 0-18 inches), similar slopes (all are 0-2%) and all had restrictive features greater than 80-inches below the soil surface. Since the sites were only about three (3) miles apart it was assumed they received similar precipitation, which was important since the HGM Guidebook for Mineral Flats described the hydrology of these systems as primarily precipitation driven. Additionally, the Reference Standard site was by nature a mature forest systems so evapotranspiration should have been optimal. Lastly, as per the HGM Guidebook for Mineral Flats, the Reference Standard site that was proposed appeared to have less than 1% invasive/ non-native species, was located greater than 200 meters from a ditch and the last logging within the Dismal Swamp occurred in 1973. The Reference Standard location was likely last logged before 1973 and the area protected with the creation of the refuge in 1974, so there have been no vegetative disturbance in the past 50 years. Though there have been several anthropomorphic disturbances in this watershed, the proposed Reference Standard site adhered to the HGM Guidebook for Mineral Flats as "*Generally, they* (reference standards) *are the least altered wetland sites in the least altered landscapes."*

## Results

In total, 10 wetland data points on the SPSA property were sampled. During the permitting process, the project area had been reduced; therefore seven (7) of these data points were within the current project area and three (3) data points were outside of the project area and will not be impacted. Results for each Transect are located in Appendices B-E. The project area appeared to contain trees with an average DBH of around 12 to 24 inches (30.48 to 60.96 centimeters) and the last timbering is estimated to have occurred 30-40 years ago. The vegetation consisted of a mix of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and swamp chestnut oak (*Quercus michauxii*), and American holly *(Ilex opaca*) in the tree layer and a mix of poison ivy (*Toxicodendron radicans*), cane (*Arundinaria tecta*), and sensitive fern (*Onoclea sensiblis*) in the herb layer. The invasive Japanese stiltgrass (*Microstigium viminium*) was present in several plots as well. The soils were generally 10YR 2/1 overlying a depleted layer, at 10YR 4/1, with redox concentrations. Hydrology was consistently driven by water-stained leaves and the presence of crayfish burrows. Based on the results of the wetland datapoints, there is very little variability in the wetland form and function.

A total of five (5) WAA plots were sampled, with three (3) subplots in each. Three WAAs were located within the project area, with T2WAA and T3WAA on the boundaries. The RWAA was located east of the project area, and the RSWAA was located in the Dismal Swamp (see Appendix A for mapping and Appendices B-F for HGM forms and photos). The results of the study are summarized in Table 1.

Table 1. HGM Results

| Characteristic | T1WAA | T2WAA | T3WAA | RWAA | RSWAA |
|---|---|---|---|---|---|
| Habitat | 1.00 | 0.93 | 1.00 | 1.00 | 1.00 |
| Plant Community | 0.53 | 0.47 | 1.00 | 0.75 | 0.93 |
| Water Level Regime | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Carbon Cycle Processes | 1.00 | 0.77 | 0.75 | 0.75 | 1.00 |

Calculations were done in accordance with the manual; however, the FQAI adjusted values were manually calculated using Virginia specific C values (DeBerry et al. 2021). Additionally, the ND-Drain tool referenced in the Guidebook for Mineral Flats was no longer working. Based on visual observations during the study, it was determined that none of the WAAs were actively experiencing hydrologic modifications and were scored 1.00. The natural landcover was greater than 80% for all WAAs, though the T2WAA was equal to 80%. The overall scores for T2WAA were less than the other sites, likely due to the proximity to the ROW and landfill just south of the project boundary. RSWAA and T3WAA were the only WAAs that did not contain Japanese stiltgrass.

## Conclusions

The project area exhibited consistent wetland characteristics throughout; however, the boundaries near ROW and disturbed areas from geotechnical boring paths, which were cut in the last 5 years, contained more Japanese stiltgrass than the interior. Wetland hydrology was predominantly met through secondary indicators due the fact that mineral flats are driven by precipitation and these systems typically have a season drawdown of the water table from late summer through fall. The plant community was dominated by oaks with a smaller percentage of pine.

Based on the results of this study the overall wetlands within the project area have slightly lower functional conditions than surrounding reference wetlands.   This biggest difference between the project area and the reference sites s is primarily the presence of invasive species and greater than 40% herbaceous cover.

**References**

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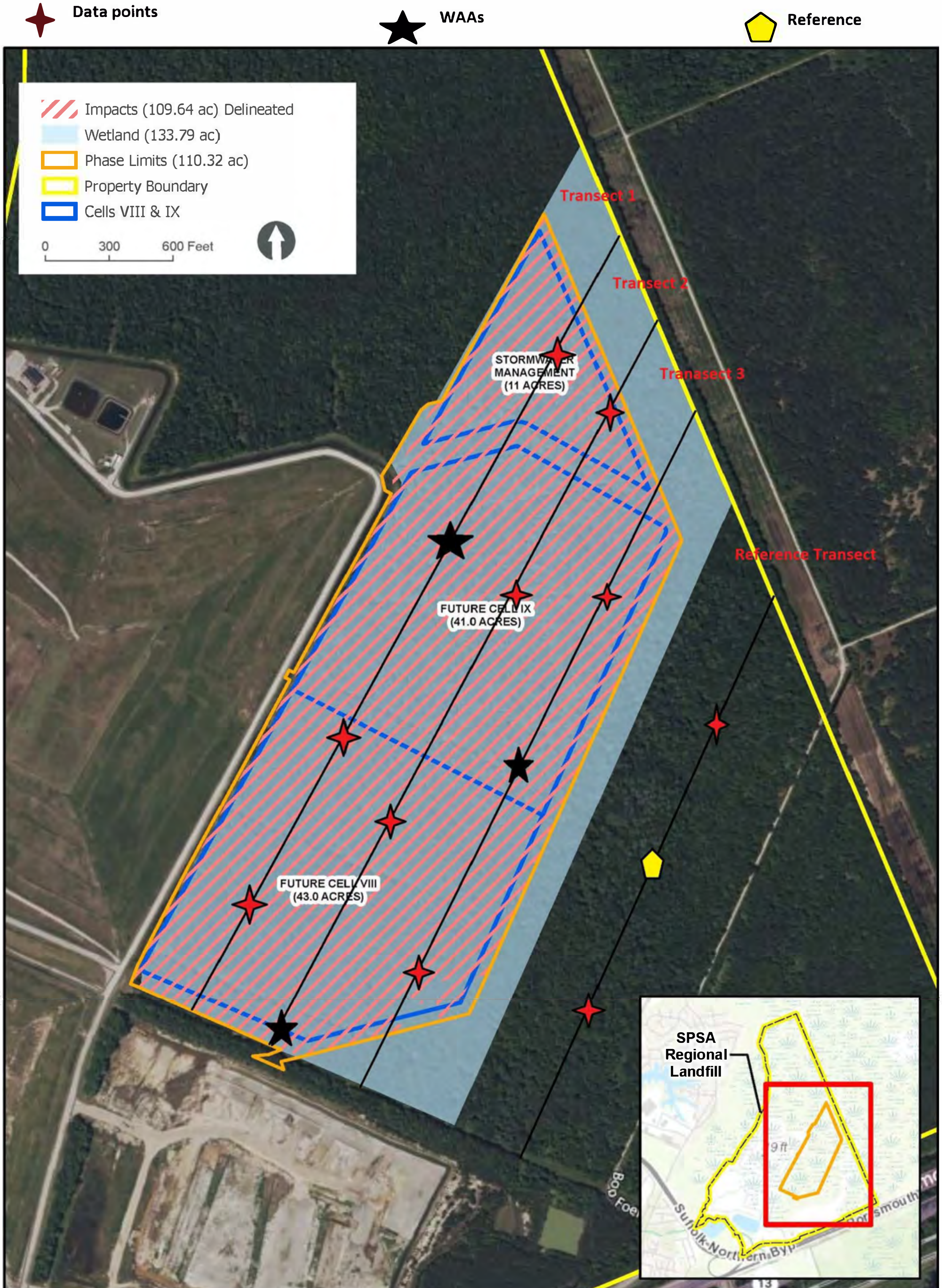
# A

Figures




HDR

Proposed Sampling Plan

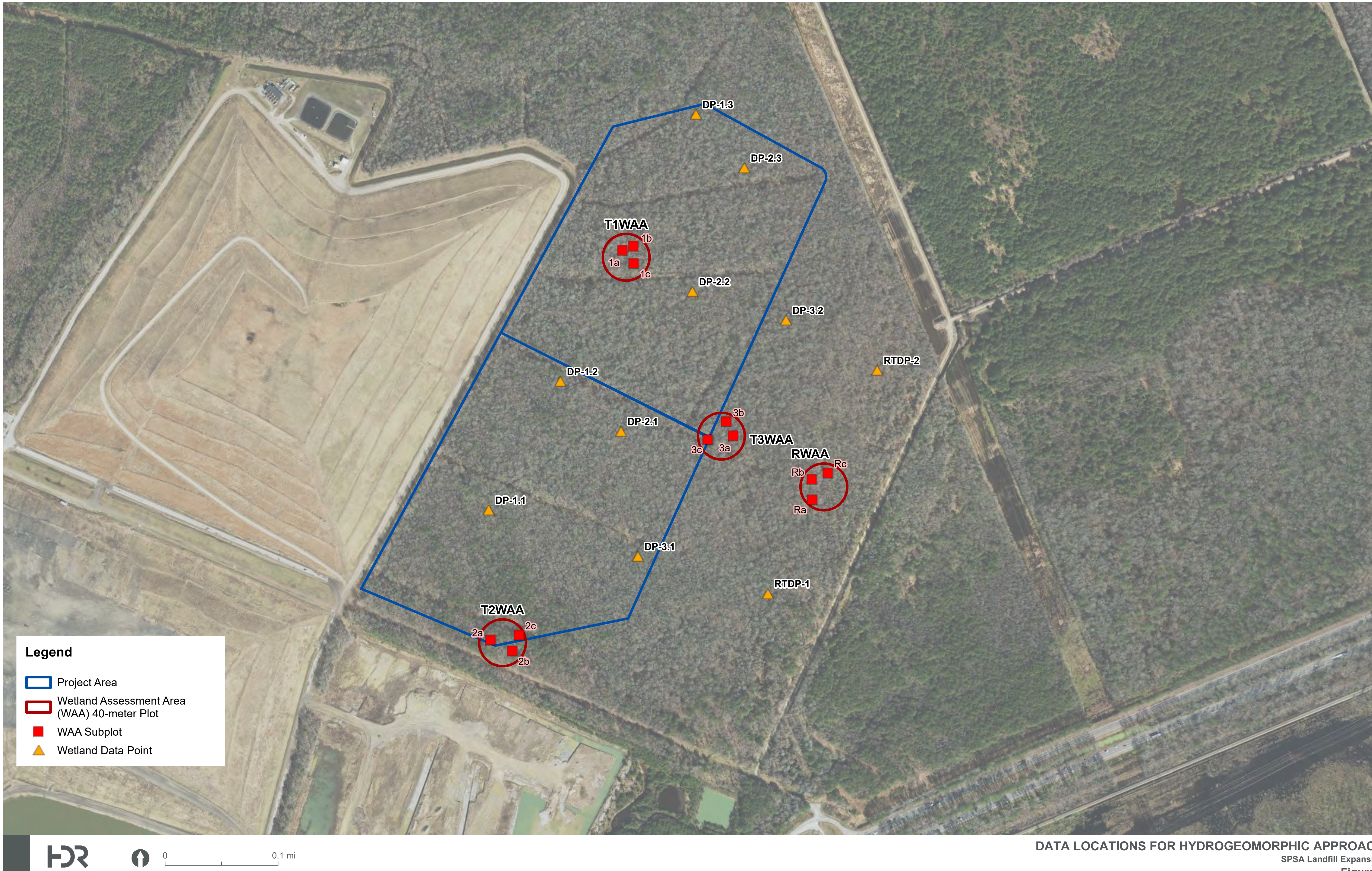
**WETLAND DELINEATION**

SPSA REGIONAL LANDGFILL CELLS VIII AND IX

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\3062_SPSA\10139129_CELLX_XI_XII\7.2_WORK_IN_PROGRESS\MAP_DOCS\APRX\230323_WORKING\230323_WORKING.APRX DATE: 6/7/2023


WETLAND ASSESSMENT AREAS
SPSA Landfill Expansion
Figure 1

X:\GIS\PROJECTS\3062_SPSA\103450004_CELL_VIII_AND_IX_MITIGATION\7.2_WORK_IN_PROGRESS\MAP_DOCS\APRX\230327_SPSA_CELLSVIII_IX\230327_SPSA_CELLSVIII_IX.APRX DATE: 11/10/2023




DATA LOCATIONS FOR HYDROGEOMORPHIC APPROACH

SPSA Landfill Expansion

Figure 3

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# B

Transect 1

# Hydrogeomorphic Assessment of Wet Hardwood Flats on Mineral Soils

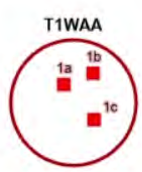
Site # T1WAA Site Name SPSA Functional Assessment Date 07/19/2023

Time(Start & Finish) 10:30am-11:30am Crew J. Mace, J. Irvin

Lat/Long: 36.76551, -76.51316 AA shape: circle or rectangle or entire wetland polygon (circle)

AA moved from original location? Yes or No (circle one) If Yes, reason

**Assessment Area Sketch**




| Stability of AA (check one) | |
|---|---|
| X | Healthy & Stable |
| | Deteriorating/Fragmenting |
| | Severe deterioration/fragmentation |

**Soils**

Depth of organic layer (cm): 10

Comments on soil sample:

## Function 1: Habitat Characteristic

| Variable: Woody Debris ($V_{WD}$) DBH in CM | | | |
|---|---|---|---|
| Sub-plot A | 48.8 | 50 | 47.8 |
| B | 49 | 45.2 | 39.1 |
| C | 42.7 | 38.9 | 48.5 |
| Mean: | 45.6 | | |

Subindex Score: 1.00

| Variable: Food Plants ($V_{FOOD}$) |
|---|
| Number of species*: 12 |
| * Number produced from species in $V_{FQAI}$ |
| * Food list species provided in HGM Manual |

Subindex Score: 1.00

| Variable: Natural landcover with 200m ($V_{NATURAL}$) | |
|---|---|
| % Natural: | >80% |

Subindex Score: 1.00

| Variable: Tree Density ($V_{DENSITY}$) | |
|---|---|
| Sub-plot A | 13 |
| Sub-plot B | 9 |
| Sub-plot C | 13 |
| Mean: | 11.7 (468 stems/ha) |

Subindex Score: 1.00

**Habitat Functional Capacity Formula**

$(V_{WD} + V_{FOOD} + V_{NATURAL} + V_{DENSITY})/4 =$ **1.00**

**Function 2: Plant Community Characteristic**

| Species: | A | B | C | $V_{CANOPY}$ |
|---|---|---|---|---|
| *Acer rubrum* | ✓ | ✓ | ✓ | ● ●●● |
| *Agrostis stolonifera* | | | | |
| *Aralia spinosa* | | | | |
| *Chasmanthium laxum* | | | | |
| *Clethra alnifolia* | ✓ | ✓ | ✓ | |
| *Fraxinus pennsylvanica* | | | | |
| *Ilex opaca* | ✓ | ✓ | ✓ | |
| *Juncus effusus* | | | | |
| *Liquidambar styraciflua* | ✓ | ✓ | ✓ | ● ● ● |
| *Magnolia virginiana* | ✓ | ✓ | ✓ | |
| *Pinus taeda* | | ✓ | | |
| *Pyrola americana* | | | | |
| *Quercus alba* | | | | |
| *Quercus michauxii* | ✓ | ✓ | | ● ● |
| *Quercus pagoda* | | | | |
| *Quercus phellos* | | | | |
| *Quercus prinus* | | | | |
| *Sambucus canadensis* | | | | |
| *Smilax rotundifolia* | ✓ | ✓ | ✓ | |
| *Symplocos tinctoria* | | | | |
| *Tipularia discolor* | | | | |
| *Vaccinium corymbosum* | ✓ | ✓ | | |
| *Viburnum nudum* | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 35.77

* Adjusted FQI value determined by entering species list into FQAI Calculator at the Mid-Atlantic Wetlands Workgroup website: http://mawwg.psu.edu/tools/fqai.asp

Subindex Score: 1.00

**Variable: Canopy Tree Composition ($V_{CANOPY}$)**

| Relative Dominance | Subindex |
|---|---|
| No canopy trees | 0.0 |
| >50% pine | 0.0 |
| >50% hardwoods, >25% pine, <1% oak | 0.2 |
| >50% hardwoods, <25% pine, <1% oak | 0.3 |
| >50% hardwoods, >25% pine, 1-10% oak | 0.5 |
| >50% hardwoods, <25% pine, 1-10% oak | 0.7 |
| >50% hardwoods, >25% pine, >10% oak | 0.8 |
| >50% hardwoods, <25% pine, >10% oak | 1.0 |

**Variable: Hardwood Regeneration ($V_{REGEN}$) %**

Sub-plot **A** = 0

Sub-plot B = 2

Sub-plot C = 0

Mean = **0.67**

Subindex Score: **0.33**

**Variable:Non-native Invasive PlantS ($V_{INVASIVE}$) %**

Sub-plot A = 0

Sub-plot B = 1

Sub-plot C = 0

Mean = **0.3**

Subindex Score: **0**.00

**Plant Community Functional Capacity Formula**

FCI = ($V_{FQAI}$ + $V_{CANOPY}$ + $V_{REGEN}$ + $V_{INVASIVE}$)/4 **FCI** =

0.53

**Function 3: Water Level Regime Characteristic**

**Variable: Anthropogenic Drainage ($V_{DRAIN}$)**

% Impacted: 0

$V_{DRAIN}$ = 0.00

**Variable: Percent Fill in WAA ($V_{FILL}$)**

% Fill: 0

$V_{FILL}$ = 1.00

**Variable: Natural Landcover with 200m ($V_{NATURAL}$)***

*$V_{NATURAL}$ value given in Function 1.

Subindex Score: 1.00

**Water Regime Functional Capacity Formula**

FCI = ($V_{NATURAL}$ + $V_{DRAIN}$ + $V_{FILL}$)/3

**FCI = 1.00**

**Function 4: Carbon Cycling Processes Characteristic**

**Variable: Woody Debris ($V_{WD}$)***

*$V_{WD}$ value given in Function 1.

Subindex Score: 1.00

**Variable: Herbaceous Cover ($V_{HERB}$) %**

Sub-plot A = 30

Sub-plot B = 10

Sub-plot C = 30

Mean = 23.3

Subindex Score: 1.00

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 35.77

Subindex Score: 1.00

**Carbon Cycling Processes Functional Capacity Formula**

($V_{WD}$ + $V_{FQAI}$ + $V_{HERB}$ + Water Level Regime Functional Capacity Score)/4

**FCI = 1.00**

## Photo Log – Transect 1 – Wetland Assessment Area (T1WAA)

**Subplot 1a**

**Subplot 1b**

**Subplot 1c**

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

*Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)*

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023
Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 1-1
Investigator(s): J Mace and J Irvin Section, Township, Range: ____
Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.761664 Long: -76.515909 Datum: NAD83
Soil Map Unit Name: Tomotley Loam NWI classification: PFO1/4Cd
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |
| Hydric Soil Present? | Yes X No ___ | |
| Wetland Hydrology Present? | Yes X No ___ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP 1-1

| Tree Stratum (Plot size: 30 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liriodendron tulipifera* | 35 | Yes | FACU |
| 2. *Acer rubrum* | 20 | Yes | FAC |
| 3. *Quercus nigra* | 10 | No | FAC |
| 4. *Liquidambar styraciflua* | 10 | No | FAC |
| 5. *Ilex opaca* | 10 | No | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 85 | =Total Cover | |
| 50% of total cover: 43 | | 20% of total cover: | 17 |

| Sapling/Shrub Stratum (Plot size: 15 ) | | | |
|---|---|---|---|
| 1. *Clethra alnifolia* | 20 | Yes | FACW |
| 2. *Magnolia virginiana* | 15 | Yes | FACW |
| 3. *Liquidambar styraciflua* | 5 | No | FAC |
| 4. *Acer rubrum* | 5 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 45 | =Total Cover | |
| 50% of total cover: 23 | | 20% of total cover: | 9 |

| Herb Stratum (Plot size: 5 ) | | | |
|---|---|---|---|
| 1. *Arundinaria tecta* | 70 | Yes | FACW |
| 2. *Toxicodendron radicans* | 5 | No | FAC |
| 3. *Vitis rotundifolia* | 5 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 80 | =Total Cover | |
| 50% of total cover: 40 | | 20% of total cover: | 16 |

| Woody Vine Stratum (Plot size: 30 ) | | | |
|---|---|---|---|
| 1. *Berchemia scandens* | 5 | Yes | FAC |
| 2. *Smilax rotundifolia* | 5 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 10 | =Total Cover | |
| 50% of total cover: 5 | | 20% of total cover: | 2 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 105 | x 2 = | 210 |
| FAC species | 80 | x 3 = | 240 |
| FACU species | 35 | x 4 = | 140 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 220 (A) | | 590 (B) |

Prevalence Index = B/A = 2.68

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 1-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-9 | 10YR 2/2 | 100 | | | | | Loamy/Clayey | silt loam texture |
| 9-18 | 10YR 4/1 | 90 | 7.5YR 5/8 | 10 | C | PL | Loamy/Clayey | clay loam texture |
| 18-20 | 10YR 4/1 | 70 | 7.5YR 5/8 | 30 | C | PL/M | Loamy/Clayey | loamy clay texture |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ___
Depth (inches): ___

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

| U.S. Army Corps of Engineers<br>WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 1-2

Investigator(s): J Mace and J Irvin Section, Township, Range: ______

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.763621 Long: -76.514484 Datum: NAD83

Soil Map Unit Name: Torhunta Loam NWI classification: PFO1/4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |
| Hydric Soil Present? | Yes X No ___ | |
| Wetland Hydrology Present? | Yes X No ___ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. There is a path cut through the wetland for geotechnical borings.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| X Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
X Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Humocks are present in the wetland.

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP 1-2

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Quercus michauxii* | 25 | Yes | FACW |
| 2. *Liquidambar styraciflua* | 20 | Yes | FAC |
| 3. *Ilex opaca* | 15 | No | FAC |
| 4. *Quercus laurifolia* | 15 | No | FACW |
| 5. *Pinus taeda* | 10 | No | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 85 | =Total Cover | |
| 50% of total cover: 43 | | 20% of total cover: | 17 |
| **Sapling/Shrub Stratum (Plot size: 15)** | | | |
| 1. *Ilex opaca* | 20 | Yes | FAC |
| 2. *Quercus michauxii* | 15 | Yes | FACW |
| 3. *Clethra alnifolia* | 10 | No | FACW |
| 4. *Magnolia virginiana* | 5 | No | FACW |
| 5. *Persea borbonia* | 2 | No | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 52 | =Total Cover | |
| 50% of total cover: 26 | | 20% of total cover: | 11 |
| **Herb Stratum (Plot size: 5)** | | | |
| 1. *Smilax rotundifolia* | 12 | Yes | FAC |
| 2. *Acer rubrum* | 2 | No | FAC |
| 3. *Quercus phellos* | 2 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 16 | =Total Cover | |
| 50% of total cover: 8 | | 20% of total cover: | 4 |
| **Woody Vine Stratum (Plot size: 30)** | | | |
| 1. *Smilax rotundifolia* | 10 | Yes | FAC |
| 2. *Berchemia scandens* | 5 | Yes | FAC |
| 3. *Vitis rotundifolia* | 5 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| | 20 | =Total Cover | |
| 50% of total cover: 10 | | 20% of total cover: | 4 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 74 | x 2 = | 148 |
| FAC species | 99 | x 3 = | 297 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 173 (A) | | 445 (B) |

Prevalence Index = B/A = 2.57

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 1-2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-9 | 10YR 2/2 | 100 | | | | | Loamy/Clayey | texture is silt loam |
| 9-17 | 10YR 4/2 | 95 | 7.5YR 5/8 | 5 | C | PL | Loamy/Clayey | texture is a fine sandy loam |
| 17-20 | 10YR 4/1 | 80 | 10YR 6/1 | 10 | D | M | Loamy/Clayey | texture is clay loam |
| | | | 7.5YR 5/8 | 10 | C | PL/M | | Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ________

Depth (inches): ________

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

| **U.S. Army Corps of Engineers**<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | ***Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)*** |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 1-3

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.767688 Long: -76.511782 Datum: NAD83

Soil Map Unit Name: Torhunta Loam NWI classification: PFO1/4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? Yes X No ____ | | **Is the Sampled Area within a Wetland? Yes X No ____** |
| Hydric Soil Present? Yes X No ____ | | |
| Wetland Hydrology Present? Yes X No ____ | | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | | |
|---|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) | |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** | |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) | |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) | |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) | |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) | |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) | |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) | |
| ___ Inundation Visible on Aerial Imagery (B7) | | |
| X Water-Stained Leaves (B9) | | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
X Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present? Yes X No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP 1-3

| Tree Stratum (Plot size: 30 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liquidambar styraciflua* | 30 | Yes | FAC |
| 2. *Ilex opaca* | 25 | Yes | FAC |
| 3. *Quercus laurifolia* | 15 | No | FACW |
| 4. *Acer rubrum* | 15 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 85 | =Total Cover | |
| 50% of total cover: 43 | | 20% of total cover: | 17 |

| Sapling/Shrub Stratum (Plot size: 15 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Ilex opaca* | 20 | Yes | FAC |
| 2. *Quercus laurifolia* | 15 | Yes | FACW |
| 3. *Clethra alnifolia* | 10 | Yes | FACW |
| 4. *Magnolia virginiana* | 5 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 50 | =Total Cover | |
| 50% of total cover: 25 | | 20% of total cover: | 10 |

| Herb Stratum (Plot size: 5 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Onoclea sensibilis* | 15 | Yes | FACW |
| 2. *Smilax rotundifolia* | 10 | Yes | FAC |
| 3. *Quercus phellos* | 5 | No | FACW |
| 4. *Acer rubrum* | 5 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 35 | =Total Cover | |
| 50% of total cover: 18 | | 20% of total cover: | 7 |

| Woody Vine Stratum (Plot size: 30 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Smilax rotundifolia* | 10 | Yes | FAC |
| 2. *Berchemia scandens* | 5 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 15 | =Total Cover | |
| 50% of total cover: 8 | | 20% of total cover: | 3 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 65 | x 2 = | 130 |
| FAC species | 120 | x 3 = | 360 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 185 (A) | | 490 (B) |

Prevalence Index = B/A = 2.65

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 1-3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 3/2 | 100 | | | | | Loamy/Clayey | texture is silt loam |
| 6-15 | 10YR 4/2 | 98 | 10YR 4/6 | 2 | C | PL/M | Loamy/Clayey | texture is fine sandy loam |
| 15-20 | 10YR 5/2 | 95 | 10YR 6/6 | 5 | C | PL/M | Loamy/Clayey | texture is a clay loam |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ______
Depth (inches): ______

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

## Photo Log – Transect 1 – Wetland Data Points

**Data Point 1-1**


**Data Point 1-2**



**Data Point 1-3**

# C

Transect 2

## Hydrogeomorphic Assessment of Wet Hardwood Flats on Mineral Soils

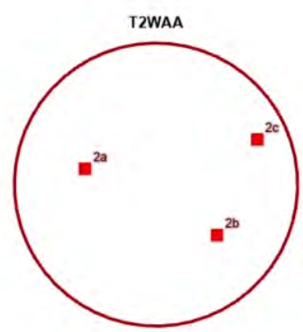
Site # T2WAA    Site Name SPSA Functional Assessment    Date 07/19/2023

Time(Start & Finish) 11:30am-12:30pm    Crew J. Mace, J. Irvin

Lat/Long: 36.75961, -76.51569    AA shape: circle or rectangle or entire wetland polygon (circle)

AA moved from original location? Yes or No (circle one) If Yes, reason

**Assessment Area Sketch**




| Stability of AA (check one) | |
|---|---|
| X | Healthy & Stable |
| | Deteriorating/Fragmenting |
| | Severe deterioration/fragmentation |

**Soils**

Depth of organic layer (cm): 10

Comments on soil sample:

### Function 1: Habitat Characteristic

| Variable: Woody Debris ($V_{WD}$) DBH in CM | | | |
|---|---|---|---|
| Sub-plot A | 44.2 | 41.8 | 41.5 |
| Sub-plot B | 44.2 | 51.1 | 52.6 |
| Sub-plot C | 45.5 | 42.2 | 50.8 |
| | Mean: | 45.99 | |

Subindex Score: 1.00

| Variable: Food Plants ($V_{FOOD}$) |
|---|
| Number of species*: 9 |
| * Number produced from species in $V_{FQAI}$ |
| * Food list species provided in HGM Manual |

Subindex Score: 0.90

| Variable: Natural landcover with 200m ($V_{NATURAL}$) | |
|---|---|
| % Natural: | >80% |

Subindex Score: 1.00

| Variable: Tree Density ($V_{DENSITY}$) | |
|---|---|
| Sub-plot A | 19 |
| Sub-plot B | 17 |
| Sub-plot C | 15 |
| Mean: | 17 (680 stems/ha) |

Subindex Score: 0.823

**Habitat Functional Capacity Formula**

$(V_{WD} + V_{FOOD} + V_{NATURAL} + V_{DENSITY})/4 =$ **0.93**

**Function 2: Plant Community Characteristic**

| Species: | A | B | C | $V_{CANOPY}$ |
|---|---|---|---|---|
| *Acer rubrum* | ✓ | ✓ | ✓ | ● ● |
| *Agrostis stolonifera* | | | | |
| *Aralia spinosa* | | | | |
| *Chasmanthium laxum* | | | | |
| *Clethra alnifolia* | | | | |
| *Fraxinus pennsylvanica* | | | | |
| *Ilex opaca* | | | | |
| *Juncus effusus* | | | | |
| *Liquidambar styraciflua* | ✓ | ✓ | ✓ | ●●●● |
| *Magnolia virginiana* | | | | |
| *Pinus taeda* | ✓ | ✓ | ✓ | 9 |
| *Pyrola americana* | | | | |
| *Quercus alba* | | | | |
| *Quercus michauxii* | ✓ | ✓ | ✓ | |
| *Quercus pagoda* | | | | |
| *Quercus phellos* | | | | |
| *Quercus prinus* | | | | |
| *Sambucus canadensis* | | | | |
| *Smilax rotundifolia* | ✓ | ✓ | ✓ | |
| *Symplocos tinctoria* | | | | |
| *Tipularia discolor* | | | | |
| *Vaccinium corymbosum* | | | | |
| *Viburnum nudum* | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 30.36

* Adjusted FQI value determined by entering species list into FQAI Calculator at the Mid-Atlantic Wetlands Workgroup website: http://mawwg.psu.edu/tools/fqai.asp

Subindex Score: 0.07

**Variable: Canopy Tree Composition ($V_{CANOPY}$)**

| Relative Dominance | Subindex |
|---|---|
| No canopy trees | 0.0 |
| >50% pine | 0.0 |
| >50% hardwoods, >25% pine, <1% oak | 0.2 |
| >50% hardwoods, <25% pine, <1% oak | 0.3 |
| >50% hardwoods, >25% pine, 1-10% oak | 0.5 |
| >50% hardwoods, <25% pine, 1-10% oak | 0.7 |
| >50% hardwoods, >25% pine, >10% oak | $\boxed{0.8}$ |
| >50% hardwoods, <25% pine, >10% oak | 1.0 |

**Variable: Hardwood Regeneration ($V_{REGEN}$) %**

Sub-plot **A** = 5

Sub-plot B = 15

Sub-plot C = 5

Mean = 8.33

Subindex Score: 1.00

**Variable:Non-native Invasive PlantS ($V_{INVASIVE}$) %**

Sub-plot A = **30**

Sub-plot B = 5

Sub-plot C = 50

Mean = 28.**3**

Subindex Score: 0

**Plant Community Functional Capacity Formula**

FCI = $(V_{FQAI} + V_{CANOPY} + V_{REGEN} + V_{INVASIVE})/4$ **FCI** =

0.47

## Function 3: Water Level Regime Characteristic

**Variable: Anthropogenic Drainage ($V_{DRAIN}$)**

% Impacted: 0.00

$V_{DRAIN}$ = 1.00

**Variable: Percent Fill in WAA ($V_{FILL}$)**

% Fill: 0

$V_{FILL}$ = 1.00

**Variable: Natural Landcover with 200m ($V_{NATURAL}$)***

*$V_{NATURAL}$ value given in Function 1.

Subindex Score: 1.00

**Water Regime Functional Capacity Formula**

FCI = ($V_{NATURAL}$ + $V_{DRAIN}$ + $V_{FILL}$)/3

**FCI = 1.00**

## Function 4: Carbon Cycling Processes Characteristic

**Variable: Woody Debris ($V_{WD}$)***

*$V_{WD}$ value given in Function 1.

Subindex Score: 1.00

**Variable: Herbaceous Cover ($V_{HERB}$) %**

Sub-plot A = 35

Sub-plot B = 5

Sub-plot C = 70

Mean = 36.67

Subindex Score: 1.00

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 30.36

Subindex Score: 0.07

**Carbon Cycling Processes Functional Capacity Formula**

($V_{WD}$ + $V_{FQAI}$ + $V_{HERB}$ + Water Level Regime Functional Capacity Score)/4

**FCI = 0.77**

## Photo Log – Transect 2 - Wetland Assessment Area (T2WAA)

**Subplot 2a**

**Subplot 2b**

**Subplot 2c**

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 2-1

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.759620 Long: -76.515696 Datum: NAD83

Soil Map Unit Name: Tomotley loam NWI classification: PFO4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |
| Hydric Soil Present? | Yes X No ___ | |
| Wetland Hydrology Present? | Yes X No ___ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. The ground is hummocky.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| X Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
X Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP 2-1

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liquidambar styraciflua* | 30 | Yes | FAC |
| 2. *Ilex opaca* | 15 | Yes | FAC |
| 3. *Liriodendron tulipifera* | 10 | No | FACU |
| 4. *Nyssa sylvatica* | 10 | No | FAC |
| 5. *Magnolia virginiana* | 10 | No | FACW |
| 6. *Acer rubrum* | 10 | No | FAC |
| 7. | | | |
| 8. | | | |
| | 85 | =Total Cover | |
| 50% of total cover: 43 | | 20% of total cover: | 17 |
| **Sapling/Shrub Stratum** (Plot size: 15) | | | |
| 1. *Ilex opaca* | 30 | Yes | FAC |
| 2. *Clethra alnifolia* | 20 | Yes | FACW |
| 3. *Quercus michauxii* | 5 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 55 | =Total Cover | |
| 50% of total cover: 28 | | 20% of total cover: | 11 |
| **Herb Stratum** (Plot size: 5) | | | |
| 1. *Onoclea sensibilis* | 5 | Yes | FACW |
| 2. *Mitchella repens* | 5 | Yes | FACU |
| 3. *Acer rubrum* | 2 | No | FAC |
| 4. *Toxicodendron radicans* | 2 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 14 | =Total Cover | |
| 50% of total cover: 7 | | 20% of total cover: | 3 |
| **Woody Vine Stratum** (Plot size: 30) | | | |
| 1. *Smilax rotundifolia* | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | =Total Cover | |
| 50% of total cover: 3 | | 20% of total cover: | 1 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 40 | x 2 = | 80 |
| FAC species | 104 | x 3 = | 312 |
| FACU species | 15 | x 4 = | 60 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 159 (A) | | 452 (B) |

Prevalence Index = B/A = 2.84

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 2-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-8 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 8-18 | 10YR 3/1 | 40 | 10YR 6/1 | 40 | | | Loamy/Clayey | clayey loam texture |
| | | | 10YR 5/8 | 20 | C | M | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
_X_ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** **Yes** _X_ **No** ___

Remarks:

| U.S. Army Corps of Engineers<br>WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM  City/County: Suffolk  Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia  State: VA  Sampling Point: DP 2-2

Investigator(s): J Mace and J Irvin  Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat  Local relief (concave, convex, none): none  Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 153A  Lat: 36.762832  Long: -76.513347  Datum: NAD83

Soil Map Unit Name: Torhunta loam  NWI classification: PFO1Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |
| Hydric Soil Present? | Yes X No ___ | |
| Wetland Hydrology Present? | Yes X No ___ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. This point is about 100 feet south of the cut geotechnical area. The ground is hummocky.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| X Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- X Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants.

Sampling Point: DP 2-2

| Tree Stratum (Plot size: 30 ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 40 | Yes | FAC |
| 2. *Liquidambar styraciflua* | 20 | Yes | FAC |
| 3. *Quercus michauxii* | 10 | No | FACW |
| 4. *Ilex opaca* | 10 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 80 | =Total Cover | |
| 50% of total cover: 40 | | 20% of total cover: | 16 |

| Sapling/Shrub Stratum (Plot size: 15 ) | | | |
|---|---|---|---|
| 1. *Ilex opaca* | 20 | Yes | FAC |
| 2. *Quercus phellos* | 10 | Yes | FACW |
| 3. *Quercus michauxii* | 10 | Yes | FACW |
| 4. *Magnolia tripetala* | 5 | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 45 | =Total Cover | |
| 50% of total cover: 23 | | 20% of total cover: | 9 |

| Herb Stratum (Plot size: 5 ) | | | |
|---|---|---|---|
| 1. *Arundinaria tecta* | 30 | Yes | FACW |
| 2. *Clethra alnifolia* | 10 | Yes | FACW |
| 3. *Liquidambar styraciflua* | 2 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 42 | =Total Cover | |
| 50% of total cover: 21 | | 20% of total cover: | 9 |

| Woody Vine Stratum (Plot size: 30 ) | | | |
|---|---|---|---|
| 1. *Smilax rotundifolia* | 10 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 10 | =Total Cover | |
| 50% of total cover: 5 | | 20% of total cover: | 2 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 70 | x 2 = | 140 |
| FAC species | 102 | x 3 = | 306 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 177 (A) | | 466 (B) |

Prevalence Index = B/A = 2.63

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 2-2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-11 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 11-18 | 10YR 5/1 | 95 | 10YR 5/8 | 5 | C | M | Loamy/Clayey | Fine sandy loam texture |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ___
Depth (inches): ___

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 2-3

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.766850 Long: -76.510877 Datum: NAD83

Soil Map Unit Name: Torhunta loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ____ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ____ |
| Hydric Soil Present? | Yes X No ____ | |
| Wetland Hydrology Present? | Yes X No ____ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. The ground is hummocky.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ____ Surface Water (A1) | ____ Aquatic Fauna (B13) |
| ____ High Water Table (A2) | ____ Marl Deposits (B15) **(LRR U)** |
| ____ Saturation (A3) | ____ Hydrogen Sulfide Odor (C1) |
| ____ Water Marks (B1) | ____ Oxidized Rhizospheres on Living Roots (C3) |
| ____ Sediment Deposits (B2) | ____ Presence of Reduced Iron (C4) |
| ____ Drift Deposits (B3) | ____ Recent Iron Reduction in Tilled Soils (C6) |
| ____ Algal Mat or Crust (B4) | ____ Thin Muck Surface (C7) |
| ____ Iron Deposits (B5) | ____ Other (Explain in Remarks) |
| ____ Inundation Visible on Aerial Imagery (B7) | |
| ____ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- X Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION (Four Strata)** – Use scientific names of plants. Sampling Point: DP 2-3

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Quercus michauxii* | 30 | Yes | FACW |
| 2. *Acer rubrum* | 20 | Yes | FAC |
| 3. *Quercus laurifolia* | 20 | Yes | FACW |
| 4. *Ilex opaca* | 10 | No | FAC |
| 5. *Magnolia virginiana* | 10 | No | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | =Total Cover | |
| 50% of total cover: 45 | | 20% of total cover: | 18 |

| Sapling/Shrub Stratum (Plot size: 15) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liquidambar styraciflua* | 20 | Yes | FAC |
| 2. *Quercus laurifolia* | 10 | Yes | FACW |
| 3. *Ilex opaca* | 10 | Yes | FAC |
| 4. *Vaccinium corymbosum* | 10 | Yes | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 50 | =Total Cover | |
| 50% of total cover: 25 | | 20% of total cover: | 10 |

| Herb Stratum (Plot size: 5) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Onoclea sensibilis* | 10 | Yes | FACW |
| 2. *Sphagnum sp.* | 10 | Yes | |
| 3. *Carex sp.* | 5 | Yes | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 25 | =Total Cover | |
| 50% of total cover: 13 | | 20% of total cover: | 5 |

| Woody Vine Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | =Total Cover | |
| 50% of total cover: | | 20% of total cover: | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 90 | x 2 = | 180 |
| FAC species | 60 | x 3 = | 180 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 150 (A) | | 360 (B) |

Prevalence Index = B/A = 2.40

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 2-3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 8-10 | 10YR 3/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 10-18 | 10YR 5/1 | 100 | | | | | Sandy | very fine sandy loam |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) (**MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ___

Depth (inches): ___

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

Photo Log – Transect 2– Wetland Data Points

**Data Point 2-1**

**Data Point 2-2**

**Data Point 2-3**

# D

Transect 3

# Hydrogeomorphic Assessment of Wet Hardwood Flats on Mineral Soils

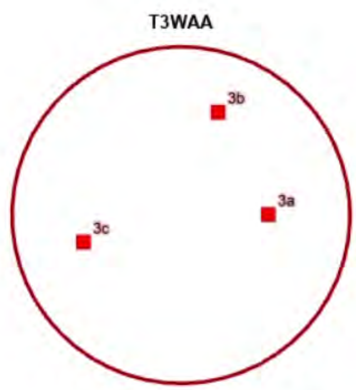
Site # T3WAA    Site Name SPSA Functional Assessment    Date 07/19/2023

Time(Start & Finish) 12:30pm-1:30pm    Crew J. Mace, J. Irvin

Lat/Long: 36.76272, -76.51142    AA shape: circle or rectangle or entire wetland polygon (circle)

AA moved from original location? Yes or No (circle one) If Yes, reason

**Assessment Area Sketch**




| Stability of AA (check one) | |
|---|---|
| X | Healthy & Stable |
| | Deteriorating/Fragmenting |
| | Severe deterioration/fragmentation |

**Soils**

Depth of organic layer (cm): 10

Comments on soil sample:

## Function 1: Habitat Characteristic

| Variable: Woody Debris ($V_{WD}$) DBH in CM | | | |
|---|---|---|---|
| Sub-plot A | 69.5 | 56.4 | 46.7 |
| Sub-plot B | 57.7 | 51.1 | 34 |
| Sub-plot C | 50.5 | 41.9 | 55 |
| | Mean: | 51.42 | |

Subindex Score: 1.00

**Variable: Food Plants ($V_{FOOD}$)**

Number of species*: 11

* Number produced from species in $V_{FQAI}$

* Food list species provided in HGM Manual

Subindex Score: 1.00

| Variable: Natural landcover with 200m ($V_{NATURAL}$) | |
|---|---|
| % Natural: | >80% |

Subindex Score: 1.00

| Variable: Tree Density ($V_{DENSITY}$) | |
|---|---|
| Sub-plot A | 8 |
| Sub-plot B | 14 |
| Sub-plot C | 9 |
| Mean: | 10.3 (412 stems/ha) |

Subindex Score: 1.00

**Habitat Functional Capacity Formula**

$(V_{WD} + V_{FOOD} + V_{NATURAL} + V_{DENSITY})/4 =$ **1.00**

**Function 2: Plant Community Characteristic**

| Species: | A | B | C | $V_{CANOPY}$ |
|---|---|---|---|---|
| *Acer rubrum* | ✓ | ✓ | ✓ | ● |
| *Agrostis stolonifera* | | | | |
| *Aralia spinosa* | | | | |
| *Chasmanthium laxum* | | | | |
| *Clethra alnifolia* | | | | |
| *Fraxinus pennsylvanica* | | | | |
| *Ilex opaca* | ✓ | ✓ | ✓ | ●● |
| *Juncus effusus* | | | | |
| *Liquidambar styraciflua* | ✓ | ✓ | ✓ | ●● ● |
| *Magnolia virginiana* | | ✓ | ✓ | |
| *Pinus taeda* | | | | |
| *Pyrola americana* | | | | |
| *Quercus alba* | | | | |
| *Quercus michauxii* | ✓ | ✓ | ✓ | ● |
| *Quercus pagoda* | | | | |
| *Quercus phellos* | | | | |
| *Quercus prinus* | | | | |
| *Sambucus canadensis* | | | | |
| *Smilax rotundifolia* | | ✓ | ✓ | |
| *Symplocos tinctoria* | | | | |
| *Tipularia discolor* | | | | |
| *Vaccinium corymbosum* | ✓ | ✓ | | |
| *Viburnum nudum* | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 43.57

* Adjusted FQI value determined by entering species list into FQAI Calculator at the Mid-Atlantic Wetlands Workgroup website: http://mawwg.psu.edu/tools/fqai.asp

Subindex Score: 1.00

**Variable: Canopy Tree Composition ($V_{CANOPY}$)**

| Relative Dominance | Subindex |
|---|---|
| No canopy trees | 0.0 |
| >50% pine | 0.0 |
| >50% hardwoods, >25% pine, <1% oak | 0.2 |
| >50% hardwoods, <25% pine, <1% oak | 0.3 |
| >50% hardwoods, >25% pine, 1-10% oak | 0.5 |
| >50% hardwoods, <25% pine, 1-10% oak | 0.7 |
| >50% hardwoods, >25% pine, >10% oak | 0.8 |
| >50% hardwoods, <25% pine, >10% oak | $\boxed{1.0}$ |

**Variable: Hardwood Regeneration ($V_{REGEN}$) %**

Sub-plot **A** = 10
Sub-plot B = 0
Sub-plot C = 0
Mean = **3.33**

Subindex Score: 1.0

**Variable:Non-native Invasive PlantS ($V_{INVASIVE}$) %**

Sub-plot A = 0
Sub-plot B = 0
Sub-plot C = 0
Mean = 0

Subindex Score: 1.00

**Plant Community Functional Capacity Formula**

FCI = ($V_{FQAI}$ + $V_{CANOPY}$ + $V_{REGEN}$ + $V_{INVASIVE}$)/4 **FCI** =

1.00

**Function 3: Water Level Regime Characteristic**

| Variable: Anthropogenic Drainage ($V_{DRAIN}$) | |
|---|---|
| % Impacted: | 0 |
| $V_{DRAIN}$ = | 1.0 |

| Variable: Percent Fill in WAA ($V_{FILL}$) | |
|---|---|
| % Fill: | 0 |
| $V_{FILL}$ = | 1.00 |

**Variable: Natural Landcover with 200m ($V_{NATURAL}$)***

*$V_{NATURAL}$ value given in Function 1.

Subindex Score: 1.00

**Water Regime Functional Capacity Formula**

FCI = ($V_{NATURAL}$ + $V_{DRAIN}$ + $V_{FILL}$)/3

**FCI = 1.00**

**Function 4: Carbon Cycling Processes Characteristic**

**Variable: Woody Debris ($V_{WD}$)***

*$V_{WD}$ value given in Function 1.

Subindex Score: 1.00

| Variable: Floristic Quality Assessment Index ($V_{FQAI}$) | |
|---|---|
| Adjusted FQI Value*= | 43.57 |

Subindex Score: 1.00

| Variable: Herbaceous Cover ($V_{HERB}$) % | |
|---|---|
| Sub-plot A = | 70 |
| Sub-plot B = | 40 |
| Sub-plot C = | 90 |
| Mean = | 66.67 |

Subindex Score: 0.01

**Carbon Cycling Processes Functional Capacity Formula**

($V_{WD}$ + $V_{FQAI}$ + $V_{HERB}$ + Water Level Regime Functional Capacity Score)/4

**FCI = 0.75**

## Photo Log – Transect 3 - Wetland Assessment Area (T3WAA)

**Subplot 3a**

**Subplot 3b**

**Subplot 3c**

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 3-1

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.760899 Long: -76.513071 Datum: NAD83

Soil Map Unit Name: Tomotley Loam NWI classification: PFO1Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes X No ___<br>Hydric Soil Present? Yes X No ___<br>Wetland Hydrology Present? Yes X No ___ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ___ |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. The ground is hummocky. There is ditching to the south of the data point.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ___ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
X Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No X | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP 3-1

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liriodendron tulipifera* | 60 | Yes | FACU |
| 2. *Acer rubrum* | 10 | No | FAC |
| 3. *Liquidambar styraciflua* | 10 | No | FAC |
| 4. *Ilex opaca* | 10 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | =Total Cover | |
| 50% of total cover: 45 | | 20% of total cover: | 18 |
| **Sapling/Shrub Stratum** (Plot size: 15) | | | |
| 1. *Magnolia tripetala* | 15 | Yes | FACU |
| 2. *Ilex opaca* | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 25 | =Total Cover | |
| 50% of total cover: 13 | | 20% of total cover: | 5 |
| **Herb Stratum** (Plot size: 5) | | | |
| 1. *Microstegium vimineum* | 30 | Yes | FAC |
| 2. *Parthenocissus quinquefolia* | 5 | No | FACU |
| 3. *Potentilla indica* | 5 | No | FACU |
| 4. *Onoclea sensibilis* | 5 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 45 | =Total Cover | |
| 50% of total cover: 23 | | 20% of total cover: | 9 |
| **Woody Vine Stratum** (Plot size: 30) | | | |
| 1. *Toxicodendron radicans* | 10 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 10 | =Total Cover | |
| 50% of total cover: 5 | | 20% of total cover: | 2 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 5 | x 2 = | 10 |
| FAC species | 80 | x 3 = | 240 |
| FACU species | 85 | x 4 = | 340 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 170 (A) | | 590 (B) |

Prevalence Index = B/A = 3.47

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 3-1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 12-18 | 10YR 4/1 | 95 | 10YR 4/4 | 5 | C | M | Loamy/Clayey | clayey loam texture |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ______
Depth (inches): ______

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: DP 3-2

Investigator(s): J Mace and J Irvin Section, Township, Range: ______

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.764492 Long: -76.510141 Datum: NAD83

Soil Map Unit Name: Deloss Mucky loam NWI classification: PFO1Ed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ____ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ____ |
| Hydric Soil Present? | Yes X No ____ | |
| Wetland Hydrology Present? | Yes X No ____ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. The ground is hummocky.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | | |
|---|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) | |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** | |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) | |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) | |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) | |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) | |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) | |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) | |
| ___ Inundation Visible on Aerial Imagery (B7) | | |
| X Water-Stained Leaves (B9) | | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present? Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP 3-2

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 60 | Yes | FAC |
| 2. *Liquidambar styraciflua* | 20 | Yes | FAC |
| 3. *Liriodendron tulipifera* | 5 | No | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 85 | =Total Cover | |
| 50% of total cover: 43 | | 20% of total cover: | 17 |
| **Sapling/Shrub Stratum** (Plot size: 15) | | | |
| 1. *Clethra alnifolia* | 20 | Yes | FACW |
| 2. *Magnolia tripetala* | 10 | Yes | FACU |
| 3. *Ilex opaca* | 10 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 40 | =Total Cover | |
| 50% of total cover: 20 | | 20% of total cover: | 8 |
| **Herb Stratum** (Plot size: 5) | | | |
| 1. *Athyrium filix-femina* | 20 | Yes | UPL |
| 2. *Saururus cernuus* | 15 | Yes | OBL |
| 3. *Onoclea sensibilis* | 5 | No | FACW |
| 4. *Carex sp.* | 5 | No | |
| 5. *Clethra alnifolia* | 5 | No | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 50 | =Total Cover | |
| 50% of total cover: 25 | | 20% of total cover: | 10 |
| **Woody Vine Stratum** (Plot size: 30) | | | |
| 1. *Smilax rotundifolia* | 10 | Yes | FAC |
| 2. *Berchemia scandens* | 10 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 20 | =Total Cover | |
| 50% of total cover: 10 | | 20% of total cover: | 4 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | 15 | x 1 = 15 |
| FACW species | 30 | x 2 = 60 |
| FAC species | 110 | x 3 = 330 |
| FACU species | 15 | x 4 = 60 |
| UPL species | 20 | x 5 = 100 |
| Column Totals: | 190 (A) | 565 (B) |

Prevalence Index = B/A = 2.97

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: DP 3-2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-13 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 13-18 | 10YR 4/1 | 95 | 7.5YR 4/6 | 5 | C | M | Loamy/Clayey | Fine sandy loam texture |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ______
Depth (inches): ______

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

## Photo Log – Transect 3 – Wetland Data Points

| Data Point 3-1 | |
|---|---|
|  |  |
| **Data Point 3-2** | |
|  |  |

# E

Transect R (Reference)

## Hydrogeomorphic Assessment of Wet Hardwood Flats on Mineral Soils

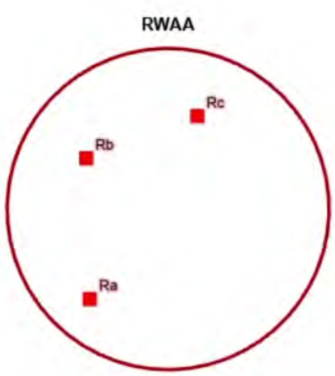
Site # RWAA    Site Name SPSA Functional Assessment    Date 07/19/2023

Time(Start & Finish) 1:30pm-2:30pm    Crew J. Mace, J. Irvin

Lat/Long: 36.761909, -76.50947    AA shape: circle or rectangle or entire wetland polygon (circle)

AA moved from original location? Yes or No (circle one) If Yes, reason

**Assessment Area Sketch**




| **Stability of AA (check one)** | |
|---|---|
| X | Healthy & Stable |
| | Deteriorating/Fragmenting |
| | Severe deterioration/fragmentation |

**Soils**

Depth of organic layer (cm): 10

Comments on soil sample:

### Function 1: Habitat Characteristic

| **Variable: Woody Debris ($V_{WD}$) DBH in CM** | | | |
|---|---|---|---|
| Sub-plot A | 71.6 | 47.6 | 50.3 |
| Sub-plot B | 64 | 45.6 | 42.4 |
| Sub-plot C | 25.3 | 21.5 | 35.1 |
| | Mean: | 44.8 | |

Subindex Score: 1.00

| **Variable: Food Plants ($V_{FOOD}$)** |
|---|
| Number of species*: 10 |
| * Number produced from species in $V_{FQAI}$ |
| * Food list species provided in HGM Manual |

Subindex Score: 1.00

| **Variable: Natural landcover with 200m ($V_{NATURAL}$)** | |
|---|---|
| % Natural: | >80% |

Subindex Score: 1.00

| **Variable: Tree Density ($V_{DENSITY}$)** | |
|---|---|
| Sub-plot A | 12 |
| Sub-plot B | 14 |
| Sub-plot C | 11 |
| Mean: | 12.3 (492 stems/ha) |

Subindex Score: 1.00

**Habitat Functional Capacity Formula**

$(V_{WD} + V_{FOOD} + V_{NATURAL} + V_{DENSITY})/4 =$ **1.00**

**Function 2: Plant Community Characteristic**

| Species: | A | B | C | $V_{CANOPY}$ |
|---|---|---|---|---|
| *Acer rubrum* | ✓ | ✓ | ✓ | |
| *Agrostis stolonifera* | | | | |
| *Aralia spinosa* | | | | |
| *Chasmanthium laxum* | | | | |
| *Clethra alnifolia* | | ✓ | | |
| *Fraxinus pennsylvanica* | | | | |
| *Ilex opaca* | ✓ | ✓ | ✓ | |
| *Juncus effusus* | | | | |
| *Liquidambar styraciflua* | | ✓ | ✓ | 7 |
| *Magnolia virginiana* | ✓ | | | |
| *Pinus taeda* | | | | |
| *Pyrola americana* | | | | |
| *Quercus alba* | | | | |
| *Quercus michauxii* | ✓ | ✓ | | |
| *Quercus pagoda* | | | | |
| *Quercus phellos* | | | | |
| *Quercus prinus* | | | | |
| *Sambucus canadensis* | | | | |
| *Smilax rotundifolia* | ✓ | ✓ | ✓ | |
| *Symplocos tinctoria* | | | | |
| *Tipularia discolor* | | | | |
| *Vaccinium corymbosum* | ✓ | | | |
| *Viburnum nudum* | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 35.88

* Adjusted FQI value determined by entering species list into FQAI Calculator at the Mid-Atlantic Wetlands Workgroup website: http://mawwg.psu.edu/tools/fqai.asp

Subindex Score: 1.00

**Variable: Canopy Tree Composition ($V_{CANOPY}$)**

| Relative Dominance | Subindex |
|---|---|
| No canopy trees | 0.0 |
| >50% pine | 0.0 |
| >50% hardwoods, >25% pine, <1% oak | 0.2 |
| >50% hardwoods, <25% pine, <1% oak | 0.3 |
| >50% hardwoods, >25% pine, 1-10% oak | 0.5 |
| >50% hardwoods, <25% pine, 1-10% oak | 0.7 |
| >50% hardwoods, >25% pine, >10% oak | 0.8 |
| >50% hardwoods, <25% pine, >10% oak | 1.0 |

**Variable: Hardwood Regeneration ($V_{REGEN}$) %**

Sub-plot **A** = 10
Sub-plot B = 5
Sub-plot C = 0
Mean = 5

Subindex Score: 1.0

**Variable:Non-native Invasive PlantS ($V_{INVASIVE}$) %**

Sub-plot A = 0
Sub-plot B = 10
Sub-plot C = 0
Mean = 3.33

Subindex Score: 0

**Plant Community Functional Capacity Formula**

FCI = ($V_{FQAI}$ + $V_{CANOPY}$ + $V_{REGEN}$ + $V_{INVASIVE}$)/4 **FCI** =

0.75

## Function 3: Water Level Regime Characteristic

**Variable: Anthropogenic Drainage ($V_{DRAIN}$)**

% Impacted: 0

$V_{DRAIN}$ = 1.0

**Variable: Percent Fill in WAA ($V_{FILL}$)**

% Fill: 0

$V_{FILL}$ = 1.00

**Variable: Natural Landcover with 200m ($V_{NATURAL}$)***

*$V_{NATURAL}$ value given in Function 1.

Subindex Score: 1.00

**Water Regime Functional Capacity Formula**

FCI = ($V_{NATURAL}$ + $V_{DRAIN}$ + $V_{FILL}$)/3

**FCI = 1.00**

## Function 4: Carbon Cycling Processes Characteristic

**Variable: Woody Debris ($V_{WD}$)***

*$V_{WD}$ value given in Function 1.

Subindex Score: 1.00

**Variable: Herbaceous Cover ($V_{HERB}$) %**

Sub-plot A = 80

Sub-plot B = 70

Sub-plot C = 90

Mean = 80

Subindex Score: 0.01

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 35.88

Subindex Score: 1.00

**Carbon Cycling Processes Functional Capacity Formula**

($V_{WD}$ + $V_{FQAI}$ + $V_{HERB}$ + Water Level Regime Functional Capacity Score)/4

**FCI = 0.75**

## Photo Log – Reference Transect - Wetland Assessment Area (RWAA)

**Subplot Ra**

**Subplot Rb**

**Subplot Rc**

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: RTDP 1

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.760284 Long: -76.510597 Datum: NAD83

Soil Map Unit Name: Tomotley loam NWI classification: PFO4/1Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? Yes X No ____ | **Is the Sampled Area within a Wetland?** | **Yes** X **No** ____ |
| Hydric Soil Present? Yes X No ____ | | |
| Wetland Hydrology Present? Yes X No ____ | | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. This form represents the reference transect data point 1 taken on-site. The point was taken in a dried-up ephemeral pool.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: RTDP 1

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Liquidambar styraciflua* | 50 | Yes | FAC |
| 2. *Acer rubrum* | 30 | Yes | FAC |
| 3. *Ilex opaca* | 10 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | =Total Cover | |
| 50% of total cover: 45 | | 20% of total cover: | 18 |
| **Sapling/Shrub Stratum (Plot size: 15)** | | | |
| 1. *Acer rubrum* | 15 | Yes | FAC |
| 2. *Magnolia tripetala* | 10 | Yes | FACU |
| 3. *Ilex opaca* | 5 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 30 | =Total Cover | |
| 50% of total cover: 15 | | 20% of total cover: | 6 |
| **Herb Stratum (Plot size: 5)** | | | |
| 1. *Athyrium filix-femina* | 15 | Yes | UPL |
| 2. *Onoclea sensibilis* | 15 | Yes | FACW |
| 3. *Smilax rotundifolia* | 2 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 32 | =Total Cover | |
| 50% of total cover: 16 | | 20% of total cover: | 7 |
| **Woody Vine Stratum (Plot size: 30)** | | | |
| 1. *Toxicodendron radicans* | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 5 | =Total Cover | |
| 50% of total cover: 3 | | 20% of total cover: | 1 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 15 | x 2 = | 30 |
| FAC species | 117 | x 3 = | 351 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 15 | x 5 = | 75 |
| Column Totals: | 157 (A) | | 496 (B) |

Prevalence Index = B/A = 3.16

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: RTDP 1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-3 | 10YR 2/1 | 100 | | | | | Muck | |
| 3-14 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 14-18 | 10YR 4/1 | 94 | 10YR 5/1 | 3 | D | M | Loamy/Clayey | Loamy clay tetxure |
| | | | 7.5YR 4/6 | 3 | C | PL | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
X 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**
Type: ______
Depth (inches): ______

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

| U.S. Army Corps of Engineers<br>**WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region**<br>See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R | *Requirement Control Symbol EXEMPT (Authority: AR 335-15, paragraph 5-2a)* |
|---|---|

Project/Site: SPSA Landfill Expansion - HGM City/County: Suffolk Sampling Date: 07/19/2023

Applicant/Owner: Southeastern Public Service Authority of Virginia State: VA Sampling Point: RTDP 2

Investigator(s): J Mace and J Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): Mineral Flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR T, MLRA 153A Lat: 36.763691 Long: -76.508415 Datum: NAD83

Soil Map Unit Name: Belhaven muck NWI classification: PSS1/4Cd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No ____ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ____ |
| Hydric Soil Present? | Yes X No ____ | |
| Wetland Hydrology Present? | Yes X No ____ | |

Remarks:
The Army Corps of Engineers' Antecedent Precipitation Tool was used to determine the climatic/hydrologic conditions for the site at the time of surveying and found that conditions were normal for this time of year. The ground is hummocky.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

| | |
|---|---|
| ___ Surface Water (A1) | ___ Aquatic Fauna (B13) |
| ___ High Water Table (A2) | ___ Marl Deposits (B15) **(LRR U)** |
| ___ Saturation (A3) | ___ Hydrogen Sulfide Odor (C1) |
| ___ Water Marks (B1) | ___ Oxidized Rhizospheres on Living Roots (C3) |
| ___ Sediment Deposits (B2) | ___ Presence of Reduced Iron (C4) |
| ___ Drift Deposits (B3) | ___ Recent Iron Reduction in Tilled Soils (C6) |
| ___ Algal Mat or Crust (B4) | ___ Thin Muck Surface (C7) |
| ___ Iron Deposits (B5) | ___ Other (Explain in Remarks) |
| ___ Inundation Visible on Aerial Imagery (B7) | |
| ___ Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)
___ Sphagnum Moss (D8) **(LRR T,U)**

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: RTDP 2

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 50 | Yes | FAC |
| 2. *Liquidambar styraciflua* | 20 | Yes | FAC |
| 3. *Quercus michauxii* | 20 | Yes | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 90 | =Total Cover | |
| 50% of total cover: 45 | | 20% of total cover: | 18 |
| **Sapling/Shrub Stratum** (Plot size: 15) | | | |
| 1. *Vaccinium corymbosum* | 20 | Yes | FACW |
| 2. *Ilex opaca* | 20 | Yes | FAC |
| 3. *Magnolia tripetala* | 10 | No | FACU |
| 4. *Acer rubrum* | 10 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 60 | =Total Cover | |
| 50% of total cover: 30 | | 20% of total cover: | 12 |
| **Herb Stratum** (Plot size: 5) | | | |
| 1. *Arundinaria tecta* | 20 | Yes | FACW |
| 2. *Microstegium vimineum* | 10 | Yes | FAC |
| 3. *Smilax rotundifolia* | 5 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 35 | =Total Cover | |
| 50% of total cover: 18 | | 20% of total cover: | 7 |
| **Woody Vine Stratum** (Plot size: 30) | | | |
| 1. *Vitis rotundifolia* | 10 | Yes | FAC |
| 2. *Berchemia scandens* | 5 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 15 | =Total Cover | |
| 50% of total cover: 8 | | 20% of total cover: | 3 |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 60 | x 2 = | 120 |
| FAC species | 130 | x 3 = | 390 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 200 (A) | | 550 (B) |

Prevalence Index = B/A = 2.75

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

## SOIL

Sampling Point: RTDP 2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | fine silty loam texture |
| 10-12 | 10YR 2/1 | 50 | 10YR 4/1 | 50 | | | Loamy/Clayey | fine silty loam texture |
| 12-18 | 10YR 4/1 | 95 | 7.5YR 4/6 | 5 | C | PL | Loamy/Clayey | loamy clay texture |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR, P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
X Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: ______

Depth (inches): ______

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

## Photo Log – Reference Transect – Wetland Data Points

**Data Point RTDP-1**

**Data Point RTDP-2**

# F

Reference Standard

# Hydrogeomorphic Assessment of Wet Hardwood Flats on Mineral Soils

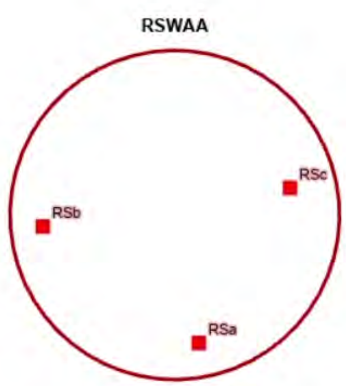
Site # RSWAA Site Name Great Dismal Swamp Date 09/13/2023

Time(Start & Finish) 10:30am-11:30am Crew J. Mace, J. Irvin

Lat/Long: 36.71798, -76.55521 AA shape: circle or rectangle or entire wetland polygon (circle)

AA moved from original location? Yes or No (circle one) If Yes, reason

**Assessment Area Sketch**




| Stability of AA (check one) | |
|---|---|
| X | Healthy & Stable |
| | Deteriorating/Fragmenting |
| | Severe deterioration/fragmentation |

**Soils**

Depth of organic layer (cm): 10

Comments on soil sample:

## Function 1: Habitat Characteristic

| Variable: Woody Debris ($V_{WD}$) DBH in CM | | | |
|---|---|---|---|
| Sub-plot A | 90 | 69.9 | 45.3 |
| Sub-plot B | 43.2 | 40.1 | 46.6 |
| Sub-plot C | 45.3 | 48.4 | 52.1 |
| | Mean: | 53.4 | |

Subindex Score: 1.00

**Variable: Food Plants ($V_{FOOD}$)**

Number of species*: 13

* Number produced from species in $V_{FQAI}$

* Food list species provided in HGM Manual

Subindex Score: 1.0

| Variable: Natural landcover with 200m ($V_{NATURAL}$) | |
|---|---|
| % Natural: | >80% |

Subindex Score: 1.00

| Variable: Tree Density ($V_{DENSITY}$) | |
|---|---|
| Sub-plot A | 11 |
| Sub-plot B | 10 |
| Sub-plot C | 15 |
| Mean: | 12 |

Subindex Score: 1.00

**Habitat Functional Capacity Formula**

$(V_{WD} + V_{FOOD} + V_{NATURAL} + V_{DENSITY})/4 =$ **1.00**

**Function 2: Plant Community Characteristic**

| Species: | A | B | C | $V_{CANOPY}$ |
|---|---|---|---|---|
| *Acer rubrum* | ✓ | ✓ | ✓ | |
| *Agrostis stolonifera* | | | | |
| *Aralia spinosa* | | | | |
| *Chasmanthium laxum* | | | | |
| *Clethra alnifolia* | ✓ | ✓ | ✓ | |
| *Fraxinus pennsylvanica* | | | | |
| *Ilex opaca* | ✓ | ✓ | ✓ | |
| *Juncus effusus* | | | | |
| *Liquidambar styraciflua* | ✓ | ✓ | | |
| *Magnolia virginiana* | | | | |
| *Pinus taeda* | ✓ | | | |
| *Pyrola americana* | | | | |
| *Quercus alba* | | ✓ | ✓ | ● ● ● |
| *Quercus michauxii* | ✓ | | | ● |
| *Quercus pagoda* | | | | |
| *Quercus phellos* | | | ✓ | |
| *Quercus prinus* | | | | |
| *Sambucus canadensis* | | | | |
| *Smilax rotundifolia* | ✓ | ✓ | ✓ | |
| *Symplocos tinctoria* | | ✓ | ✓ | |
| *Tipularia discolor* | | | | |
| *Vaccinium corymbosum* | ✓ | ✓ | ✓ | |
| *Viburnum nudum* | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 42.00

* Adjusted FQI value determined by entering species list into FQAI Calculator at the Mid-Atlantic Wetlands Workgroup website: http://mawwg.psu.edu/tools/fqai.asp

Subindex Score: 1.00

**Variable: Canopy Tree Composition ($V_{CANOPY}$)**

| Relative Dominance | Subindex |
|---|---|
| No canopy trees | 0.0 |
| >50% pine | 0.0 |
| >50% hardwoods, >25% pine, <1% oak | 0.2 |
| >50% hardwoods, <25% pine, <1% oak | 0.3 |
| >50% hardwoods, >25% pine, 1-10% oak | 0.5 |
| >50% hardwoods, <25% pine, 1-10% oak | $\boxed{0.7}$ |
| >50% hardwoods, >25% pine, >10% oak | 0.8 |
| >50% hardwoods, <25% pine, >10% oak | 1.0 |

**Variable: Hardwood Regeneration ($V_{REGEN}$) %**

Sub-plot **A** = 5

Sub-plot B = 5

Sub-plot C = 15

Mean = 8.33

Subindex Score: 1.0

**Variable:Non-native Invasive PlantS ($V_{INVASIVE}$) %**

Sub-plot A = 0

Sub-plot B = 0

Sub-plot C = 0

Mean = 0

Subindex Score: 1.0

**Plant Community Functional Capacity Formula**

FCI = ($V_{FQAI}$ + $V_{CANOPY}$ + $V_{REGEN}$ + $V_{INVASIVE}$)/4 **FCI** =

0.93

## Function 3: Water Level Regime Characteristic

**Variable: Anthropogenic Drainage ($V_{DRAIN}$)**

% Impacted: 0.00

$V_{DRAIN}$ = 1.00

**Variable: Percent Fill in WAA ($V_{FILL}$)**

% Fill: 0.00

$V_{FILL}$ = 1.00

**Variable: Natural Landcover with 200m ($V_{NATURAL}$)***

*$V_{NATURAL}$ value given in Function 1.

Subindex Score: 1.00

**Water Regime Functional Capacity Formula**

FCI = ($V_{NATURAL}$ + $V_{DRAIN}$ + $V_{FILL}$)/3

**FCI = 1.00**

## Function 4: Carbon Cycling Processes Characteristic

**Variable: Woody Debris ($V_{WD}$)***

*$V_{WD}$ value given in Function 1.

Subindex Score: 1.00

**Variable: Herbaceous Cover ($V_{HERB}$) %**

Sub-plot A = 40

Sub-plot B = 40

Sub-plot C = 35

Mean = 38.33

Subindex Score: 1.00

**Variable: Floristic Quality Assessment Index ($V_{FQAI}$)**

Adjusted FQI Value*= 42.00

Subindex Score: 1.00

**Carbon Cycling Processes Functional Capacity Formula**

($V_{WD}$ + $V_{FQAI}$ + $V_{HERB}$ + Water Level Regime Functional Capacity Score)/4

**FCI = 1.00**

## Photo Log – Reference Standard (Dismal Swamp) - Wetland Assessment Area (RSWAA)

**Subplot RSa**



**Subplot RSb**



**Subplot RSc**




# Compensatory Mitigation Plan Part 2

Southeastern Public Service Authority

Cells VIII and IX Development

Suffolk, Virginia

January 27, 2025

## Contents



## Attachments

Attachment 1 – Draft of Conservation Easement

## Mitigation Work Plan

The permittee responsible mitigation (PRM) credits are being acquired through the long-term protection of existing wetlands near the project site. The wetland mitigation and canebrake habitat preservation areas total 742.56 acres of primarily previously logged forested wetlands (678.80 acres), as well as emergent wetlands (2.00 acres), open water (12.65 acres), ditches (1,103 lf), a portion of Burnett's Mill Creek (1,533 lf), and uplands (48.20 acres). The entire 742.56 acres (Site) will be protected as a conservation easement held by the Virginia Outdoors Foundation (VOF) and managed in perpetuity by the SPSA, who will serve as the long-term steward. SPSA will ensure the protection and condition of the preservation areas, including Virginia Department of Wildlife Resources (DWR), US Army Corps of Engineers (USACE) and Virginia Department of Environmental Quality (DEQ) covenants and restrictions. The Site shall be preserved in perpetuity in its natural state, by prohibiting the following activities unless approved in writing by the USACE, DEQ and DWR:

1. Destruction or alteration of the preservation area other than those alterations recommended by the Virginia Department of Wildlife Resources (VDWR) for the purpose of habitat improvement within canebrake habitat preservation areas;
2. Construction, maintenance or placement of any structures or fills including but not limited to buildings, mobile homes, fences, and signs other than those which currently exist;
3. Ditching, draining, diking, damming, filling, excavating, grading, plowing, flooding/ponding, mining, drilling, placing of trash and yard debris or removing/adding topsoil, sand, or other material;
4. Permitting livestock to graze, inhabit or otherwise enter the preservation area;
5. Cultivating, harvesting, cutting, logging, planting, and pruning of trees and plants, or using fertilizers and spraying with biocides;
6. Utilizing a non-reporting Nationwide Permit or State Program General Permit under Section 404 of the Clean Water Act or state general permits under VWPP regulations to impact any Water of the U.S., or any State Waters on the Property. Notification shall be required for the use of any Nationwide Permit, State Program General Permit, Regional Permit, or state general permit under VWPP regulations.

No restoration or enhancement is proposed as these areas are composed of mixed hardwood and pines and will eventually become climax communities over time. Invasive species such as Japanese honeysuckle, Japanese stilt grass, Chinese bush clover, and Chinese privet. are interspersed throughout each of the preservation areas, but only dominant in recently disturbed locations. It is anticipated that their densities will be reduced once the forest matures. Additionally, the effort to remove invasive species would likely cause damage to surrounding established native species either from access or herbicide. Invasive species monitoring will be incorporated into this plan to maintain the ecological integrity of the preservation site.

## Maintenance Plan

The proposed preservation areas will be left undisturbed for vegetation to mature except for periodic mowing to maintain existing access roads and adjacent utility easements. Mowing of existing access roads will be restricted between November 1 through April 31 to minimize potential impacts to the state-listed endangered Canebrake Rattlesnake. Additionally, signage will be placed around the perimeter of each site to alert the public that the area is under preservation and should not be accessed.

## Performance Standards

- The percentage of invasive species will not increase from pre-construction to post-construction conditions in the preservation areas adjacent to the impact area.
- The percentage of invasive species throughout the preservation areas not directly adjacent to the impact area will not increase.

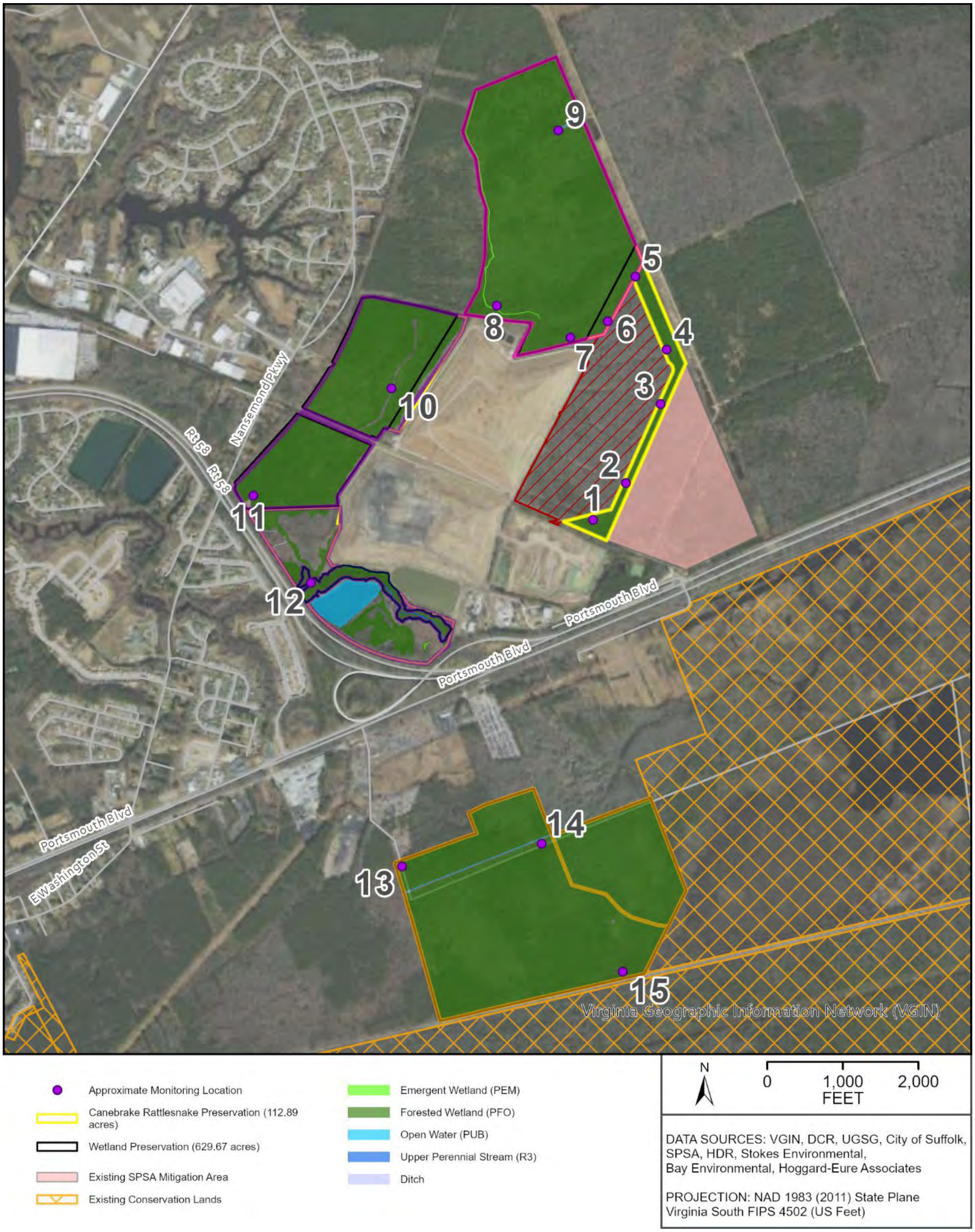
## Monitoring Requirements

SPSA will determine whether the performance standards are being achieved by performing annual monitoring for five consecutive monitoring years starting once construction commences for Cells 8 & 9. The annual monitoring will include an on-site evaluation of conditions, signs of trespass or vandalism, and to collect any trash that has accumulated within each of the preservation areas.

Photo monitoring locations will be established prior to the beginning of construction in areas where invasive species growth is most likely to occur to determine a baseline. Each monitoring location will consist of a 30-foot radius where invasive species will be identified, photographed, and the percent abundance will be visually determined. A preliminary map is below showing where these monitoring stations could be located. Photo monitoring locations are concentrated along the proposed impact site where tree clearing associated with the proposed project will occur. All tree clearing is anticipated to occur time, approximately 12-18 months after the permit is issued. Photo points 1-6 are within the buffer area around where the proposed impact will be taken. The remaining points 7-15 are scattered throughout the preservation areas.

SPSA will submit a pre-construction report followed by five consecutive annual post-construction monitoring reports to the USACE an DEQ by December 31 each year. The report will contain descriptions of the overall findings, photographs, and documentation of conditions at each plot. If there is evidence of invasive species growth, SPSA will include that information in the report and discuss with the agencies. After the final monitoring report, as approved by the USACE and DEQ, SPSA will cease the monitoring and assume the Long-Term Maintenance Plan.

**Figure 1: Preliminary Invasives Photo Monitoring Map**



## Long-term Management Plan

SPSA will be responsible for the long-term management of the preservation areas. Any unforeseen changes in site conditions will be addressed to maintain the quality of the existing habitat. The long-term management plan (LTMP) for this site, post the five-year monitoring window, will be observation-based. If there is a significant degradation in the quality of the wetlands proposed for preservation, an adaptive management plan will be crafted in conjunction with the long-term steward (SPSA), the easement holder (VOF), and any necessary enforcement agencies. The LTMP is included in Attachment 2.

## Adaptive Management Plans

If there is a repetitive issue with trespassing and vandalism of the preservation areas, SPSA will contact local law enforcement to mitigate those issues. SPSA will also keep the USACE and VOF informed of any developments in relation to this and any potential effort to abate the problem.

If there is a significant increase in invasive species or a significant change in vegetation or ecosystem qualities, an action plan will be crafted in conjunction with the long-term steward (SPSA), the easement holder (VOF), and any necessary enforcement agencies.

## Financial Assurances

A third-party entity (VOF) will hold a conservation easement over the PRM sites and will be the enforcer of the quality and assurances laid out in this document. SPSA will be the long-term steward of the sites and will provide financial assurance for the preservation areas. The cost of the easement and entity fee will be negotiated in a contract. SPSA will purchase the properties they do not currently own and will pay VOF an agreed-upon price that will be deemed sufficient by the entity for the role they will play in the site's long-term management. In addition to the payments listed above, SPSA will pay staff to carry out the monitoring requirements and any additional action needed. A third-party agreement will be obtained before the commencement of this project.

**Long-Term Management Plan (LTMP)**

**For**

**The SPSA Landfill Expansion Preservation Sites**

# I Introduction

## A Purpose of Site Establishment

The SPSA Landfill Preservation Area ("The Site") was established to compensate for 111.67 acres of disturbance, including 109.64 acres of unavoidable impacts to wetlands as authorized by Corps Permit Number NAO-1988-00021/VMRC # 23-V1262 and to conserve and protect streams and wetlands and their associated buffers. The Site includes 112.89 acres of preserved wetlands and uplands for canebrake rattlesnake habitat and 629.67 acres of preserved wetlands for compensatory mitigation.

## B Purpose of Long-Term Management Plan (LTMP)

The purpose of this LTMP is to ensure the Site is managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities, and tasks to monitor, manage, maintain, and report on the waters of the U.S. and/or State Waters and their associated protected buffers, covered species, and covered habitat on The Site. This LTMP is implemented in accordance with permit conditions and the site protection instrument (conservation easement) covering The Site and the period of LTMP will begin upon the Site meeting all performance standards and monitoring requirements for a period of 5 consecutive years after the start of construction as identified in Part 2 of the Final Mitigation Plan.

## C Long-Term Steward and Responsibilities

The Long-Term Steward is the Southeastern Public Service Authority (SPSA). The Long-Term Steward, and subsequent Long-Term Stewards upon transfer, shall implement this LTMP, managing and monitoring the Site in perpetuity to preserve its habitat and conservation values in accordance with the mitigation plan, conservation easement, and/or declaration of restrictions, and the LTMP. Long-term management tasks shall be funded through the Long-Term Management Fund. The Long-Term Steward must maintain a copy of the Final Mitigation Work Plan (FMWP), the LTMP, and all addendums/modifications associated with The Site including all site protection instruments. The Long-Term Steward shall be responsible for providing an annual report to the Corps detailing the time period covered, an itemized account of the management tasks, and the total amount expended. Any subsequent grading, or alteration of the hydrology and/or topography by the Long-Term Steward or its representatives must be approved by the Corps and the necessary permits, such as a Section 404 permit and/or Virginia Water Protection Permit, must be obtained if required.

## D Eminent Domain

If the Site is taken in whole or in part through eminent domain, the Long-Term Steward shall use all monies it receives as compensation for lands and all associated services and values taken to provide replacement compensation for the loss of wetlands and streams authorized by Corps permit number NAO-1988-00021/VMRC # 23-V1262. The Corps will have the right to participate in any proceeding associated with the determination of the amount of such compensation.

# II Property Description

## A Setting and Location

The Site is situated at 1 Bob Foeller Drive, Suffolk, Virginia, within the Commonwealth, and is designated as Parcel Nos. 27*28A, 27*44A, 27*39A, and 27*37A, along with two additional parcels across Route 58, identified as Nos. 3627 and 27D28. The Site is shown on the general vicinity map (Figure 1) and the Site location map (Figure 2). The general vicinity map shows The Site's location in relation to cities, towns, major roads, and other distinguishable landmarks. The Site location map shows the property boundaries on a topographic map (1:24,000 scale).

**Figure 1. Site Vicinity Map.**

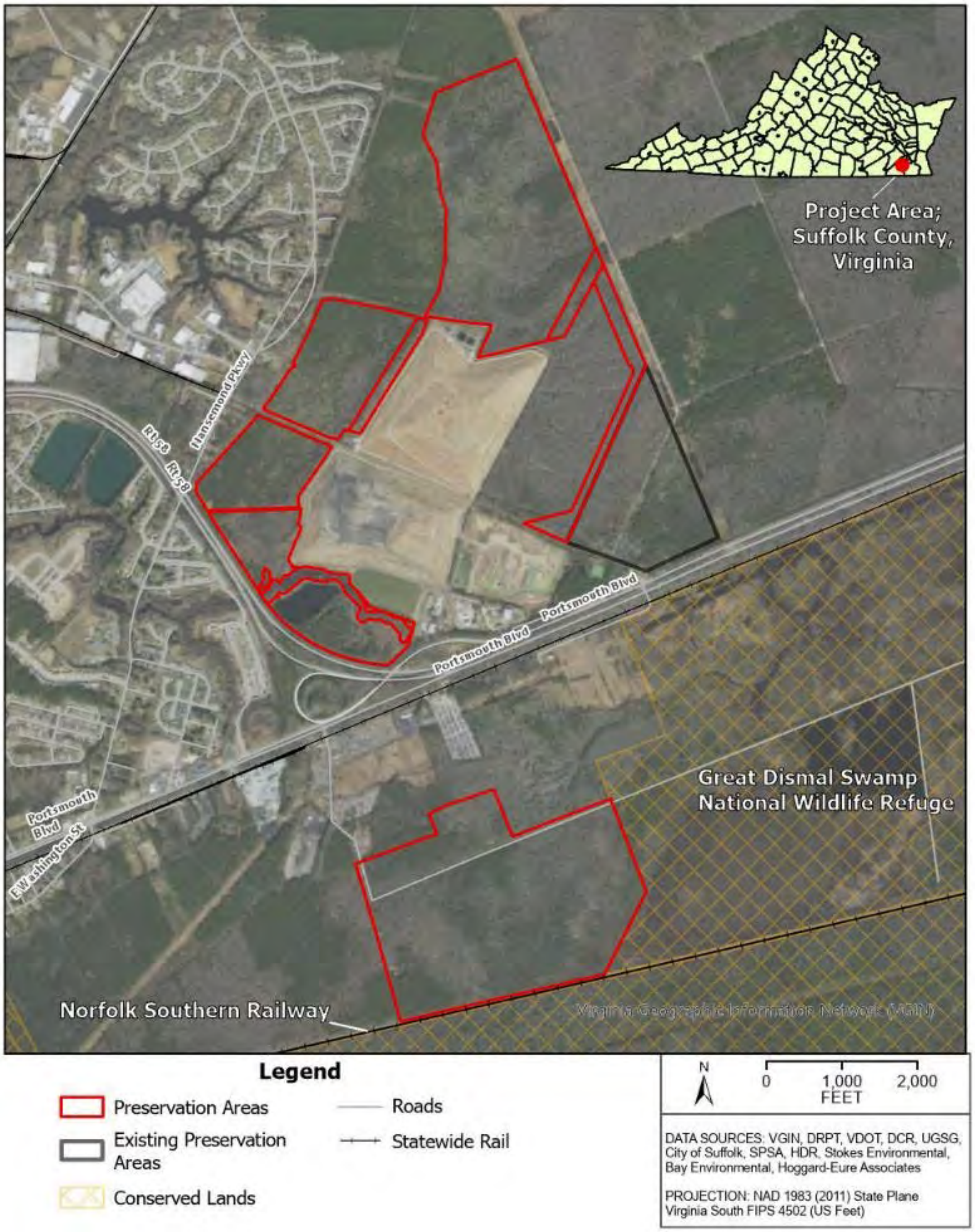
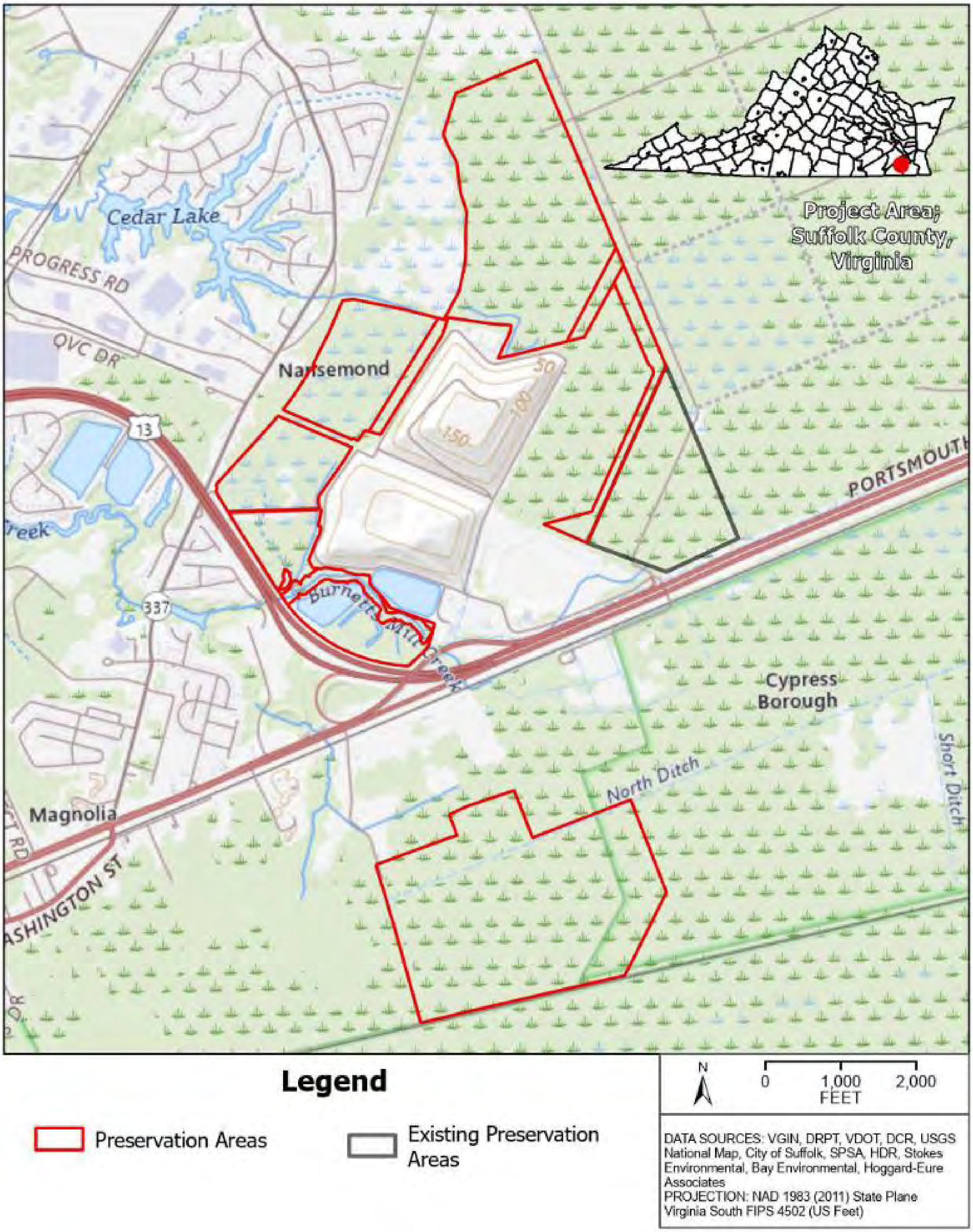


**Figure 2. Site Location Map.**



## B Cultural Resources

HDR conducted a records review through the Virginia Cultural Resources Information System (VCRIS) in January 2025. The purpose of this review is to identify previously recorded archaeological sites and cultural resources surveys located within The Site.

Based on the VCRIS review, The Site has been partially previously surveyed. The VCRIS review indicated two previous investigations conducted within The Site and five within 0.5 miles of The Site (VCRIS 2025). The three previous investigations within The Site are VA-176, SK-015, and SK-153.

**Table 2. Archaeological Surveys within The Site.**

| DHR Report Number | County | Report Title | Report Author | Report Year |
|---|---|---|---|---|
| VA-176 | Virginia | Phase I Archaeological Survey, Virginia Reliability Project, Cities of Chesapeake and Suffolk, and Greensville, Isle of Wight, Prince George, Southampton, Surry, and Sussex Counties, Virginia | David Birnbaum, Larissa A. Thomas, Emily Tucker-Laird | 2022 |
| SK-015 | Suffolk | An Archaeological Reconnaissance Survey of the 500 KV, Septa to Yadkin Line in the County if Isle of Wight and the Cities of Suffolk and Chesapeake, Virginia | Howard A. MacCord, Sr. | 1981 |
| SK-153 | Suffolk | Phase I Archaeological Survey for the Proposed Hampton Roads Sanitation District Suffolk Regional Landfill to Bainbridge Boulevard Force Main Project, Suffolk and Chesapeake, VA | James G. Parker, Owen Ford, Pamela Hale | 2020 |

The VCRIS database does not depict any archaeological resources; however, it does identify three previously recorded built resources within The Site. Previously recorded resource 131-6322 is part of the Great Dismal Swamp National Wildlife Refuge, Virginia Portion. Research Collections states that the area is a part of the Underground Railroad and this area is currently included in the nationwide Network of Freedom. Only a small portion of southern part of The Site intersects this area. This resource is not listed on the NRHP and its status for eligibility is unknown. Previously recorded resources 133-5593 and 133-5592 are houses and their eligibility for NRHP listing is unknown.

**Table 2. Historic Resources within The Site**

| DHR ID | Latitude | Longitude | Property Name | Address | NRPH Eligibility Status | Research Collections |
|---|---|---|---|---|---|---|
| 131-6322 | 36.6545721 | -76.46142041 | Great Dismal Swamp National Wildlife Refuge, Virginia Portion | 3100 Desert Road | Unknown | Underground Railroad |
| 133-5593 | 36.74952152 | -76.51489646 | House, Military Hwy | Military Hwy West | Unknown | null |
| 133-5592 | 36.74923825 | -76.51584558 | House, Military Hwy | Military Hwy West | Unknown | null |

*"null" from VCRIS, contained no other identifying data

### C Existing Easements

There are existing easements along the eastern side of parcel number 27*28A. The easement along 27*28A is an above-ground powerline easement managed by Dominion Energy. There is an 80-foot TRC gas pipeline easement that bisects the Nahra Property and runs through SPSA. There is also a 20-foot Nansemond Co. easement that runs east to west through the southern Nahra parcel. Additionally, the Chesapeake Raw Water Main parallels US Route 58 to the south of the Nahra property. These utility easements have been excluded from the Site.

### D Existing Man-Made Structures

The long-term stewards (SPSA) will post signage around The Site's perimeter to discourage trespassing. No structures are proposed to be installed on The Site, but existing access roads and culverts will be maintained for monitoring and agency visits. Exiting man-made structures are included in Figure 3.

**Figure 3: Existing Man-Made Structures**

## III Habitat and Species Descriptions

### A Baseline Description of Biological Resources

The Site is composed of 678.8 acres of Palustrine Forested Wetland, 2.0 acres of Palustrine Emergent Wetland, 12.65 acres of Palustrine Unconsolidated Bottom, 1,533 lf (0.63 acres) of Upper Perennial Stream, 1,103 lf (0.28 acres) of ditch, and 48.2 acres of upland. The overall topography of the site is generally flat with little to no relief, as is typical for the area.

The majority of The Site is adjacent/connected to the proposed impact area, except for 282.92 acres across Route 58 referred to as the Magnolia Farms Property. Magnolia Farms is within the same HUC as the other preservation area, the proximity of this section of the Site can be seen in Figures 1, 2, and 4.

The forested sections of the Site are dominated by red maple (*Acer rubrum*), willow oak (*Quercus phellos*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda),* and bald cypress *(Taxodium distichum)* in the tree layer, while switchcane *(Arundinaria sp.),* lizards-tail *(Saururus cernuus),* sensitive fern *(Onoclea sensibilis),* American holly *(Ilex opaca),* and common pawpaw *(Asimina triloba)* dominate the understory. Invasive species are present within The Site in more recently disturbed areas and include Chinese privet (*Ligustrum sinense*), mimosa (*Albizia julibrissin*), sericea lespedeza (*Lespedeza cuneata*), Japanese honeysuckle (*Lonicera japonica*) and Japanese stilt grass (*Microstegium vimineum).*

A wetland delineation was conducted for all acreage within The Site with details about species, abundance, and the overall quality of the areas within Part 1 of the mitigation plan. It also provides detailed information about the biological qualities of The Site.

The primary goal of this LTMP is to preserve the current ecosystem functions on The Site. This includes maintaining the on-site wetland composition to offset impacts and protecting 112.89 acres for Canebrake Rattlesnake mitigation. The area designated for rattlesnake preservation was chosen for its prime canebrake habitat, which features an upland and wetland mosaic with a concentration of switchcane (*Arundinaria sp.*). Like the rest of The Site, it will be monitored with the shared aim of preserving the existing ecosystem.

### B Summary of Final Mitigation Work Plan (FMWP)

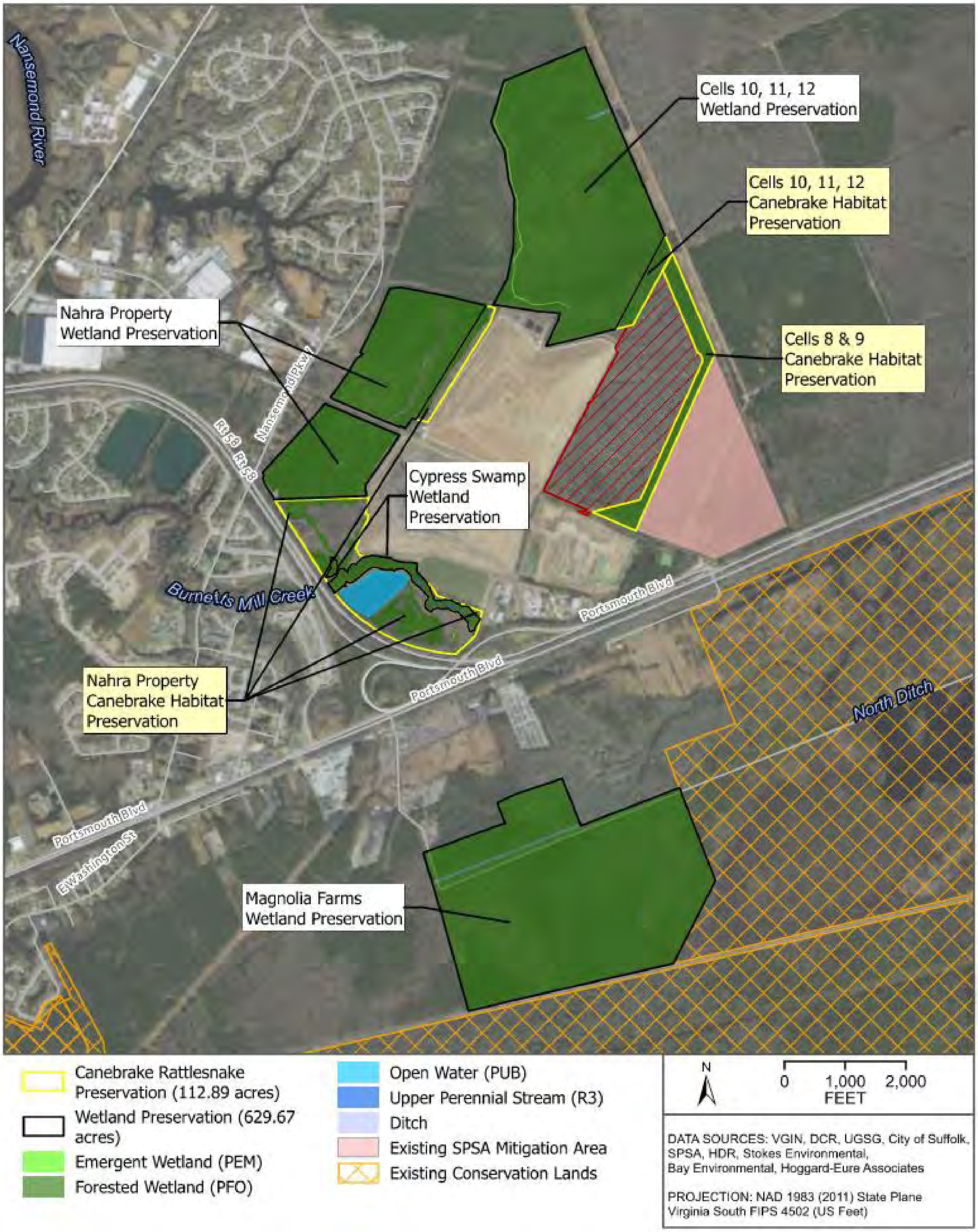
The Site will be preserved in perpetuity in its natural state. The Site map with a visual breakdown of resources can be seen in Figure 4 below. A breakdown of the composition of the preservation areas is listed below in Table 3.

**Table 3: Preservation Areas by Classification**

| Classification | Wetland Preservation | Canebrake Habitat Preservation |
|---|---|---|
| Palustrine Forested Wetlands (PFO) | 621.46 ac | 57.34 ac |
| Palustrine Emergent Wetlands (PEM) | 1.89 ac | 0.11 ac |
| Palustrine Unconsolidated Bottom (PUB) | 0.90 ac | 11.75 ac |
| Upper Perennial Stream (R3) | 1,491 lf (0.60 ac) | 42 lf (0.03 ac) |
| Ditch | 273 lf (0.08 ac) | 830 lf (0.20 ac) |
| Upland | 4.74 ac | 43.46 ac |
| **Total** | **629.67 ac** | **112.89 ac** |
| **Combined Total** | **742.56 ac** | |

The Site is comprised of 91.41% PFO, 0.27% PEM, 1.70% PUB, 0.08% R3, 0.38% ditch, and 6.49% upland.

**Figure 4: Site Composition Map.**



### C Rare/Threatened/Endangered Species

Table 4 below includes the state and/or federal threatened and/or endangered species along with species of concern that have the potential to occur within The Site according to the USFWS IPaC system and Virginia DWR's WERMS system. Figure 5 below is a map showing the species with confirmed sightings within a 2-mile radius of The Site in the DWR Wildlife Environmental Review Map Service (WERMS) database.

**Table 4. Protected Species Database Search Results.**

| Species Name | Designation | Source | Notes |
|---|---|---|---|
| Northern Long-eared Bat (*Myotis septentrionalis*) | FEST | USFWS | The Site lies within USFWS Year Round Active Zone 1 and suitable habitat is present within The Site. |
| Tricolored Bat (*Perimyotis subflavus*) | PESE | USFWS, VaFWIS | A confirmed sighting of the species is within 2 miles of The Site. The Site lies within USFWS Year Round Active Zone 1 and suitable habitat is present within The Site. |
| Red-cockaded Woodpecker (*Dryobates borealis*) | FTSE | USFWS | Habitat for this species is a mature pine forest with periotic burning. The Site does not contain suitable habitat for this species. |
| Monarch Butterfly (*Danaus Plexippus*) | PT | USFWS | Suitable habitat for this species includes milkweed, which was not documented in any of the surveys conducted on The Site. The adjacent transmission right-of-way may contain habitat. |
| Canebrake Rattlesnake (*Crotalus horridus*) | SE | VaFWIS | A confirmed sighting of the species is within 2 miles of The Site. As mentioned previously in this document, suitable habitat is present within The Site and is being protected with the DWR restrictions and covenants. |
| Mabee's Salamander (*Ambystoma mabeei*) | ST | VaFWIS | A confirmed sighting of the species is within 2 miles of The Site. Suitable habitat for this species is hardwood or pine forests near a pond system, which The Site includes. |
| Spotted Turtle (*Clemmys guttata*) | CC | VaFWIS | A confirmed sighting of the species is within 2 miles of The Site. Suitable habitat for this species is shallow ponded areas surrounded by dense vegetation. |

USFWS – U.S. Fish and Wildlife Service, VaFWIS – Virginia Fish and Wildlife Information System, FE – Federally Endangered, FT – Federally Threatened, PE – Proposed Endangered, PT – Proposed Threatened, SE – State Endangered, ST – State Threatened, CC – Collection Concern

**Figure 5: VDWR WERMS Database Results**

## IV Management and Monitoring

The overall objective of long-term management is to foster the long-term viability of The Site's streams and wetlands and their associated buffers, and any listed species/habitat. Routine monitoring and minor maintenance tasks are intended to ensure the viability of the Site in perpetuity. The primary task of the annual walk-throughs will be to pick up trash and assess any evidence of trespass or vandalism. Other possible observations prompting management actions are laid out below.

### A Biological Resources

The approach to the long-term management of The Site biological resources is to abide by the monitoring requirements laid out in the mitigation plan, then observe the site visually. The visual monitoring post the 5-year window will assess the Site condition based on species abundance, invasive species composition, and/or other aspects that may warrant management actions. While it is not anticipated that major management actions will be needed, an objective of this LTMP is to conduct monitoring to identify any issues that arise and use adaptive management to determine what actions might be appropriate. Those chosen to accomplish monitoring responsibilities will have the knowledge, training, and experience to accomplish monitoring responsibilities.

Adaptive management means an approach to natural resource management that incorporates changes to management practices, including corrective actions as determined to be appropriate by the Corps in discussion with the Long-Term Steward. Adaptive management includes those activities necessary to address the effects of climate change, fire, flood, or other natural events. Before considering any adaptive management changes to the LTMP, the Corps will consider whether such actions will help ensure the continued viability of Site biological resources.
The Long-Term Steward for the Site shall implement the following as appropriate:

**Element A.1 Streams, wetlands and Canebrake Rattlesnake Habitat**

**Objective:** Monitor The Site streams, wetlands, and uplands. Limit any impacts to streams and wetlands and their associated buffers from vehicular travel or other adverse impacts.

**Task:** One annual walk-through survey will be conducted to pick up trash and monitor evidence of trespassing. During this, general observations of the vegetation cover and composition, including INU species, will be noted. If canebrake rattlesnakes are encountered, that will be noted as well.

Special attention should be paid to any area adjacent to the impact site along with any area that drains outside of The Site limits. The report should provide a discussion of any recent changes in the watershed (i.e., subdivision being developed upstream of stream bank). This report of observation will be produced along with the annual walk-through survey documentation. If there is a significant increase in INU species or a significant change in vegetation or ecosystem qualities, an action plan will be crafted in conjunction with the long-term steward (SPSA), the easement holder (VOF), and any necessary enforcement agencies.

### B Security, Safety, and Public Access

The Site will be appropriately marked and shall have no general public access, nor any regular public use. Research and/or other educational programs or efforts, hunting, fishing, and passive recreational activities may be allowed on the Site as deemed appropriate by the Corps and VDWR in consultation with the landowner and as provided for in the site protection instrument, but are not specifically funded or a part of this LTMP.

**Element B.1 – Trash and trespass**

**Objective:** Monitor sources of trash and trespass.

**Objective:** Collect and remove trash and rectify trespass impacts.

**Task:** During each site visit, record occurrences of trash and/or trespass. Record type, location, and management mitigation recommendations to avoid, minimize, or rectify a trash and/or trespass impact.

**Task:** During The Site's annual monitoring, collect and remove as much trash as possible and repair and rectify vandalism and trespass impacts.

### C Infrastructure and Facilities

**Element C.1 Signage and Property Boundaries**

**Objective:** Monitor condition of signage, and property boundaries.

**Objective:** Maintain signage, and property boundaries to prevent casual trespass and allow necessary access.

**Task:** During each site visit, record condition of signs, and property boundaries. Record location, type, and recommendations to implement, repair, or replace signage, or property boundary markers, if applicable.

**Task:** Maintain signs, and property boundary markers as necessary by replacing posts and signs. Replace as necessary, and as funding allows.

**Element C.2 Crossings, Trails, Culverts, and Roads**

**Objective:** Monitor the condition of access roads.

**Objective:** Maintain access roads to ease of access within The Site for annual walks and agency monitoring.

**Task:** During each site visit, record the condition the access roads. Record location, type, and recommendations to implement repair or replacement to access roads.

**Task:** Maintain trails, culverts, crossings, and roads as necessary. Replace trails, crossings, and roads as necessary, and as funding allows. Mowing of existing access roads will be restricted between November 1 through April 31 to minimize potential impacts to the state-listed endangered Canebrake Rattlesnake.

## D Reporting and Administration

**Element D.1 – Annual Report**

**Objective:** Provide an annual report on all management tasks conducted and general Site conditions to Corps and any other appropriate parties. Each report shall include a cover page with the following information: the Site name, Long-Term Steward (name, address, phone number, and email address), monitoring year, and any requested action (e.g. funding release, maintenance recommendations requiring Corps approval).

**Task:** Prepare annual report and any other additional documentation. Include a summary. Complete and circulate to the Corps and other parties by December 31 of each year. Reports should be distributed electronically.

**Task:** Make recommendations with regard to (1) any enhancement measures deemed to be warranted, (2) any problems that need near-, short-, and long-term attention (e.g., weed removal, fence repair, erosion control), (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date, (4) and provide documentation that the Long-Term Steward is considered active and in good standing with the SCC. Provide documentation of the cost of any recommended maintenance and repairs.

**Task:** Provide a copy of the LTM Fund end-of-year statement that indicates the balance in the fund, interest accrued, withdrawals made, etc.

**Element D.2 – Administrative & Contingency Fees**

**Objective:** Provide funds for regular administrative costs incurred as a result of administrative tasks, maintenance of escrow, endowment, or other funding accounts, etc. These funds shall be paid from the earnings of the account and not the principal funds.

**Task:** Pay all regular administrative or other fees through this task.

**Element D.3 – Defense of Easement or Other Real Estate Issues**

**Objective:** Ensure the perpetual protection of and address any encroachments on the property on which the wetland and stream compensatory mitigation activities occurred.

**Task:** Maintain site protection instruments intended to protect The Site.

**Task:** If the property is owned by the permittee or the stewardship organization, assist in resolving real estate issues, such as property taxes, title considerations, Virginia Land Conservation Incentives Act, relevant county initiatives, mineral rights, easements and maintenance, and conservation, water or other district assessments.

**Task:** If the LTS is not the easement holder, then coordination/cooperation with the easement holder.

**Task:** Hire attorney or other legal representation for defense of easement or other proceedings, where necessary.

# V Transfer, Replacement, Amendments, and Notices

### A Transfer

Any subsequent transfer of responsibilities under this LTMP to a different Long-Term Steward shall be requested by the Long-Term Steward in writing to the Corps, will require written approval by the Corps, and will be incorporated into this LTMP by amendment.

The long-term steward shall be required to ensure that any subsequent property owners (if not identified as the long-term steward) are notified of the deed restriction, conservation easement, purpose and location of the Site lands, and requirements for long-term stewardship.

### B Replacement

If the Long-Term Steward fails to implement the tasks described in this LTMP and is notified of such failure in writing by the Corps, the Long-Term Steward shall have 90 days to correct such failure. If failure is not corrected within 90 days, the Long-Term Steward may request a meeting with the Corps to resolve the failure.

Based on the outcome of the meeting, or if no meeting is requested, the Corps may designate a replacement Long-Term Steward in writing by amendment of this LTMP. If the Long-Term Steward fails to designate a replacement Long-Term Steward, then such public or private land or resource management organization acceptable to and as directed by the Corps may enter onto the Site property in order to fulfill the purposes of this LTMP.

### C Amendments

The Long-Term Steward, property owner, and the Corps may meet and confer from time to time, upon the request of any one of them, or at a minimum every five (5) years, to revise the LTMP to better meet management objectives and preserve the conservation values of the Site. Any proposed changes to the LTMP will be discussed with the Corps and the Long-Term Steward. Any proposed changes will be designed with input from all parties. Amendments to the LTMP will be approved by the Corps in writing, will be required management components and will be implemented by the Long-Term Steward.

### D Notices

Any notices regarding this LTMP will be directed as follows:

<u>Long-Term Steward (name, address, telephone)</u>

Name: **Southeastern Public Service Authority (SPSA)**

Address: **1 Bob Foeller Drive, Suffolk, VA 23434**

Phone Number: **757-961-3683**

<u>Property Owner (name, address, telephone)</u>

Name: **Southeastern Public Service Authority (SPSA)**

Address: **1 Bob Foeller Drive, Suffolk, VA 23434**

Phone Number: **757-961-3683**

<u>US Army Corps of Engineers (name, address, telephone)</u>

Name: **U.S. Army Corps of Engineers Norfolk District**

Address: **803 Front St., Norfolk, VA 23510**

Phone Number for Wetlands/Permitting: **757-201-7652**

<u>Virginia Department of Environmental Quality (name, address, telephone)</u>

Name: **Virginia DEQ Tidewater Regional Office**

Address: **5636 Southern Blvd., Virginia Beach, Virginia 23462**

Phone Number: **757-518-2000**

## VI Funding and Task Prioritization

### A Funding

Table 5 summarizes the anticipated costs of long- term management for the Site. These costs include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, trash removal, etc. a prorated calculation of funding needed to fully repair and/or replace fences and other structures every 10 years, and funding for catastrophic event assessment and repair every 10 years. The total annual funding anticipated is approximately $**3,931.20**, therefore, with the current annual estimated capitalization rate of 3.5% the total endowment amount (The Long-Term Management Fund) required will be $**112,320.**

SPSA shall hold the endowment principal and earnings (The Long-Term Management Fund) as required as a condition of the permit, which consists of monies that are paid into it in trust, and is appropriated to fulfill the purposes for which payments into it are made. The Long-Term Management Fund (principal and earnings) will fund the long-term management, enhancement, and monitoring activities on Site lands in a manner consistent with this LTMP.

**Table 5. Annual Cost estimate for long-term management of The Site**

**B Task Prioritization**

| Task | Component/ Specification | Unit | Number | Cost/Unit | Annual Cost | Recurrence interval (years) | Total |
|---|---|---|---|---|---|---|---|
| Sign | Boundary | Ea. | 30 | $6 | $180 | 10 | $18 |
| Sign | Inspect/replace | Hour | 6 | $25 | $150 | 1 | $150 |
| Trash | Collection & dump | Hour | 12 | $25 | $300 | 1 | $300 |
| Trash | Dump Fee | Ea. | 3 | $20 | $60 | 1 | $60 |
| Adaptive Management Plan | Labor | Hour | 100 | $120 | $12,000 | 50 | $240 |
| Exotic Control | Monitoring report | Hour | 15 | $75 | $1,125 | 1 | $1,125 |
| Annual Report | Narrative summary | Hour | 8 | $75 | $600 | 1 | $600 |
| Field Equipment | Small pickup | Ea. | 0.10* | $30,000 | $3,000 | 10 | $300 |
| Fence | Labor | Hours | 32 | $30 | $960 | 5 | $211 |
| Gate | Powder River, Classic | Ea. | 1.0 | $300 | $300 | 15 | $20 |
| | | | | | | | |
| Sub Total | | | | | | | $3,024 |
| | | | | | | | |
| Contingencies | 20% | | | | | 1 | $604.80 |
| Administration | 10% | | | | | 1 | $302.40 |
| Easement Defense | | | | | | | |
| Estimated Annual Expenses | | | | | | | $3,931.20 |
| Capitalization rate | 3.5% | | | | | | |
| Total Endowment amount | Est. Annual Expenses/Capitalization rate | | | | | | $112,320 |

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Long-Term Steward and the Corps will discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate the Site (including unauthorized impacts); and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the Corps and as authorized by the Corps in writing.

### C Enforcement

The Corps and its authorized agents will have the right to inspect the Property and take actions necessary to verify compliance with this LTMP. The LTMP herein shall be enforceable by any proceeding at law or in equity or administrative proceeding by the Corps, including the Corps or DEQ. Failure by any agency (or owner) to enforce the LTMP contained herein shall in no event be deemed a waiver of the right to do so thereafter.

The parties hereto have executed this Long-Term Management Plan on the date herein below last written.

______________________________ ____________________

Long-Term Steward Date

______________________________ ____________________

William T. Walker Date

Chief, Regulatory Branch
US Army Corps of Engineers, Norfolk District

______________________________ ____________________

David L. Davis Date

Virginia Department of Environmental Quality

Director, Office of Wetlands and Stream Protection

# Attachment 1 - Draft of Conservation Easement

NOTE TO TITLE EXAMINERS: This open-space easement contains restrictions on permitted structures and activities on the property described below, which run with the land and are applicable to the property in perpetuity.

Prepared by**:** Nathaniel P. Tyler (VSB #47490)
Willcox & Savage, P.C.
440 Monticello Ave., Ste. 2200
Norfolk, VA 23510

Return to: Virginia Outdoors Foundation
39 Garrett Street, Suite 200
Warrenton, VA 20186

TAX MAP NUMBERS: *Numbers 27-39A, 27-28A, 27D-28, 27-44A, and 36-27,*

Exempt from recordation tax under the Code of Virginia (1950), as amended,
Sections 58.1-811 (A) (3), 58.1-811 (D) and 10.1-1803 and from any
Circuit Court Clerk's fees pursuant to Section 17.1-266

THIS DEED OF EASEMENT (this "Easement"), made this ___ day of _________, 2025, between SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA, a public body politic and corporate of the Commonwealth of Virginia "Grantor"); and the VIRGINIA OUTDOORS FOUNDATION, an agency of the COMMONWEALTH OF VIRGINIA, ("Grantee") (the designations "Grantor" and "Grantee" refer to Grantor and Grantee and their respective successors and assigns); witnesseth:

## RECITALS

**R-1** Grantor is the owner in fee simple of certain real property situated in the City of Suffolk Virginia, containing approximately 742.56 acres as further described below (the "Property"), and desires to grant, and convey to Grantee a perpetual open-space easement over the Property as set forth herein.

**R-2** Grantee is a governmental agency of the Commonwealth of Virginia and a "qualified organization" and "eligible donee" under Section 170(h)(3) of the Internal Revenue Code ("the IRC") (references to the Internal Revenue Code in this Easement are to the United States Internal Revenue Code of 1986, as amended, and the applicable regulations and rulings issued thereunder, or the corresponding provisions of any subsequent federal tax laws and regulations) and Treasury Regulations Section 1.170A-14(c)(1) and is willing to accept a perpetual open-space easement over the Property as set forth herein.

**R-3** Chapter 461 of the Virginia Acts of 1966 provides in part "that the provision and preservation of permanent open-space land are necessary to help curb urban sprawl, to prevent the spread of urban blight and deterioration, to encourage and assist more economic and desirable urban development, to help provide or preserve necessary park, recreational, historic, and scenic areas, and to conserve land and other natural resources" and authorizes the acquisition of interests in real property, including easements in gross, as a means of preserving open-space land. The balance of the Chapter is codified in Chapter 17, Title 10.1, Sections 10.1-1700 through 10.1-1705 of the Code of Virginia (1950), as amended, (the "Open-Space Land Act").

**R-4** Pursuant to the Open-Space Land Act, the purposes of this Easement include retaining and protecting open-space and natural resource values of the Property, and the limitations on division, construction of buildings and other structures, and commercial and industrial activities contained in Section II ensures that the Property will remain perpetually available for watershed protection, natural habitat, biological diversity, agricultural, forestal, or open-space use, all as more particularly set forth below.

**R-5** Chapter 525 of the Virginia Acts of 1966, codified in Chapter 18, Title 10.1, Sections 10.1-1800 through 10.1-1804 of the Code of Virginia (1950), as amended, declares it to be the public policy of the Commonwealth to encourage preservation of open-space land and authorizes the Virginia Outdoors Foundation to hold real property or any estate or interest therein for the purpose of preserving the natural, scenic, historic, scientific, open-space, and recreational lands of the Commonwealth.

**R-6** Section 10.1-1701 of the Open Space Land Act requires that the use of the Property for open-space conforms to the City of Suffolk (the "City") 2035 Comprehensive Plan adopted on April 1, 2015 (the "Comprehensive Plan"), and the Property is located within an area that is designated as suburban use district on the City's future land use map. City of Suffolk has advised Grantee in writing that the restrictions set forth herein conform to its Comprehensive Plan adopted on April 1, 2015.

**R-7** This open-space easement in gross constitutes a restriction granted in perpetuity on the use that may be made of the Property and is in furtherance of and pursuant to the clearly delineated governmental conservation policies set forth below:

**(i) Land conservation policies of the Commonwealth of Virginia as set forth in:**

a. Section 1 of Article XI of the Constitution of Virginia, which states that it is the Commonwealth's policy to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth;

b. The Open-Space Land Act cited above;

c. Chapter 18, of Title 10.1, Sections 10.1-1800 through 10.1-1804 of the Code of Virginia (1950), as amended, cited above;

d. The Virginia Land Conservation Incentives Act, Chapter 3 of Title 58.1, Sections 58.1-510 through 58.1-513 of the Code of Virginia (1950), as amended, cited above, which supplements existing land conservation programs to further encourage the preservation and sustainability of the Commonwealth's unique natural resources, wildlife habitats, open spaces, and forested resources;

e. Grantee's formal practices in reviewing and accepting this Easement. Grantee has engaged in a rigorous review, considered, and evaluated the benefits provided by this Easement to the public as set forth in these recitals, and has concluded that the protection afforded the open-space character of the Property by this Easement will yield a significant public benefit and further the open-space conservation objectives of Grantee and the Commonwealth of Virginia. Treasury Regulations Section 1.170A-14(d)(4)(iii)(B) states that such review and acceptance of a conservation easement by a governmental entity tends to establish a clearly delineated governmental conservation policy;

f. The Commonwealth's land conservation strategy of identifying and protecting high-value lands and conservation sites across the Commonwealth of Virginia. The Property or a portion thereof is located on the Commonwealth's ConserveVirginia Map under the Natural Habitat & Ecosystem Diversity, and Floodplains & Flooding Resilience categories;

**(ii) Land use policies of the City of Suffolk as delineated in:**

a. its Comprehensive Plan, which contains the following land use policies:

Policy 7-2: Protect the City's natural resources from negative impacts of development;

b. The City has determined that it is desirable to encourage the continued preservation of open space and forest land by providing for preferential use value taxation under Section 82-71 et seq. of the City Code and Sections 58.1-3230 through 58.1-3244 of the Code of Virginia (1950) as amended, which provides for use value assessment of real estate devoted to such uses.

**R-8** The Property contains forest lands, stream systems, and significant wetlands. The protection of the Property from development hereunder will preserve wetlands and forest lands for future use and habitat necessary for the survival of many species of wildlife.

**R-9** The Property contains frontage on Burnetts Mill Creek and perennial streams, all tributaries of the Chesapeake Bay. Protection of the Property from unrestrained development hereunder will help preserve the water quality of the Chesapeake Bay by reducing non-point source pollution.

**R-10** The Property lies within the Chesapeake Bay watershed, and the protection of the rivers and streams in the bay watershed will help implement the goals of Federal Executive Order 13508 (May 19, 2009), which include "restore clean water, recover habitat, sustain fish and wildlife, conserve land and increase public access in the Bay watershed by 2025."

**R-11** Preservation of the Property in a relatively undeveloped state by the restrictions set forth herein contributes to the "Goals and Outcomes" of the 2014 "Chesapeake Bay Watershed Agreement," entered into by the Commonwealth of Virginia, six other states, the District of Columbia, the Chesapeake Bay Commission, and seven federal agencies. The agreement's Land Conservation Goal states in part: "By 2025, protect an additional two million acres of land throughout the watershed . . . and reduce the rate of conversion of agricultural lands, forests, and wetlands as well as the rate of changing landscapes from more natural lands that soak up pollutants to those that are paved-over, hardscaped, or otherwise impervious."

**R-12** The Property contains and supports habitat for the Canebrake Rattlesnake (Crotalus horridus), a state endangered species as listed in Article 6, Title 29.1 of the Code of Virginia. The Property is identified as being within a Canebrake Rattlesnake Conservation Zone (1c: Dismal Swamp NWR and Swamplands North of Routes 460 and 58) in the Virginia Department of Wildlife Resources ("DWR") Conservation Plan for the species. Protection of the Property hereunder will maintain habitat for Canebrake Rattlesnake and support their population in the area.

**R-13** Though not formally documented on the Property, The Virginia Department of Wildlife Resources suspects multiple other listed species known to inhabit bottomland forests may be present on the Property potentially including State Threatened Mabee's Salamanders, State Endangered Rafinesque's Eastern Big-Eared Bats, State Endangered Little Brown Bats, and Federally Endangered and State Endangered Indiana Bats.

**R-14** A portion of the Property lies within the area designated by the Audubon Natural Society as the Great Dismal Swamp Important Bird Area, one of several regions in Virginia supporting habitat and species diversity. The restrictions set forth herein help to preserve bird habitat, consistent with the Audubon Naturalist Society's conservation program in this important bird area.

**R-15** The Virginia Department of Conservation and Recreation has developed the Virginia Natural Landscape Assessment project (the "VNLA") as part of the Virginia Conservation Lands Needs Assessment to identify, prioritize and link natural lands as targets for protective activities, such as the adoption of conservation easements and the restoration of habitat. The VNLA has identified the Property as having an ecological core of high integrity. Limiting development of the Property herein helps to protect these natural lands and habitat values.

**R-16** The Property has ecological value as mitigation and contains natural resource values including streams, wetlands, and species habitat that serve as compensation and mitigation for impacts to approximately 111.67 acres (including 109.64 acres of palustrine forested wetland) in connection with the development of Cells VIII and IX of the Southeaster Public Service Authority Regional Landfill. The Property includes 678.8 acres of palustrine forested wetlands that will be preserved in connection with this Easement. In addition to the preservation of the Property by this Easement, Grantor has purchase 219.28 wetland mitigation credits to further offset the impact of its development of Cells VIII and IX.

**R-17** Grantee has determined that this Easement will yield significant public benefit to the citizens of the Commonwealth as set forth in these recitals and in Section I below.

**R-18** Grantor and Grantee desire to protect in perpetuity the conservation values of the Property as specified in Section I (the "Conservation Values of the Property") by restricting the use of the Property as set forth in Section II.

**R-19** Grantee has determined that the restrictions set forth in Section II will preserve and protect in perpetuity the Conservation Values of the Property and will limit use of the Property to those uses consistent with, and not adversely affecting, the Conservation Values of the Property and the governmental conservation policies furthered by this Easement.

**R-20** Grantee, by acceptance of this Easement, designates the Property as property to be retained and used in perpetuity for the preservation and provision of open-space land pursuant to the Open-Space Land Act.

**NOW, THEREFORE**, in consideration of the foregoing recitals, incorporated herein and made a part hereof, and in consideration of the mutual covenants herein and their acceptance by Grantee and Grantor, Grantor does hereby give, grant, and convey to Grantee for the public purposes set forth in Section I below an open-space easement in gross over, and the right in perpetuity to restrict the use of, the Property, which is described on <u>Schedule A</u> attached hereto and made a part hereof, and consists of approximately 742.56 acres located in City of Suffolk, Virginia, fronting on State Route 58.

This conveyance is made subject to all unexpired conditions, covenants, restrictions, reservations, and easements of record as they may lawfully apply to the Property herein conveyed.

The Property is shown as portions of Tax Map Numbers 27-39A, 27-28A, 27D-28, 27-44A, and 36-27, among the tax maps of the City of Suffolk , Virginia**.** Even though the Property currently consists of all or part of five parcels for real estate tax purposes and it may have been acquired previously as separate parcels, it will be considered one parcel for purposes of this Easement, and the restrictions of this Easement will apply to the Property as a whole and will bind Grantor and Grantor's successors in interest in perpetuity.

## SECTION I -PURPOSES

The conservation purpose of this Easement is to preserve and protect the Conservation Values of the Property in perpetuity by imposing the restrictions on the use of the Property set forth in Section II and providing for their enforcement in Section III. The Conservation Values of the Property are described in the above recitals, are documented in the Baseline Documentation Report described in Section IV below and include the Property's open-space values.

Pursuant to the Virginia Land Conservation Foundation's Conservation Value Review Criteria, the further conservation purpose(s) of this Easement are preservation of land for use, forestal use, natural habitat and biological diversity, and watershed preservation.

Grantor covenants that no acts or uses are currently being conducted or will be conducted on the Property that are: (i) inconsistent with the conservation purposes of this Easement, or (ii) consistent with the conservation purposes of this Easement, but destructive of other significant conservation interests unless such acts or uses are necessary for the protection of the Conservation Values of the Property. This paragraph may not be construed to permit any matter prohibited under the restrictions set forth in Section II of this Easement as Grantee has determined that such restrictions will limit the use of the Property to uses consistent with and supporting the Conservation Values of the Property and the conservation purposes of this Easement.

## SECTION II – RESTRICTIONS

Restrictions expressly set forth in this Section II are hereby imposed on the uses of the Property pursuant to the public policies set forth above. The acts that Grantor hereby covenants to do and not to do upon the Property and the restrictions that Grantee is hereby entitled to enforce are as follows:

### 1. DIVISION.

(i) The Property must be maintained as a whole, and separate conveyance of a portion of the Property is prohibited. The foregoing notwithstanding, the Property may be separately subdivided from property that is not subject to this Easement, and the Property may be consolidated into four or fewer parcels in the future.

(ii) The taking or conveyance of a *de minimis* portion of the Property adjacent to State Route 58 for minor road improvements or public road expansions will not be considered a division of the Property. Neither the taking or conveyance of such a *de minimis* portion of the Property nor the use of the portion of the Property so acquired will be prohibited by this Easement, provided that Grantee approves such taking or conveyance, which approval will be contingent upon the project including all reasonable actions, such as making landscaping or topographic improvements, to minimize the project's impact on the Property and prevent harm to the Conservation Values of the Property. Grantor reserves its separate right to approve such taking or conveyance. Use of the Property for such a project is limited to minor improvements to or widening of Route 58_in its present alignment, including, but not limited to, maintenance, correction, repair, or upgrading of the existing public road. Such improvements may include, but are not limited to, (a) the addition or renovation of ditches, box culverts, drainage swales, side slopes, or curbing, (b) road re-grading, or (c) enhancements such as pull-offs, bike or pedestrian lanes, trails, or restoration projects. Any portion of the Property acquired from Grantor pursuant to this paragraph will remain subject to the terms and restrictions of this Easement.

### 2. IMPERVIOUS COVERAGE LIMITATIONS.

(i) **Definition**. Impervious coverage is (a) the aggregate ground area measured in square feet of all three-dimensional buildings and structures excluding walls or fences and (b) the aggregate ground area measured in square feet of all impervious two-dimensional surfaces not including roads or driveways. For the purpose of this Easement the surfaces of solar panels are to be considered impervious surfaces.

(ii) **Limitation.** Total impervious coverage, including that of both existing and future improvements, may not exceed 1,000 square feet.

(iii) **Increase in impervious coverage**. If Grantor can demonstrate that an increase in the permitted impervious coverage would result in increased protection of the Conservation Values of the Property, Grantee may approve such increase.

## 3. BUILDINGS, STRUCTURES, ROADS, DRIVEWAYS, TRAILS, UTILITIES AND SIGNS.

No buildings, structures, roads, driveways, trails, utilities, or signs, other than the following, are permitted on the Property:

(i) **Buildings and structures**.

(a) New buildings and structures on the Property with the right to construct, use, enlarge, maintain, and replace such buildings and structures, all subject to the impervious coverage limitations set forth in Section II Paragraph 2 above and the siting restrictions set forth in Section II Paragraph 3(ii) below.

(b) No building may exceed 35 feet in height, measured from the average grade of the foundation thereof except for cupolas, chimneys, antennas, silos, or other structural features having the prior written approval of Grantee.

(ii) **Roads, driveways, and trails.**

(a) Private roads and driveways to serve permitted buildings and structures and roads for permitted uses and activities.

(b) Private roads or driveways and access easements over same to serve adjacent properties, provided that the location and configuration of such roads or driveways and access easements therefor have the prior written approval of Grantee, which approval will take into consideration the impact of the roads or driveways on the Conservation Values of the Property.

(c) Trails for access and hiking, and walking.

(iii) **Utilities and renewable energy facilities.**

(a) Public or private utilities within existing rights-of-way therefor, consistent with any recorded instrument granting such rights-of-way;

(b) Public or private utilities and renewable energy facilities used to harness natural renewable energy sources such as sunlight, wind, water, or biomass to serve permitted buildings, structures, or activities on the Property. Such limitation will not prohibit the sale of excess power generated incidentally in the operation of renewable energy facilities; and

(c) Public or private utilities, including renewable energy facilities as described above, to be constructed in whole or in part to serve other properties, provided that Grantee gives its prior written approval therefor, which approval will take into consideration whether such utilities have an adverse effect on the Conservation Values of the Property.

Grantor reserves its separate right to approve any public or private utilities.

(iv) **Signs**.

Signs not exceeding 32 square feet in area.

**4. ACTIVITIES.**

No activities other than the following are permitted on the Property, provided, however, that such activities may not be carried out in a way that is inconsistent with the conservation purposes of this Easement:

(i) Management of wildlife;

(ii) Natural resource-based educational and scientific activities in compliance with the limitations on buildings and structures, impervious surfaces, and ground disturbance contained herein and in compliance with local, state, and federal laws and regulations;

(iii) Outdoor recreational activities requiring little or no surface alteration of the land, including hunting and fishing.

**5. MANAGEMENT OF FOREST.**

No timbering or forest management activity shall be permitted other than for the following purposes:

(i) The cutting of trees for maintenance, but not expansion, of existing cleared areas used for roads, trails, or utilities;

(ii) The cutting of trees for the creation and maintenance of trails;

(iii) The cutting of trees for wildlife habitat management, and for the protection or enhancement of natural heritage resources;

(iv) The removal of trees posing an imminent hazard to the health or safety of persons or to property;

In general, the forest shall be maintained in its natural state. Forest Management practices conducted shall comply with an approved forest stewardship plan with the intent of restoring the ecological health and function of the forest. Grantee shall consult with the Virginia Division of Wildlife Resources prior to granting any forest management approval including during the development or update of any forest stewardship management plan.

Best Management Practices (BMPs), as defined by the Virginia Department of Forestry, shall be used to control erosion and protect water quality when any timber harvest is undertaken. A pre-harvest plan must be submitted to Grantee for approval no later than 60 days before the proposed date of such harvest to allow Grantee to consult with the Virginia Division of Wildlife Resources. Such plan must be consistent with the terms of this Easement on the Property and must describe the applicable BMPs to be used in sufficient detail to ensure that water quality will be protected.

## 6. PROTECTION OF WATERS.

(i) **Protected Area(s)**. To protect water quality and natural habitat, the following must be maintained on the Property:

A riparian protection zone (RPZ). Such zone is made up of marshland, swampland, or other wetlands as delineated on Exhibit A.

(ii) **Prohibited Activities.** The following activities are prohibited within the RPZ:

(a) Storage of compost, manure, fertilizers, or chemicals;

(b) Construction of buildings or structures except as set forth in subparagraph (iii) below;

(c) Construction, maintenance, or paving of roads except as set forth in subparagraph (iii) below;

(d) Removal of trees except:

(1) Removal of invasive species,

(2) Removal of dead, diseased, or dying trees, including salvage harvests in response to a natural disaster,

(3) Removal of trees posing a threat to human health or safety,

(4) Minimal removal of trees for creation of small wildlife plots,

(5) Removal of trees for construction and maintenance of permitted roads, stream crossings, or other structures permitted in subparagraph (iii) below, and

(e) Plowing, cultivation, filling, dumping, or other earth-disturbing activities except as may be necessary for the activities permitted in subparagraph (iii) below.

(iii) **Permitted Activities**. The following activities are permitted within the RPZ:

(a) Fencing along or within such areas;

(b) Construction and maintenance of stream crossings for pedestrians, which crossings minimize obstruction of water flow;

(c) Creation and maintenance of improvements over such areas to access crossings;

(d) Creation and maintenance of trails;

(e) Maintenance of existing roads;

(f) Creation and maintenance of natural habitat and small wildlife plots;

(g) Planting of trees, shrubs, grasses, and other vegetation;

(h) Development of ecosystem functions on the land using necessary equipment and structures, with the prior written approval of Grantee;

(i) Outdoor recreational activities, including hunting and fishing;

(j) Construction of new utilities to serve permitted buildings and structures requiring Grantee's written approval; and

(k) Maintenance, repair and replacement of the existing dam on the Property.

**Livestock Exclusion.** In addition, livestock must be excluded from the RPZ.

**7. LANDSCAPE ALTERATION, EXCAVATION, AND MINING**.

(i) Grading, blasting, filling, excavation, or earth removal may not materially alter the topography of the Property except (a) for restoration, enhancement, or development of ecosystem functions on the Property, (b) as required in the construction of permitted buildings, structures, roads, driveways, trails, utilities, or signs, or (c) for erosion and sediment control pursuant to an erosion and sediment control plan.

(ii) Grading, blasting, filling, or earth removal in excess of one acre for the purposes set forth in subparagraph (i) above requires 30 days' prior notice to Grantee.

(iii) Surface mining on the Property, subsurface mining from the surface of the Property, and drilling for oil or gas or other minerals on the Property are prohibited. Dredging on or from the Property is prohibited, except for routine maintenance of the pond on the Property.

**8. MEASUREMENTS AND DETERMINATIONS**

The following may only be made by employees, agents, or other representatives of Grantee:

(i) All measurements of length, width, square footage, height, and quantity set forth in Section II Paragraphs 1 through 7 above in accordance with common and standard methods of measurement;

(ii) Determination of whether a particular surface is permeable or impermeable; and

(iii) Determination of whether a particular structure is two-dimensional or three-dimensional.

## <u>SECTION III – ENFORCEMENT</u>

**1. RIGHT OF INSPECTION.** After reasonable notice to Grantor or Grantor's representative, employees, agents, and other representatives of Grantee may enter the Property or use remote inspection methods from time to time for the purposes of (i) inspection (including photographic documentation of the condition of the Property), (ii) flagging or otherwise marking the boundaries of specific areas or zones on the Property that are restricted as to the structures or activities allowed thereon in Section II above, and (iii) enforcement of the terms of this Easement provided, however, that in the event of an emergency, entrance may be made to observe, document, prevent, terminate, or mitigate a potential violation of these restrictions with notice to Grantor or Grantor's representative being given at the earliest practicable time.

**2. ENFORCEMENT.**

(i) Grantee, in accepting this Easement, commits to protecting the Conservation Values of the Property and advancing the conservation purposes of this Easement and has the resources necessary to enforce the restrictions set forth herein. Grantee has the right to bring a judicial proceeding to enforce the restrictions, which right specifically includes the right (a) to require restoration of the Property to its condition on the Effective Date or to its condition prior to a violation hereof, provided that such prior condition was in compliance with the provisions of this Easement; (b) to recover any damages arising from non-compliance; (c) to compel

Grantor to disgorge to Grantee any proceeds received in activities undertaken in violation of the restrictions set forth in Section II of this Easement; (d) to require Grantor to replant or pay for the replanting of trees on the Property harvested in violation of the restrictions involving timber or trees set forth in Section II of this Easement, (e) to require Grantor to pay the costs of ascertaining the value of the timber harvested in violation of restrictions involving timber or trees set forth in Section II of this Easement; (f) to pay to Grantee three times the value of the timber on the stump for the value (at the time of harvesting) of such timber harvested in violation of restrictions involving timber or trees set forth in Section II of this Easement, constituting the agreed-upon harm to the Conservation Values of the Property protected herein caused by such wrongful harvest; (g) to enjoin non-compliance by temporary or permanent injunction; and (h) to pursue any other appropriate remedy in equity or at law. If the court determines that Grantor failed to comply with this Easement, Grantor must reimburse Grantee for any reasonable costs of enforcement, including costs of restoration, court costs, expert-witness costs, and attorney's fees, in addition to any other payments ordered by the court. Grantee's delay will not waive or forfeit its right to take such action as may be necessary to ensure compliance with this Easement, and Grantor hereby waives any defense of waiver, estoppel, or laches with respect to any failure to act by Grantee.

(ii) Grantor will not be responsible or liable for any damage to the Property or change in the condition of the Property (a) caused by fire, flood, storm, Act of God, governmental act, or other cause outside of Grantor's control or (b) resulting from prudent action taken by Grantor to avoid, abate, prevent, or mitigate such damage to or changes in the condition of the Property from such causes**.**

(iii) Nothing in this Easement creates any right in the public or any third party to maintain a judicial proceeding against Grantor or Grantee. The conveyance of this Easement to Grantee does not affect the property rights of contiguous landowners or vest in any contiguous or nearby landowner rights in the Property or in the administration of this Easement by Grantee.

## SECTION IV – DOCUMENTATION

Grantor has made available to Grantee, prior to conveyance of this Easement, documentation sufficient to describe the condition and character of the Property, and the Baseline Documentation Report (BDR) describes the condition and character of the Property on the Effective Date. The BDR may be used to determine compliance with and enforcement of the terms of this Easement. However, the parties are not precluded from using other relevant evidence or information to assist in that determination. The parties hereby acknowledge that the BDR contained in the files of Grantee is an accurate representation of the Property.

Grantee may compile written reports and photographic or other visual media documentation of the condition of the Property from time to time as a result of inspection of the Property pursuant to Section III Paragraph 1. Right of Inspection above.

## SECTION V – GENERAL PROVISIONS

**1. DURATION.**

This Easement will be perpetual. It is an easement in gross that runs with the land as an incorporeal interest in the Property. The covenants, terms, conditions, and restrictions contained in this Easement are binding upon, and inure to the benefit of, Grantor and its successors in title to the Property, or any portion thereof or interest therein, and will continue as a servitude running in perpetuity with the Property. The rights and obligations of an owner of the Property under this Easement terminate upon proper transfer of such owner's interest in the Property, except that liability for acts or omissions occurring prior to transfer will survive transfer.

**2. NO PUBLIC ACCESS AND GRANTOR'S RETENTION OF USE.**

Although this Easement will benefit the public as described above, nothing herein may be construed to convey to the public or any third party a right of access to or use of the Property. Subject to the terms hereof, Grantor retains the exclusive right to such access to and use of the Property.

**3. GRANTOR'S REPRESENTATIONS AND WARRANTIES**.

Grantor represents, covenants, and warrants that (i) Grantor has good fee simple title to the Property (including the mineral rights located under the surface of the Property), (ii) Grantor has all right and authority to give, grant and convey this Easement, (iii) the Property is not subject to any purchase options, deed of trust liens, mortgage liens, or other liens not subordinated to this Easement, (iv) no consent of any third party is required for Grantor to enter into this Easement, (v) each person and/or entity signing on behalf of Grantor is authorized to do so, and (vi) Grantor is validly created authority legally existing under the laws of the Commonwealth of Virginia.

**4. ACCEPTANCE**.

Grantee accepts this conveyance pursuant to Virginia Code Section 10.1-1801, which acceptance is evidenced by the signature of the Executive Director, a Deputy Director, or the Staff Attorney by authority granted by Grantee's Board of Trustees.

**5. INTERACTION WITH OTHER LAWS.**

This Easement does not permit any use of the Property that is otherwise prohibited by federal, state, or local law or regulation. Therefore, even though certain structures, infrastructures, or activities are permitted on the Property by this Easement, this does not guarantee that such structures, infrastructures, or activities will be permitted by federal, state, or local governments, which permission will depend upon federal, state, or local laws or regulations. Neither the Property, nor any portion of it, has been or may be proffered or dedicated as open space within, or as part of, a residential subdivision or any other type of residential or commercial development; proffered or dedicated as open space in, or as part of, any real estate development plan; or proffered or dedicated for the purpose of fulfilling density requirements to obtain approvals for zoning, subdivision, site plan, or building permit. No development rights that have been encumbered or extinguished by this Easement may be transferred to any other property pursuant to a transferable development rights scheme, cluster development arrangement, or otherwise. Grantor and Grantee intend by this Easement to permanently and irrevocably terminate and extinguish all development rights (except such rights as are specifically reserved to Grantor by this Easement) that are now, or hereafter may be, allocated to, implied, reserved, or inherent in or to the Property.

## 6. CONSTRUCTION AND INTERPRETATION.

Pursuant to the public policy of the Commonwealth of Virginia favoring land conservation, any general rule of construction to the contrary notwithstanding (including the common-law rule that covenants restricting the free use of land are disfavored and must be strictly construed), it is the intent of the parties hereto that this Easement and all language contained herein be liberally construed in favor of the grant to effect the purposes of this Easement. If any provision of this Easement is found to be ambiguous, an interpretation that is consistent with the purposes of this Easement (to protect the Conservation Values of the Property and prevent the exercise of reserved rights in a way that would impair such values) and that would render the provision valid will be favored over any interpretation that would render it invalid. Notwithstanding the foregoing, lawful acts or uses consistent with the purposes of and not expressly prohibited by this Easement are permitted on the Property.

## 7. REFERENCE TO EASEMENT IN SUBSEQUENT DEEDS.

It is the intention of Grantor and Grantee that this Easement be referenced by deed book and page number, instrument number, or other appropriate reference in any deed or other instrument conveying any interest in the Property, provided that any failure of Grantor to comply with this requirement will not impair the validity of this Easement, limit the Easement's enforceability in any way, or constitute a violation of this Easement.

## 8. NOTICE TO GRANTEE AND GRANTOR.

(i) For the purpose of giving notices hereunder the current address of Grantee is P. O. Box 9110, Richmond, Virginia 23227-9110, or notice may be given at https://www.vof.org/contact/ and any notice to Grantor should be given to Grantor at the address at which the real estate tax bill is mailed for the Property or portion thereof that is the subject of the notice and which is currently Attn: Executive Director, 723 Woodlake Drive, Chesapeake, Virginia 23320. Notice to such Grantor's address will constitute notice to all record owners of the Property.

(ii) Grantor should notify Grantee in writing at or prior to closing on any *inter vivos* transfer other than a deed of trust or mortgage on all or part of the Property. Failure to give such notification will not impair the validity of this Easement, limit its enforceability in any way, or constitute a violation of this Easement.

**9. FUTURE ISSUES.**

(i) No use may be made of the Property, no activity may be undertaken thereon, and no construction of improvements on the Property will be permitted by Grantee that have an adverse effect on (a) The Conservation Values of the Property as encumbered by this Easement.

(ii) Grantor and Grantee acknowledge that, in view of the perpetual nature of the Easement, they are unable to foresee (a) all changes in climate, all changes in the Property and its natural resources, and all changes in the land and natural resources of nearby properties, (b) all plant and animal migration, (c) all natural disasters, (d) all future land uses, (e) all future technologies, and (f) all future occurrences that may adversely affect the Conservation Values of the Property and the conservation interests associated with this Easement.

(iii) Grantee may therefore determine whether (a) proposed uses, activities, or improvements on the Property not specifically contemplated by or addressed in this Easement or (b) alterations of existing uses or improvements or any potential adaptations necessitated by new occurrences, whether from natural events or otherwise, may adversely affect the Conservation Values of the Property and the conservation interests associated with this Easement.

(iv) Upon such determination, Grantee will advise Grantor in writing whether such uses, activities, improvements, alterations, or adaptations are permissible or not permissible on the Property.

(v) Grantee may only grant its consent to such uses, activities, improvements, alterations, or adaptions if it determines that they are not in violation of any of the terms of this Easement.

(vi) In addition, Grantee will monitor such activities to ensure that they are carried out in a manner not having an adverse effect on the Conservation Values of the Property or the conservation interests associated with this Easement.

**10. NO MERGER**.

Grantor and Grantee agree that if Grantee acquires a fee interest in the Property, this Easement will not merge into the fee interest but will survive the deed and continue to encumber the Property.

**11. ASSIGNMENT BY GRANTEE**

Assignment of this Easement is permitted by Virginia Code Section 10.1-1801, but Grantee may not transfer or convey this Easement unless Grantee conditions such transfer or conveyance on the requirement that (i) all restrictions set forth in this Easement are to be continued in perpetuity, (ii) the transferee then qualifies as an eligible donee as defined in IRC Section 170(h)(3) and the applicable Treasury Regulations, and (iii) the transferee is a public body as defined in Section 10.1-1700 of the Open-Space Land Act. Grantee must notify Grantor in writing at or prior to closing that this Easement is being assigned and to whom it is being assigned.

**12. EXTINGUISHMENT.**

Grantor and Grantee agree that if a subsequent unexpected change in the conditions surrounding the Property that is the subject of the donation of this perpetual conservation Easement renders impossible or impractical the continued use of the Property or a portion thereof for conservation purposes, the conservation purpose may nonetheless be treated as protected in perpetuity if (1) the Easement is extinguished by a judicial proceeding and (2) all of Grantee's portion of the proceeds (as determined below) from a subsequent sale or exchange of the Property or portion thereof are used by Grantee in a manner consistent with the conservation purposes of the original contribution.

**13. CONVERSION OR DIVERSION.**

Grantor and Grantee intend that this Easement be perpetual and acknowledge that no part of the Property may be converted or diverted from its open-space use except in compliance with the provisions of Section 10.1-1704 of the Open-Space Land Act that does not permit loss of open space.

**14. AMENDMENT.**

Grantee and Grantor may amend this Easement to enhance the Conservation Values of the Property or add acreage to the restricted property by an amended deed of easement, provided that no amendment may (i) affect this Easement's perpetual duration or remove this Easement from any portion of the Property, (ii) conflict with or be contrary to or inconsistent with the conservation purposes of this Easement, (iii) reduce the protection of the Conservation Values of the Property, (iv) affect the qualification of this Easement as a "qualified conservation contribution" or "interest in land", or (v) affect the status of Grantee as a "qualified organization" or "eligible donee". No amendment will be effective unless documented in a notarized document executed by Grantee and Grantor and recorded in the Clerk's Office of the Circuit Court of the City of Suffolk, Virginia.

**15. COST RECOVERY CHARGES.**

Grantee reserves the right to recover its costs incurred in responding to requests initiated by Grantor involving matters such as easement amendments, project reviews for ecosystem services, preparation of reports to facilitate sales, or access or utility easements over the Property. Such cost recovery charges will be determined and periodically adjusted by Grantee's Board of Trustees, as set forth in a published fee schedule.

**16. JOINT OWNERSHIP**.

If Grantor at any time owns the Property or any portion of or interest therein in joint tenancy, tenancy by the entirety, or tenancy in common, all such tenants will be jointly and severally liable for all obligations of Grantor set forth herein.

**17. SEVERABILITY**.

It is the express intent of the parties hereto that all provisions of this Easement be considered and construed as part of the whole and that no provision will be applied in isolation without consideration of the overall purposes of this Easement. Nevertheless, if any provision of this Easement or its application to any person or circumstance is determined by a court of competent jurisdiction to be invalid, the remaining provisions of this Easement will not be affected thereby.

**18. ENTIRE AGREEMENT**.

This instrument, including Schedule A and Exhibit A, sets forth the entire agreement of the parties with respect to this Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to this Easement whether verbal or written.

**19. CONTROLLING LAW**.

The interpretation and performance of this Easement will be governed by the laws of the Commonwealth of Virginia and the United States, resolving any ambiguities or questions of the validity of specific provisions in a manner consistent with the provisions of Section V, Paragraph 6 above to give maximum effect to its conservation purposes.

**22. RECODIFICATION AND AMENDMENT OF STATUTES AND REGULATIONS**

This Easement cites various federal statutes and regulations applicable to open-space easements. In the event that such statutes or regulations are re-codified or amended, this Easement will be interpreted and enforced according to the re-codified or amended statutes and regulations most closely corresponding to those cited herein and carrying out the purposes recited herein.

**23. RECORDING**.

This Easement will be recorded in the land records in the Clerk's Office of the Circuit Court of the City of Suffolk, Virginia, and Grantee may take any steps necessary in said clerk's office to preserve its rights under this Easement in the future.

## 24. COUNTERPARTS.

This Easement may be executed in one or more counterpart copies, each of which, when executed and delivered, will be an original, but all of which will constitute one and the same Easement. Execution of this Easement at different times and in different places by the parties hereto will not affect the validity of this Easement.

## 25. DEFINITIONS.

For purposes of this Easement, the phrase “Effective Date” means the date upon which this Easement was first put to record in the Clerk’s Office of the Circuit Court of the City of Suffolk, Virginia. The words “currently” or “existing” mean currently or existing on the Effective Date. Time will be calculated in calendar days, not business days.

[Counterpart signature pages follow.]

[Counterpart signature page 1 of 2 of deed of open-space easement]

WITNESS the following signatures and seals:

SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA, a public body politic and corporate of the Commonwealth of Virginia

By:___________________________________
Dennis Bagley
Executive Director

COMMONWEALTH OF VIRGINIA,
CITY OF CHESAPEAKE, TO WIT:

The foregoing instrument was acknowledged before me this ___ day of __________, 20___ by Dennis Bagley, Executive Director of Southeastern Public Service Authority of Virginia, a public body politic and corporate of the Commonwealth of Virginia on behalf of the authority.

_____________________________________
Notary Public

My commission expires: ______________________
(SEAL) Registration No. _____________________________

[Counterpart signature page 2 of 2 of deed of open-space easement]

Accepted:
VIRGINIA OUTDOORS FOUNDATION,

By: ___________________________________

COMMONWEALTH OF VIRGINIA,
CITY/COUNTY OF ______________________________, TO WIT:

The foregoing instrument was acknowledged before me this __________ day of ___________, 20_____ by _________________________, [*Select*: the Executive Director, Deputy Director *or* Staff Attorney] of the Virginia Outdoors Foundation.

_____________________________________
Notary Public

My commission expires: _________________________
(SEAL) Registration No. _______________________________

## SCHEDULE A

Legal Description of Property

## EXHIBIT A

Plat Showing RPZ

# Appendix H: Draft MOA

MEMORANDUM OF AGREEMENT
AMONG
SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA
AND
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE
AND
THE NORFOLK DISTRICT, U.S. ARMY CORPS OF ENGINEERS
AND
THE NANSEMOND INDIAN NATION
DATE

**WHEREAS,** the Southeastern Public Service Authority of Virginia (SPSA) (the "Permittee") proposes to construct an expansion to the SPSA Regional Landfill to collectively be known as Cells VIII and IX located at 1 Bob Foeller Drive in Suffolk, Virginia (the Undertaking) under the Department of Historic Resources (DHR) project review number 2021-3845; and

**WHEREAS**, pursuant to Section 404 of the Clean Water Act, a permit from the U.S. Army Corps of Engineers, Norfolk District (Corps) is required for permanent impacts to approximately 109.64 acres of forested wetlands to construct the Undertaking, which the Corps is evaluating under project NAO-1988-00021; and

**WHEREAS**, pursuant to 36 CFR Part 800 (regulations implementing Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (54 U.S.C. § 306108), and 33 CFR Part 325, Appendix C (*Processing of Department of the Army Permits: Procedures for Protection of Historic Places*), the Corps is required to take into account the effects of federally permitted undertakings on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) prior to the issuance of a permit for an undertaking and to consult with the Virginia State Historic Preservation Office (SHPO), which in Virginia is DHR; and

**WHEREAS,** the Corps, in consultation with the SHPO, has determined that the Area of Potential Effects (APE) (Corps Permit Area) for this project is the entire limits of disturbance for the Undertaking as shown on attached the Permit Area/Area of Potential Effects Map (Attachment A); and

**WHEREAS**, the Permittee has completed the identification of historic properties, and the Corps, in consultation with the SHPO, finds that the Phase I identification survey entitled *Phase IB Archaeological Survey of the Southeastern Public Service Authority Regional Landfill Expansion Project Area, City of Suffolk, Virginia,* prepared by Gray & Pape, Inc., dated April 2, 2024 meets the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation* (48 FR 44734-37, September 29, 1983) and the SHPO's *Guidelines for Conducting Historic Resources Survey in Virginia (2017)*; and

**WHEREAS**, the Corps, in consultation with the SHPO and other consulting parties, has determined that a Traditional Cultural Place (TCP) of significance to the Nansemond Indian Nation and further identified by the *Ethnographic Evaluation, Ethnobotanical Mapping, and GIS Mapping study* completed by Gray & Pape as depicted on the attached map (Attachment B) is listed on or eligible for inclusion in the NRHP; and

**WHEREAS,** the Corps has determined that the Undertaking will have an adverse effect on 114 acres of the Mawinsowa Swamp TCP of significance to the Nansemond Indian Nation; and

**WHEREAS**, the Corps issued a public notice on November 15, 2024, to allow public comments on the adverse effect to the TCP and no comments were received; and

**WHEREAS**, the Corps has invited the participation of the Advisory Council on Historic Preservation (ACHP) in this consultation, and the ACHP has declined to participate; and

**WHEREAS**, the Corps has invited the Delaware Nation, Chickahominy Tribe, the Chickahominy Tribe-Eastern Division, Nansemond Indian Nation, Monacan Nation, Pamunkey Tribe, Rappahannock Tribe, and the Upper Mattaponi Tribe, to participate in this consultation and to sign this Memorandum of Agreement (Agreement) as a concurring party, and the Nansemond Indian Nation has elected to participate, the Delaware Nation has declined to participate and no comments were received from the other Tribes contacted; and

**WHEREAS**, the Corps has invited the Permittee to participate in this consultation and to sign this Agreement as an invited signatory and the Permittee has elected to participate; and

**NOW THEREFORE**, in order to satisfy the Corps’ Section 106 responsibilities to take into account the effects of the Undertaking requiring Corps permits on historic properties, the Corps and the SHPO agree that the Corps may issue a permit to the Permittee for the Undertaking and such permit will require compliance with this Agreement as a permit condition; thereby effectively incorporating all terms, provisions and stipulations of this Agreement as conditions to the permit such that if any provision or stipulation herein is not fulfilled, such failure will constitute noncompliance with the permit, and the Corps may pursue enforcement and may seek all available remedies.

**The Corps, in coordination with the Permittee, shall ensure the implementation of the following stipulations:**

## STIPULATIONS

## I. TREATMENT FOR THE MAWINSOWA SWAMP TCP

a. Within 30 days of the issuance of the final, signed permit, the Permittee shall transfer a total of $700,000 to the Nansemond Indian Nation as mitigation for adverse effects to 114 acres of the TCP, a culturally significant swamp landscape including traditional Nansemond hunting and fishing grounds. The Nansemond Indian Nation agrees to accept such funds as sufficient for all adverse impacts to the TCP by this Undertaking. These funds will support the development and expansion of Nansemond cultural programming and cultural assets at the Nation's Cross Swamp property, located largely within the Mawinsowa Swamp TCP boundaries. Development of the cultural program at Cross Swamp will help preserve the Nansemond customs of hunting, fishing, tribal traditional crafting, way-finding, and cultural and natural resource management within the Mawinsowa Swamp TCP. These projects will strengthen and enhance the Nation's ability to engage tribal youth with their culture, educate other local communities about Nansemond history and presence in the swamp, and will provide opportunities for reconnection for Nansemond people who have grown up outside of their traditional territory. While the Nation has the ultimate discretion regarding the dispensation of funds, the following activities are contemplated:

1. Completion of a comprehensive plan at Cross Swamp to use the swamp property in an environmentally sustainable, preservation-oriented way for tribal citizens' use and benefit.
2. Construction of an activities building at Cross Swamp.
3. Construction of an activities pavilion at Cross Swamp.
4. Start-up funds and ongoing annual salary for a full-time site manager and cultural programs coordinator at Cross Swamp.
5. Development of an environmentally sensitive trail system at Cross Swamp.

## II. REPORTING REQUIREMENTS

a. Upon the completion of all stipulations to this Agreement, the Permittee shall provide to the Corps, the SHPO and the Nansemond Indian Nation a signed memorandum documenting that the Permittee has fulfilled all its responsibilities under this Agreement.

b. The Corps, the SHPO, and the Nansemond Indian Nation shall provide the Permittee with concurring and/or objecting opinions within fifteen (15) days of receipt of the signed memorandum documenting that the Permittee has fulfilled all its responsibilities under this Agreement. Any objections will be addressed through the Dispute Resolution process outlined in Stipulation VIII.

c. Should any party fail to provide an opinion within the fifteen (15) day comment period, the Permittee may assume that the non-objecting party has no objections and that all responsibilities under the Agreement have been fulfilled.

## III. POST-REVIEW DISCOVERIES

a. The Permittee shall ensure that the following provision is included in all construction contracts for land disturbance work on the Undertaking: "If previously unidentified historic properties or unanticipated effects to historic properties are discovered during construction, the construction contractor will immediately halt all activity within a one hundred (100) foot radius of the discovery, notify the SPSA of the discovery and implement interim measures to protect the discovery from looting and vandalism."

b. Immediately upon receipt of a notification required by the contract provision described in *Stipulation III.a.,* the Permittee shall:
   1. inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted;
   2. clearly mark the area of the discovery;
   3. implement additional measures, as appropriate, to minimize risk to the discovery from looting and vandalism;
   4. have a professional archeologist inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment; and
   5. within 24 hours notify the Corps, the SHPO, the Nansemond Indian Nation and other consulting parties of the discovery and describe the measures that have been implemented to comply with this Stipulation.

c. Upon receipt of the information required in *Stipulation III.b.5*., the Corps shall provide the Permittee, the SHPO, the Nansemond Indian Nation and other consulting parties with its assessment of the NRHP eligibility of the discovery and effect recommendation. In making its evaluation, the Corps, in consultation with the SHPO, may assume the discovery to be NRHP eligible for the purposes of Section 106 pursuant to 36 CFR § 800.13(c). The Permittee, the SHPO, the Nansemond Indian Nation and other consulting parties shall respond to the Corps' assessment within forty-eight (48) hours of receipt.

d. The Corps shall take into account the SHPO's, the Nansemond Indian Nation's and other consulting parties' opinion on the discovery's NRHP eligibility and the assessment of effect and determine which actions, if any, are appropriate for the Permittee to take with regard to the discovery. The Corps shall notify and provide documentation to the Permittee regarding any such appropriate actions that are required. The Permittee must comply with the required actions and provide the Corps and consulting parties with a report on the actions when implemented.

e. Once the Corps has determined that implementation of the actions undertaken to address the discovery pursuant to *Stipulation IIId*. are complete, construction activities may proceed in the area of discovery.

## IV. PROFESSIONAL QUALIFICATIONS

In the event of a post-review discovery, all archaeological and/or architectural work carried out pursuant to this Agreement will be conducted by or under the direct supervision of an individual or individuals who meets, at a minimum, the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9, September 29, 1983) in the appropriate discipline.

## V. PREPARATION AND REVIEW OF DOCUMENTS

a. In the event of a post-review discovery, the following shall apply.

b. Except as otherwise stated elsewhere in the stipulations, the Permittee shall submit a draft of all technical reports, treatment plans and other documentation to the Corps (one (1) copy) and the SHPO (one (1) hard copy and one (1) electronic copy in Adobe® Portable Document Format (.pdf)) and to other consulting parties (one (1) Copy) for thirty (30)-day review and comment. The Permittee shall address all comments received within thirty (30) days of confirmed receipt in the revised technical report/documentation. Following written approval by the Corps, the Permittee shall provide one (1) copy of all final reports, bound and on acid-free paper, and one (1) electronic copy in Adobe® Portable Document Format (.pdf) to the SHPO and one (1) copy (.pdf or hardcopy) to the Corps, and one copy to other consulting parties in the format of their choosing.

c. All technical reports prepared pursuant to this Agreement will be consistent with the federal standards titled *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44716-44742, September 29, 1983) and the SHPO's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017), or any subsequent revisions or replacements of these documents.

d. All architectural and landscape studies resulting from this agreement will be consistent with pertinent standards and guidelines of the Secretary of the Interior, including as applicable the Secretary's *Standards and Guidelines* *for Historical Documentation* (48 FR 44728-30) and for *Architectural and Engineering Documentation* (48 FR 44730-34).

**e.** The SHPO, the Nansemond Indian Nation and other consulting parties agree to provide comments on all technical reports, treatment plans, and other documentation arising from this Agreement within thirty (30) calendar days of receipt. If no comments are received from the SHPO or other consulting parties within the thirty (30) day review period, the Permittee may assume the non-responding party(ies) has no comments.

## VI. CURATION

In the event of a post-review discovery, within thirty (30) days of approval by the Corps and the SHPO of the final technical report, the Permittee shall deposit all archaeological materials and appropriate field and research notes, maps, drawings and photographic records collected as a result of archeological investigations arising from this Agreement (with the exception of human skeletal remains and associated funerary objects) for permanent curation with the SHPO which meets the requirements in 36 CFR 79, *Curation of Federally Owned and Administered Archeological Collections*. The Permittee shall provide the Corps with a copy of the curation agreement as evidence of its compliance with this stipulation. All such items will be made available to educational institutions and individual scholars for appropriate exhibit and/or research under the operating policies of the SHPO.

## VII. HUMAN REMAINS

a. The Permittee **shall** make all reasonable efforts to avoid disturbing gravesites, including those containing Native American human remains and associated funerary artifacts. The Permittee **shall** treat all human remains in a manner consistent with the ACHP's *Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects* (March 1, 2023; https://www.achp.gov/treatment-burial-sites).

b. If removal is proposed, the Permittee **shall** apply for a permit from the SHPO for the removal of human remains in accordance with the regulations noted below. The Permittee **shall** ensure that any removed human skeletal remains and associated funerary objects encountered during the course of actions taken as a result of this Agreement **will** be treated in accordance with the Regulations Governing Permits for the Archaeological Removal of Human Remains (Virginia Register 390-01-02) found in the *Code of Virginia* (10.1-2305, et seq., Virginia Antiquities Act).

c. The Permittee shall make a good faith effort to ensure that the general public is excluded from viewing any Native American burial site or associated funerary artifacts. The consulting parties to this Agreement shall release no photographs of any Native American burial site or associated funerary artifacts to the press or general public. The Corps shall notify the appropriate Federally recognized Tribe(s), and/or appropriate tribal leaders when Native American burials, human skeletal remains, or funerary artifacts are encountered on the project, prior to any analysis or recovery. The Permittee shall deliver any removed Native American human skeletal remains and associated funerary artifacts recovered pursuant to this Agreement to the appropriate tribe to be reinterred. The disposition of any other human skeletal remains and associated funerary artifacts will be governed as specified in any permit issued by the SHPO or any order of the local court authorizing their removal. The Permittee will be responsible for all reasonable costs associated with treatment of human remains and associated funerary objects.

## VIII. DISPUTE RESOLUTION

a. Should any party to this Agreement object in writing to the Corps regarding any action carried out or proposed with respect to any undertakings covered by this Agreement or to implementation of this Agreement, the Corps will consult with the objecting party to resolve the objection.

b. If after initiating such consultation, the Corps determines that the objection cannot be resolved through consultation, the Corps shall forward all documentation relevant to the objection to the ACHP, including the proposed response to the objection.

c. Within thirty (30) days after receipt of all pertinent documentation, the ACHP shall exercise one (1) of the following options:
   1. Advise the Corps that the ACHP concurs with the Corps' proposed response to the objection, whereupon the Corps will respond to the objection, accordingly; or
   2. Provide the Corps with recommendations, which the Corps shall take into account in reaching a final decision regarding its response to the objection; or
   3. Notify the Corps that the objection will be referred for comment pursuant to 36 CFR § 800.7(a)(4) and proceed to refer the objection for comment. The Corps shall take the resulting comment into account in accordance with 36 CFR § 800.7(c)(4) and Section 110(l) of the NHPA.

d. Should the ACHP not exercise one of the above options within thirty (30) days after receipt of all pertinent documentation, the Corps may assume the ACHP's concurrence in its proposed response to the objection.

e. The Corps shall take into account any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; the Corps' responsibility to carry out the actions under this Agreement, for which it is otherwise responsible, and that are not the subjects of the objections, will remain unchanged.

f. At any time during implementation of the measures stipulated in this Agreement, should an objection pertaining to this Agreement be raised by a member of the public, the Corps shall notify the parties to this Agreement and take the objection into account, consult with the objector, and should the objector so request, with any of the parties to this Agreement to consider the objection.

## IX. AMENDMENTS AND TERMINATION

a. Any signatory party to this Agreement may propose to the Corps that the Agreement be amended, whereupon the Corps will consult with the other parties to this Agreement to consider such an amendment. In order to amend the Agreement, all signatories to the Agreement must agree to the proposed amendment in accordance with 36 CFR § 800.6(c)(7).

b. If the Permittee decides it will not proceed with the Undertaking, it shall so notify the Corps, the SHPO, and the Nansemond Indian Nation and this Agreement will become null and void.

c. If the Permittee determines that it cannot implement the terms of this Agreement, or if the Corps or SHPO determines that the Agreement is not being properly implemented, the Permittee, the Corps, SHPO, or the Nansemond Indian Nation may propose to the other parties to this Agreement that it be amended or terminated.

d. This Agreement may be terminated by any signatory to the Agreement in accordance with the procedures described in 36 CFR § 800.6(c)(8). Termination will include the submission of a technical report or other documentation by the Permittee on any work done up to and including the date of termination. If the Corps is unable to execute another Agreement following termination, the Corps may choose to modify, suspend, or revoke the Department of the Army permit as provided by 33 CFR § 325.7.

## X. COORDINATION WITH OTHER FEDERAL REVIEWS

In the event that SPSA or another agency applies for additional federal funding or approvals for the Undertaking and the Undertaking remains unchanged, such funding or approving agency may comply with Section 106 by agreeing in writing to the terms of this MOA and notifying and consulting with SHPO and ACHP. Any necessary modifications will be considered in accordance with Stipulation IX, Amendments.

## XI. DURATION OF AGREEMENT

This Agreement will continue in full force and effect until fifteen (15) years after the date of the last signatory party signature. The Permittee shall fulfill the requirements of this Agreement prior to and in conjunction with the work authorized by the Department of the Army permit. All obligations under this Agreement must be complete before expiration of this Agreement. At any time in the six-month period prior to expiration of this Agreement, the Corps may request the signatory parties to consider an extension or modification of this Agreement. No extension or modification will be effective unless all parties to the Agreement have agreed to it in writing.

## XII. MISCELLANEOUS PROVISIONS

a. This Agreement will be effective on the date it has been signed by all signatory parties.

b. This Agreement may be executed in counterparts, with a separate page for each signatory. The Corps will ensure that each signatory party is provided with a copy of the fully executed Agreement.

c. Execution of this Agreement by the Corps and the SHPO and its submission to the ACHP in accordance with 36 CFR § 800.6(b)(1)(iv), will, pursuant to 36 CFR § 800.6(c), be considered to be an agreement pursuant to the regulations issued by the ACHP for the purposes of Section 110(l) of the NHPA.

d. Execution and submission of this Agreement, and implementation of its terms, evidence that the Corps has afforded the ACHP an opportunity to comment on the Undertaking and its effect on historic properties and that the Corps has taken into account the effect of the Undertaking on historic properties.

e. Compliance with the terms and provisions of this Agreement will be required as a condition to the permit which the Corps may issue to the Permittee for the Project. Failure by the Permittee to comply with such terms and provisions will constitute a violation of the permit, and the Corps may seek all available remedies for such violations, including enforcement. Failure by the Corps to pursue any such violation is NOT a waiver of the Corps' right or authority to do so in the future.

# SIGNATURES

SIGNATORY:

Southeastern Public Service Authority

By:_________________________________ Date:________________
Dennis Bagley
Executive Director
Southeastern Public Service Authority

SIGNATORY:

NORFOLK DISTRICT, U. S. ARMY CORPS OF ENGINEERS

By:________________________________ Date:________________

William T. Walker
Chief, Regulatory Branch

SIGNATORY:

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By:_________________________________ Date:________________

Julie V. Langan
Director, Department of
Historic Resources

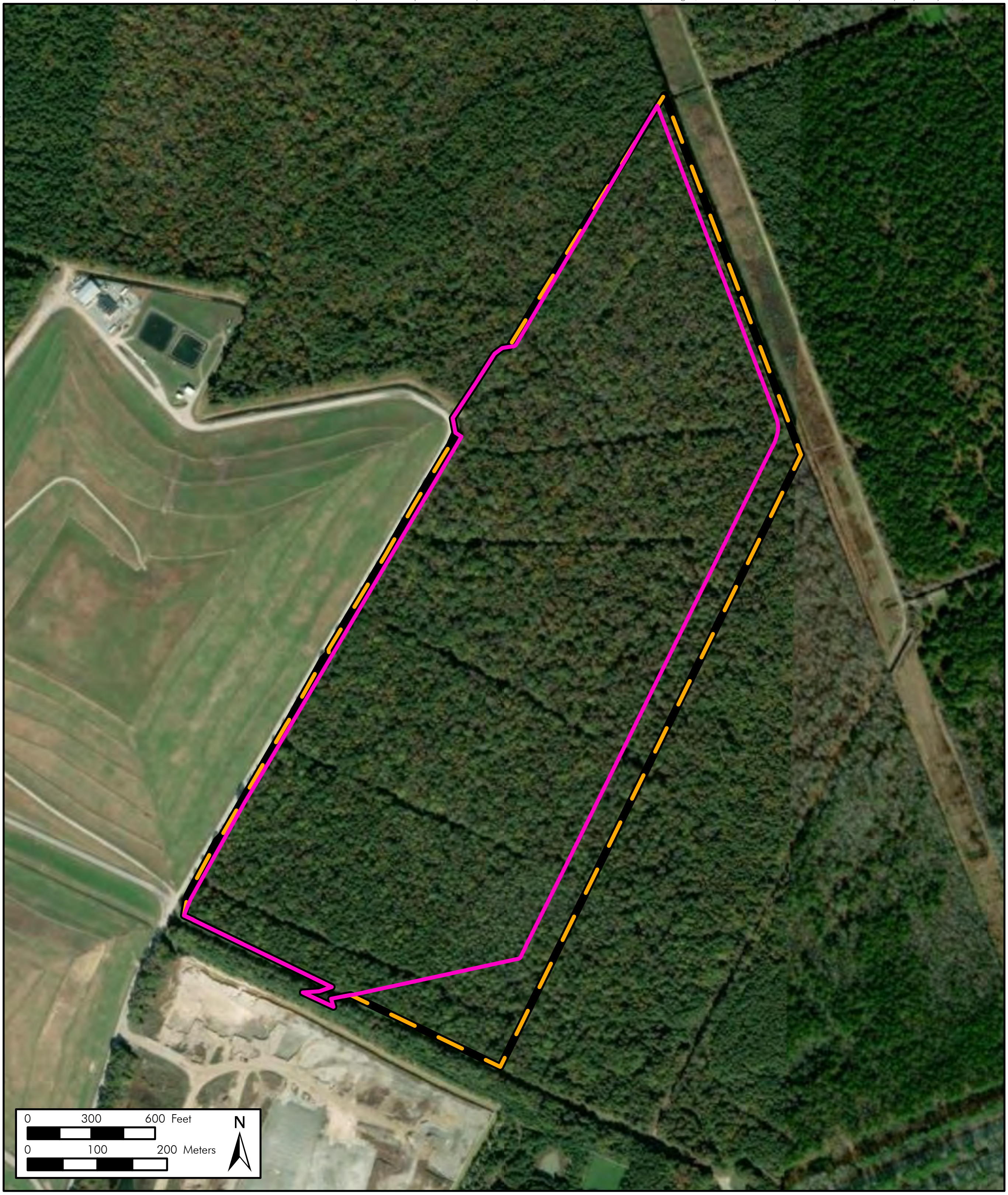
INVITED SIGNATORY:

Nansemond Indian Nation

By:________________________________ Date:_______________

Keith F. Anderson
Tribal Chief
Nansemond Indian Nation

# Attachment A: Permit Area/Area of Potential Effects Map





Project Area and Area of Potential Effects overlaid on aerial imagery circa 2023.

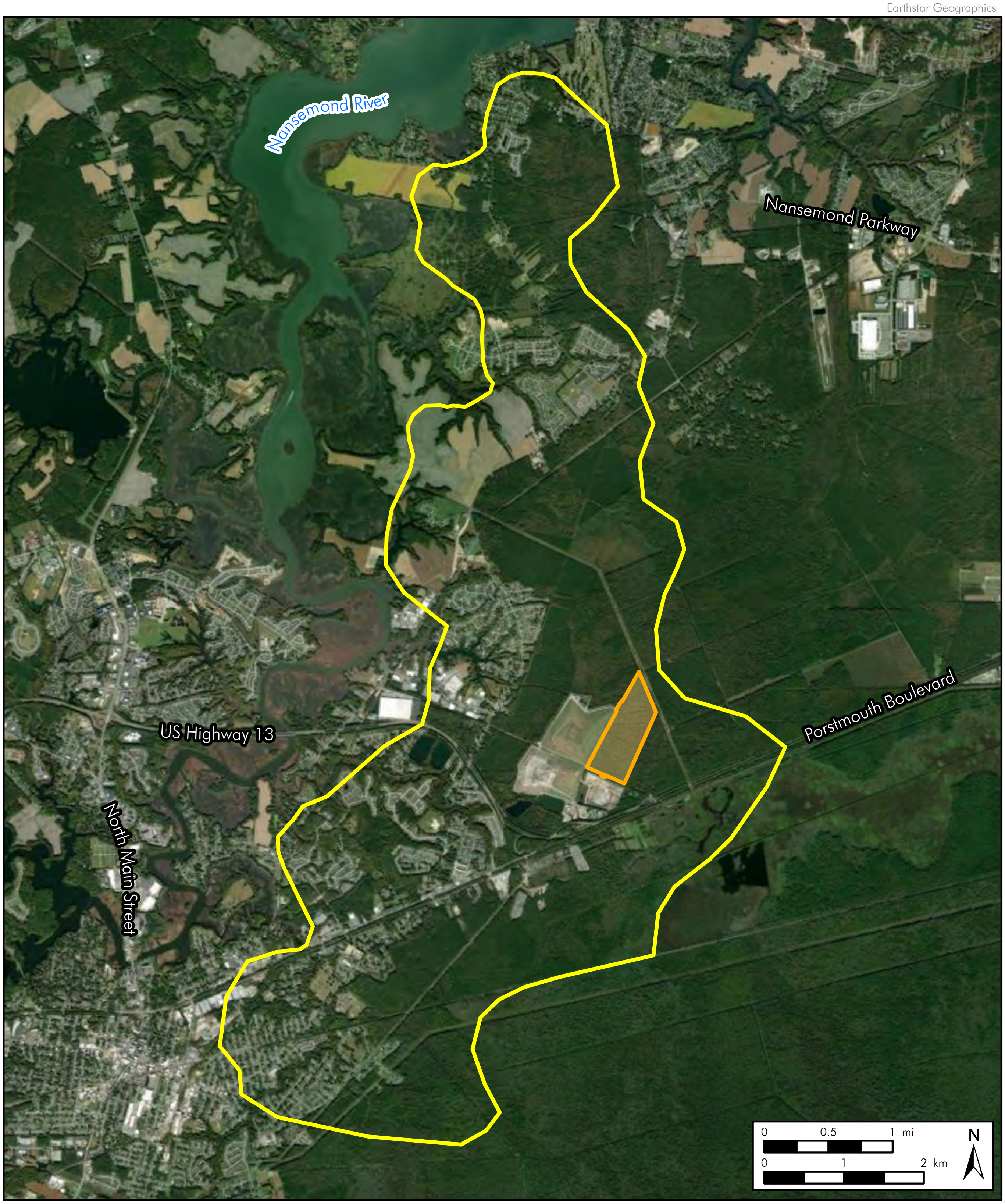
Limits of Disturbance/APE

Project Area

GRAY & PAPE
HERITAGE MANAGEMENT

# Attachment B: Mawinsowa Swamp TCP Map

2/18/2025 Created in ArcPro 3.0 for G&P Project 23-5705.001.




Location of the Project Area and TCP overlaid on 2023 aerial imagery.

Project Area
TCP Boundary

GRAY & PAPE
HERITAGE MANAGEMENT

# Appendix I: SPSA 2023 Waste Characterization Study

# Southeastern Public Service Authority 2023 Waste Characterization Study

## Southeastern Public Service Authority

723 Woodlake Drive
Chesapeake, VA 23320

SCS ENGINEERS

02222100.07 | September 1, 2023

SCS Engineers
Reston, VA 20191
703-471-6150

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# Table of Contents



## Figures



## Tables

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# 1 BACKGROUND

The Southeastern Public Service Authority (SPSA) contracted with SCS Engineers to conduct a waste characterization study of municipal solid waste (MSW) collected curbside from residences and businesses. This report details the findings of the two week-long field efforts performed at the Chesapeake Transfer Station and the Landstown Transfer Station.

The first part of this report details the methods of material characterization. It also provides guidelines for material definitions that are used throughout the report. The second part of the report presents the results from the two week-long field efforts broken down by residential and commercial waste streams.

## CHARACTERIZATION METHOD

### Field Efforts

A total of 50 samples were collected from incoming trash trucks at each transfer station. Materials were sampled and sorted at the Chesapeake Transfer Station during the week of June 26th through June 30th and at the Landstown Transfer station during the week of July 10th through July 14th.

*Sorting at the Chesapeake Transfer Station*

### Sampling and Sorting

Samples were distributed by sector (residential routes versus commercial routes) based on the actual tonnage from these sources arriving at the transfer station. Residential trucks are usually side or rear loaders and collect from carts that are placed curbside from single-family homes. Commercial trucks are usually front-loaders that collect dumpsters of varying sizes from businesses. The samples were distributed as follows at each site:

- Chesapeake Transfer Station – 17 commercial samples and 33 residential samples
- Landstown Transfer Station – 13 commercial samples and 36 residential samples

*Materials being manually sorted on the table*

Trucks at the Landstown Transfer Station run routes throughout the city of Virginia Beach and the Chesapeake Transfer Station services the city of Chesapeake.

As suitable trucks for sampling arrived at the transfer station, a skid steer collected a scoop of MSW from the load on the transfer station floor and transferred it to the sorting area where it was deposited in trash bins. Each sample weighed at least 200 pounds. After sample collection, the sample was transferred to a table and manually sorted into the 32 material categories presented in Table 1. At the completion of sorting, each bin and material category was weighed and the corresponding data was recorded on a field data sheet.

Table 1. Material Categories and Examples

| | Material | Examples |
|---|---|---|
| Paper | Corrugated Cardboard | Shipping or packing boxes |
| | Recyclable Paper | Newsprint, office paper, boxboard, unwanted mail |
| | Gable-top and Aseptic Containers | Paper milk and juice cartons and containers |
| Metals | Aluminum Cans | Soda cans, some aerosol cans |
| | Steel Cans | Food containers (canned soup, vegetables, etc.), some aerosol cans |
| | Other Ferrous Metals | Pipes, bolts, metal alloys with iron |
| | Other Non-Ferrous Metals | Copper wire, brass clasps, aluminum scraps |
| Organics | Food Waste | Excess food scraps, rotted fruits/vegetables, meat & animal parts |
| | Yard Waste | Leaves, grass, weeds |
| | Compostable Paper | Paper towels, napkins, tissues, food-soiled paper, waxed paper |
| | Untreated Wood | Unpainted, unstained wood such as plywood or particleboard |
| Inorganic | Glass Bottles & Jars | Beer, wine, and liquor bottles |
| | Construction Materials | Gypsum board, vinyl siding, concrete, brocks, rocks, window glass, asphalt roofing |
| | Carpet/Rugs/Padding | Carpet, carpet padding, and rugs |
| | Electronics | Cell phones, chargers, computers and related equipment, brown goods |
| Plastics | #1 PET Bottles | Blue, green, or clear bottles (#1): soda bottles, water bottles, hand soap bottles |
| | #1 PET Thermoforms - Clear | Clear clamshells |
| | #1 PET Containers - Pigment | PET bottles or thermoforms NOT blue, green, or clear |
| | #2 HDPE Containers - Natural | Translucent bottles and containers, usually milk jugs or juice |
| | #2 HDPE Containers - Colored | Opaque white or colored plastic bottles such as cleaning products, laundry detergent bottles |
| | #3 PVC | Rigid plastic piping, security packaging, blister packaging, vinyl soft packaging (air mattress bag) |
| | Grocery & Merchandise Bags | Single-use bags used in retail and grocery stores |
| | Other Film | Chip bags, ziplock bags, trash bags |
| | #5 Polypropylene | Containers labeled #5, usually yogurt containers |
| | Other Plastic Containers | Bottles, tubs, and jars (#3, #4, #5, #6, or #7) |

| Material | | Examples |
|---|---|---|
| | Expanded Polystyrene | Cups, trays, clamshells, egg cartons, other packaging |
| | Rigid Plastics | Plastic furniture, bins/crates, buckets; made from a mix of plastics |
| | Mixed Plastics | Tubs, trays, lids, items labeled #7 |
| Other | Batteries | Lithium ion, car, and household batteries |
| Other | HHW | Gasoline, anti-freeze, motor oil, oil-based paint, cleaning products, etc. |
| Other | Latex Paint | Spray paint, house paint |
| Other | Other | Material that does not fit into above categories |

Materials identified in Table 1 above were further classified by divertible category (recyclable, compostable, etc). Table 2 presents the divertible categories and the corresponding materials associated with each.

Table 2. Divertible Categories and Associated Materials

| Divertible Category | Materials |
|---|---|
| Recyclable Fiber | Corrugated Cardboard, Recyclable Paper, Gable-top and Aseptic Containers |
| Recyclable Plastics | #1 PET Bottles, #1 PET Thermoforms, #1 PET Containers, #2 HDPE Containers (Natural and Pigmented), #5 Polypropylene Containers, Other Plastic Containers/Tubs |
| Recyclable Metal and Glass | Steel Cans, Aluminum Cans, Other Ferrous, Other Non-Ferrous, Glass Bottles and Jars |
| Compostable Organics | Food Waste, Yard Waste, Compostable Paper, Untreated Wood |
| Other Divertibles | Grocery and Merchandise Bags, Electronics, Carpets/Rugs/Padding, Batteries, HHW, Latex Paint |
| Non-Divertible | Mixed Plastics (#7), Expanded Polystyrene, Rigid Plastics, Other Film, Construction Materials, Other Uncategorized Trash |

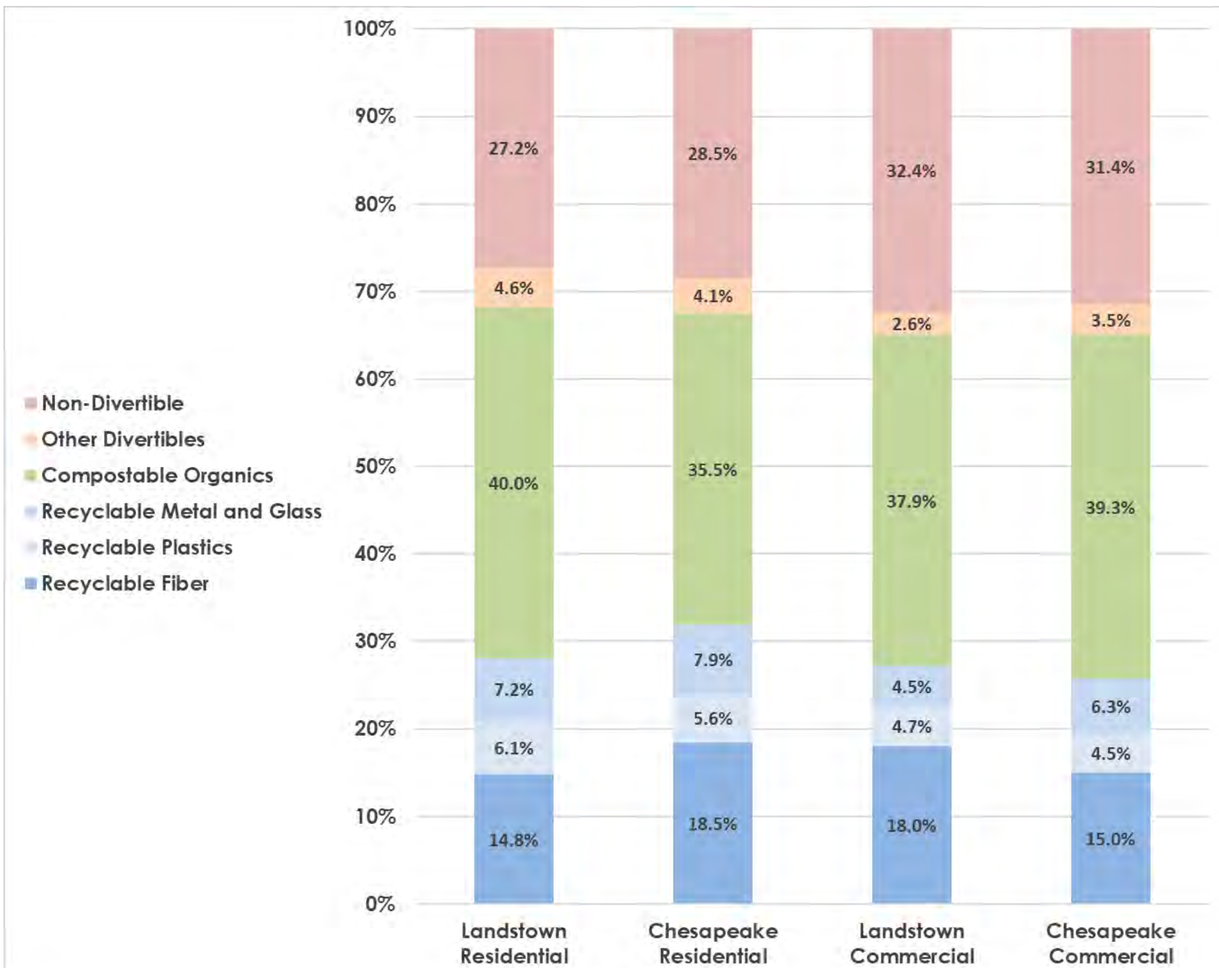
# 2 RESULTS

This section of the report summarizes the data collected from each transfer station. In order to show the potential for waste diversion, the materials are grouped in the divertible categories presented in Table 2 Please note that the totals may not add up to 100 percent due to rounding.

## COMPARISON BY SECTOR AND TRANSFER STATION

Figure 1 presents a comparison of residential and commercial waste compositions for each transfer station. Chesapeake residential routes had the highest proportion of potentially recyclable materials (paper, plastics, metal, and glass) at approximately 32 percent by weight versus approximately 28 percent from Landstown residential routes. Landstown residential routes had the highest proportion of compostable materials at approximately 40 percent by weight.

Figure 1. Waste Stream Comparison by Sector and Transfer Station

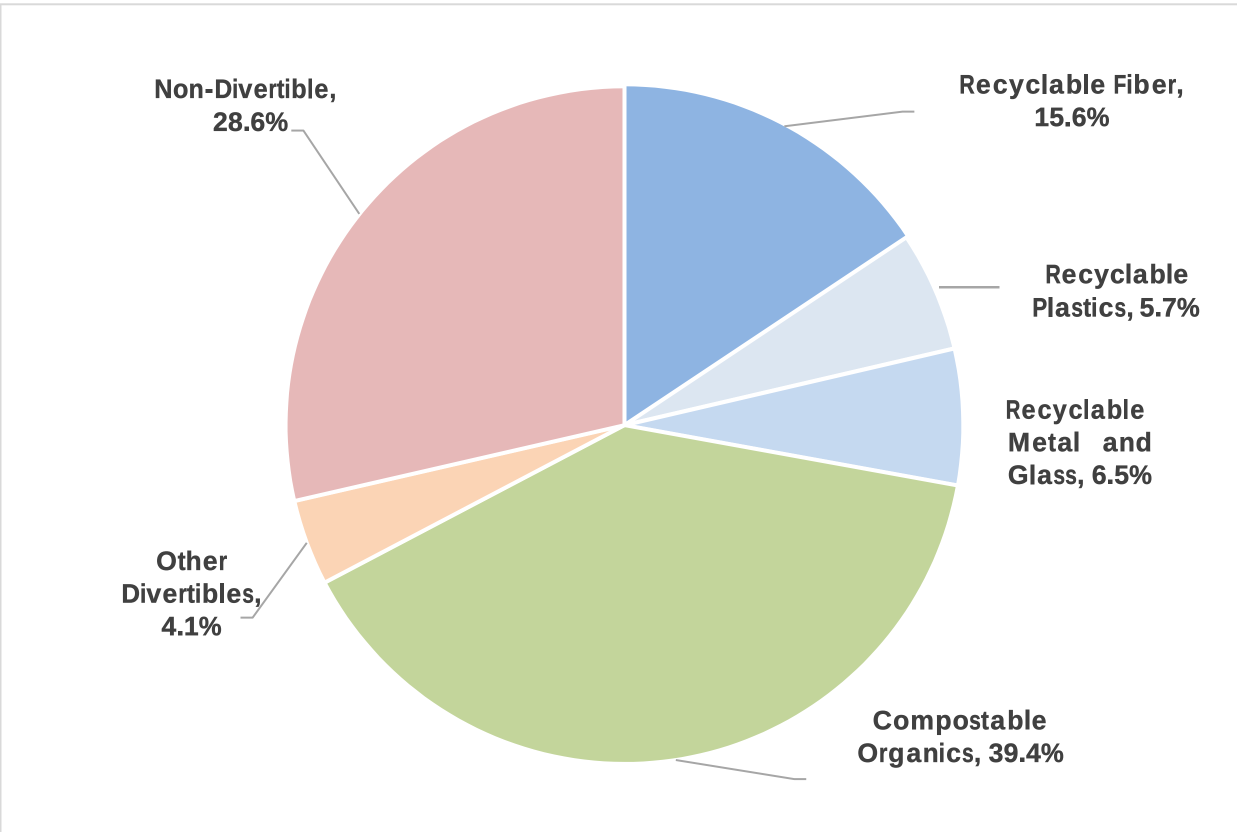


## LANDSTOWN TRANSFER STATION (VIRGINIA BEACH)

### Landstown Overall Waste Stream

Figure 2 and Table 3 present a compilation of the 49 waste samples (36 residential and 13 commercial) collected and sorted during the field effort at Landstown Transfer Station. One residential sample is omitted because it was determined to come from a recycling collection truck that unloaded at the transfer station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Landstown Overall waste stream are Food Waste (21.8 percent), Recyclable Paper (11.1 percent), and Compostable Paper (8.3 percent).

Figure 2. Landstown Overall Waste Stream Diversion Potential



## Table 3. Landstown Overall Waste Stream Composition

| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 3.3% | 2.4% | 2.7% | 4.0% |
| Recyclable Paper | 11.1% | 2.7% | 10.3% | 11.8% |
| Gable-top and Aseptic Containers | 1.3% | 0.6% | 1.1% | 1.4% |
| **Total Paper** | **15.6%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.7% | 0.7% | 1.5% | 1.9% |
| #1 PET Thermoforms (Clear) | 1.1% | 0.6% | 0.9% | 1.3% |
| #1 PET Containers (Pigmented) | 0.5% | 0.2% | 0.4% | 0.6% |
| #2 HDPE Containers (Natural) | 0.5% | 0.3% | 0.4% | 0.6% |
| #2 HDPE Containers (Colored) | 0.6% | 0.5% | 0.5% | 0.7% |
| Grocery & Merchandise Bags | 1.0% | 0.4% | 0.9% | 1.1% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.6% | 0.4% | 0.5% | 0.7% |
| Other Plastic Containers/Tubs | 0.7% | 0.4% | 0.6% | 0.8% |
| #3 - PVC | <0.1% | <0.1% | <0.1% | <0.1% |
| Expanded Polystyrene | 1.0% | 0.4% | 0.9% | 1.1% |
| Rigid Plastic | 2.3% | 1.3% | 1.9% | 2.6% |
| Other Film | 9.5% | 1.8% | 9.0% | 10.0% |
| **Total Plastic** | **19.6%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 21.8% | 4.8% | 20.5% | 23.2% |
| Yard Waste | 7.4% | 7.3% | 5.3% | 9.4% |
| Compostable Paper | 8.3% | 1.5% | 7.9% | 8.8% |
| Untreated Wood | 1.9% | 1.9% | 1.4% | 2.4% |
| **Total Organics** | **39.4%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.7% | 0.4% | 0.5% | 0.8% |
| Aluminum Cans | 0.8% | 0.4% | 0.6% | 0.9% |
| Other Ferrous | 1.3% | 1.4% | 0.9% | 1.7% |
| Other Non-Ferrous | 0.6% | 0.5% | 0.5% | 0.8% |
| **Total Metals** | **3.4%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 3.1% | 1.7% | 2.6% | 3.6% |
| **Total Glass** | **3.1%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 2.5% | 3.6% | 1.5% | 3.6% |
| Electronics | 2.0% | 1.7% | 1.5% | 2.5% |
| Carpets/Rugs/Padding | 0.9% | 3.2% | <0.1% | 1.8% |
| **Total Inorganics** | **5.5%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | <0.1% |
| HHW | <0.1% | 0.2% | <0.1% | 0.1% |
| Latex Paint | 0.1% | 0.4% | <0.1% | 0.2% |
| Other Uncategorized Trash | 13.1% | 4.0% | 12.0% | 14.3% |
| **Total Other Wastes** | **13.3%** | | | |
| **TOTALS** | **99.9%** | | | |

Notes: Composition based on 49 samples

Confidence limits are calculated at the 95% confidence level.

N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

## Landstown Residential Waste Stream

Figure 3 and Table 4 present a compilation of the 36 residential waste samples collected and sorted during the field effort at Landstown Transfer Station. One residential sample is omitted from the analysis because it was determined to come from a recycling collection truck that unloaded at the transfer station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Landstown Residential waste stream are Food Waste (21.4 percent), Recyclable Paper (11.0 percent), and Yard Waste (8.8 percent).

Figure 3. Landstown Residential Waste Stream Diversion Potential

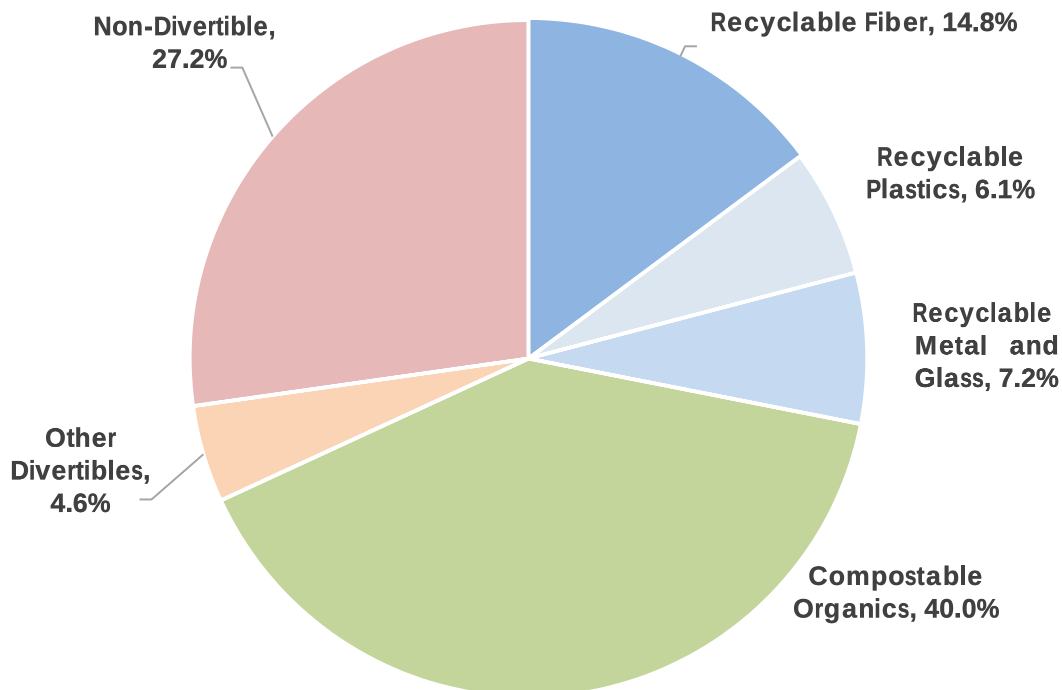


Table 4. Landstown Residential Waste Stream Composition

| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 2.6% | 1.6% | 2.1% | 3.1% |
| Recyclable Paper | 11.0% | 2.5% | 10.2% | 11.9% |
| Gable-top and Aseptic Containers | 1.2% | 0.3% | 1.1% | 1.3% |
| **Total Paper** | **14.8%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.9% | 0.5% | 1.7% | 2.1% |
| #1 PET Thermoforms (Clear) | 1.2% | 0.6% | 1.0% | 1.4% |
| #1 PET Containers (Pigmented) | 0.5% | 0.2% | 0.4% | 0.6% |
| #2 HDPE Containers (Natural) | 0.4% | 0.2% | 0.4% | 0.5% |
| #2 HDPE Containers (Colored) | 0.7% | 0.5% | 0.5% | 0.9% |
| Grocery & Merchandise Bags | 1.1% | 0.4% | 1.0% | 1.2% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.6% | 0.3% | 0.5% | 0.7% |
| Other Plastic Containers/Tubs | 0.7% | 0.3% | 0.6% | 0.8% |
| #3 - PVC | <0.1% | <0.1% | <0.1% | <0.1% |
| Expanded Polystyrene | 1.0% | 0.3% | 0.9% | 1.1% |
| Rigid Plastic | 2.3% | 1.3% | 1.9% | 2.7% |
| Other Film | 9.2% | 1.6% | 8.7% | 9.7% |
| **Total Plastic** | **19.8%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 21.4% | 4.4% | 19.9% | 22.8% |
| Yard Waste | 8.8% | 7.6% | 6.3% | 11.3% |
| Compostable Paper | 8.2% | 1.2% | 7.8% | 8.6% |
| Untreated Wood | 1.7% | 1.5% | 1.2% | 2.2% |
| **Total Organics** | **40.0%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.8% | 0.4% | 0.7% | 0.9% |
| Aluminum Cans | 0.8% | 0.4% | 0.7% | 1.0% |
| Other Ferrous | 1.5% | 1.6% | 1.0% | 2.0% |
| Other Non-Ferrous | 0.8% | 0.6% | 0.6% | 0.9% |
| **Total Metals** | **3.9%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 3.3% | 1.6% | 2.8% | 3.8% |
| **Total Glass** | **3.3%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 1.7% | 2.6% | 0.9% | 2.6% |
| Electronics | 2.2% | 1.8% | 1.6% | 2.7% |
| Carpets/Rugs/Padding | 1.1% | 3.6% | <0.1% | 2.3% |
| **Total Inorganics** | **5.0%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | <0.1% |
| HHW | <0.1% | 0.3% | <0.1% | 0.1% |
| Latex Paint | 0.1% | 0.5% | <0.1% | 0.3% |
| Other Uncategorized Trash | 12.9% | 4.3% | 11.5% | 14.3% |
| **Total Other Wastes** | **13.1%** | | | |
| **TOTALS** | **100.0%** | | | |

Notes: Composition based on 36 samples

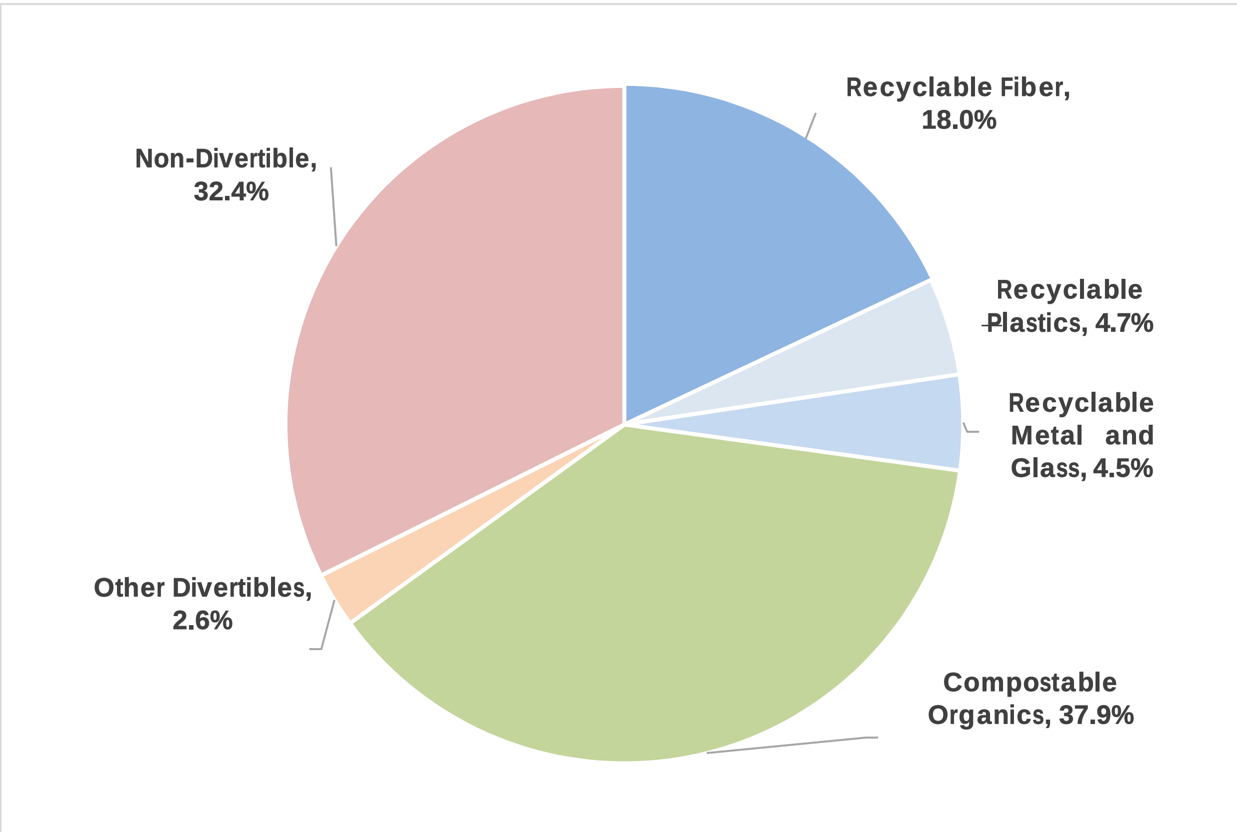
Confidence limits are calculated at the 95% confidence level.

N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

## Landstown Commercial Waste Stream

Figure 4 and Table 5 present a compilation of the 13 commercial waste samples collected and sorted during the field effort at Landstown Transfer Station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Landstown Commercial waste stream are Food Waste (23.2 percent), Recyclable Paper (11.1 percent), and Compostable Paper (8.7 percent).

Figure 4. Landstown Commercial Waste Stream Diversion Potential



## Table 5. Landstown Commercial Waste Stream Composition

| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 5.3% | 3.0% | 3.7% | 7.0% |
| Recyclable Paper | 11.1% | 3.4% | 9.3% | 13.0% |
| Gable-top and Aseptic Containers | 1.5% | 0.9% | 1.0% | 2.0% |
| **Total Paper** | **18.0%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.1% | 0.6% | 0.7% | 1.4% |
| #1 PET Thermoforms (Clear) | 0.8% | 0.5% | 0.5% | 1.1% |
| #1 PET Containers (Pigmented) | 0.5% | 0.2% | 0.3% | 0.6% |
| #2 HDPE Containers (Natural) | 0.6% | 0.4% | 0.4% | 0.8% |
| #2 HDPE Containers (Colored) | 0.4% | <0.1% | 0.3% | 0.4% |
| Grocery & Merchandise Bags | 0.6% | 0.3% | 0.4% | 0.8% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.7% | 0.5% | 0.4% | 0.9% |
| Other Plastic Containers/Tubs | 0.7% | 0.5% | 0.4% | 1.0% |
| #3 - PVC | <0.1% | <0.1% | <0.1% | <0.1% |
| Expanded Polystyrene | 1.0% | 0.5% | 0.8% | 1.3% |
| Rigid Plastic | 2.2% | 1.2% | 1.6% | 2.9% |
| Other Film | 10.4% | 1.9% | 9.4% | 11.5% |
| **Total Plastic** | **19.0%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 23.2% | 5.7% | 20.1% | 26.3% |
| Yard Waste | 3.4% | 4.3% | 1.1% | 5.7% |
| Compostable Paper | 8.7% | 2.3% | 7.5% | 9.9% |
| Untreated Wood | 2.6% | 2.6% | 1.2% | 4.0% |
| **Total Organics** | **37.9%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.3% | 0.2% | 0.2% | 0.4% |
| Aluminum Cans | 0.5% | 0.3% | 0.3% | 0.7% |
| Other Ferrous | 0.8% | 0.6% | 0.5% | 1.1% |
| Other Non-Ferrous | 0.3% | 0.3% | 0.2% | 0.5% |
| **Total Metals** | **2.0%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 2.6% | 1.9% | 1.6% | 3.6% |
| **Total Glass** | **2.6%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 4.8% | 5.0% | 2.0% | 7.5% |
| Electronics | 1.6% | 1.3% | 0.9% | 2.3% |
| Carpets/Rugs/Padding | 0.3% | 1.2% | <0.1% | 1.0% |
| **Total Inorganics** | **6.7%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | 0.1% |
| HHW | <0.1% | <0.1% | <0.1% | <0.1% |
| Latex Paint | <0.1% | <0.1% | N/A | N/A |
| Other Uncategorized Trash | 13.8% | 3.2% | 12.1% | 15.6% |
| **Total Other Wastes** | **13.9%** | | | |
| **TOTALS** | **100.0%** | | | |

Notes: Composition based on 13 samples

Confidence limits are calculated at the 95% confidence level.

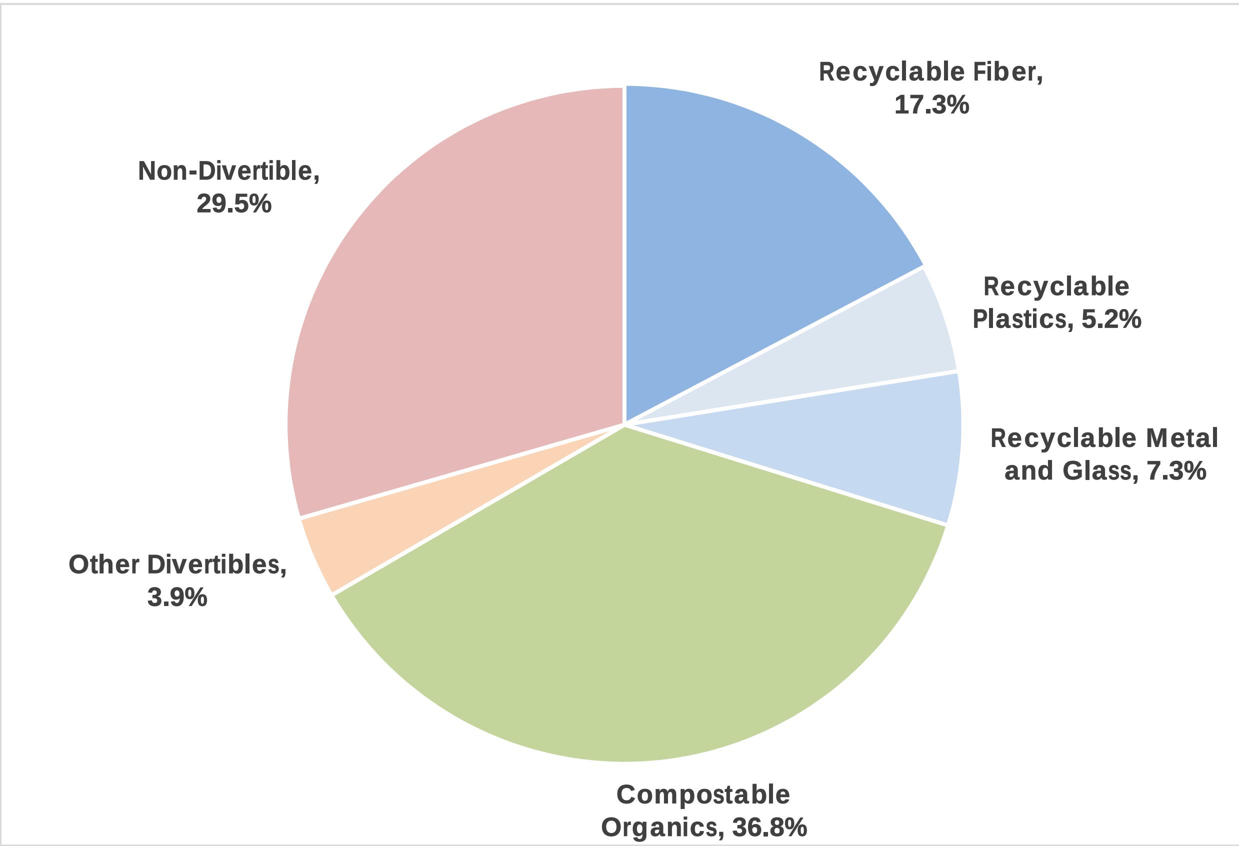
N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

## CHESAPEAKE TRANSFER STATION

### Chesapeake Overall Waste Stream

Figure 5 and Table 6 present a compilation of the 50 waste samples (33 residential and 17 commercial) collected and sorted during the field effort at the Chesapeake Transfer Station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Chesapeake Overall waste stream are Food Waste (20.5 percent), Recyclable Paper (10.6 percent), and Compostable Paper (7.6 percent).

Figure 5. Chesapeake Overall Waste Stream Diversion Potential



## Table 6. Chesapeake Overall Waste Stream Composition

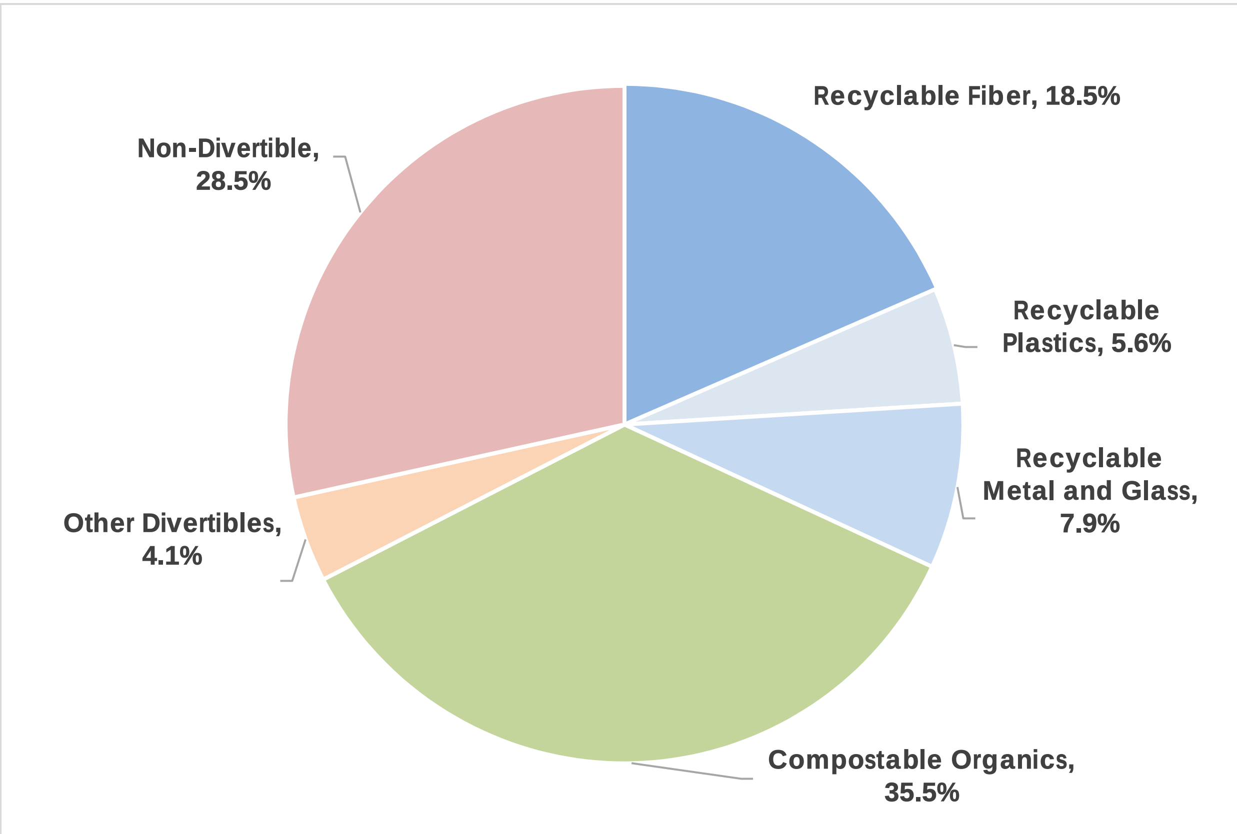
| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 5.1% | 3.0% | 4.2% | 5.9% |
| Recyclable Paper | 10.6% | 3.6% | 9.6% | 11.6% |
| Gable-top and Aseptic Containers | 1.6% | 0.7% | 1.4% | 1.8% |
| **Total Paper** | **17.3%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.4% | 0.7% | 1.2% | 1.5% |
| #1 PET Thermoforms (Clear) | 1.0% | 0.5% | 0.8% | 1.1% |
| #1 PET Containers (Pigmented) | 0.5% | 0.3% | 0.4% | 0.6% |
| #2 HDPE Containers (Natural) | 0.5% | 0.3% | 0.4% | 0.6% |
| #2 HDPE Containers (Colored) | 0.5% | 0.3% | 0.4% | 0.6% |
| Grocery & Merchandise Bags | 0.9% | 0.5% | 0.7% | 1.0% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.5% | 0.4% | 0.4% | 0.6% |
| Other Plastic Containers/Tubs | 0.9% | 0.9% | 0.6% | 1.1% |
| #3 - PVC | <0.1% | 0.1% | <0.1% | <0.1% |
| Expanded Polystyrene | 0.9% | 0.5% | 0.8% | 1.0% |
| Rigid Plastic | 2.4% | 1.1% | 2.1% | 2.7% |
| Other Film | 8.4% | 2.3% | 7.7% | 9.0% |
| **Total Plastic** | **17.8%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 20.5% | 5.9% | 18.9% | 22.1% |
| Yard Waste | 6.0% | 6.3% | 4.3% | 7.8% |
| Compostable Paper | 7.6% | 2.1% | 7.0% | 8.2% |
| Untreated Wood | 2.7% | 2.9% | 1.9% | 3.5% |
| **Total Organics** | **36.8%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.6% | 0.5% | 0.5% | 0.8% |
| Aluminum Cans | 0.7% | 0.4% | 0.5% | 0.8% |
| Other Ferrous | 1.6% | 1.8% | 1.1% | 2.1% |
| Other Non-Ferrous | 0.4% | 0.3% | 0.3% | 0.4% |
| **Total Metals** | **3.2%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 4.1% | 1.8% | 3.6% | 4.6% |
| **Total Glass** | **4.1%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 4.2% | 4.2% | 3.0% | 5.3% |
| Electronics | 2.2% | 2.2% | 1.6% | 2.8% |
| Carpets/Rugs/Padding | 0.5% | 2.1% | <0.1% | 1.1% |
| **Total Inorganics** | **6.9%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | <0.1% |
| HHW | <0.1% | 0.2% | <0.1% | 0.1% |
| Latex Paint | 0.2% | 0.6% | <0.1% | 0.4% |
| Other Uncategorized Trash | 13.6% | 5.1% | 12.2% | 15.0% |
| **Total Other Wastes** | **13.9%** | | | |
| **TOTALS** | **100.0%** | | | |

Notes: Composition based on 50 samples
Confidence limits are calculated at the 95% confidence level.
N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

## Chesapeake Residential Waste Stream

Figure 6 and Table 7 present a compilation of the 33 residential waste samples collected and sorted during the field effort at the Chesapeake Transfer Station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Chesapeake Residential waste stream are Food Waste (18.7 percent), Recyclable Paper (11.8 percent), and Compostable Paper (7.7 percent).

Figure 6. Chesapeake Residential Waste Stream Diversion Potential



## Table 7. Chesapeake Residential Waste Stream Composition

| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 5.0% | 2.8% | 4.1% | 6.0% |
| Recyclable Paper | 11.8% | 3.0% | 10.8% | 12.8% |
| Gable-top and Aseptic Containers | 1.6% | 0.6% | 1.4% | 1.8% |
| **Total Paper** | **18.5%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.4% | 0.7% | 1.2% | 1.7% |
| #1 PET Thermoforms (Clear) | 1.1% | 0.6% | 0.8% | 1.3% |
| #1 PET Containers (Pigmented) | 0.5% | 0.3% | 0.4% | 0.6% |
| #2 HDPE Containers (Natural) | 0.5% | 0.4% | 0.4% | 0.7% |
| #2 HDPE Containers (Colored) | 0.6% | 0.3% | 0.5% | 0.6% |
| Grocery & Merchandise Bags | 1.0% | 0.4% | 0.8% | 1.1% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.5% | 0.3% | 0.4% | 0.6% |
| Other Plastic Containers/Tubs | 0.9% | 0.5% | 0.8% | 1.1% |
| #3 - PVC | <0.1% | <0.1% | <0.1% | <0.1% |
| Expanded Polystyrene | 0.9% | 0.3% | 0.7% | 1.0% |
| Rigid Plastic | 2.7% | 1.1% | 2.3% | 3.1% |
| Other Film | 7.7% | 1.8% | 7.1% | 8.3% |
| **Total Plastic** | **17.8%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 18.7% | 3.4% | 17.5% | 19.8% |
| Yard Waste | 6.7% | 6.0% | 4.6% | 8.7% |
| Compostable Paper | 7.7% | 1.8% | 7.1% | 8.3% |
| Untreated Wood | 2.5% | 1.8% | 1.9% | 3.2% |
| **Total Organics** | **35.5%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.7% | 0.4% | 0.6% | 0.9% |
| Aluminum Cans | 0.7% | 0.3% | 0.6% | 0.8% |
| Other Ferrous | 1.4% | 1.1% | 1.1% | 1.8% |
| Other Non-Ferrous | 0.4% | 0.3% | 0.3% | 0.5% |
| **Total Metals** | **3.2%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 4.7% | 1.5% | 4.2% | 5.2% |
| **Total Glass** | **4.7%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 4.0% | 4.8% | 2.4% | 5.7% |
| Electronics | 2.4% | 2.5% | 1.6% | 3.3% |
| Carpets/Rugs/Padding | 0.4% | 2.1% | <0.1% | 1.1% |
| **Total Inorganics** | **6.8%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | <0.1% |
| HHW | <0.1% | 0.2% | <0.1% | 0.1% |
| Latex Paint | 0.2% | 0.6% | <0.1% | 0.5% |
| Other Uncategorized Trash | 13.1% | 5.2% | 11.3% | 14.9% |
| **Total Other Wastes** | **13.5%** | | | |
| **TOTALS** | **100.0%** | | | |

Notes: Composition based on 33 samples

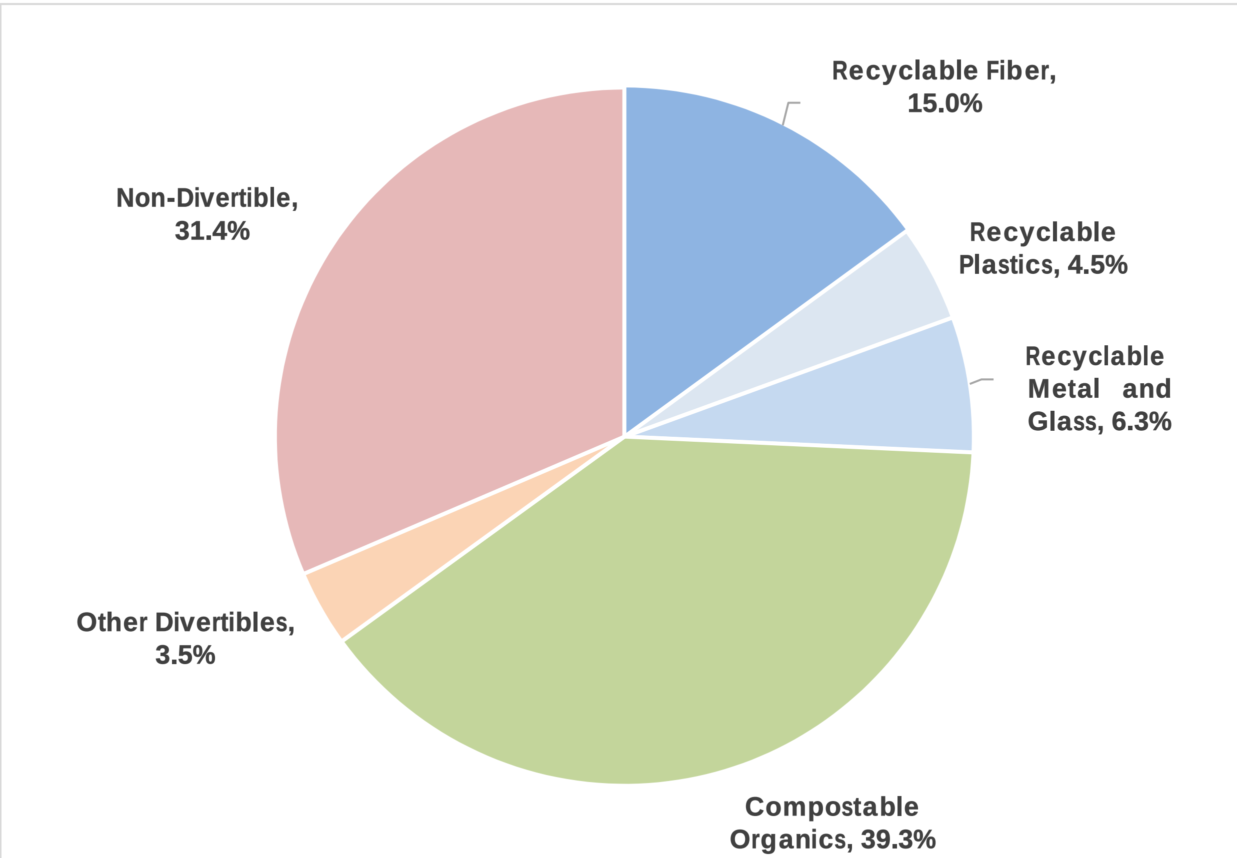
Confidence limits are calculated at the 95% confidence level.

N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

## Chesapeake Commercial Waste Stream

Figure 7 and Table 8 present a compilation of the 17 commercial waste samples collected and sorted during the field effort at Chesapeake Transfer Station. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. The three largest divertible materials, by weight, of the Chesapeake Commercial waste stream are Food Waste (24.1 percent), Recyclable Paper (8.4 percent), and Compostable Paper (7.5 percent).

Figure 7. Chesapeake Commercial Waste Stream Diversion Potential



## Table 8. Chesapeake Commercial Waste Stream Composition

| Material Components | Mean Composition | Standard Deviation | Confidence Limits Lower | Confidence Limits Upper |
|---|---|---|---|---|
| **PAPER** | | | | |
| Corrugated Cardboard | 5.1% | 3.6% | 3.4% | 6.8% |
| Recyclable Paper | 8.4% | 3.7% | 6.6% | 10.1% |
| Gable-top and Aseptic Containers | 1.5% | 0.9% | 1.1% | 1.9% |
| **Total Paper** | **15.0%** | | | |
| **PLASTIC** | | | | |
| #1 PET Bottles | 1.2% | 0.6% | 0.9% | 1.5% |
| #1 PET Thermoforms (Clear) | 0.8% | 0.3% | 0.6% | 0.9% |
| #1 PET Containers (Pigmented) | 0.5% | 0.3% | 0.3% | 0.6% |
| #2 HDPE Containers (Natural) | 0.4% | 0.2% | 0.3% | 0.6% |
| #2 HDPE Containers (Colored) | 0.4% | 0.2% | 0.3% | 0.5% |
| Grocery & Merchandise Bags | 0.7% | 0.6% | 0.4% | 1.0% |
| Mixed Plastics (#7) | <0.1% | <0.1% | <0.1% | <0.1% |
| #5 Polypropylene Containers | 0.4% | 0.5% | 0.1% | 0.6% |
| Other Plastic Containers/Tubs | 0.8% | 1.4% | 0.1% | 1.5% |
| #3 - PVC | <0.1% | 0.2% | <0.1% | 0.2% |
| Expanded Polystyrene | 1.0% | 0.8% | 0.6% | 1.4% |
| Rigid Plastic | 1.8% | 0.9% | 1.4% | 2.2% |
| Other Film | 9.6% | 2.7% | 8.4% | 10.9% |
| **Total Plastic** | **17.7%** | | | |
| **ORGANIC** | | | | |
| Food Waste | 24.1% | 7.9% | 20.3% | 27.8% |
| Yard Waste | 4.8% | 6.8% | 1.5% | 8.0% |
| Compostable Paper | 7.5% | 2.7% | 6.2% | 8.8% |
| Untreated Wood | 3.0% | 4.4% | 0.9% | 5.0% |
| **Total Organics** | **39.3%** | | | |
| **METALS** | | | | |
| Steel Cans | 0.5% | 0.5% | 0.3% | 0.8% |
| Aluminum Cans | 0.7% | 0.6% | 0.4% | 0.9% |
| Other Ferrous | 1.8% | 2.8% | 0.5% | 3.1% |
| Other Non-Ferrous | 0.3% | 0.3% | 0.2% | 0.5% |
| **Total Metals** | **3.4%** | | | |
| **GLASS** | | | | |
| Glass Bottles and Jars | 2.9% | 1.8% | 2.0% | 3.8% |
| **Total Glass** | **2.9%** | | | |
| **INORGANICS** | | | | |
| Construction Materials | 4.4% | 2.6% | 3.2% | 5.7% |
| Electronics | 1.8% | 1.5% | 1.1% | 2.6% |
| Carpets/Rugs/Padding | 0.8% | 1.9% | <0.1% | 1.8% |
| **Total Inorganics** | **7.1%** | | | |
| **OTHER / UNCATEGORIZED** | | | | |
| Batteries | <0.1% | <0.1% | <0.1% | <0.1% |
| HHW | <0.1% | <0.1% | <0.1% | <0.1% |
| Latex Paint | 0.1% | 0.5% | <0.1% | 0.3% |
| Other Uncategorized Trash | 14.5% | 5.0% | 12.1% | 16.9% |
| **Total Other Wastes** | **14.7%** | | | |
| **TOTALS** | **100.0%** | | | |

Notes: Composition based on 17 samples

Confidence limits are calculated at the 95% confidence level.

N/A indicates the material was not found while sampling so confidence intervals cannot be calculated.

# 3 RECOMMENDATIONS FOR INCREASED DIVERSION

Assess Waste Composition Over Multiple Seasons – Continue to conduct waste characterization studies over multiple seasons and at more transfer stations to improve the level of precision and accuracy of the waste composition estimates. The SPSA service area likely has seasonal fluctuations due to high vacation and tourist traffic during the summer, when the fieldwork for this study was completed. Assessing the waste stream during each season allows SPSA to distinguish seasonal trends and diminish the effect of seasonality on the overall composition. Collecting more samples improves the range of confidence intervals for each component.

Visual Characterizations of Bulky Loads - Conduct visual characterization of bulky and C&D loads (including self-haul loads) to identify materials that could be diverted from the waste stream. Including bulky waste and C&D will achieve a more complete analysis of the overall waste stream managed at the transfer stations and may identify new diversion opportunities.

Target Specific Industry Groups from Commercial Sector - Distinguish sources of commercial waste to better understand the non-residential waste stream. Commercial waste has high variability between samples due to the varied business activities (e.g., high quantities of food from restaurants and grocery stores, high quantities of corrugated cardboard from retail and grocery stores, high quantities of paper from offices). Targeting specific business types would allow SPSA to identify more specific diversion opportunities from the commercial sector. Waste characterization studies can be conducted directly at select businesses (rather than at the transfer station) to assess waste composition by industry group.

Encourage Organics Composting and Diversion – Compostable organics make up nearly 40 percent of the waste stream at Landstown Transfer station. This may be partially due to increased numbers of restaurants and other food service establishments in the area. Jurisdictions are increasingly considering curbside collection of organics to divert additional materials from landfill disposal. Restaurants can be also be encouraged to donate food and use compostable packaging for take out.

# Appendix J: Draft Environmental Impact Statement Comment Response Summary

# Southeastern Public Service Authority of Virginia (SPSA) Landfill Expansion

## Draft Environmental Impact Statement Public Comment Response Summary

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FEBRUARY 2025

# Table of Contents

# Public and Agency Review of DEIS

The U.S. Army Corps of Engineers (Corps), Norfolk District (Norfolk District) published the Draft environmental impact statement (DEIS) on June 16, 2023. The DEIS was distributed to interested individuals, agencies, and organizations and was available for public and agency review for 60 days. The Norfolk District posted a public notice announcing the availability of the DEIS on June 16, 2023, along with locations and dates of the public information meetings which were held on June 21 and 22 of 2023 and public hearings on July 26 and 27 of 2023. The meetings were held in the City of Suffolk, Virginia (proposed expansion location) and in the Town of Ivor, which is in Southampton County, Virginia (near the proposed alternative site SH30). Prior to the public notice, the Norfolk District distributed information flyers to all residential property owners within one mile of both the SH30 alternative site and the existing Regional Landfill. The informational flyer was also provided to area community centers, places of worship, and local governments. Meeting dates and times were also shared via the Norfolk District's social media account. The public information meetings and public hearings were widely attended by approximately 100 citizens, some of whom spoke at the public hearings, which were transcribed by a court reporter and made part of the administrative record.

Comments were collected in writing at the public hearings, through a virtual public meeting room, via email, and through verbal comments that were transcribed by an independent court reporter during the public hearings.

## Website

A website (http://projects.vhb.com/spsa-eis/) was established at the outset of the project to provide information about the proposed project, including access to the virtual public meeting room. This website serves as a portal through which interested parties can track the progress of the EIS process and review pertinent information as it becomes available. The Norfolk District hosts a project webpage on its District website (https://www.nao.usace.army.mil/Missions/Regulatory/SPSAPermit/), which provides information on the project and the EIS process, with links to the project website and the virtual public meeting room.

## Comments Received

Comments were received during the 60-day comment period (June 16, 2023, through August 15, 2023). Responses to substantive comments are detailed below. Comments provided by the public, as well as state and local governments on the DEIS were summarized and addressed within this comment response document and within appropriate sections of the Final EIS (FEIS), as necessary. The Norfolk District received approximately 77 comments from the public concerning SH30 and received six comments from the public concerning the proposed Regional Landfill expansion. Comments received on the DEIS from federal agencies, tribal nations, and a combined comment letter from Southern Environmental Law Center (SELC), Wetlands Watch, and Chesapeake Bay Foundation (CBF) were copied verbatim and addressed with individualized responses within this comment response document.

## Agency Responses to Public, State, and Local Government Comments Received on the DEIS

The following list indicates the subjects identified in the summarized comments received from the public, state agencies, local government, private entities, and non-governmental organizations during the DEIS comment period.

| Category | Definitions |
|---|---|
| Purpose and Need | Comments related to the project purpose and need, including the timing of the project, the use-life of the cells, etc. |
| Alternatives Analysis | Comments or reasons for support/opposition for specific alts |
| Water Resources | Comments related to water resource impacts |
| Biological Resources | Comments related to biological resource impacts, including wetlands, protected species, migratory birds, and wildlife resources |
| Transportation and Traffic | Comments related to transportation and traffic impacts |
| Air Quality, Greenhouse Gases, and Climate Change | Comments related to air quality (including pollution), greenhouse gases, and climate change |
| Noise | Comments related to noise impacts |
| Cultural Resources | Comments related to cultural resource impacts |
| Socioeconomics | Comments related to socioeconomic impacts |
| Environmental Justice | Comments related to environmental justice |
| Other Impacts | Comments related to issues or impacts that are not currently analyzed in the EIS (e.g., quality of life, odor, local character, emergency services, recreation, health) |
| Mitigation | Comments related to mitigation measures and/or suggestions for mitigation |
| Out of Scope | Comments related to issues that are outside the scope of the EIS, are speculative, or are not within the Corps' authority |
| Public Communication | Comments related to communication about the project for public involvement or availability of information in the DEIS to the public |

## Purpose and Need Comments and Responses

1. **Summary Comment:** Commenters stated that SPSA does not currently need to move to another new location given that their existing location could potentially provide another 40 years of waste disposal capacity.

   ***Summary Response:*** *As the permitting agency, the Corps is required by NEPA to explore and evaluate reasonable alternatives to the proposed action, which—here—is an on-site expansion of the SPSA landfill. Furthermore, the Clean Water Act Section 404(b) Guidelines require that the Corps explore whether there is a practicable alternative to the proposed action that would have less adverse impacts on the aquatic ecosystem. For these reasons, the Norfolk District explored 68 (10 on-site and 58 off-site) alternatives to the proposed action, including both on-site and off-site alternatives.*

## Alternatives Analysis Comments and Responses

2. **Summary Comment:** Commenters noted that it was impractical to locate a landfill at SH30 because it is in a remote corner of the region and more than 40 miles from where a majority of the trash is being created, whereas the existing Regional Landfill is located more centrally, serves the region's needs more equally, is efficient, and should be utilized for future expansion. Commenters questioned why SH30 was being considered as an alternative if Southampton County already has its own waste sites. Commenters also noted that Southampton County should not have to host a landfill site for waste created outside of the county. Some commenters urged the Corps to expand the landfill at the Regional Landfill location to utilize the existing infrastructure in place, where impacts have already occurred. Some commenters felt expansion here would be more economically and environmentally beneficial. Commenters also noted that SPSA's current operation at the Regional Landfill is smoothly run, established, and well managed, and do not think it is logical to destroy land and the way of life in Southampton County when the Suffolk landfill is already in place. Some commenters praised the Regional Landfill expansion plan SPSA has proposed. A commenter noted that the SH30 alternative is inconsistent with the Town of Wakefield's Comprehensive Plan, as well as its housing and economic development initiatives. A commenter noted that building a landfill at SH30 would create an illogical distribution of landfill facilities at a location that is not central to the SPSA service area and not consistent with solid waste management planning for the Hampton Roads region. A commenter noted that the zoning designation of the SH30 alternative was within an agricultural zone which would require public hearings. A commenter noted that proposed Virginia House Bill No. 1370 (2023) would prohibit construction of municipal solid waste landfills which are within one-mile upgradient of any existing private wells. A commenter noted that the small capacity and lifespan of SH30 would make

construction of a renewable natural gas generation plant challenging.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

3. **Summary Comment:** A commenter suggested that Suffolk better match its development growth to its waste production and processing limits and select an alternative site location that is landlocked and well above sea-level, regardless of the cost involved.

***Summary Response:*** *The SPSA Regional landfill service area includes approximately 2,000 square miles located in the Virginia cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the counties of Isle of Wight and Southampton. The localities and HRPDC work together to responsibly manage the regions waste including meeting state required recycling goals. Alternatives were extensively reviewed throughout the service area. Additional detail on SPSA's waste management hierarchy and alternatives review is provided in Chapter 2.*

## Traffic and Transportation Comments and Responses

4. **Summary Comment:** Commenters expressed concern about the additional traffic on Route 460 in Southampton County also spilling onto side (secondary) roads, affecting residents' safe ingress/egress into neighborhoods and delaying them in local travel. A commenter expressed concern that the increased traffic along Route 460, specifically the industrial truck traffic from landfill trucks, would make equestrian trail crossings more difficult. A commenter noted that Suffolk is developing an industrial park on Route 460 near Route 58 which would further exacerbate traffic issues if a landfill at SH30 were to be developed. Commenters expressed concern about the effect of increased traffic on school bus routes and safely getting students to and from school, as well as the impact of increased traffic to first responders traveling on Route 460. A commenter expressed concern about the danger of hauling leachate and potential spills along Route 460. A commenter was concerned about an increase in trash blowing out of garbage trucks and littering the roadway. Another commenter expressed concern about mud being tracked onto Route 460 within a few miles of the proposed landfill entrance. Another commenter was concerned that Route 460 would be turned into an eyesore. One commenter supported the expansion of the Regional Landfill because it would result in less traffic problems.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Air Quality, Greenhouse Gas, and Climate Change Comments and Responses

5. **Summary Comment:** A commenter expressed concern about the process of extracting methane from landfills and the pollution associated with this practice,

which would be detrimental to the climate crisis. The commenter also noted that it is not desirable to have infrastructure involved in methane extraction at a landfill located near wetlands and that wetlands likely wouldn't be able to support this infrastructure.

***Summary Response:*** *Methane capture provides a beneficial reuse of collected landfill gases. Landfill gas energy projects have contributed to a 23% decrease in total methane emissions. Additional information is provided in Chapter 3, Subsection: Air Quality and Emissions, Greenhouse Gases.*

6. **Summary Comment:** A commenter calculated that constructing a new offsite landfill would result in the carbon emissions equivalent of operating 70,000+ average passenger vehicles over a 20-year period, as compared to the Regional Landfill. The commenter also noted that a new offsite landfill would result in a significant amount of fugitive methane escaping and producing even more global warming potential, due to there being a delay (several years) in a requirement for gas collection and flaring.

   ***Summary Response:*** *The Norfolk District analyzed the difference in emissions in further detail in Chapter 3, Subsection: Air Quality and Emissions.*

7. **Summary Comment:** Commenters expressed concern about pollution and adverse impacts to air quality if a landfill were built at SH30. Commenters also expressed concern about the additional trucks in the area that would emit toxic chemicals (e.g., diesel exhaust). Specifically, a commenter noted that the increased GHGs emitted from trucks having to travel a longer distance to SH30 (an additional 50+ miles per day) would counteract any environmental savings the Corps would otherwise gain from using this location. Commenters expressed concern about the increased carbon dioxide and methane gases, as well as atmospheric pollution from machinery at the Regional Landfill and if a new landfill were built at SH30, that contribute to climate change. Commenters noted that nearby property owners chose to live near SH30 because of the clean air and that developing a landfill at SH30 would jeopardize air quality. One commenter cited that as high as 78% of property owners living closer to landfills indicated serious air quality contamination. A commenter expressed concern that excess dust and poor air quality associated with a new landfill at SH30 would be harmful to those with breathing disorders, allergies, and respiratory issues.

   ***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Noise Comments and Responses

8. **Summary Comment:** Commenters expressed concern about additional trucks on

Route 460 making noise and keeping residents awake.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Cultural Resource Comments and Responses

9. **Summary Comment:** A commenter noted that the SH30 project area is the Seacocks' (refugees from the Nansemond), who lived with the Weyanokes and Nottoway, and requested to be included in the environmental and cultural proceedings.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Socioeconomics Comments and Responses

10. **Summary Comment:** Commenters noted that Southampton County residents already pay a fee to use Trash/Recycle centers and expressed concern that the environmental damage caused by a landfill on SH30 could ultimately result in higher long-term financial costs. Commenters expressed concern over the use of agricultural zoned land being used for a landfill site in Southampton County. Commenters stated that the continued conversion of small farms to other uses could cause a toll in the future. Commenters also noted the detrimental impact of increased methane emissions from a landfill at SH30 on agricultural production. Commenters expressed concern that building a landfill at SH30 would be detrimental to nearby businesses and may deter tourism. Some commenters noted that a landfill at SH30 would devalue nearby farms and residential properties. Other commenters expressed concern that a landfill at SH30 would result in the loss of crops and farms. A commenter expressed concern that the increased truck traffic on Route 460 from a landfill at SH30 would cause road damage and result in increased taxes.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Water Resources Comments and Responses

11. **Summary Comment:** Commenters noted that the area near SH30 sits on a major aquifer which feeds underground wells for Hampton Roads residents and expressed concern over the potential exposure to contaminated water supply, one commenter specifically citing concern over polyfluoroalkyl substances (PFAs). Another commenter added that all residences in the area surrounding SH30 are on well water. Rainfall causes toxins and heavy metals from manufactured items such as mercury, lead, arsenic, and copper, to accumulate in the soil beneath the landfill. Commenters expressed concern that building a

landfill at SH30 would contaminate groundwater with leachate from the landfill, damaging local water bodies and supply when landfill liners break or leak. Another commenter expressed concern that a landfill would compromise angling opportunities in the Blackwater River, increasing pollution and reducing water quality which could have indirect impacts on various fish species.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

12. **Summary Comment:** A commenter supported the building of a landfill at SH30 due to avoiding siting a landfill in a 100-year flood zone.

***Summary Response:*** *The proposed Regional Landfill Expansion site was further studied and most of the area was determined not to be within the flood zone. The expansion was re-designed to avoid landfill construction within the small portion of 100-year flood zone on site as discussed in Chapter 3, Subsection: Water Resources, specifically the Floodplain section.*

13. **Summary Comment:** A commenter expressed concern that a potential accident involving a garbage truck near SH30 would result in trash pollution to surrounding farmlands, creeks, and swamps along Route 460.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

14. **Summary Comment:** Commenters expressed concern that expansion at the Regional Landfill would negatively impact surrounding water resources, including tributaries to the Chesapeake Bay, draining to both tidal waters and essential groundwater.

***Summary Response:*** *The EIS summarizes the water resources considered and evaluated under the proposed alternatives. Specifically, regarding the drainage of waters to both tidal waters and groundwater, the EIS discusses both the management of surface runoff, its treatment and discharge to existing receiving waters, and the management and treatment of groundwater discharge, as the landfill has continued to demonstrate while being in operation. Surface waters would be collected using best management practices per state stormwater regulations. The landfill as currently in operation, and as proposed, would utilize an inward gradient system, with a low permeability, composite double liner system, and both groundwater and leachate dewatering systems. This system is designed such that an inward directed hydrostatic pressure head difference is maintained, delivering pressure on the landfill and leachate within the liner system such that migration of particles through the liner system is inward and not outward to the adjacent groundwater table. The leachate and groundwater dewatering* *systems are continually monitored and adjusted through an electronic system which can adjust as leachate and groundwater elevations fluctuate.*

15. **Summary Comment:** A commenter stated that the EIS should present the worst-case sea level rise scenario, inundation and/or infiltration projections through the 21st century, combined with land subsidence projections. The commenter was concerned that the EIS did not provide an approach to anticipate and protect against groundwater infiltration and seepage therefrom.

    ***Summary Response:*** *Various sea level rise scenarios are listed in the EIS, as is land subsidence projections of 2.2 mm/year (0.55 feet by 2100). The worst-case sea-level rise, per the Corps study performed in response to Hurricane Sandy, NOAA modelling predicts a SLR increase of 5.64 feet by 2100.*

    *As previously noted in the response to Comment 14, the landfill system currently operates, and the proposed alternatives would operate, with an inward gradient system, with a low permeability composite double liner system, and computerized electronic leachate and groundwater dewatering system that adapts to short and long-term variations in flow. The existing water table is high in the location of the proposed alternative, so any potential increase from sea level rise and land subsidence would be negligible.*

16. **Summary Comment:** A commenter noted that containment used for the landfill must be able to withstand constant submersion in rainwater, irrigation water, and especially both brackish and salt water, but that it would be difficult for any containment system to do this.

    ***Summary Response:*** *The landfill containment areas are designed specifically for the location with submersion within the local groundwater table. The local surficial aquifer, at depths corresponding to the proposed excavation depth of the proposed landfill, is brackish and may, in time, increase in salinity as sea level rises.*

    *However, as previously noted in the responses to Comments 14 and 15, the landfill system operates as an inward gradient landfill, with a low permeability composite double liner system, and computerized electronic leachate and groundwater dewatering system that adapts to short and long-term variations in flow. The existing water table is high in the location of the proposed alternative, so any potential increase from sea level rise, precipitation, and land subsidence, would be negligible.*

17. **Summary Comment:** A commenter suggested using Best Management Practices to minimize adverse impacts to water quality resulting from surface runoff due to construction activities.

    ***Summary Response:*** *As discussed in Chapter 3, Subsection: Water Resources, specifically the Surface Water/Hydrology and Water Quality sections of the EIS, Best Management Practices would be employed as* *required by State and local regulations, to minimize adverse impacts to water quality.*

18. **Summary Comment:** A commenter stated that the Regional Landfill expansion area is sited in the locally designated Chesapeake Bay Preservation Area (CBPA) and that the EIS does not indicate whether a site-specific determination was conducted. If a site-specific determination is conducted, and conditions are adhered to, the proposed project activity would be consistent with the CBPA.

    ***Summary Response:*** *The City of Suffolk RPA Boundary and Soil Survey map does indicate that a portion of the existing landfill and expansion area are sited in the locally designated RPA. A site-specific determination would be prepared for City approval and if the site-specific determination indicates an RPA within the expansion area, then as per the City Chesapeake Bay Ordinance, the site development would comply and provide a necessary Water Quality Impact Assessment.*

19. **Summary Comment:** A commenter expressed concern about leaching and groundwater contamination to the Great Dismal Swamp National Wildlife Refuge (GDS NWR). The commenter requested further explanation and background data in the Final EIS to explain why the proposed expansion at the Regional Landfill would not adversely affect groundwater for both Alternatives B and C.

    ***Summary Response:*** *As previously noted in responses to Comments 14, 15, and 16, the landfill currently operates, and the proposed alternatives would operate, as an inward gradient landfill, with a low permeability composite double liner system. A computerized electronic leachate and groundwater dewatering system that adapts to short and long-term variations in flow would monitor levels. The existing water table is high in the location of the proposed alternative, so any potential increase from sea level rise, precipitation, and land subsidence, would be negligible.*

## Biological Resources Comments and Responses

20. **Summary Comment:** Commenters stated that methane gas from a landfill at SH30 and the destruction of forested land would have adverse effects on animals and their habitats (such as bees and livestock). A commenter noted that rainfall causes toxins and heavy metals from manufactured items such as mercury, lead, arsenic, and copper, to accumulate in the soil beneath the landfill which is a hazard to native animals and plants.

    ***Summary Response:*** *Comments were made in reference to SH30, the Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

21. **Summary Comment:** A commenter also noted the importance of wetlands in mitigating against species and habitat devastation.

    ***Summary Response:*** *The location of the proposed wetland impact is within a larger contiguous wetland system that includes the Great Dismal Swamp. The* *proposed wetland impact would have both temporary and permanent effects on species and habitat loss. However, the proposed preservation areas and mitigation bank sites would provide similar functions and values as well as providing habitat corridors, as discussed in Chapter 2, Subsection: Project-Specific Mitigation Options and Appendix G.*

22. **Summary Comment:** A commenter noted the difficulty in preventing landfill toxins from leaching into wetlands, considering that water would be rising, saltier (more corrosive), and the ground beneath would be sinking.

    ***Summary Response:*** *Liners and a surrounding ditch system would be installed during construction to prevent landfill toxins from leaching into the remaining surrounding wetlands. See the previous response to Comment 14, above.*

23. **Summary Comment:** A commenter doubted that a wetland could support landfill infrastructure.

    ***Summary Response:*** *NRCS mapping indicates that the mapped soils in the footprint of the existing landfill, its infrastructure and that of the proposed expansion are Torhunta loam, which consists of loamy sand to sandy loam. As demonstrated by the existing landfill operation, the land is suitable for landfill infrastructure. Perimeter and interior ditching draws down the immediate water table, while grading and soil amendments, where necessary, elevate and dry the existing soils to improve their structural integrity and utility for a landfill operation.*

24. **Summary Comment:** A commenter raised a concern about how building a landfill at SH30 might affect the northernmost population of the federally endangered red cockaded woodpecker living in the Big Woods Wildlife Management Area. Another commenter expressed concern about landfills negatively impacting native bird migration patterns and the hazard of birds eating from landfills, which can be fatal.

    ***Summary Response:*** *Comments were made in reference to SH30, the Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

25. **Summary Comment:** A commenter recommended that the Corps conduct an inventory for Swainson's warbler in order to more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts.

    ***Summary Response:*** *One of the main threats to the Swainson's warbler in southeast Virginia is the loss of habitat which is similar in nature to Canebrake rattlesnake habitat. Canebrake rattlesnake mitigation measures will be implemented in association with permit issuance and are described in detailed in Chapter 2, Subsection: Project Specific Mitigation Options and Appendix G.*

26. **Summary Comment:** To minimize adverse impacts to the documented occurrences of Elliot's goldenrod and Hairy seedbox as a result of the proposed

activities, DCR recommends avoidance of any ground disturbing activities on the gas pipeline right-of-way located within the southern portion of the project site, to include any road building, staging of equipment, or stacking of logging debris.

***Summary Response:*** *In response to concerns about Elliot's Goldenrod and Hairy Seedbox, SPSA does not plan on orchestrating any ground-disturbing activities on the gas pipeline right-of-way located to the south of the project area, including road building, staging of equipment, or stacking of logging debris.*

27. **Summary Comment:** A commenter expressed confusion about how there would only be 8 acres of wetland impact when there are over 80 acres of wetlands at SH30. Commenters expressed the desire for some of the agricultural land (including wetlands) at SH30 to be maintained as such and urged the Corps to protect these areas. A commenter expressed concern that livestock could be harmed by consuming loose trash associated with the new landfill at SH30. One commenter stated that SH30 has not been physically tested for wetlands, citing a previous project in this area that found hundreds of acres of wetlands once a land survey was completed. One commenter questioned why the wetlands at the Regional Landfill couldn't be rerouted if the ones at SH30 could be. One commenter noted that building a landfill at SH30 would result in less land for livestock to live and graze on, resulting in their relocation and this greater wildlife pressure on crops could cause crop damage.

    ***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

28. **Summary Comment:** A commenter raised a concern about the legality of siting a landfill next to wetlands.

    ***Summary Response:*** *Corps regulations do not prevent landfills from being located next to wetlands; however, authorization may be required for impacting wetlands for construction of a landfill or infrastructure associated with the landfill.*

29. **Summary Comment:** A commenter suggested using Best Management Practices to minimize adverse impacts to wetlands resulting from surface runoff due to construction activities.

    ***Summary Response:*** *Best Management Practices would be used during construction and operation of the landfill.*

30. **Summary Comment:** A commenter recommended that project design and implementation consider potential adverse impacts to numerous species and their habitat in the Regional Landfill project vicinity, including tricolored bat, State Threatened Mabee's Salamanders, State Endangered Rafinesque's Eastern Big-Eared Bats, State Endangered Little Brown Bats, and Federally Endangered State Endangered Indiana Bats. The commenter also specifically recommended that Virginia Department of Wildlife Resources (DWR)'s Guidance on Best

Management Practices for Tri-Colored Bats be reviewed and that if suitable breeding habitat for Mabee's Salamanders exists within the expansion area, the Corps coordinate further with DWR. The commenter also recommended that the Virginia Wildlife Action Plan be reviewed to determine threats known to Species of Greatest Conservation Concern, suitable habitat requirements for these species, and ways to protect them and their habitats.

> ***Summary Response:*** *There is no suitable breeding habitat within the project area to support Mabee's Salamander; therefore, the project should not adversely affect this species. Due to the potential presence of federal and state listed bat species, best management practices would be adhered to, including a time of year restrictions (TOYR). Additional information is detailed in Chapter 4, Subsection: Agency and Tribal Coordination.*

31. **Summary Comment:** Some commenters in response to the Alternative SH30 site expressed concern about contaminated soil, particularly from ammonia, as well as contamination of adjacent properties from leachate leaking from the landfill, causing damage to local wetlands, animals, and aquatic life. A commenter noted that landfills can render the land and soil where it's placed unusable.

> ***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Environmental Justice Comments and Responses

32. **Summary Comment:** A commenter noted that the SH30 proposed landfill site was within Census Tract 2001, and that this track is above the regional average in elderly population, female heads of household, households received cash public assistance, households receiving supplemental nutrition assistance, and households below the poverty level. The commenter added that siting a landfill would likely bring noise, traffic congestion, and deaths, but no jobs or potential for economic development, which would only exacerbate these decisions.

> ***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Other Impacts Comments and Responses

33. **Summary Comment:** Commenters expressed concern about the potential odor (from methane and the waste itself) and additional insects/rodents being attracted from implementation of a landfill at SH30 and how it would affect nearby properties and being a nuisance to residents. Commenters noted that locating a landfill at SH30 would result in wasted driving time, wasted fuel, and would impact drivers' mental health while traveling the extra miles. Commenters expressed concern about negative impacts to the peace, rural nature, beautiful landscapes, tranquility, and quality of life that residents enjoy in Southampton

County if SH30 were selected for a landfill. Some commenters noted that they would not have moved to the area had they known there was a plan to install a landfill. Commenters were concerned that locating the landfill at SH30 would attract nuisance pests, flies, and seagulls, and that trucks traveling to the landfill would leave behind trash littering the roads and nearby land/fields. Some commenters expressed concern over the building of a landfill at SH30 disturbing the peaceful nature along wooded horse trails in the area. Commenters stated that recreation at Tidewater Horse Trails is a treasured opportunity in the area and that odor from a landfill would ruin this experience. Commenters also expressed concern about impacts to other sport activities including hunting and bike riding. A commenter expressed concern that increased methane and carbon dioxide at a landfill could cause explosions and fires. A commenter expressed concern that emergency service departments in Southampton County would not be able to manage the associated impacts posed by the increased traffic safety concern associated with a landfill sited at SH30.

***Summary Response:*** *Comments were made in reference to SH30, the Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

34. **Summary Comment:** Commenters in response to the Alternative SH30 site expressed concerns for how a landfill would affect food and public health in the future. A commenter noted that there would be adverse health effects due to increased frequency of illness for people living near landfills including cancer, respiratory diseases, birth defects, and low weight at birth.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

35. **Summary Comment:** One commenter expressed concerns about decentralizing the landfill since renewable natural gas funds could not be used to reduce the overall cost of waste disposal operations for the community.

***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Mitigation Comments and Responses

36. **Summary Comment:** A commenter noted that the EIS did not include measures to prevent stormwater contamination, prevent landfill leachate drainage/contaminants, monitor groundwater, ensure that contaminated fill materials do not remain below the water table, mitigate future sea-level rise and/or subsidence effects/damage, monitor both waste disposal streams and well as stormwater runoff, monitor and protect affected wildlife, known or to-be-discovered the health of those humans living near the facility (previous health

effects and ongoing).

*Summary Response:* *Stormwater runoff, leachate, groundwater monitoring, prevention of contamination and sea-level rise are all discussed in Chapter 3, Subsection: Water Resources. Wildlife resources are analyzed in Chapter 3, Subsection: Biological Resources and Chapter 2, Subsection: Project-Specific Mitigation Options.*

37. **Summary Comment:** A commenter recommended that project design and implementation consider potential adverse impacts to tricolored bat and its habitat in the Regional Landfill project vicinity, and to review DWR's Guidance on Best Management Practices for Tri-Colored Bats.

    ***Summary Response:*** *Due to the potential presence of federal and state listed bat species, best management practices will be adhered to, including time of year restrictions (TOYR). Additional information is detailed in Chapter 4, Subsection: Agency and Tribal Coordination.*

38. **Summary Comment:** Comments recommended avoiding impacts to the interior forested cores and if avoidance cannot be achieved, it was recommended to minimize the area of impacts overall and concentrating the impacted area at the edges of forested cores, so that the core interior would remain intact. Commenters also recommended mitigation for the Canebrake Rattlesnake including coordination with DWR to ensure compliance with the Virginia Endangered Species Act due to the species' legal status, training contractors on the identification of the species, payments to the Aquatic Resources Trust Fund, purchasing wetland credits that apply to the species' habitat, preservation of suitable habitat, and future species' habitat management.

    ***Summary Response:*** *SPSA proposes the conservation of 742.56 acre of primarily forested wetland habitat within the sub watershed (020802080105-Nansemond River-Cedar Lake), with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for Canebrake rattlesnake habitat. This preservation plan includes 23.81 acres of wetlands within the proposed expansion area that SPSA proposes to avoid. The proposed mitigation plan is discussed in Chapter 2, Subsection: Project Specific Mitigation Options and Appendix G.*

39. **Summary Comment**: A commenter noted their support for Alternative C since its wetland mitigation actions would reduce the adverse environmental consequences to the wetlands within the project area.

    ***Summary Response:*** *Additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options. SPSA's revised mitigation plan provides even greater detail and is included in Appendix G.*

40. **Summary Comment:** A commenter recommended that tree removal and ground clearing adhere to time of year restrictions protective of residents and songbird nesting, and adherence to erosion and sediment controls during ground disturbance. A commenter also recommended using matting made from natural

or organic materials to minimize potential wildlife entanglement as mitigation measures.

***Summary Response:*** *SPSA would be required to follow TOYR restrictions for federally protected bat species from December 15 through February 15 and April 1 through July 15 which partially overlaps with VDWR's recommended TOYR for resident and migratory songbird nesting. In response to VDWR comments, SPSA has indicated their willingness to follow strict adherence to erosion and sediment controls during construction and use of natural/organic matting in place of synthetic/plastic matting would be implemented.*

## Out of Scope Comments and Responses

41. **Summary Comment:** Commenters questioned the reliability of SPSA to meet health and safety requirements instead of just paying a fine for not being in compliance.

    ***Summary Response:*** *The management of the SPSA landfill operation would be dictated by the landfill permit obtained under the Virginia Waste Management Act. The Virginia Department of Environmental Quality (VDEQ) would be responsible for regulating SPSA's adherence to the permit.*

42. **Summary Comment:** A commenter questioned why funds were being used for SH30 in Ivor, VA instead of being put toward other local resources.

    ***Summary Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Public Communication Comments and Responses

43. **Summary Comment:** Commenters requested better communication from the Corps regarding the project status and stated that the Corps did not adequately notify the public about the proposed site at SH30, considering the amount of time the Corps has been analyzing the alternative. Commenters noted it would have been considerate of the Corps to notify residents living within a 5-mile radius of SH30 of the potential to build a landfill on the site. A commenter expressed that the 60-day public comment period for the DEIS should have begun after the public was notified of the project, attended meetings, and become educated on the issue.

    ***Summary Response:*** *The Norfolk District posted a public notice announcing the availability of the Draft EIS on June 16, 2023, along with locations and dates of the public information meetings which were held on June 21 and 22 of 2023 and public hearings held on July 26 and 27 of 2023. Prior to the public notice, the Norfolk District distributed information flyers to all residential property owners within one mile of both the SH30 alternative site and the existing Regional Landfill. The informational flyer was also provided to area* *community centers, places of worship, and local governments. Meeting dates and times were also shared via the Norfolk District's social media account. The public information meeting and public hearing were widely attended and approximately 100 citizens spoke at the public hearing which was transcribed by a court reporter and made part of the administrative record. Public interest factors shared by the citizens during the public hearings were one component of the dismissal of SH30 from further review. Additional details regarding the dismissal are provided in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Agency Responses to Tribal Nations Comments

44. **Nansemond Indian Nation Comment:** The DEIS acknowledges that the SH30 property, Alternative D, is practicable. The Nation urges the Corps to follow both federal law and its own regulations and deny a permit for the proponent's preferred on-site alternative (Alternative C) and recognize Alternative D as the Least Environmentally Damaging Practicable Alternative ("LEDPA").

    ***Response:*** *The Norfolk District determined that Alternative D was not practicable for numerous reasons and dismissed SH30 from further review. Additional detail describing the dismissal is provided in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

45. **Nansemond Indian Nation Comment:** The Corps must require SPSA to relocate the landfill to Alternative D, the SH30 property, in order to comply with the higher degree of scrutiny that Federal law places on projects that create damages to wetlands. Federal law requires agencies to "avoid undertaking or providing assistance for new construction located in wetlands unless… there is no practicable alternative …and… the proposed action includes all practicable measures to minimize harm to wetlands." Additionally, Section 404 guidelines at 40 CFR § 230.10(a) prohibit the Corps from issuing a permit if a practicable alternative exists that would have less adverse effect on the aquatic ecosystem (the Least Environmentally Damaging Practicable Alternative, or LEDPA).

    ***Response:*** *The Norfolk District determined that Alternative D was not practicable for numerous reasons and dismissed SH30 from further review. Additional detail describing the dismissal is provided in Chapter 2, Subsection: Alternatives Considered but Dismissed. The Norfolk District will complete a public interest review and 404 (b)(1) analysis in the Record of Decision (ROD) before designating a LEDPA. Additional detail is provided in Chapter 2, Subsection: Alternatives Screening Process.*

46. **Nansemond Indian Nation Comment:** The DEIS includes a clearly practicable alternative that has far fewer direct impacts on wetlands; has fewer impacts on the traditional cultural places of the Nation including the Great Dismal Swamp; lower risks of habitat destruction of observed state list endangered species and habitat fragmentation; and avoids the environmental risks related to the siting of a landfill in a 100-year flood zone. The off-site alternative SH30 (Alternative D), although it exceeds the same two-acre limit of impacts imposed by Virginia state law as the preferred on-site alternative (Alternative C), would impact an estimated 8 acres of wetlands, over 100 acres less than either on-site alternative (B or C), which would have 117 acres or 109 acres of wetlands impacts respectively. Furthermore, Southampton County has already included this area in plans for rezoning to "Industrial" use.

    ***Response:*** *The Norfolk District determined that Alternative D was not practicable for numerous reasons and dismissed SH30 from further review. Additional detail describing the dismissal is provided in Chapter 2, Subsection: Alternatives Considered but Dismissed. Additionally, on February 28, 2023,* *Southampton County passed a resolution of opposition against development of a new landfill within the boundaries of the County.*

47. **Nansemond Indian Nation Comment:** The environmental benefits of Alternative D are well worth the moderate cost increase. According to Appendix D of the DEIS, while Alternative D is 13.6% more expensive than Alternative B, the preferred alternative, it is also expected to destroy 12.6 times fewer acres of wetlands (1,260% fewer wetlands). Although Alternative D may cost more dollar-wise in the short run, Alternative D's benefits far exceed its costs in the long run, considering the long time period (25 years) of environmental impacts based on the projected use-life of cells VIII and IX and relatively large community (the 1.2 million people who live within the SPSA service area).

    ***Response:*** *The Norfolk District determined that Alternative D was not practicable for numerous reasons and dismissed SH30 from further review. Additional detail describing the dismissal is provided in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

## Agency Responses to EPA Comments

48. **EPA Comment:** The DEIS notes that the SPSA Board of Directors "has considered running a yard waste, composting, and organics program" (p 11, 65) and the DEIS indicates that an RFP for system-wide disposal methods will be issued in 2023 (p 16). However, no specific commitments have been made. Diversion of organic wastes, especially programs that prevent food waste, may also reduce generation of methane. We recommend that the alternatives, incorporate a commitment to reducing landfilled organic wastes. Overall, we recommend that the alternatives, including the preferred alternative, incorporate a clear commitment by the permittee to measures that reduce landfilled waste, such as incentivizing municipalities to promote source reduction, recycling, reuse, and composting programs. EPA recommends fully evaluating other options to reduce municipal waste, including working with partners on options such as construction of a new refuse-derived fuel (RDF) manufacturing plant. A number of specific examples of operational alternatives are provided in our JPA comments.

    ***Response:*** *SPSA completed a Waste Characterization Study in 2023 to better understand waste flow and potential for improved waste diversion. The study analyzed waste composition to quantify the types of waste found in the waste stream. This information can be utilized to educate member communities as well as citizens of the region on what is being discarded. The data also assists in developing strategies for source reduction as well as potential economic benefits for recycling which may attract vendors desiring to offer alternative waste disposal mechanisms. SPSA began a pilot program in December 2023 that sorts 40,000 tons of municipal solid waste annually. Artificial Intelligence (AI) and robotics are used to increase efficiency and productivity. This pilot will be used to determine the future potential for this* *technology. Additionally, SPSA is a supporting member of HR Green which is the regional organization tasked with developing educational material, workshops, and other learning opportunities regarding recycling for the region. SPSA has increased their community outreach by offering more landfill tours, increased outreach, and increased education to inform citizens on the complexity of the waste system in the region and to encourage alternative disposal mechanisms.*

*On February 5, 2024, SPSA issued an RFP seeking alternative options. The SPSA Alternative Waste Disposal RFP Review Committee reviewed several proposals and toured some prospective facilities that could provide alternate technologies to reduce the amount of waste to be disposed. SPSA staff is nearing completion of their review of the Alternative Waste Disposal RFP responses and anticipate making a recommendation to the full SPSA Board of Directors to issue an intent to award a contract to one of the final two vendors at a Board Meeting. After the Board decides, staff will finalize negotiations with the selected vendor to develop a final contract that would then go back to the full SPSA Board for approval. Both of the vendors being considered through the RFP process included an organics component in their proposals. The potential vendors would use different methods to process organics into reusable products. The proposed organics processing should help reduce the total amount of waste entering the Regional Landfill.*

*The evaluation of waste reduction alternatives and SPSA's ongoing efforts in this area are set forth in part in the "Alternatives Considered but Dismissed" section of the FEIS. SPSA supports waste reduction efforts, and currently has programs for processing tires and recycling scrap metal. Municipalities already have an incentive to reduce waste because they are charged by the ton for solid waste, and municipalities have already demonstrated that savings can be achieved through recycling (though this does not eliminate the need to meet current and anticipated demand for waste capacity).*

49. **EPA Comment:** The DEIS states that for the proposed landfill expansion alternatives, all materials, including trees, other vegetation, and woody debris would be disposed of from onsite clearing and grubbing activities. EPA recommends using disposal methods that would avoid landfilling organic matter from construction.

    ***Response:*** *All material resulting from clearing and grubbing would be disposed of appropriately and in a manner that would not consume landfill capacity. Text revisions have been incorporated into FEIS in Chapter 2, Subsection Alternative B: Original Proposed Alternative.*

50. **EPA Comment:** EPA recommends that the EIS quantify the results that could be achieved with waste diversion, alternative technologies, or source reduction. We recommend that the EIS not limit its consideration of waste diversion, alternative technologies, or source reduction as standalone alternatives, but to analyze these actions in combination with other alternatives to reduce impacts, including

GHG emissions.

***Response:*** *In response to EPA's comment and to better understand waste diversion potential, SPSA completed a Waste Characterization Study in 2023. The data will assist in developing strategies for source reduction as well as potential economic benefits for recycling. Revisions have been incorporated into Chapter 2, Subsection: Alternatives Considered but Dismissed. SPSA would continue to pursue waste reduction efforts in combination with all of the alternatives, but the amount of waste that may be reduced through such future efforts remains speculative. Accordingly, the impacts of alternatives that reduce landfill capacity are most accurately evaluated as if material in excess of capacity must be hauled to another landfill site.*

**51. EPA Comment:** The EIS should consider whether continued hauling of certain wastes to other landfills could reduce impacts by being combined with other options such as source reduction or a more limited on-site expansion.

- Certain types of wastes, such as construction debris, or from transfer stations closer to non-SPSA landfill facilities could be diverted from the Regional Landfill.
- The explanation of solid waste management (p 11) states "non-processible wastes unsuited for burning in the RDF Plant are separated at the RDF Plant and taken for disposal to a non-SPSA landfill outside of the service area." To inform both the purpose and need and alternatives, EPA recommends providing information regarding the amount/percentage of municipal solid waste diverted to a non-SPSA landfill, which landfill(s) this waste is diverted to, and an evaluation of continuing to divert this amount or greater of waste to non-SPSA landfills.

***Response:*** *In response to comments received around the concept of an alternative that combined expansion of a smaller landfill footprint in combination with hauling to other private area landfills, the Norfolk District analyzed an additional alternative within the FEIS. Alternative E was added and is described in Chapter 2, Subsection: Alternative E: Hybrid Alternative and is analyzed throughout the entirety of Chapter 3.*

*SPSA may currently haul some MSW from the farthest western localities to private facilities in order to extend the life of the current landfill. The waste that SPSA diverts to private landfills is commercial waste that is received at SPSA transfer stations. SPSA's Use and Support Agreements with its member communities does not allow commercial waste to be disposed of at the Regional Landfill. Therefore the volume of waste being disposed of at private landfills is equal to the total amount of commercial waste received at all of SPSA's facilities throughout the region.*

**52. EPA Comment:** Of the 9 potential onsite alternatives to Alternative B (onsite Alternative #1), only onsite Alternative #6 (Alternative C) was determined to be practicable. However, the information in Chapter 2 only briefly addresses onsite alternatives. Tables 1 and 5 do not clearly indicate how the various alternatives do not meet purpose and need or are not practicable based on the factors briefly discussed, including timeframes, loss of soil from retaining walls, or impacts to infrastructure.

***Response:*** *A detailed description and additional information concerning each of the on-site alternatives is provided in Appendix B.*

53. **EPA Comment:** While the On-site Alternatives Screening Process (p 24) indicates the timeframe of the effort to relocate the existing natural gas main is “beyond the scope of when additional capacity is needed and would cost more than $34 million to relocate,” the proposed replacement of the Columbia Gas Transmission Line is not addressed in relation to this assessment. The JPA for the Columbia Gas Virginia Reliability Project states that Columbia Gas is currently anticipating that all facilities will be placed in service by November 2025. Since the time and cost of relocation of the natural gas main appears to be factor in eliminating several alternatives, this merits additional discussion and explanation.

***Response:*** *The on-site alternatives that were dismissed from further review because they did not meet the Purpose and Need could not be constructed until at least 30 years after closure of the cells currently being utilized. The alternatives which involve relocating the Columbia Gas Natural Gas Main are discussed in detail within Appendix B under Section 2 Alternatives Assessment. Even if a shorter project purpose timeframe was used, these on-site alternatives would still not meet the Purpose and Need for the project. Additionally, the proposed Columbia Gas Transmission Line project proposes the replacement of approximately 50 miles of existing 12-inch diameter pipe with 24-inch diameter pipe plus new expansion. However, the project does not propose relocation and therefore the existing Regional Landfill site would remain bisected by the pipeline upon project completion. The Norfolk District has clarified the FEIS in Chapter 2, Subsection: Alternatives Screening Process.*

54. **EPA Comment:** Chapter 2 directs the reader to Appendix B. We recommend including additional information to clearly support the findings in Chapter 2; however, if relying on this appendix for onsite alternatives, we recommend that it be updated to reflect current impacts and costs. For example, Appendix B indicates an impact of 119 acres for the proposed expansion, the cost of relocating the gas main is $22 million, and estimated costs for mitigation are based on a ratio of 2:1 at $30,000/acre. Appendix B also does not include information for onsite Alternative #10.

***Response:*** *The intent of Appendix B was to evaluate engineering design considerations to analyze avoidance and minimization measures. These alternatives were determined not practicable due to numerous reasons such as engineering constraints, timing, and costs. However, updated costs would not provide substantial information that would be used to change this* *decision. Additional information on Alternative 10 has been incorporated into materials provided in Appendix B.*

55. **EPA Comment:** The offsite alternatives that "did not pass Phase III analysis" are listed as not practicable or reasonable in Table 5. However, it remains unclear that the Phase III sites that were not evaluated in Phase IV are neither practicable nor reasonable, as the Phase IV selection was based on ranking sites with weighed criteria. We recommend that the EIS further support this finding.

    ***Response:*** *The evaluation criteria utilized for the 29 sites has been added to the FEIS in Chapter 2, Table 2. After advancement of the highest ranking six sites from the Phase III analysis, the Norfolk District used nine criteria to evaluate those six sites. The Norfolk District considered all six to be reasonable alternatives after this Phase IV ranking and therefore began to evaluate whether the sites were practicable, beginning with an evaluation of whether each site could be obtained through a willing sale or through condemnation. For condemnation to result in landfill development, a site must either be able to be developed as landfill under existing planning and zoning laws or the local government must be amenable to granting a conditional use permit (CUP) or altering existing laws or plans to allow the construction of a landfill. For each of the six highest ranking alternatives, development of a landfill could be allowed with a CUP but local administrators indicated a very low likelihood of approval. Moreover, at minimum, landfill development at each site was inconsistent with applicable plans and ordinances. Prior to DEIS release, and in coordination with EPA, the Norfolk District selected the next 10 highest ranking alternatives from the Phase III analysis and—rather than evaluate under Phase IV criteria—the Norfolk District investigated the potential for successful site acquisition or condemnation. These 10 alternatives were rejected for the same reasons as the initial six highest-ranking alternatives. Thus, they were determined to be impracticable as a result of both incompatibility with local land use laws and local government opposition. Text has been added to the "Reason" column of Table 5 of the FEIS.*

56. **EPA Comment:** As indicated, stormwater BMPs are not designed for the largest storms. However, it is currently unclear if control of the water volume resulting from a 24-hour, 25-year storm is sufficiently protective of water quality, especially given impacts from climate change.

    ***Response:*** *Stormwater BMPs would provide water quantity and water quality control, through infiltration (recharge of groundwater) and retention. As per the current Virginia Stormwater Handbook, the BMP wet pond sited in the project area may provide 50 to 75% reduction in total phosphorus loads and 30 to 40% reduction in total nitrogen loads. Additional pollutant reduction is anticipated due to the treatment train of BMP facilities existing on-site and downstream of Cells VIII and IX, including the existing 13-acre BMP wet pond, that also serves as a water supply for on-site operations such as the truck* *wheel wash and roadway wetting, which in turn cycles back into the existing stormwater management system.*

57. **EPA Comment:** A robust discussion of water quality is needed to support the conclusion that there will be no short- or long-term effects to water quality. The loss of forested wetlands to reduce runoff and protect water quality is not adequately addressed. The Wetland Attribute Form indicates that existing wetlands in the expansion area support groundwater recharge, and the principal wetland functions include nutrient removal/retention/transformation and sediment/toxicant removal. The vegetated wetlands remove sediment and nutrients from surface water and provide "substantial floodflow attenuation." The replacement of such functions warrants a more extensive evaluation than compliance with the minimum required stormwater management regulations, as permitting alone does not prevent adverse effects. Constructed stormwater management systems are unlikely to fully replace the range of water quality functions provided by a forested wetland system.

    ***Response:*** *Additional detail has been incorporated into Chapter 3, Subsection: Biological Resources related to the anticipated loss of wetland function associated with the applicant's preferred alternative, along with proposed measures to offset that loss. Additional analysis was performed and is described throughout Chapter 3, Subsection Water Resources. Specifically, the Surface Water/Hydrology and Water Quality subsections. have been revised accordingly, as short- and long-term adverse effects are anticipated due to the loss of existing forested wetlands. While it is noted that the existing wetlands have the potential to provide water quality benefits, those benefits are realized only for atmospheric pollutants that enter the wetlands from direct precipitation. Off-site stormwater runoff, which typically has higher concentrations of pollutants from construction sites and developed lands, does not drain to the existing wetlands on-site, thus actual water quality benefits are anticipated to be low. On-site stormwater management would provide water quality benefits, as would proposed off-site wetland mitigation in the form of preservation of lands surrounding the project site and within the same watershed, draining to Burnetts Mill Creek and Nansemond River.*

58. **EPA Comment:** The expected use of undefined stormwater BMPs does not address impacts on surface hydrology. The conclusion that long-term adverse effects to hydrology are not anticipated under Alternative B and C because surface water will be intercepted by best management practices per state regulations is unsupported. The EIS should explain how the loss of the water quality protection functions of the forests and forested wetlands will be offset. Impacts from discharge locations and changes in hydroperiods should be evaluated.

    ***Response:*** *On-site stormwater management would provide water quality benefits, as would proposed off-site wetland mitigation.*

    *Prior to and during construction and operation, on-site stormwater management, under the Virginia state stormwater regulations must meet* *minimum standards during construction for the control of sediment, specifically, the capture of sediment-laden runoff during the borrow pit operation, and thereafter for the control of water quality, specifically for Phosphorus and Nitrogen, and water quantity to ensure discharges to downstream receiving waters are non-erosive. Standards during construction include the stabilization of land, the capture and detention of stormwater runoff to allow the settlement of sediment prior to discharging to downstream receiving waters, and other measures per section 560 of the Virginia Erosion and Stormwater Management Regulation (9VAC25-875-560). Anticipated stormwater measures to meet these standards would include sediment traps and basins, perimeter ditches, watering roads for dust control, and washing of vehicles to reduce mobilization of sediment to off-site untreated locations.*

*Post-construction, stormwater management is required for water quality (reduction of Phosphorus and Nitrogen) and water quantity (adequacy of the downstream man-made and/or natural channels to safely convey the developed condition runoff). Per the Virginia Runoff Reduction Method for determining pollutant load and required removal, a forested area with a hydrologic soil group of D, indicative of the project site, is assumed to discharge 0.104 pounds of total phosphorus per acre per year. Accordingly, 100% impervious areas are assumed to discharge approximately 0.858 pounds of total phosphorus per acre per year. While the completed and capped landfill would be considered impervious since its design uses a vegetated cap system to prevent infiltration beyond the surficial vegetation root zone and into the landfill materials, runoff and pollutant loading may fall somewhere between 0.858 and 0.454 pounds of total phosphorus per acre, which is the assumed value for infrequently maintained grass areas. In the post-construction condition, with the implementation of stormwater best management practices, total phosphorus load would not exceed 0.26 pound per acre per year as calculated pursuant to 9VAC25-875-590. Thus, even with stormwater management practices in place, and the pollutant reduction provided, the post-development condition would have a net increase in pollutant loading as compared to the existing forested wetland condition, and thus an adverse effect on water quality.*

*The preserved wetlands on-site would allow for storage capacity for floodflow alteration and would serve to recharge the aquifer similar to the impact area. The bald cypress-tupelo swamp on site allows for increased storage capacity for floodflow alteration, nutrient cycling, and carbon sequestration and acts as a sponge to hold onto water, sediment, and pathogens flowing downstream. Water is filtered and settled out in the cypress swamp, increasing downstream water quality in Burnetts Mill Creek as it continues to flow further down the creek and enters the Nansemond River. Benefits of water quality protection functions of the preservation areas is discussed in Chapter 2, Subsection: Project Specific Mitigation and Appendix G.*

**59. EPA Comment:** As indicated, land use changes may result in increases in impervious area and reductions in ground absorption. The DEIS (p 137) states, "The increase in impervious area under Alternative B is nominal, with the only addition coming from the construction of the gravel perimeter road. The landfill itself consists of primarily dirt and grass cover materials which are considered pervious." EPA disagrees that active and closed landfill expansion areas are pervious surfaces and there is "nominal" change from a forested wetland to a compacted, lined landfill. The landfill does not infiltrate water. As described in the DEIS, precipitation would be intercepted from initial excavation through final cover installation and routed into on-site stormwater management facilities such as basins and perimeter channels. After closure, the landfill will be covered with grass, but water infiltration through the landfill cells to groundwater would be undesirable. Therefore, the area of the landfill is effectively impervious. Further, as indicated above, it is unsupported that constructed features "would collect and slow the release of the runoff volume to an extent comparable to the release of runoff from the existing condition," given that that the existing condition is a forested wetland with numerous trees, leaf litter and woody debris, microtopography, etc. (Models to estimate rainfall interception from trees include Xiao et al. (1998) and Wang et al. (2008), which are used as a basis for iTree tools. Gerrits & Savenije (2011) note that studies show that forest floor interception can also play an important role in water balance.) The loss of rainfall interception, infiltration, and evapotranspiration are not evaluated and appear to be unmitigated.

***Response:*** *The Norfolk District acknowledges EPA's comment and agrees that the developed landfill should be considered an impervious surface. Revisions to the FEIS have been made in Chapter 3, Subsection: Water Resources.*

**60. EPA Comment:** We recommend a thorough discussion of the requirements that ensure groundwater protection and the information that has been obtained or will be required in accordance with Virginia Department of Environmental Quality's (VADEQ) Solid Waste Permitting requirements.

***Response:*** *The current landfill facility operates in accordance with and as required by current VA DEQ Solid Waste Permitting regulations. The proposed landfill expansion would be designed and operated to meet these regulations as would be demonstrated through the design, permitting, construction and operation of the facility. The facility currently operates the necessary stormwater management facilities, erosion and sediment controls, groundwater and leachate pumping, water quality testing, and treatment and has demonstrated past communication with VA DEQ when regulations have not been met and coordinated and complied with corrective actions, as necessary. The current groundwater monitoring program detailed in Table 9 of Chapter 3 would be applicable to any landfill expansion areas.*

**61. EPA Comment:** The Methodology section states that groundwater resources were characterized based on a review of available reports and data, such as

USGS reports and "hydrologic and hydrogeologic studies of the project area that were produced as part of the engineering analyses and groundwater monitoring." It is unclear from this text whether recent site-specific hydrogeologic and geotechnical reports have been submitted to VADEQ for the expansion area. We expect that such reports would include specific information on groundwater levels and flow that would inform this analysis. We recommend indicating if and when such studies would be conducted.

***Response:*** *In 2020, borings were drilled at 18 locations in a grid within the footprint of the proposed landfill expansion. Borings characterized the soil profile from depths down to 40 to 80 feet below the ground surface. Piezometer wells were installed at each location for groundwater elevation monitoring, with a monitoring event completed on January 11, 2021. This data and subsequent monitoring events have been conducted for planning and design purposes only and have not been submitted to VDEQ, as the piezometers are not a part of any regulatory action with VDEQ.*

62. **EPA Comment:** Page 143 indicates that groundwater and surface water samples are collected for the existing operating permit and in accordance with the Detection and Assessment Monitoring Programs (9 VAC 20-81-250) and Corrective Action Program (9 VAC 20-81-260). While Table 9 is helpful in describing the number of wells and monitoring frequency, we recommend further clarification regarding the existing monitoring program, including how long monitoring is required for the corrective action and the specific parameters monitored (by including or linking to the referenced Table 3.1 of 9VAC 20-81-250.)

***Response:*** *The Corrective Action was completed in 2019, with the installation of the sitewide SCADA System, installation of the permanent loadout station and associated leachate pump station improvements, and stormwater management improvements. The pending installation of Heartland Water Technology, Heartland Concentrator™, leachate evaporation plant, will also aid in leachate management at the landfill. Note that, as described in Chapter 3, Subsection: Water Quality, of the FEIS, the Corrective Action addressed the presence of elevated levels of leachate over the liner system in Cells V and VI; the leachate was contained within the liner system.*

*Specific parameters monitored are those as required in Table 3.1 of 9VAC 20-81-250, and are to be completed in compliance with the Hampton Roads Sanitation District's (HRSD) Industrial Waste Water Discharge Regulations and EPA's SW846 Test Methods for Evaluating Solid Waste.*

63. **EPA Comment:** This section would benefit from clearer analysis of water quality results and additional discussion to indicate the event that precipitated the corrective action plan and its monitoring requirements. From the high-level discussion that follows ("monitoring results to date do not indicate cadmium or cobalt are migrating within the groundwater or surface water at concentrations above groundwater protection standards") it is unclear that no water quality degradation has occurred. It is also unclear what plans are in place to respond to

an exceedance if detected in the future.

***Response:*** *In response to the presence of elevated leachate levels, SPSA developed a Corrective Action Plan dated July 2017, and revised on August 25 and September 21, 2017. As described in Chapter 3, Subsection: Water Quality, corrective actions were resolved by 2019 to install new equipment and continue pumping down the leachate until sufficient levels were obtained and new operating procedures and equipment were in place. These actions most notably included the installation of a new Supervisory Control and Data Acquisition (SCADA) system that controls and monitors the leachate system in real time. If affected groundwater or surface water migrated off-site in the future, SPSA would notify all persons who own the land or reside on the land that directly overlies any part of the release, as required by 9 VAC 20-81-260(C)(1)(b). If groundwater contamination were detected at the Regional Landfill, per the Good Neighbor Agreement SPSA holds with Suffolk, communities would be notified of an exceedance of any kind. SPSA would be required to coordinate with VDEQ to resolve any potential issues.*

**64. EPA Comment:** Expected monitoring for the proposed expansion or for construction of Alternative D should be clarified. Page 86 indicates that groundwater removed during the dewatering process for the expansion area “would be routinely monitored, and if uncontaminated, released into the on-site stormwater management system and discharged off site.” The extent and frequency of such monitoring should be indicated.

***Response:*** *The extent and frequency of monitoring would be determined by VDEQ’s solid waste permitting division. Table 9 in Chapter 3 details the current monitoring program which would be applicable to any landfill expansion areas.*

**65. EPA Comment:** “Long-term” adverse effects to groundwater are not anticipated under Alternatives B or C, based on the assumption that the radius of influence of sumps used for dewatering Cells VIII and IX is approximately 1,400 ft. and once sufficient waste is added to the cells, dewatering would cease. To support this finding, the expected time period for dewatering should be clarified. The cumulative loss of infiltration area from the proposed expansion and existing landfill and other projects should be further evaluated in the Potential Cumulative Impacts section.

***Response:*** *Dewatering would occur in stages as construction progresses as illustrated in Figures 20 & 21. Hydrology of wetlands in nearby areas has not shown a discernible impact from dewatering. As stated in the EIS, once sufficient ballast (waste) is added to the cells, dewatering would cease, and the lined bases of Cells VIII and IX would lie within the surface aquifer and displace groundwater locally. Thus, regardless of the duration of dewatering, impacts to groundwater are not anticipated to be long-term, as evidenced by the ongoing operation and its effects on the surrounding groundwater. Clarity* *has been added to the FEIS. See Chapter 3, Subsection: Indirect and Secondary Impacts.*

*Preservation and conservation efforts would offset the proposed loss of wetland functions and values, specifically the infiltration function. To better understand the extent and duration of potential indirect and secondary impacts, monitoring and reporting conditions could be considered during the Section 404 permitting process. If adverse effects are identified, SPSA would be required to mitigate.*

66. **EPA Comment:** Page 148 states, "the post-development condition, as a landfill, has an average impervious cover less than the 16% threshold for new development, thus no post-development best management practices are required." Please see our earlier comments regarding impervious cover and conversion of the forested wetland. Given that landfills do not infiltrate water, EPA recommends including the area of the landfill cells to the calculation of impervious surface. It is unclear that the minimum required run-on flow prevention of storm peak discharge and runoff collection and treatment of volume from the 24-hour, 25-year storm is protective of water resources.

***Response:*** *This statement that the landfill has an average impervious cover less than 16% was in error and removed from the EIS. It is anticipated that a stormwater management facility would be sized and located north of the future Cells VIII and IX. Perimeter ditches would provide conveyance of storm flows from the cells to the stormwater management facility and then to receiving waters to the south until connecting into Burnetts Mill Creek. Impervious areas in the post-development condition would consist of gravel roadways used for access to the new cells, and the cells themselves as they would be capped with materials necessary to limit the infiltration of waters and exfiltration of leachate. Stormwater management facilities currently serving the landfill are sized for the 100-year storm and also function to provide water on-site for roadway dust-control, and wheel washing to remove sediment from vehicles leaving the site. Future stormwater management would be sized to meet the minimum requirement or larger and would depend on the overall management plan for the site that includes a multi-pronged approach to stormwater management, maintenance, larger storm resiliency and water reuse with post-development conditions consisting of grass as final cover.*

67. **EPA Comment:** The Leachate section (p 149-150) indicates "…leachate from the low flow pump is still being discharged to HRSD's Nansemond Treatment Plant, which is in the Sustainable Water Initiative for Tomorrow (SWIFT) program (and therefore is restricted to 28,800 gallons per day) while any remaining gallons are hauled and discharged to HRSD's Atlantic Treatment Plant in Virginia Beach...SPSA has contracted with Heartland Water Technology to install a heat assisted leachate evaporation plant capable of treating up to 60,000 gallons of leachate per day. This technology will reduce the need for reliance on HRSD for treatment of the landfill leachate." This section would benefit from further discussion. Specifically, we have the following questions, which we recommend

be addressed in this section:

- How much leachate is generated per day and is sent to the Atlantic Treatment Plant?
- How much more leachate is expected with the expansion?
- When would the leachate evaporation plant be constructed at the Regional Landfill?
- What impacts are associated with the evaporation plant, including energy use and emissions, construction of utility lines or disturbance?
- Where would the leachate be discharged after treatment from the evaporation plant?

***Response:*** *Currently, the SPSA facility leachate production is approximately 50,000 gallons per day. Of that, approximately 20,000 gallons per day is pumped to the Nansemond Treatment Plant under the SWIFT program; however, HRSD and SPSA are working together to eliminate this pumping quantity due to the high cost and complexity of treating leachate to meet drinking water standards. The remaining 30,000 gallons per day are hauled by tanker to the Atlantic Treatment Plant. Because SPSA utilizes intergradient landfill design, leachate production is the highest when the landfill first opens due to the waste elevation being below grade. As the waste level rises above grade, leachate is reduced through good operating procedures to shed rainwater and minimizing the size of the landfill working face. It is anticipated that an additional 30,000 – 50,000 gallons of leachate would be produced per day when the expansion site is first constructed. This will be offset by the closure and reduction of leachate in Cells I – VII.*

*The Heartland Water Technology, Heartland ConcentratorTM, leachate evaporation plant, is a direct-contact, low-temperature, high turbulence evaporation system that would be located within the service yard area of the Regional Landfill, where utilities are pre-existing for other operations at the yard. VDEQ determined that the unit would require New Source Review (NSR). The draft NSR was published, and the comment ended on January 31, 2025. The evaporator will be installed once a Construction Permit is issued. SPSA expects the system to be operational by mid-2025. The VDEQ public notice indicates that the "maximum annual emissions of air pollutants from the leachate concentrator system under the proposed permit are expected to be: 18.7 tons per year of particulate matter (PM/PM10/PM2.5); 15.8 tons per year of nitrogen oxides; 26.3 tons per year of carbon monoxide; and 9.5 tons per year of volatile organic compounds. The applicant proposes to use 257.6 million standard cubic feet of natural gas per year. The technology that will be used to control the air pollution from the facility is a mist eliminator for the control of PM, PM10, and PM2.5 emissions from the leachate concentrator; good combustion practices and proper operation, for the control of PM, PM10, PM2.5, and NOx emissions from the enclosed flare. There will be no adverse* *impact on the air quality near the facility. The air quality will remain in compliance with all applicable federal and state ambient air quality standards." (VDEQ Air Public Notice 12/11/2024-01/31/2025)*

*The evaporation system re-uses waste heat generated at the Landfill from sources such as flare gas or engine or generator exhaust. The system also replaces the need for heat exchangers used by traditional evaporators by directly contacting hot gas with wastewater feed within a compact turbulent evaporation zone. The evaporation zone due to its low temperature process, avoids the volatilization of any particulate matter. The then cooled water vapor passes through a high-efficiency three-stage mist-elimination process, and cooled, clean water vapor is discharged through an exhaust stack. The vapor is not expected to have an odor.*

*The Leachate Evaporator removes the water from the leachate through an evaporation process and the residual will be mixed with a thickening agent and returned to the Landfill as a solid. No leachate material will leave the site.*

68. **EPA Comment:** It would be helpful to further explain expected water quality impacts and which/ how pollutants are monitored and treated. For example, are potential impacts possible from Per- and Polyfluoroalkyl Substances (PFAS) and are PFAS or precursors monitored? What parameters are monitored by the Supervisory Control and Data Acquisition (SCADA) system?

    ***Response:*** *SPSA Leachate is sampled once per month in accordance with its Industrial Discharge Permit with HRSD. The pH during this period has ranged from 7.2 to 7.9. All VOCs per EPA Method 624.1 have been below analytical detection limits. While these data describe current leachate characteristics, changes will occur over the coming years as the waste in the currently operating cells ages and the new cell opens up.*

    *Promulgation of PFAS maximum contaminant levels (MCL) is now required by the Code of Virginia, and sampling and analysis of the PFAS constituents is forthcoming.*

    *The Supervisory Control and Data Acquisition (SCADA) system measures the depth of leachate on the liner; flow from each leachate vault; flow from each lift station; total gallons pumped to HRSD for treatment; total gallons sent to the pump and haul station; electrical information on each pump (volts, Amps) and start/stop status of pumps to record run times.*

69. **EPA Comment:** We appreciate the discussion under Indirect and Secondary Impacts (p167-168). As indicated, the range of potential impacts could include altering the hydrology of remaining wetlands, impacting communities and species via the edge effect, and impacting the movement of nutrients, sediment, and/or wildlife between and within wetlands. However, the discussion that follows does not evaluate these potential impacts. The conclusion that construction of the project "would not adversely affect adjacent wetlands to a large degree" is not fully supported in this section or in the referenced Surface Water/Hydrology section, and the use of ditches to prevent runoff does not address these effects.

We recommend that the specific effects outlined be evaluated in detail.

***Response:*** *Clarity has been added to the FEIS. See Chapter 3, Subsection: Wetlands, Indirect and Secondary Impacts.*

70. **EPA Comment:** Both the EIS and JPA should address protection of the remaining wetlands onsite. Of the 133.79 acres Palustrine Forested (PFO) wetlands and 0.93-acre ditch mapped onsite, the JPA indicates that SPSA's preferred alternative would avoid 24.15 acres of wetlands. It is currently unclear how these existing wetlands will be protected during construction and operation of the expansion area.

    ***Response:*** *SPSA's mitigation plan includes 23.81 acres of wetlands within the proposed expansion area that SPSA proposes to avoid and preserve as canebrake rattlesnake mitigation. The proposed mitigation plan is discussed in Chapter 2, Subsection: Project Specific Mitigation Options and Appendix G. Revisions to the FEIS were also made in Chapter 3, Subsection Indirect and Secondary Impacts.*

71. **EPA Comment:** The area of wetlands or resources that may be affected by dewatering Cells VIII and IX should be estimated. This section indicates that "monitoring and reporting conditions could be considered during the Section 404 permitting process" to better understand the extent and duration of potential indirect and secondary impacts. If the USACE selects Alternative B, C, or D as its Preferred Alternative, EPA recommends that a monitoring plan for changes in hydrology and associated plant communities that includes invasive species monitoring and treatment be a condition of permit approval.

    ***Response:*** *The Norfolk District is amenable to requiring monitoring of undisturbed portions of Cells VIII and IX as a requirement of any permit that would be authorized. The conditions would be developed during the permit review process.*

72. **EPA Comment:** The principal functions of the wetlands site currently identified at the expansion are related to water quality protection and wildlife habitat. At this time, it is not evident how these impacts will be offset.

    ***Response:*** *The Norfolk District's 2:1 mitigation ratio was established to address losses to wetland functions and values. Additional detail related to mitigation, preservation and conservation, as well as wildlife habitat and corridors is provided in revisions made in Chapter 2, Subsection: Project Specific Mitigation Options and included in SPSA's Mitigation Plan located in Appendix G.*

73. **EPA Comment:** As described under Wetlands, the Wetland Attribute Form identified wildlife habitat as a principal function of the wetlands, due to "the complete tree canopy, moderate shrub cover, ample groundcover, and large size provide high quality nesting and foraging habitat for wildlife." It is also indicated that the wetland is "part of a larger contiguous and undeveloped habitat complex that functions as a corridor for migration." Additional baseline information

regarding habitat, vegetation, and wildlife use and movement would be helpful to assess impacts.

***Response:*** *Additional detail related to mitigation, including preservation and conservation as well as wildlife habitat and corridors is provided in revisions made in Chapter 2, Subsection: Project Specific Mitigation Options and included in SPSA's Mitigation Plan located in Appendix G.*

74. **EPA Comment:** Impacts to vegetation and resources such as upland forests should be indicated. The 137.8-acre expansion site was determined to consist of 133.79 acres of forested wetlands and 0.93-acre ditch. Therefore, 3.08 acres are mapped as uplands. We recommend clarifying if the disturbance area for construction and operation is limited to the wetland impact (approximately 110 or 117 acres, depending on alternative) or whether additional earth disturbance or other impacts (e.g., clearing) are anticipated in the upland areas.

***Response:*** *The expansion site is 137.18 acres, and it contains 133.79 acres of wetlands, 0.93 acres of ditch and 2.46 acres of upland along the ditch. The upland area is not forested as it consists of a grassy strip between the ditch and the forested wetlands. There are 23.81 acres of wetlands surrounding the limits of disturbance for the development of Cells VIII and IX. This area was included in the study limits but would not be disturbed as a result of the SPSA Preferred Alternative. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII. SPSA proposes to include this acreage as a part of the on-site PRM preservation area. Revisions were made within the FEIS to provide clarity around the amount of uplands on the Regional Landfill property. See Chapter 3, Subsection: Biological Resources and Chapter 2, Subsection: Project Specific Mitigation Options.*

75. **EPA Comment:** According to the DEIS, the proposed Cells VIII and IX expansion area was clearcut or selectively cut in 1991 or 1992. We recommend further discussion regarding the maturity, species, and size of trees to assess their habitat value in relation to adjacent areas. We suggest providing the aerial imagery or other supporting information to show the extent of timbering and note that selective cutting would be expected to result in the presence of more mature trees and less disturbance.

***Response:*** *A discussion pertaining to the logging times, vegetation and habitat present is located in Chapter 2, Subsection: Project Specific Mitigation Options and Appendix G.*

76. **EPA Comment:** The EIS would benefit from an analysis that includes assessment of impacts on Forest Interior Dwelling Species and on habitat connectivity for species, particularly for species that are currently experiencing

declines such as reptiles, amphibians, bats, and migratory bird species.

> ***Response:** Revisions to the FEIS have been addressed in Chapter 3, Subsection: Wildlife Resources.*

77. **EPA Comment:** Given the large impact in the historic Great Dismal Swamp, surveys for sensitive species or their habitat may be appropriate to determine the extent of impact and potential mitigation measures. A survey for vernal pools or other specialized habitat would be helpful in assessing impacts.

> ***Response**: Based on their extensive review of the proposed expansion site, SPSA's environmental consultant has indicated that there is no suitable breeding habitat within the project area to support Mabee's Salamander**.** The Norfolk District has determined that the site does not contain vernal pools. Geographically, the applicant's preferred alternative's regional location in the southeastern Virginia coastal plain creates an opportunity to provide mitigation to valuable wetland resources that have been systematically impacted to support agriculture, forestry, and development since the inception of Virginia's colonial era. Approximately 87% of the wetland credits obtained are from the creation/restoration of wetlands, many of which were within the historic Great Dismal Swamp. Proposed mitigation measures would be implemented in association with permit issuance and are described in detailed in Chapter 2, Subsection: Project Specific Mitigation Options and attached in Appendix G.*

78. **EPA Comment:** As detailed, a number of direct and indirect effects may occur for fauna. For those more limited in mobility and those currently experiencing population declines, these impacts may be more severe. If accessible habitat is not present, population impacts could occur due to mortality, lack of habitat, failure to successfully reproduce, or loss of genetic diversity. Again, we recommend that the USACE fully consider how the alternatives and proposed mitigation support the management, long-term conservation, enhancement, protection, and restoration of habitat, including seasonal and stopover habitat, watersheds, and other features that promote habitat connectivity and wildlife corridors in accordance with the CEQ Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors.

> ***Response:** Additional detail related to mitigation, including preservation and conservation as well as wildlife habitat and corridors is provided in revisions made in Chapter 2, Subsection: Project Specific Mitigation Options and included in SPSA's Mitigation Plan located in Appendix G.*

79. **EPA Comment:** The extent of habitat connectivity is critical for an assessment of impacts. While page 197 states that some species may relocate to the Great Dismal Swamp NWR, page 177 indicates that it is very unlikely that red-cockaded woodpeckers would be found in the SPSA expansion site, stating, "This is especially true because the SPSA site is separated from the Great Dismal Swamp NWR by several roads and infrastructure for an active landfill, fragmenting any potential wildlife corridor." If the extent of fragmentation would

preclude dispersal of bird species to the NWR, other species would be even more vulnerable to isolation of populations. Potential mitigation measures may include improving connectivity of habitat for species. We also recommend that impacts from barriers, facility lighting, restrictive culverts, structures that may cause collisions, and any control measures employed at the landfill also be assessed.

***Response:*** *As part of their proposed mitigation plan, SPSA is in the process of purchasing a 282.92-acre property south of the SPSA property called Magnolia Farms which is adjacent to the Great Dismal Swamp National Wildlife Refuge. This property would function as an extension of the refuge and would provide connectivity of wetland habitat for the wildlife that is protected in the refuge. Additional details related to mitigation, including preservation and conservation as well as wildlife habitat and corridors is provided in revisions made in Chapter 2, Subsection: Project Specific Mitigation Options and included in SPSA's Mitigation Plan located in Appendix G.*

**80. EPA Comment:** Some of the effects that are characterized as “indirect” in the Biological Resources section appear to be impacts directly caused by the proposed action. We note that §1508.1 defines direct effects as “caused by the action and occur at the same time and place” while indirect effects, “are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.” Therefore, habitat loss, noise, vibration, and human presence during construction and operation of the landfill presents direct effects to wildlife, although there may be additional indirect impacts as well.

***Response:*** *Revisions to the FEIS have been made. See Chapter 3, Subsection: Biological Resources.*

**81. EPA Comment:** Likewise, we question the characterization of habitat and species loss as a “temporary” impact. As indicated, “Suitable habitat for most of the species listed would be lost and the project area would no longer be able to support these species.” While some species may be able to relocate, the proposed action presents a permanent loss of habitat. It is unclear to the extent that populations may be ultimately impacted, so therefore it is debatable whether mortality, injury, and the other effects outlined on page 197 can be described as temporary. (“Direct, temporary effects to some of the species included in Table 15 are anticipated during activities associated with construction...”) Loss of breeding success could represent an indirect but a long-term or permanent impact for species with low reproductive rates.

***Response:*** *Revisions to the FEIS have been made. See Chapter 3, Subsection: Biological Resources.*

**82. EPA Comment:** As described, development associated with Alternative B or C would create a new ecotone at the edge of the adjacent wetland areas, and the hydrology of nearby wetland areas could be adversely affected. This could lead to changes in the vegetation community composition, including the spread of invasive species. We recommend that the EIS include a through discussion of the potential for the project to spread invasive species in accordance with Executive Order 13112 and recommend developing a plan to monitor and treat invasive species to prevent dispersal into nearby natural areas.

***Response:*** *The edge of the proposed disturbance would be within the proposed preservation area. As part of the mitigation plan, the preservation areas would be monitored for invasive species. To better understand the extent and duration of potential indirect and secondary impacts to hydrology, monitoring and reporting conditions would be considered during the Section 404 permitting process. These conditions could be included as a mitigative measure of the permit requirements.*

**83. EPA Comment:** The expansion site provides suitable habitat for several state-listed species of concern, including canebrake rattlesnake (Crotalus horridus), Mabee’s salamander (Ambystoma mabeei), and the tri-colored bat (Perimyotis subflavus). While it is unclear whether the expansion or adjacent areas have vernal pools that may support breeding of Mabee’s salamander, the site may support the “home ranges of numerous individuals” of canebrake rattlesnakes, which have been previously documented onsite. Overall, the potential impacts to these species are uncertain, but it appears there is potential for the impact to canebrake rattlesnakes to be adverse to significantly adverse. We recommend that consultation with the Virginia Department of Wildlife Resources be completed for appropriate assessment, avoidance, and mitigation measures for these species. As noted above, surveys for species or habitats such as vernal pools may be appropriate to assess such impacts.

***Response:*** *Based on their extensive review of the proposed expansion site, SPSA’s environmental consultant has indicated that there is no suitable breeding habitat within the project area to support Mabee’s Salamander. The Norfolk District has determined that the site does not contain vernal pools. Coordination with VDWR has been completed and resulted in a mitigation plan for potential impacts to canebrake rattlesnakes. Additional detail related to mitigation, including preservation and conservation as well as wildlife habitat and corridors is provided in revisions made in Chapter 2, Subsection: Project Specific Mitigation Options and included in SPSA's Mitigation Plan located in Appendix G. Coordination for protected species, including bat species, is detailed in Chapter 4, Subsection: Agency and Tribal Coordination.*

**84. EPA Comment:** Northern long-eared bat (Myotis septentrionalis) have the potential to occur onsite. The statement, “These bats are listed as Threatened at both the state and federal level” on page 176 should be revised. As indicated, the USFWS published a final rule to reclassify the northern long-eared bat as Endangered under the ESA on November 29, 2022. While the effective date was delayed to March 31, 2023, the northern long-eared bat is currently listed as federally Endangered.

***Response:*** *Comment noted, appropriate revisions have been made throughout the FEIS to clarify the uplisting and final ruling classifying the NLEB as endangered.*

**85. EPA Comment:** The DEIS indicates that suitable habitat for canebrake rattlesnakes, Mabee’s salamanders, tri-colored bats, and northern long-eared bats would be lost. We find the characterization of such impact as “indirect” to be inconsistent with the definition found a §1508.1. While indirect effects may also occur, the construction and operation of the project represents a direct loss of habitat and it is unclear that the mortality would represent a “temporary” effect to these species. Similarly, it is the unclear that the destruction of nests, eggs, and chicks during the clearance of trees and vegetation during construction activities is appropriately characterized as either “indirect” or “temporary” effects, rather than as direct effects on migratory bird populations.

***Response:*** *Comment acknowledged, revisions to the FEIS have been made. See Chapter 3, Subsection Biological Resources.*

**86. EPA Comment:** This section (p 191) states, “Potential adverse impacts would be coordinated between the Norfolk District and the USFWS. This consultation process would occur during the Section 404 permitting process. Appropriate mitigative measures would be considered and agreed upon during the Section 7 consultation process.” Currently, the significance of impacts to both state and federally listed species is unclear. Adverse impacts to species of special concern should be fully evaluated, especially as the permit process appears to be concurrent with NEPA.

***Response:*** *The Norfolk District has completed coordination with the USFWS, concurrence occurred on December 4, 2024. Additional detail has been added to the FEIS in Chapter 4, Subsection: Agency and Tribal Coordination.*

**87. EPA Comment:** Mitigative measures may lessen potential impacts on species, including surveys, relocation, and/or time of year restrictions. For example, time of year clearing restrictions may be helpful in reducing the potential for impacts to nesting migratory birds. Pages 178 -179 indicate that time-of-year restrictions may be required to minimize the direct impact of construction activities on bat species and the red-cockaded woodpecker. EPA recommends clearly indicating and committing to time of year restrictions and other measures to minimize potential adverse impacts to bats, migratory birds, or other sensitive species.

***Response:*** *SPSA would be required to follow TOYR restrictions for federally protected bat species from December 15 through February 15 and April 1 through July 15 which partially overlaps with VDWR's recommended TOYR for resident and migratory songbird nesting. Additional information is detailed in Chapter 4, Subsection: Agency and Tribal Coordination.*

**88. EPA Comment:** While it is clear that traffic is expected to increase regionally, the EIS would benefit from clarifying the projected traffic to the Regional Landfill from heavy trucks and other vehicles to assess the potential for impacts. Page

199 states that based on peak hour counts and forecasts, Bob Foeller Drive carried almost 600 vehicles per day (vpd) in 2021 and this volume is projected to grow to 800 vpd by 2040, with an estimated 350 heavy truck trips per day or 43% of facility trips. Page 207 states that it is estimated that in 2037, approximately 500 site trips would occur per day. Appendix D - SPSA Growth Projections shows 379 estimated trips per day in 2040.

***Response:*** *Text was revised in Chapter 3, Transportation and Traffic, Vehicular Traffic, based on values in Appendix F.*

89. **EPA Comment:** Traffic Safety (p 200) indicates that there were approximately 58 total crashes in the vicinity of the Regional Landfill from 2016 – 2020. While the new flyover should reduce the issue of making an eastbound left turn (stated as the source of the one fatal crash) it is unclear if the majority of the crashes are due to the landfill entrance and traffic or other factors. We recommend clarifying the extent to which the flyover will improve overall traffic safety.

    ***Response:*** *The analysis of the flyover has already been approved by VDOT and is planned for construction prior to SPSA beginning operation of Cell VII, before any additional on-site expansion. It will mitigate safety concerns by eliminating conflicts between through traffic on Route 58 and traffic turning left into the site.*

90. **EPA Comment:** As indicated, the SPSA Regional Landfill is operating under a Clean Air Act (CAA) Title V Air Permit issued in 2012 by VDEQ (p 203). The USACE appears to rely on the Title V permit to demonstrate compliance with applicable regulations. Reliance on the fact that SPSA complies with its 2012 permit, and even reliance that SPSA may seek a new permit for emissions from the proposed expansion, does not replace the need to analyze potential impacts to air quality from the proposed expansion. Further, we note that a number of applicable regulations have been updated since 2012. For example, the DEIS states that the permit complies with 40 CFR 60 Subpart CC, but that emission requirement has been updated by 40 CFR 60 Subpart Cf. Virginia subsequently updated its state plan for existing landfills as required by Subpart Cf. Similarly, 40 CFR 63 Subpart AAAA, 40 CFR 63 Subpart ZZZZ, and 40 CFR 60 Subpart JJJJ have been updated since 2012, and the facility may also be required to comply with 40 CFR 60 Subpart XXX. If applicable, compliance with these regulations is required whether they are included in the Title V permit or not. Therefore, we recommend that the EIS include a discussion of emissions and how existing and future operations are protective of air quality.

    ***Response:*** *The Regional Landfill has an existing Title V permit as detailed in the Affected Environment section, which lists the applicable regulations in place at the time the permit was obtained. As stated in the comment, sections of these requirements have been updated, replaced or added to since the issuance of the permit, including 40 CFR 60 Subpart Cf, 40 CFR 63 Subpart AAAA, 40 CFR 63 Subpart ZZZZ, and 40 CFR 60 Subpart JJJJ. The applicant's preferred alternative would require amendment of the Title V Permit and would require compliance with the updated sections and any* *newly applicable requirements enacted between this FEIS and the permit amendment.*

*If needed, SPSA would submit an air permit modification to VDEQ in support of proposed changes associated with air quality resulting from the expansion into the new cells. The air permit also requires multiple fugitive dust mitigation measures, including wetting or covering of stockpiled materials; use of asphalt, water, or chemical stabilization on haul roads; and prevention of dust exiting the facility to public roads through wheel washing, wetting, and sweeping. Control measures for equipment that combusts the landfill gases would also be required by the air permit. Obtaining and complying with the air permit would demonstrate compliance with all applicable federal and state air regulations.*

*As the proposed project is located in an Attainment area, a qualitative assessment of air quality impacts has been provided in Chapter 3. The assessment considers potential impacts from the operation and construction of the proposed alternatives and compares impacts from all alternatives against one another. GHG emissions have been quantitatively assessed.*

**91. EPA Comment:** We recommend the air discussion be expanded to provide additional information regarding emissions and identify the types of air permit that are required for the landfill expansion or construction alternatives. For example, a New Source Review (NSR) under Prevention of Significant Deterioration (PSD) regulations may be required.

***Response:*** *The Regional Landfill has an existing Title V permit as detailed in the Affected Environment section, which lists the applicable regulations in place at the time the permit was obtained. If needed, SPSA would submit an air permit modification to VDEQ in support of proposed changes associated with air quality resulting from the expansion into the new cells. SPSA does not believe that an NSR would be needed for construction of Cells VIII and IX begin. However, their consultants will be reviewing the requirements prior to any request for a part B permit to construct Cells VIII and IX is processed. VDEQ reviewed the new leachate evaporation plant under an NSR.*

**92. EPA Comment:** We recommend providing additional details in the Affected Environment section. Please include:

- Quantity and types of emissions, including a general discussion of landfill gases (including both methane and non-methane organic compounds).
- A description of the gas collection system and how it operates, including collection efficiency.
- A description of the required emissions control equipment (flares,

combustion equipment, etc.), including destruction efficiency.

- A list of all BMPs used to control emissions.

***Response:*** *A discussion of the requested information has been added to the Affected Environment section in Chapter 3.*

**93. EPA Comment:** In addition, EPA recommends expanding the discussion of air quality to include considerations for controlling landfill gas emissions beyond meeting state and federal regulations. Areas for consideration include additional landfill gas leak monitoring, improved collection efficiency and improved destruction efficiency of the control device(s). We recommend that SPSA determine if any newer technology could be employed to reduce emissions. Examples of more recent technologies are using drones to monitor for landfill gas emissions [1]and leak detection in locations that would otherwise be inaccessible and wellhead tuning software that uses sensors to constantly measure operating parameters and make adjustments to maximize the collection of the landfill gas.

***Response:*** *SPSA is in the process of improving their landfill gas collection system and control technologies to further reduce landfill gas emissions. The SPSA Regional Landfill is in the process of replacing or upgrading existing gas collection systems with LOCI controls. The LOCI electronic well monitoring system provides for real-time monitoring and adjustments based on preset criteria. The entire collection system is being replaced on Cells V and VI while improvements and upgrades are being made to Cells I – IV. The conservative estimate of the increased collection efficiency for this project is 5%. Upgrades to the gas collection system are already underway and will be completed within the next 6 months.*

*Additionally, landfill gases are now being directed to the recently opened RNG facility. An emissions study conducted for the facility found that its operation would reduce emissions of the majority of pollutants compared to flaring and on-site engines. Emissions of GHG in particular were found to be reduced by 18% compared to flaring and 48% compared to engine combustion. The requested information has been added to the Affected Environment section in Chapter 3.*

**94. EPA Comment:** We recommend clarification of the text on pages 206-207 regarding “steps SPSA has taken to reduce its emissions and carbon footprint.” We recommend indicating specific actions that have been taken or are planned. Specifically:

- The Study discusses consideration of utilizing electric vehicles as part of its vehicle fleet. EPA recommends that the EIS provide information to explain the specific effort taken or plans regarding electric vehicles and how this is expected to impact air quality and climate change.

- Replacement of the gas collection system and the addition of remote monitoring for the gas wellheads is briefly indicated. EPA recommends that the EIS include additional details, including a timeline for the replacement and monitoring, whether the electronic monitoring will allow for real-time adjustments, and an estimate of the increased collection efficiency expected from these changes.

- This section should provide brief background on the Terreva Renewables natural gas facility, including if the facility has been constructed or when it is planned to start operation, and the use(s) for the natural gas.

***Response:*** *Over the past two years SPSA has been working with Peterbilt Corporation to develop a strategy to implement electric vehicles into their Tractor Trailer Fleet. However, current technology for short-haul tractors is still underdeveloped. Electric options have become available in the market, but the design is better utilized and more reliable on tractors performing long-haul operations. Tractors utilized by SPSA are considered off-road and short-haul and the current available electric units do not perform well in these areas. SPSA is ready to transition to electric tractors as soon as the technology is available to provide dependable units for the off-road and short-haul market. Due to the need for horsepower in heavy equipment, this industry lags in developing fully electric technology. SPSA works closely with Caterpillar who has developed some electric drive bulldozers, but these are primarily used for road building and are not available in a "High Drive" design which is utilized in their waste handling package. Electric Caterpillar Excavators are very promising and SPSA will be transitioning to electric excavators with the next excavator scheduled to be purchased in 2025. SPSA will be purchasing 3 - 4 electric skid steer units, as funds allow, and these will replace diesel-powered units used at their transfer stations. SPSA's transition to electrified equipment would further reduce GHG emissions from those estimated in Chapter 3.*

*The LOCI electronic well monitoring system does provide for real-time monitoring and adjustments based on preset criteria. The entire collection system is being replaced on Cells V and VI while improvements and upgrades are being made to Cells I – IV. The conservative estimate of the increased collection efficiency for this project is 5%. Upgrades to the gas collection system have been completed.*

*The RNG facility has been completed and is currently producing renewable natural gas which is being injected directly into the Columbia Gas pipeline that bisects the Regional Landfill. The RNG that is being injected into the Columbia Gas pipeline is being sold as RNG on the open market. A portion of the gas is being utilized to fulfill long-term contract agreements put in place by Terreva Renewables while the remainder is being sold on the daily market. SPSA explored utilizing the RNG produced at the RLF to power natural gas vehicles and equipment within the SPSA fleet but determined that the value of the RNG on the open market far outweighed the value of any on-site options for use.*

95. **EPA Comment:** As indicated, the SPSA Regional Landfill is a large contributor to methane emissions in both the state and regionally. The Regional Landfill is the 3rd highest methane emitter in Virginia and has the highest reported

greenhouse gas emissions in the waste sector in EPA Region 3.[5] Therefore, the EIS should not only discuss existing and proposed GHG emissions from the landfill control systems in detail, but also provide background on regional GHG emissions and state and/or regional goals for reductions in accordance with the 2023 National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. In accordance with this guidance, mitigation measures should be fully evaluated to reduce or avoid GHG emissions. Given the impact of methane, even a minor decrease may have appreciable effects. As indicated above, EPA recommends further evaluation of potential mitigation measures, such as strategies to improve gas collection efficiency or commitment to conversion of vehicles to landfill gas.

***Response:*** *With regards to SPSA being reported as the 3rd highest methane emitter in Virginia, through further review SPSA's engineering consultant determined that they made a clerical error when they were retroactively filling in the e-GGRT report models. Based on the corrected values, the total CO2e emissions metric has been reduced from about 450,000 metric tonnes/year to about 50,000 metric tonnes/year. A GHG analysis was prepared in 2023-2024 using guidance that was in effect at the time, including the National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. The Affected Environment includes a discussion on greenhouse gases and has been updated with background on regional GHG emissions and state and/or regional goals for reductions. The FEIS includes a discussion of Virginia's Priority Climate Action Plan, regional emissions inventories, Senate Bill 94, the 2022 Virginia Energy Plan, and the Virginia Clean Economy Act of 2020.*

*The quantitative GHG emissions assessment evaluates GHG emissions from the various alternatives and includes consideration of GHG emissions reductions from mitigation in the form of landfill gas collection efficiencies in each alternative. Each of the action alternatives are also a benefit relative to the No-Action Alternative. SPSA has implemented some further emissions reductions measures, as outlined in responses to Comments 93 and 94. The Regional Landfill has reviewed the electrification of multiple vehicle types with plans to purchase electric excavators and skid steers in the near term, and tractors, tractor-trailers, and bulldozers in the longer term when market availability has improved. The Regional Landfill is in the process of upgrading to an electronically monitored landfill gas collection system to allow for real-time monitoring and adjustments. Additionally, a renewable natural gas facility was recently opened in October 2023. The landfill had considered a conversion of vehicles to landfill gas but found the value of RNG on the open-market far outweighed the value of any on-site usage options.*

96. **EPA Comment:** EPA recommends that the EIS also fully assess climate change impacts on the Regional Landfill and alternatives. This discussion should evaluate how climate change may affect construction, operations through the project life and after closure, and how such risks may be managed or mitigated. Potential climate change risks including extreme heat, increased precipitation

and flooding may pose risks to safety, prevention of access, and/or damage to control equipment or BMPs. EPA recommends potential adaptation measures be identified to address these impacts.

- The DEIS indicates that climate change may cause extreme heat conditions that result in drought, increased water demand, and impacted local aquifer levels but lacks an assessment of measures to offset or adapt to this these effects. We recommend discussing water use and conservation at the landfill to inform this section.

***Response:*** *SPSA implements water conservation measures at the Regional Landfill as a component of daily operation. These conservation measures demonstrate proactive efforts to reduce demand on nearby natural resources posed by increased heat and drought events. SPSA utilizes stormwater at the Regional Landfill to reduce potable water use. SPSA's approximately 13-acre stormwater pond receives stormwater drainage from approximately 148 acres. SPSA employs two beneficial reuse practices associated with the stormwater pond: 1) wheel wash, operated to remove sediment from vehicles leaving the site. The water employed during wheel washing then enters a basin and flows back to the stormwater pond. The closed nature of this system minimizes water waste and is an example of adjusting operations in consideration of project life and complex environmental conditions; 2) the Regional Landfill utilizes a water truck with water supplied by the stormwater pond to wet down roadways during dry conditions to mitigate fugitive dust.*

*Additional detail on potential mitigative measures related to increased precipitation and flooding is included in the water resources section of Chapter 3.*

**97. EPA Comment:** Water Resources includes a discussion of 'Storm Surge,' but it does not address how the landfill and its systems are protected from large storms, including high winds and flooding. Page 119 states, "[f]or Alternatives B and C, hurricane wind and precipitation pose the greatest risk for power outages and flooding of facilities, the stormwater management facilities and downstream receiving waters."

***Response:*** *SPSA maintains a Disaster Response Plan, last revised May 19, 2022, which addresses the organizational structure and tasks and responsibilities in the event of disasters or major emergency conditions. Preparedness for impending severe weather events such as hurricanes includes the temporary suspension of waste receiving services, while ensuring that on-site measures are taken to continue operation of on-site facilities, including pre-pumping of leachate or stormwater management facilities in preparation of anticipated major precipitation event, and readiness of on-site power generators in preparation of wind- or precipitation-related support facilities damage.*

*The landfill stormwater system is currently designed to handle a 100-year storm event but knowing that future events may exceed that standard as the* *climate adapts, continuous management of the landfill facility and its support systems including the stormwater management facilities provides a moderate level of adaptability. Continuous management includes maintenance of vegetative cover, routine removal of sediment buildup in conveyance ditches, moderation of water levels in the leachate ponds, installation of a wastewater concentrator which will reduce wastewater hauling and pumping, all of which are critical for a facility in this region where heavy rainfall, high wind, or hurricane level forces are somewhat common across the lifespan of a landfill facility.*

**98. EPA Comment:** We also advise full consideration of how the alternatives could potentially exacerbate climate change impacts to the surrounding area. For example, impacts from removal of >110 acres of the soil and vegetation of forested wetlands could have a range of impacts, including accelerating erosion, increasing flooding intensity, reducing groundwater recharge, reducing habitat connectivity, and creating a loss of carbon storage and sequestration, particularly when considered in light of other development in the watershed and region.

***Response:*** *Discussion of carbon sequestration and storage is described in multiple tables as the "Land Alteration Emissions" column of the Greenhouse Gases sub-section of Chapter 3. While the Norfolk District agrees that the proposed alternatives could exacerbate these impacts, mitigative measures would be employed to reduce impacts to the greatest extent practicable while still meeting the project's purpose and need.*

**99. EPA Comment:** The comparison of the alternatives in Greenhouse Gases is based on the "average" of 1,404,478 MT CO2e from 4 potential landfills (Table 17). However, the hauling and landfill emission estimate for Bethel Landfill is 1,205,238 MT CO2e, which less than the total emissions calculated for either Alternative B or C (1,237,129 and 1,235,165 MT CO2e respectively). Hauling to the Shoosmith Sanitary Landfill was estimated to only be slightly more than B at 1,283,223 MT CO2e; given the high-level of such estimates, is it similar to the action alternatives. Therefore, the No Action Alternative currently appears to have the potential for the least GHG emissions.

***Response:*** *At the time of the DEIS publication in June 2023, Shoosmith Sanitary Landfill was included as a potential receiver facility because it was an active landfill pursuing an expansion permit. Since that time, Shoosmith has been removed as a potential receiver facility because it stopped pursuing an expansion permit and stopped receiving waste. This change was due to public opposition to the expansion permit application. Averages of three receiver facilities have been updated in the FEIS in Chapter 3, Subsection: Air Quality and Emissions. Bethel Landfill remains the closest receiver facility and therefore has the lowest GHG emissions due to reduced hauling distances. However, SPSA is currently allowed to only haul a limited amount of commercial waste to the Bethel Landfill, and the amount cannot exceed the tons of commercial waste that are received at SPSA's transfer stations. Bethel*

*Landfill primarily services the Virginia Peninsula Solid Waste Public Service Authority.*

**100. EPA Comment:** We appreciate the inclusion of Appendix C: Analysis of Potential Hauling and Landfill Operations Greenhouse Gas (GHG) Impacts for the SPSA Regional Landfill and Alternative Landfill Sites to support the estimate of GHGs from the alternatives. However, EPA recommends additional detail be provided in the appendix to clarify the assumptions and methodology used to estimate and compare GHG emissions. Specifically:

- Landfill emissions under Alternative D collection system required efficiency was calculated using the "EPA default collection efficiency of 75% for new landfills." EPA recommends revising or supporting this percentage, as it would be less than SPSA's existing facility and 5 of the 6 operating local landfills listed.
- We recommend additional detail be provided to clarify the assumptions and methodology from hauling, including estimates of diesel fuel consumption and factors used to calculate emissions.
- Current operations haul waste to the incinerator and non-processible wastes unsuited for burning in the RDF Plant are hauled to a non-SPSA landfill. Have these existing emissions been estimated?

***Response:*** *The Norfolk District has dismissed Alternative D (site SH30) from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed. A revised GHG analysis, dated April 15, 2024, was performed by SCS and is attached as Appendix C. The high-level conceptual analysis utilized SPSA's reported Federal GHG Reporting Program data and budgeted truck/trailer census for its Fleet Maintenance and Transportation departments as the basis for analysis. Fleet maintenance and Transportation line item costs are detailed in the revised Appendix D's Cost Impacts analysis in Table 3 and are based on Fiscal Year 2023 costs. The hauling analysis (Appendix C) assumes that all the municipal waste from SPSA member communities (cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, and counties of Southampton and Isle of Wight) would be collected at and transferred from SPSA's existing network of transfer stations.*

**101. EPA Comment:** Emissions during construction of the proposed action and alternatives do not appear to be included in estimates. Page 207 indicates that due to "the relatively low number and types of equipment that would be used for the initial construction activities and the intermittent nature of construction, emissions from construction equipment would be minor and temporary in nature..." This is currently unsupported, as information regarding the emissions from construction and operation are lacking. The latest CEQ guidance indicates that "the effects analysis should cover the action's reasonably foreseeable lifetime, including anticipated GHG emissions associated with construction, operations, and decommissioning." We recommend that USACE include an estimate of construction-related emissions for the alternatives.

***Response:*** *An estimate of daily emissions for typical landfill construction equipment commensurate with available project data has been provided in Chapter 3. This chapter also contains a qualitative analysis of anticipated construction emissions intensity and duration under each alternative.*

**102. EPA Comment:** Additionally, consistent with the 2023 CEQ guidance, a discussion of potential minimization or mitigation measures would be appropriate. This guidance also suggests that the social costs of GHG emissions be presented in dollars based on the annual emissions over the life of the project for each alternative.

***Response:*** *A GHG analysis was prepared in 2023-2024 using guidance that was in effect at the time, including the National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change.*

**103. EPA Comment:** Table 8 indicates a loss of carbon sequestration of 32,991 MT CO2e over a "project lifespan" of 24.35 years. We appreciate the attempt at estimating carbon sequestration but have several concerns regarding the estimate. As the forested wetlands with trees >30 years old will be converted to a raised area covered with grass by 2060, 24.35 years does not capture the permanent and temporal loss from removal of trees, wetlands, and soils.

- The lifespan appears to rely on the assumption that once the landfill is closed, it "could be developed with trees and grasses." However, it is stated in the DEIS that the final landfill cover will be grass. Even if trees are planted with final cover on the closed landfill areas, a substantial temporal loss would be expected.
- It is unclear that the average of 4 American Carbon Registry projects is appropriate or transferable to the loss of forested wetlands in Virginia. For forests, default emission factors from the Intergovernmental Panel on Climate Change's Guidance for National Greenhouse Gas Inventories. Chapter 8 in Volume 4 (Agriculture, Forestry, and Other Land Use) in the 2006 IPCC Guidelines and 2019 refinement may be used for estimates.(https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html and https://www.ipcc-nggip.iges.or.jp/public/2019rf/vol4.html)

***Response:*** *The analysis performed by SCS was a high-level conceptual evaluation and a full GHG sequestration analysis was not performed. The Norfolk District's 2:1 mitigation ratio was established to address temporal losses of these types of wetland functions and values. Additional detail is provided SPSA's Mitigation Plan, included in Appendix G.*

**104. EPA Comment:** As the impacted area is a nontidal wetland, an estimate based on forest cover would likely underestimate this impact. While carbon storage and sequestration are highly variable in wetlands and are difficult to quantify, wetlands are generally known to be carbon sinks and play a critical role in the global carbon cycle. Fill of wetlands not only eliminates this function, but also releases the stored carbon. Therefore, protection and restoration of wetlands is considered to be a potential measure for climate mitigation. Mitigation from the loss of carbon sequestration and carbon storage may be appropriate, such as replacement plantings, conservation, and restoration prior to disturbance for the landfill cells.

***Response:*** *SPSA is proposing an extensive mitigation plan as described in Chapter 2, Subsection: Project Specific Mitigation Options. SPSA has purchased 159 mitigation bank credits of which 114 acres of wetlands were created or restored within the historic Great Dismal Swamp. SPSA proposes the conservation of 742.56 acre of primarily forested habitat. Additional detail regarding how mitigation efforts offset the loss of impacted wetlands and the functions and values they provide is included in the SPSA proposed Mitigation Plan, included in Appendix G.*

**105. EPA Comment:** "If necessary, additional studies will be undertaken to determine the impacts on traditional cultural landscapes and ethnographic resources of this region in coordination with Virginia Indian Tribes and other interested parties during the Section 404 permitting process." We recommend clarifying when such studies would be commenced. Without additional detailed information, it is difficult to fully assess the potential impacts to cultural resources.

***Response:*** *In consultation with Tribal Nations, an ethnographic evaluation and ethnobotanical mapping was completed in 2024 to understand the ethnographic resources that exist within the project area. This study supported further consultation with the Nansemond Indian Nation to identify and document the Traditional Cultural Property (TCP) that exists within and surrounding the project area. The FEIS analysis of Cultural Resources was updated to include the results of this study, the TCP, and the impacts that would occur on the TCP as a result of this project. The details of the Tribal Nations coordination and MOA development are located in Chapter 4 and the draft MOA is attached as Appendix H.*

**106. EPA Comment:** Given the importance of the historic Great Dismal Swamp to the Tribes, evaluation of potential resources and consultation under Section 106 should be completed to make an informed decision on the Project, and identify appropriate avoidance, minimization, and mitigation.

***Response:*** *Norfolk District has consulted with Tribal Nations and other Consulting Parties under Section 106 and a draft Memorandum of Agreement has been developed to resolve the adverse effects that would occur as a result of the project. A summary of the consultation with Tribal Nations and under Section 106 to date is available in Chapter 4 of the FEIS.*

**107. EPA Comment:** Please explain the conclusion on page 255 that "The SPSA Proposed Master Plan would contribute beneficial impacts to the overall cumulative impact on cultural resources if the conservation easement is established..." It is currently unclear how a conservation easement would protect from or offset loss from the historic fill of wetlands in the vicinity of the Regional Landfill. We recommend working with the Tribes and the State Historic Preservation Office to determine whether this measure reduces or mitigates the proposed impacts.

***Response:*** *The statement about the conservation easement offsetting the impact from historic fill of wetlands has been deleted from the FEIS. The easement would result in beneficial impacts to cultural resources by protecting a portion of ancestral lands of Virginia Indian Tribes from further loss.*

**108. EPA Comment:** The DEIS lacks a specific evaluation of potential socioeconomic impacts to surrounding communities in the service area, including impacts on property values in proximity to the landfill or alternative site, impacts on the tax base, employment from the landfill or other potentially adverse or beneficial impacts.

***Response:*** *The Regional Landfill has been in operation at its existing site since the early 1980s. Expansion at the existing facility would result in nominal changes to nearby property values as expansion is essentially an extension in time to existing operations. Nominal changes to the existing tax base and employment from the landfill are anticipated for all alternatives analyzed. Additional detail regarding cost to construct and operate for all alternatives is provided in Appendix D. As these costs are directly passed on to members of the community, the analysis focused on capital and operation costs and associated impacts.*

**109. EPA Comment:** Additional discussion regarding tipping fees and socioeconomic impacts of the alternatives to ratepayers would be helpful. The current cost of tipping fees and costs to residents, increases expected from other alternatives, and expected increases in tipping fees from the $40 million to fund the flyover should be clearly outlined to support the discussion of costs and impacts.

***Response:*** *The analysis of potential hauling and landfill capital and operational costs was performed by SCS, the Norfolk District's landfill engineering consultant. The analysis was refined since the publication of the Draft EIS. The tip fee utilized in the first analysis was adjusted based on information provided by the Environmental Research and Education Foundation (EREF) which conducts periodic surveys of landfill tip fees throughout the United States and presents the results on a national, regional, and state by state basis. Previously, the tip fee utilized in the analysis was the current SPSA negotiated tip fee that's in place with their current waste management contract. Additional detail is provided in the revised Capital and Operational cost memo prepared by SCS, dated April 22, 2024 which is included in Appendix D.*

**110. EPA Comment:** The DEIS appears to indicate that the waste disposal fees no longer provide sufficient incentive for municipalities to minimize waste streams, given the decline in the recycling market. For example, Recycling and composting (p 66) states “At the time, member localities were incentivized to maintain recycling programs in order to keep as much out of the waste stream as possible, given SPSA’s high disposal fees.” Given the weak recycling market, a fee structure or other incentives that encourages municipalities to reduce waste may be appropriate.

***Response:*** *The intent of the text in the "Recycling and composting" section of the DEIS was to convey that there is an intrinsic incentive for all localities to recycle before transferring their waste to SPSA. The more waste SPSA receives from a municipality, the higher the fee that SPSA charges to dispose of the waste since it's based on tonnage. With higher waste disposal fees from SPSA, municipalities must pass the cost on to taxpayers. This incentivizes municipalities and their citizens to reduce tonnage of waste as much as possible by removing recyclable materials before they enter the waste stream.*

**111. EPA Comment:** We appreciate the comparison of the Estimated Capital and Operational Expenses presented in Tables 25-28; however, the cost estimates are not transparent. We recommend indicating where supporting information for these numbers can be found, including further explanation of capital and operational costs, such as an explanation of “net present value of transfer equipment purchase/replacement costs” for Alternative A. (Does this include the sale of any assets that would generate revenue?) Additional detail should clarify how operation costs, including how hauling costs to other landfills were calculated. We also recommend updating mitigation costs.

***Response:*** *The analysis of potential hauling and landfill capital and operational costs was performed by SCS, the Norfolk District's landfill engineering consultant. The analysis was refined since the publication of the Draft EIS. One component of the revision was the addition of the hybrid alternative scenarios to the review, another was the removal of the Shoosmith Landfill from the potential private market scenario. In early stages of the SPSA expansion project, Shoosmith Landfill was pursuing an expansion permit. Public opposition to the project resulted in Shoosmith no longer pursuing its expansion permit and the landfill stopped receiving waste. The tip fee utilized in the analysis was also adjusted based on information provided by the Environmental Research and Education Foundation (EREF) which conducts periodic surveys of landfill tip fees throughout the United States and presents the results on a national, regional, and state by state basis. Previously, the tip fee utilized in the analysis was the current SPSA negotiated tip fee that's in place with their current waste management contract. The previous analysis for the DEIS added current dollars for landfill capital costs and net present value dollars for the fleet transfer capital costs (i.e., equipment replacement) to arrive at the total capital costs. Net present value costs discount future costs based on an assumed discount factor and timing of the costs. To increase consistency, all costs are now in current dollars versus mixing net present value and current dollar costs. Equipment costs were analyzed on a 7-year replacement schedule. Additional detail is provided* *in the revised Capital and Operational cost memo prepared by SCS, dated April 22, 2024 which is included in Appendix D.*

112. **EPA Comment:** The evaluation of socioeconomic effects should inform the discussion of Environmental Justice and cumulative impacts.

 ***Response:*** *Socioeconomic factors have been analyzed as described in Chapter 3, Subsection: Socioeconomics. The details described in the Environmental Consequences section apply to all residents within SPSA's service area. SPSA operates as a not-for-profit entity and all costs associated with SPSA's services are passed to those utilizing solid waste disposal services. Tipping fees are not disproportionate throughout local communities since they are equal across all parties that utilize SPSA's waste disposal services. The Norfolk District revised its Local Community analysis and considered the socioeconomic impact on the local community.*

113. **EPA Comment:** On page 256 the DEIS indicates, "Cumulative actions considered would result in higher costs to residents due to temporary increased tipping fees for the construction of the VDOT flyover project. All other cumulative actions considered are consistent and complementary with Alternatives B and C and would have the potential to result in beneficial cumulative impacts to socioeconomics because they are the most cost-efficient alternatives considered over the life of the landfill." We recommend clarifying this statement, including how the other cumulative actions considered "are consistent and complementary" and are expected to result in beneficial cumulative impacts.

 ***Response:*** *Revised FEIS text to add clarity associated with each alternative and removed language related to "consistent and complementary."*

114. **EPA Comment:** Page 233 cites Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. In addition, we encourage USACE to consider that several more recent EOs further address the federal government's approach to environmental justice (EJ), including EOs 13985, 14008, and 14096. In particular, EO 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, expands and deepens the directives and concepts that the White House outlined in EO 12898. EO 14096 directs agencies to actively facilitate meaningful public participation and just treatment of all people in agency decision-making processes. EO 14096 also directs agencies to consider cumulative impacts of pollution and other burdens, such as climate change.

 ***Response:*** *The foregoing Executive Orders were rescinded as of January 2025.*

115. **EPA Comment:** It is currently unclear that one mile is sufficient to assess impacts from landfill traffic, including safety and vehicular emissions. EPA recommends a 1-mile radius as a starting point that may require refinement based on characteristics of the surrounding communities and of the project. EPA has found that a radius as large as 3 miles may be helpful to consider nearby concerns. We recommend supporting the selected radius and assessing the

impacts based on the likely effects to communities.

***Response:*** *The Norfolk District analyzed potential impacts to minority and low-income communities within the one-mile study area, as detailed in Chapter 3, Subsection: Local Community. A one-mile radius was selected because it is consistent with the study areas employed for technical analyses associated with landfill practices, such as odor and aesthetics. Furthermore, minority and low-income communities were found within the one-mile radius and impacts to these communities are described in the FEIS; expanding the radius to three miles would not alter the Norfolk District's Local Community analysis.*

*Public outreach for the project was extensive. A public notice advertised two public information meetings which were held on June 21 and 22 of 2023 and two public hearings which were held on July 26 and 27 of 2023. Individual flyers detailing project information were sent to all residential property owners within a one-mile radius of the existing Regional Landfill and within one mile of SH30. The informational flyer was also provided to area community centers, places of worship, and local governments. Meeting dates and times were also shared via the Norfolk District's social media account. No concerns or opposition were raised by the surrounding community relating to expansion of the existing Regional Landfill during public outreach.*

*Therefore, the Norfolk District is advancing the Local Community analysis utilizing a one-mile study area.*

**116. EPA Comment:** Page 246 concludes that the potential effects associated with the proposed on-site expansion alternatives (Alternatives B and C) are "not anticipated to result in high and adverse impacts on the surrounding EJ communities in in a way that would be more severe or greater in magnitude than non-EJ community areas," but does not support this finding. EPA notes that certain populations, such as low-income and/or people of color populations, may face elevated susceptibility to impacts that may affect others less severely. Therefore, EPA encourages the USACE to clearly address the potential for adverse impacts even if less vulnerable populations may face similar environmental conditions. A more robust discussion of direct project impacts and cumulative impacts of traffic and transportation, noise, water quality, property values, fees, and emissions would better inform the analysis of effects.

***Response:*** *The Norfolk District shares EPA's opinion in that certain populations, such as low-income and/or people of color populations may face elevated susceptibility to impacts that may affect others less severely. The Norfolk District revised the Local Community analysis to more expressly consider whether adverse impacts identified in Chapter 3 may impact minority and low-income communities.*

*Property values were not explicitly discussed in the DEIS or FEIS, but the Norfolk District reviewed literature that discusses the impacts of landfills on property values and determined that while some landfills may impact property values, the studies are not conclusive that all landfills impact property values.*

*The Norfolk District reasoned that landfills may or may not affect property values and many factors could affect property values besides the existing Regional Landfill. Often one of the determining factors for property values is the perception of any impacts. Many of the homes in close proximity to the Regional Landfill have been constructed since the landfill was first developed, suggesting that the housing market has not precluded the sale of homes within this area due to the presence of a landfill. The Norfolk District concluded that studying property values to determine potential effects to local communities would not provide meaningful information.*

*As described in Chapter 3, Subsection: Potential Cumulative Impacts, the additional conservation proposed as a component of SPSA's mitigation plan would create a beneficial impact to the surrounding community through enhanced buffering from proposed landfilling activity. Placing these properties under conservation easement protection ensures that the ecological functions and services provided by these properties will continue or be enhanced.*

**117. EPA Comment:** The DEIS also concludes that Alternative D is not anticipated to have any potentially high and adverse impacts on communities with EJ concerns “in a manner that would be appreciably more severe or greater in magnitude than non-EJ communities” as it “would comply with the design and monitoring requirements defined in RCRA Subtitle D” and is not anticipated to be a major source of pollution. We find that this conclusion understates the potential hazards associated with waste facilities. There is extensive literature that documents the potential environmental risks and concerns of communities adjacent to waste facilities.

***Response:*** *The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

**118. EPA Comment:** EPA appreciates that the USACE will consider community feedback in determining whether a disproportionate burden would occur and recommends that comprehensive community outreach inform the identification of impacts and opportunities for impact avoidance, minimization, and/or mitigation as needed. We suggest detailing outreach that has been conducted or is planned in the EIS.

***Response:*** *The Norfolk District posted a public notice announcing the availability of the Draft EIS on June 16, 2023, along with locations and dates of the public information meetings which were held on June 21 and 22 of 2023 and public hearings on July 26 and 27 of 2023. Prior to the public notice, the Norfolk District distributed informational flyers to all residential property owners within one mile of both the SH30 alternative site and the existing Regional Landfill. The informational flyer was also provided to area community centers, places of worship, and local governments. Meeting dates and times were also shared via the Norfolk District's social media account. The public information meeting and public hearing were widely attended and approximately 100 citizens spoke at the public hearing which was transcribed* *by a court reporter and made part of the administrative record. Public interest factors shared by the citizens during the public hearings were one component of the dismissal of SH30 from further review. Additional details regarding the dismissal are provided in Chapter 2, Subsection: Alternatives Considered but Dismissed. No concerns or opposition were raised by the surrounding community relating to expansion of the existing Regional Landfill (Alternatives B and C) during public outreach.*

119. **EPA Comment:** We appreciate the cumulative impacts discussion but note that the discussion of Environmental Justice Index (EJI) for the expansion area is limited to the census tract containing the Regional Landfill. We recommend consideration of the adjacent census tract, which has an EJI rank of 0.88. We recommend extending the scope of analysis given that fence line or adjacent communities may experience adverse effects of nearby industrial activities.

    ***Response:*** *The Local Community Section has been revised to include an analysis of the proposed project on the Local Community study area, which includes the surrounding census blocks. See also Comment 115 for rationale for the area considered.*

    *Extensive public outreach was conducted for the proposed expansion area. Two informational meetings and two public hearings were held with over 100 attendees. No comments with concerns or opposition were received regarding the proposed expansion at the Regional Landfill.*

120. **EPA Comment:** The Biological Resources section is limited to 'Wetlands' and 'Protected Species." It does not substantially address habitat connectivity or impacts to at-risk species.

    ***Response:*** *The topics of habitat connectivity and the impacts on at-risk species are addressed in Chapter 3, Subsection: Biological Resources, respectively.*

121. **EPA Comment:** For the action alternatives, it seems somewhat circular to indicate that cumulative impacts would be minimized through compliance with CWA Section 404 when the current federal action subject to the NEPA analysis is approval of a CWA 404 permit. Instead, we recommend clearly assessing impacts and indicating how mitigation will compensate for the direct, indirect, and cumulative impacts for wetlands and biological resources.

    ***Response:*** *Additional mitigative measure details have been incorporated into Chapter 2, Subsection: Project-Specific Mitigation Options and in Chapter 3, Subsection: Potential Cumulative Impacts.*

122. **EPA Comment:** Likewise, page 254 indicates that cumulative impacts of Alternatives B and C, "as well as the SPSA master plan" would be mitigated by compliance with the ESA, state regulations, the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act. We recommend specifically indicating how impacts would be avoided and clarifying the mitigation provided that would "increase the amount of suitable habitat available" for the species of

concern.

***Response:*** *Additional mitigative measure details have been incorporated into Chapter 2, Subsection: Project-Specific Mitigation Options and in Chapter 3, Subsection: Potential Cumulative Impacts.*

**123. EPA Comment:** The discussion regarding cumulative effects of transportation and traffic (p 254) does not adequately assess cumulative effects from vehicular emissions, traffic, safety, and traffic noise. The EIS should consider effects of the existing landfill with the alternatives in combination with other projects that may impact traffic, such as the Port 460 Logistics Center project. Such an assessment should consider the increase in heavy truck traffic that could be expected from this project.

***Response:*** *Revisions have been made to Chapter 3, Subsection: Potential Cumulative Impacts.*

**124. EPA Comment:** The Air Quality, Greenhouse Gas, and Climate Change section (p 255) states that the “other cumulative actions considered would not have the potential to result in impacts. Therefore, there would be no cumulative impacts to this resource under Alternatives B and C.” EPA does not concur that construction and operation of other projects, particularly Bowers Hill or Port 460, would not have an impact to air quality, greenhouse gases, and climate change. We recommend revising this section.

***Response:*** *Revisions have been made to Chapter 3, Subsection: Potential Cumulative Impacts.*

**125. EPA Comment:** As indicated above, avoidance, minimization, and mitigation measures for impacts to the range of resources should be clearly described. We suggest including a table or section that outlines mitigation measures for each resource area. Where possible, we recommend clearly committing to measures to avoid or reduce a potential impact, such as time of year restrictions, species relocation, habitat replacement or connection, or community and cultural resource mitigation. Proposed monitoring and adaptive management measures should also be clearly outlined.

***Response:*** *SPSA would be required to follow TOYR restrictions for federally protected bat species from December 15 through February 15 and April 1 through July 15 which partially overlaps with VDWR's recommended TOYR for resident and migratory songbird nesting. SPSA proposes the conservation of 742.56 acre of primarily forested wetland habitat within the sub watershed (020802080105- Nansemond River-Cedar Lake), with 629.67 acres sanctioned for wetland compensatory mitigation, and 112.89 acres partitioned for canebrake rattlesnake habitat. These properties were selected due to their proximity to the impact area, similar history, and ecological characteristics to compensate for impacts associated with Cells VIII and IX. All preservation sites were historically part of the Great Dismal Swamp and are within one mile of the proposed impact area. Additional information is provided in Chapter 4, Subsection: Agency and Tribal Coordination. Additional detail regarding*

*SPSA's mitigation plan is described in Chapter 2, Subsection: Project Specific Mitigation Options and is attached as Appendix G.*

**126. EPA Comment:** The EIS would benefit from additional information regarding the preservation of the Nahra property. We suggest including information in the EIS that shows how the proposed preservation area is connected to and contributes to habitat, protecting or improving water quality, or other benefits. We recommend providing plans, maps, or other figures that show the preserved resources in the EIS.

***Response:*** *SPSA has purchased the Nahra Property, located on the northwestern perimeter of the Regional Landfill. The Nahra Property is in the primary HUC of the Regional landfill and contains approximately 205.75 acres of preservable area outside of existing maintained easements. An 80.68-acre buffer directly adjacent to the active landfill would be designated as canebrake rattlesnake habitat. The remaining 125.07 acres would count towards the wetland preservation. The Nahra property acts as a groundwater recharge system in the mineral flat wetland areas on the property. The open water features on-site allow for discharge of groundwater, storage capacity for floodflow alteration, nutrient cycling, and support the presence of fish and potentially shellfish on the property. These open water features are surrounded by mature hardwood trees that can provide a suitable habitat for bald eagles to nest. Mineral flat wetlands provide a unique habitat for various species due to the dense woody vegetation and seasonal ponding. The vegetation in the proposed impact area is very similar to the vegetation present in the proposed preservation areas. Switch cane (Arundinaria tecta) and/or giant cane (Arundinaria gigantea) were documented on-site, these areas include cane thickets that are prime habitat for the canebrake rattlesnake. The cane thickets provide cover allowing them to avoid predators and hunt grey squirrels, which is their main source of food (Kleopfer 2011). The area being preserved specifically for the canebrake rattlesnake, is connected to the on-site wetland preservation areas, which enable wildlife to freely move throughout the habitats without having to cross through urbanized areas. The swamp provides ridges and glades and during the fall months a significant amount of leaf litter. These are all prime habitat conditions for the canebrake rattlesnake (Kleopfer 2011) and other wildlife. Additional detail is provided in the SPSA proposed Mitigation Plan which is included in Appendix G.*

**127. EPA Comment:** For the 137.8-acre Cell VIII and IX expansion site, we recommend indicating how the remaining wetlands and vegetation will be protected during construction and operation. We recommend that the JPA include a monitoring and adaptive management plan for the onsite and adjacent wetlands.

***Response:*** *The 217.21 acres in Cells X, XI, and XII would be preserved in perpetuity. In addition, there are 23.81 acres of wetlands surrounding the limits of disturbance for the development of Cells VIII and IX. This area was* *included in the study limits but would not be disturbed as a result of this project. This area also provides a corridor connecting the established preservation area southeast of Cells VIII and IX and the proposed preservation area of Cells X, XI, and XII. Remaining wetlands would be monitored and reported as a component of the required Section 404 permit. Additionally, in response to VDWR comments, SPSA has indicated their willingness to follow strict adherence to erosion and sediment controls during construction and use of natural/organic matting in place of synthetic/plastic matting would be implemented.*

**128. EPA Comment:** For aquatic resources, additional information should clarify how the purchase of credits, site preservation, and the undefined permittee-responsible mitigation within the watershed will compensate for loss of functions in both the Nansemond River watershed and historic Great Dismal Swamp. EPA anticipates that the baseline functional assessments will inform the wetland compensatory mitigation plan. Additional detail should support how the proposed compensatory mitigation plan will address temporal loss in the watershed, serve as wildlife habitat, offset wetland functions, and address or offset indirect effects and cumulative loss.

***Response:*** *Additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options. The SPSA proposed Mitigation Plan is included as Appendix G.*

**129. EPA Comment:** While the JPA and other sections of the DEIS state that the 168-acre area of future Cells X, XI, and XII will be protected by a conservation easement, Page 7 of the DEIS states that they will be protected through a declaration of restrictions. EPA recommends correcting this discrepancy and placing conservation easements over all preservation areas, including the Nahra property. Designation of an independent third-party easement holder(s) in escrow is critical to ensure long-term protection. EPA recommends keeping the agencies informed on the identity of the independent, third-party easement holder(s).

***Response:*** *A legal agreement is being crafted to place the proposed preservation areas under a conservation easement for to be maintained by a third-party entity ensuring long-term protection of the sites. It is anticipated that all the preservation areas would be managed by the Virginia Outdoors Foundation (VOF) with SPSA serving as the long-term steward. The third-party entity will have the right to enforce site protections and SPSA would provide the resources necessary to monitor and enforce these site protections. The third-party holder would be required to notify the Norfolk District and other appropriate entities of any non-compliance in accordance with the terms of the real estate instrument. Additional information has been* *provided in Chapter 2, Subsection: Project Specific Mitigation Options. The SPSA proposed Mitigation Plan is included as Appendix G.*

## Agency Responses to U.S. Department of the Interior Comments

130. **DOI Comment:** The DEIS currently does not recognize that the Great Dismal Swamp is an NNL or in the project area. The Department requests that the Great Dismal Swamp NNL be added as a significant natural resource in both the potentially affected environment and environmental consequences sections. Analysis and discussion of potential impacts to the site's significant natural resources should be addressed in the DEIS.

    ***Response:*** *The document has recognized the importance of the Great Dismal Swamp National Natural Landmark by incorporating it into the affected environment and environmental consequences section. This additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options and Chapter 3, Subsection: Water Resources.*

131. **DOI Comment:** On page 146 of the DEIS, the statement is made: "Development of the expansion area is not anticipated to adversely affect groundwater in the Great Dismal Swamp NWR to the south or penetrate the deeper principal aquifers". The Department requests further explanation and additional background data be addressed in the discussions of both Alternatives B and C to support this statement in the Final Environmental Impact Statement. The NPS is concerned about leaching and groundwater contamination to the Great Dismal Swamp NWR.

    ***Response:*** *Development of the expansion area is not anticipated to adversely affect groundwater in the Great Dismal Swamp NWR or the NNL (located to the south) or penetrate the deeper principal aquifers. Groundwater flow simulations performed by the USGS indicate that groundwater in the northern portions of the NWR flow toward the north (i.e., toward the Regional Landfill) (USGS 2018), such that site groundwater is not anticipated to reach the NWR. Leachate management systems and permit requirements are designed to protect downstream waterbodies from any potential impairments. Monitoring and reporting support these efforts further. Additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options and Chapter 3, Subsection: Water Resources.*

## Agency Responses to SELC, CBF and Wetlands Watch Comments

132. **SELC, CBF, WW Comment:** Based on the analysis provided in the Draft EIS, we believe Alternative A represents the LEDPA—even despite the way the unreasonably narrow purpose and need has distorted the assessment of its potential cost. Alternative A, which consists of utilizing the currently permitted capacity available at the Regional Landfill (which SPSA expects to last until approximately 2037) and then using other existing landfills for waste processing

and disposal, clearly presents the least damaging environmental consequences of the four evaluated options. Specifically, Alternative A is the only alternative with no direct or indirect wetland impacts. It is also the only option with no anticipated adverse effects to endangered species, migratory birds, or wildlife resources. Additionally, Alternative A is expected to yield the least construction-related emissions of all considered alternatives.

***Response:*** *The Norfolk District has clarified the purpose and need statement and believes it is not unreasonably narrow as described in Chapter 1, Subsection: Purpose of and Need for Action. A full evaluation of all practicable alternatives is described in Chapter 3. A discussion concerning the Practicability of Remaining Alternatives is provided at the end of Chapter 2. The Norfolk District will complete a public interest review and 404(b)1) analysis and designate the LEDPA in the ROD.*

**133. SELC, CBF, WW Comment:** Given the huge reduction in environmental impacts that Alternative A offers relative to Alternatives B, C, and D, it is clearly the least environmentally damaging of the alternatives assessed in the Draft EIS and is therefore the only alternative the Corps may permit.

***Response:*** *The Norfolk District has further analyzed the practicability of the alternatives as described in Chapter 2, and has included a discussion concerning the Practicability of Remaining Alternatives Summary at the end of Chapter 2 and will designate the LEDPA in the ROD. The comments do not reflect that the alternative selected by the Norfolk District must be the least environmentally damaging practicable alternative. The term practicable means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.*

**134. SELC, CBF, WW Comment:** Additionally, the Draft EIS fails to account for additional considerations that could lower the anticipated costs of Alternative A. For example, the airspace between Cells V and VII has already been permitted and could provide additional waste capacity and reduce the timeframe during which off-site disposal would be required. Yet the Corps' analysis of Alternative A fails to factor in the additional capacity that could be provided by this airspace when evaluating the costs of Alternative A.

***Response:*** *Development of the airspace between Cells V and VII would require sizeable infrastructure changes. Any potential reduction in hauling costs achieved through a reduced landfill lifespan would be negated by the cost of the required infrastructure changes and regulatory approval process. Specifically, an extension of the Cell V – Quad 2 leachate pump station riser pipes and their controls would need to be relocated to outside the landfill footprint. This extension would require an additional 200 feet or more of riser pipe, which would make maintenance of the sump pumps extremely difficult because they would be 400 linear feet away from the access point. Additionally, the existing leachate forcemain to and from the Cell V lift station would need to be relocated to outside the expansion area. This is a complex* *design challenge. Regulatory approval of the modification of Cell VII would be necessary.*

**135. SELC, CBF, WW Comment:** This process for developing off-site alternatives is flawed. First, the review falls short of NEPA's requirement to evaluate "a reasonable range of alternatives to the proposed agency action" by limiting the universe of off-site alternatives that might be considered practicable and therefore qualify for detailed evaluation in the Draft EIS to the two sites with owners who expressed a willingness to sell. As the Draft EIS acknowledges, the Section 404(b)(1) Guidelines state that if a site "is an otherwise practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered." Yet here, of the 16 sites that the Corps considered evaluating in detail in the Draft EIS as off-site alternatives, the agency determined that "the off-site locations without a landowner that is willing to sell are impractical and may therefore be eliminated from further analysis." This rationale is unacceptable, especially when the filling of over one hundred acres of wetlands in a federally and state prioritized ecosystem is at issue. Analysis of additional off-site alternatives is needed, and high-ranking sites should be considered regardless of whether the owners have expressed a willingness to sell.

***Response:*** *The Norfolk District's four-phase process for off-site alternatives is set forth in the FEIS beginning with the subsection entitled Off-site Alternatives Screening Process. Fifty-eight sites were initially identified as meeting minimum thresholds for potential landfill development and then carried forward to a Phase II analysis. After elimination of sites with fatal flaws, 29 sites were evaluated in a detailed manner using 14 criteria and weighted ranking system. The six most highly ranking alternatives were then carried forward to Phase IV and a site-specific criteria analysis.*

*Only after this extensive, initial work to identify an off-site alternative did the Norfolk District begin to consider whether the site could be acquired and a landfill successfully developed, in consideration of local zoning ordinances, plans, and the position of county officials. The Norfolk District evaluated sites for the possibility of landfill development even when there was no willing landowner. For sites that did not have willing sellers, SPSA would be required to exercise condemnation authority, which does not exempt SPSA from compliance with local zoning and land use ordinances. For seven off-site alternatives, the Norfolk District investigated the process for developing a landfill, consistency with local plans and ordinances, and sought input from local officials to determine the likelihood of obtaining the necessary approvals. None of the sites permitted landfill development by right, and in each instance local officials indicated a low probability of obtaining the requisite approvals. In consideration of the amount of resource investment in pursuing condemnation, the incompatibility of the proposed landfill with the current zoning and land use ordinances and long-term land use plans, and the express determinations by a County Administrator that obtaining any* *necessary approvals needed to deviate from these existing ordinances and plans is unlikely, these alternatives are not reasonably available, and they were dismissed from further consideration in the DEIS. Clarity has been added to Chapter 2, Subsection: Off-site Alternatives Screening Process.*

*As SELC recognized in its November 16, 2021 letter providing supplemental scoping comments, Virginia State law precludes the VDEQ from issuing a solid waste permit for a municipal solid waste landfill that would impact greater than two acres of non-tidal wetlands (unless an exception applies). Indeed, SELC posited that then-proposed off-site alternatives were expressly prohibited under the state law. Though the Norfolk District has carefully evaluated the availability of an exemption under Va. Code §§ 10.1-1408.5(F), it is important to underscore the challenges associated with siting a new landfill in southeastern Virginia in light of the foregoing prohibition.*

**136. SELC, CBF, WW Comment:** Because the favorability scores and the detailed breakdown thereof for the ten sites evaluated in the Corps' second round of outreach are not provided in the Draft EIS or in the Off-Site Alternatives Analysis Technical Memo, the public is not provided with any information to determine the impacts of the promising sites that were not carried forward for further evaluation in the Draft EIS because the owners did not express a willingness to sell. NEPA requires that an EIS must make relevant information available to the public. As a result, the Draft EIS has failed to evaluate a reasonable range of off-site alternatives and has failed to provide sufficient information to gauge the environmental impacts of those alternatives that were prematurely dismissed.

***Response:*** *Table 2 in the FEIS has been updated to show the criteria used and the results of the top 29 alternatives that were reviewed. Clarity has been added to Chapter 2, Subsection: Off-site Alternatives Screening Process. As previously clarified in the response to Comment 135, this second round of 10 sites was not eliminated solely on the basis of the lack of a willing seller. However, the Phase IV analysis was only performed on the highest six ranking sites from Phase III.*

**137. SELC, CBF, WW Comment:** With no discussion of how much of an increase in precipitation intensity and a corresponding expansion of floodplain boundaries are predicted for the project area, the Draft EIS summarily concludes that, "[g]iven the landscape position of the project site in relation to the contributing watershed it is unlikely that the flood elevation of 21 feet is going to rise appreciably." The Corps must provide an analysis of rainfall and floodplain projections and explain how it supports (or does not support) this conclusion.

***Response:*** *Additional detail on anticipated precipitation increases has been provided in Chapter 3, Subsections: Floodplains and Surface Water/Hydrology. Precipitation frequency and intensity are anticipated to continue to increase. Floodplain elevations will increase accordingly, but this should be viewed from a regional perspective, since the downstream riverine flooding of Burnetts Mill Creek is predominantly on-site and affects only the SPSA property before passing under U.S. Routes 13/58/460 and entering the* *tidally influenced portion of the creek, where tidal floodplain and storm surge mapping will be the determining factor.*

**138. SELC, CBF, WW Comment:** The wetlands at risk here were historically part of the Great Dismal Swamp and therefore form part of its rich and multi-layered cultural and historic significance. In short, the wetlands threatened by this proposal are significant for both their scale and their value, and it is difficult to conceive of mitigation that could realistically offset the extent of impacts that SPSA is proposing.

***Response:*** *The Norfolk District has considered that the wetlands on the SPSA site were historically part of the GDS and within the ancestral lands of the Nansemond Indian Nation. The Norfolk District coordinated with the Nansemond Indian Nation to identify a Traditional Cultural Place within this area. As part of the MOA process there will be mitigation for the cultural resource impacts to the identified Traditional Cultural Property (TCP). Coordination with Tribal Nations is detailed in Chapter 4. The project specific wetland mitigation section in Chapter 2, Subsection: Project Specific Mitigation Options has been enhanced to include details on the proposed compensation for the potential loss of wetland functions and values. More broadly, all of the 742.56 acres that would be preserved pursuant to a conservation easement as part of the proposed project mitigation were historically part of the Great Dismal Swamp. The preservation areas provide buffers to the surrounding neighborhoods, help protect downstream water quality, and serve as a connection between Burnetts Mill Creek and the Great Dismal Swamp. The 159 mitigation bank credits that were obtained are also from banks situated within lands that were historically part of the Great Dismal Swamp.*

**139. SELC, CBF, WW Comment:** Throughout the Draft EIS, the Corps mentions the potential for SPSA to preserve the area it has previously slated for future Cells X-XII as part of its mitigation plan. However, the Corps interchangeably mentions the potential for these areas to be placed in a conservation easement or subject to a declaration of restriction. If SPSA's mitigation plan includes this permittee responsible mitigation, at a minimum the Corps must require additional protections. Specifically, the property must be protected through a conservation easement held by a public body pursuant to the Virginia Open-Space Land Act or by a qualified holder pursuant to Virginia Conservation Easement Act and co-held by a public body. This level of protection is necessary to ensure the perpetual conservation of these areas to mitigate, in part, the perpetual loss of wetlands associated with Alternatives B or C.

***Response:*** *A legal agreement is being crafted to place the proposed preservation areas under a conservation easement to be maintained by a third-party entity ensuring long-term protection of the sites. It is anticipated that all the preservation areas would be managed by the Virginia Outdoors Foundation (VOF) with SPSA serving as the long-term steward. The third-party entity will have the right to enforce site protections and SPSA would* *provide the resources necessary to monitor and enforce these site protections. The third-party holder would be required to notify the Norfolk District and other appropriate entities of any non-compliance in accordance with the terms of the real estate instrument. Additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options and attached in Appendix G. There is no legal requirement, however, that site protection for permittee-responsible mitigation be achieved only through a conservation easement.*

**140. SELC, CBF, WW Comment:** Additionally, SPSA's mitigation proposal also includes its recent acquisition of the "Nahra" property, a 175-acre parcel of forested wetlands adjoining the SPSA property. The DEIS suggests SPSA plans to preserve this property as part of its proposed mitigation plan, but no additional details are provided as to the form such preservation will take. As above, the property should be protected by a conservation easement held by a public body or a qualified holder and co-held by a public body.

***Response:*** *Additional information has been provided in Chapter 2, Subsection: Project Specific Mitigation Options and attached as Appendix G.*

**141. SELC, CBF, WW Comment:** Finally, the wetland mitigation on the SPSA property and the "Nahra" tract only include wetland preservation rather than any enhancement effort. The Corps previously required hydrology restoration and enhancement for SPSA's development of Cell VII and it should so require here as well, especially considering the contiguous nature of these wetlands and their proximity to the Great Dismal Swamp, of which they were formerly a part.

***Response:*** *Enhancement of the upland areas of the Nahra property was determined infeasible. SPSA has proposed to preserve the upland areas on the Nahra property as part of the Canebrake Rattlesnake mitigation. Additional detail is provided in Chapter 2, Subsection: Project Specific Mitigation Options and attached as Appendix G.*

**142. SELC, CBF, WW Comment:** As discussed at some length in our scoping comment letters, it is essential that the Corps independently evaluate and define the project's purpose and need statement ("purpose and need") so that the agency can properly develop reasonable alternatives to assess and compare to SPSA's proposed action. The way an agency defines a project's purpose and need establishes the parameters for the range of available alternatives, and agencies must therefore "exercise independent judgment in defining the purpose and need for the project." The Fourth Circuit has warned that a purpose is unreasonable when it is defined in a way "as to allow only one alternative from among the environmentally benign ones in the agency's power, such that the EIS becomes essentially a foreordained formality." The narrowly tailored project purpose and need that the Corps has incorporated into the Draft EIS precludes consideration of reasonable and practicable alternatives to SPSA's desired course of action, and we strongly urge the Corps to revisit the project purpose and need to avoid this result.

***Response:*** *The Norfolk District has evaluated the applicant's proposed Purpose and Need statement and has independently determined that the underlying project purpose is to provide safe, and environmentally sound solid waste management for the region through approximately 2060, which would require an additional 16 million CY of capacity. This Purpose and Need is consistent with the Regional Solid Waste Management Plan for Southeastern Virginia, requiring that SPSA plan for solid waste management through the year 2040, and the Use and Support Agreements with the member localities, requiring that SPSA maintain 20 years of operating capacity. The Norfolk District has determined that it is appropriate to plan for capacity beyond these 20-year planning and operating windows, as landfill development requires extensive planning and permitting, including coordination with the public and completion of environmental consultations, as well as lengthy dewatering and construction timeframes. Revisions have been made to Chapter 1, Subsection: Purpose of and Need for Action, to further clarify the Purpose and Need for the project. Indeed, given the scope and scale of landfill projects, and SPSA's obligation to meet planning obligations that are regularly revised, planning for an additional 20 of capacity is reasonable.*

*The Norfolk District does not believe the Purpose and Need as defined in the EIS is unreasonably narrow and, as the FEIS demonstrates, it has not confined the range of alternatives to only SPSA's proposed expansion. The Norfolk District identified several on-site and off-site alternatives that would meet the project purpose of providing 16 million CY of capacity other than SPSA's original proposed alternative. The on-site alternatives considered include Alternative C, which modified the original proposal to use airspace between Cells V and VII and reduced the footprint of the proposed expansion, and Alternative E, which proposed combining expansion of the Regional Landfill with diversion of 50% and 25% of waste to private landfills.*

*The Norfolk District also identified seven off-site alternatives that were determined to be reasonable, two of which, SU02 and SH30, were carried forward for further consideration. SU02 was dismissed on the grounds that it would result in greater impacts to wetlands than the applicant's preferred alternative and the City of Suffolk opposed development of a landfill within its boundaries. SH30 was dismissed due to uncertainty around receiving an exemption from 9 VAC 20-81-120's siting requirements, opposition from Southampton County, and public interest factors (described in greater detail in Chapter 2, Site SH30 Analysis and Dismissal). As evidenced through the off-site alternatives screening process, there are several obstacles to landfill development in Virginia, including the state's restrictions on landfill development impacting more than two acres of wetlands and county and city opposition to landfill development which would prevent necessary zoning changes or issuance of a CUP. These obstacles, rather than an unreasonably narrow purpose and need, contributed to the dismissal of off-site alternatives* *and would likely also adversely impact the practicability of a proposed landfill of a reduced capacity.*

143. **SELC, CBF, WW Comment:** The Project Purpose and Need is Unreasonably Narrow in Specifying a Forty-Year Waste Disposal Horizon. We are concerned that SPSA has effectively “reverse-engineered” the project purpose and need to limit consideration of reasonable alternatives and facilitate the Corps’ permitting approval of the proposed expansion of the Regional Landfill. More specifically, it appears that the purpose and need is the result of first determining the amount of waste disposal capacity that SPSA’s proposed expansion would provide, and then crafting the stated purpose and need for the project around that amount of capacity. As explained below, the effect of doing so has been to severely restrict the range of reasonable and practicable alternatives that was carried forward to detailed evaluation in the Draft EIS, and it has also distorted the assessment of the potential cost of one of the four alternatives that the Draft EIS does evaluate. If not corrected, the unreasonably narrow purpose and need risks rendering the NEPA environmental review—and the Clean Water Act reviews that will incorporate it—the “foreordained formality” that the Fourth Circuit has warned against.

    ***Response:*** *Norfolk District has independently verified the calculated need for Regional Landfill space and has further clarified the Purpose and Need for the project in Chapter 1, Subsection: Purpose of and Need for Action. See response to Comment 142, above, for additional detail.*

144. **SELC, CBF, WW Comment:** However, we have been unable to find the source of any state mandate requiring the 40-year horizon for planning, permitting, and construction on which the project purpose and need centers. Based on our reading of the Virginia Water and Waste Authorities Act, it imposes no such requirement. Similarly, the Virginia Solid Waste Planning and Recycling regulations include a 20-year need as a basic planning element, and the required demonstration of need for additional capacity can be met by showing that available permitted capacity is less than 20 years. To the best of our knowledge, there is no state-mandated 40-year horizon for waste disposal planning, permitting, or construction.

    ***Response:*** *The 40-year time frame discussed in the DEIS was meant to include the entire planning phase from initial start of the EIS process through the life of the project, i.e. from 2020 through 2060. The Norfolk District has removed the references to the 40-year time frame, because the references seemed to add a layer of confusion.*

145. **SELC, CBF, WW Comment:** In sum, while SPSA is required to ensure that member localities have solid waste disposal options for at least the next 20 years, we are aware of no binding requirement for SPSA to effectively double that period to 40 years.

    ***Response:*** *In terms of planning for future waste management, the regulations require that solid waste management plans within each planning unit contain* *an "assessment of all current and predicted needs for solid waste management for a period of 20 years and a description of the action to be taken to meet those needs." The planning period for the current RSWMP extends to 2040, and, accordingly, SPSA is required to plan for solid waste management through at least that year. The RSWMPs are updated every five years, however, and the current plan expires in 2025. Thus, this year, SPSA's required minimal planning horizon will extend to the year 2045 and, by 2030, to 2050. SPSA's Strategic Operating Plan (SOP), which is adopted in its Use and Support Agreements with the member localities, provides that SPSA will maintain 20 years of operating capacity. The current version of SPSA's SOP became effective on July 1, 2024. As the RSWMP notes, the Regional Landfill, including the permitted Cell VII, is expected to exhaust its capacity by 2037, requiring that SPSA develop a plan for additional capacity to meet the regulatory planning requirements and its contractual obligations. The language in reference to the project timeframe in the FEIS has been clarified in Chapter 1, Subsection: Purpose of and Need for Action. For clarity, the Norfolk District has removed references to the 40-year time frame.*

146. **SELC, CBF, WW Comment:** Thus, instead of determining the amount of capacity reasonably needed, building the project purpose and need around the needed capacity, and then using that purpose and need to assess different courses of action, we are concerned that this process has effectively been reversed with SPSA determining its preferred course of action, calculating the amount of capacity it would provide, and then having the project purpose and need be based on providing that amount of capacity. And as explained below, we are concerned that crafting the purpose and need around the capacity that SPSA's desired expansion would provide is precluding consideration of reasonable alternatives in the NEPA process, while effectively stacking the deck in favor of expanding the Regional Landfill for purposes of the Clean Water Act permitting review.

    ***Response:*** *Please see previous responses to Comments 142, 144, and 145 for additional detail.*

147. **SELC, CBF, WW Comment:** The Unreasonably Narrow Purpose and Need Precludes Consideration of Feasible Alternatives. NEPA's statutory text specifies that an EIS must include "a reasonable range of alternatives to the proposed agency action … that are technically and economically feasible and meet the purpose and need of the proposal." Unnecessarily tying the project purpose and need to a 40-year waste disposal horizon appears to have severely narrowed the universe of feasible alternatives considered in the Draft EIS, such that expanding the Regional Landfill is essentially the "foreordained formality" that courts have warned against.

    ***Response:*** *Please see previous responses to Comments 142, 144, and 145 for additional detail.*

148. **SELC, CBF, WW Comment:** In sum, we strongly urge the Corps to revisit and revise the project purpose and need to avoid the unreasonably cramped

parameters that the incorporation of the 40-year waste disposal horizon has placed on the development and consideration of feasible alternatives.

***Response:*** *For clarity, the Norfolk District has removed references to the 40-year time frame, see revisions in the FEIS in Chapter 1, Subsection: Purpose of and Need for Action. Please see previous responses to Comments 142, 144, and 145 for additional detail.*

**149. SELC, CBF, WW Comment:** First, the Draft EIS notes that the SPSA Board of Directors will soon undertake a comprehensive review of the Designated Disposal Mechanism ("DDM") that SPSA is using and assess its viability for the future, but it then presupposes only the use of the Regional Landfill for all municipal waste disposal. The DDM is the method of municipal waste disposal as determined by the SPSA Board under the SOP. The SPSA SOP provides that the DDM may include disposal of municipal waste at the Regional Landfill, disposal of municipal waste at other facilities owned or operated by SPSA, or disposal of municipal waste pursuant to agreements between SPSA and a third party. However, the assessment of the remaining years of capacity at the Regional Landfill then fails to consider any DDM other than using the Regional Landfill as the sole disposal location. In other words, the capacity assessment—which is relied on throughout the remainder of the Draft EIS—simply assumes that the outcome of the DDM is the worst-case, highest-volume scenario for incoming waste at the Regional Landfill. The Corps must assess whether this assumption is reasonable.

***Response:*** *The SPSA SOP indicates that it is "the responsibility of the SPSA Board of Directors to determine the best and most efficient Designated Disposal Mechanism for the Authority and its Member Localities (considering both process and economic factors)." It is our understanding that SPSA does incorporate other waste disposal options (including innovative technology) into their plan as they are developed. However, it is their responsibility to accommodate the waste disposal needs of the member localities to ensure that regional capacity needs are met in the most cost-effective manner. Regardless, the Norfolk District's consideration of alternatives to meet the purpose and need has not been limited to disposal at the Regional Landfill.*

**150. SELC, CBF, WW Comment:** After acknowledging that SPSA will soon "consider proposals for any and all alternative technologies and/or disposal methods that are proven to be safe, viable, and cost effective," the Draft EIS's capacity analysis nonetheless assumes that SPSA will adopt none of them and abandon the waste to energy program, such that all member localities' solid waste would be disposed of in the Regional Landfill once the RDF plant closes in 2024. Once again, the worst-case scenario for the incoming waste stream is built directly into the analysis of the capacity remaining in the existing and already permitted cells at the Regional Landfill.

***Response:*** *As the Draft and Final EIS describes, the Norfolk District has evaluated alternative technologies, source reduction, recycling/composting, and resource recovery as alternatives to landfilling. Chapter 2, Subsection:*

*Alternatives Considered but Dismissed also describes SPSA's ongoing efforts in these areas. The estimated need for disposal capacity accounts for SPSA's current efforts, and the amount of waste that may be reduced through future efforts remains speculative.*

**151. SELC, CBF, WW Comment:** Further, a number of potential alternatives were dismissed from detailed consideration in the Draft EIS precisely because they would not meet the stated purpose and need for the project.

***Response:*** *The evaluation of waste reduction alternatives and SPSA's ongoing efforts in this area are set forth in part in the Chapter 2, Subsection: Alternatives Considered but Dismissed, of the FEIS. SPSA supports waste reduction efforts and currently has programs for processing tires and recycling scrap metal. Municipalities already have an incentive to reduce waste because they are charged by the ton for solid waste, and municipalities have already demonstrated that savings can be achieved through recycling (though this does not eliminate the need to meet current and anticipated demand for waste capacity).*

**152. SELC, CBF, WW Comment:** However, these types of smaller-scale, non-disposal alternatives could help reduce the amount of waste that needs to be processed at the Regional Landfill. Individually or in combination with one another, they could extend the remaining capacity of Cells V, VI, and VII even further beyond the approximately 15 years that SPSA has estimated, potentially making a combination of one or more of these alternative technologies a reasonable and feasible alternative to meet a less restrictively defined purpose and need—especially if coupled with smaller off-site alternatives that, as discussed above, were also precluded from detailed consideration.

***Response:*** *Non-disposal alternatives and alternative technologies were considered as a component of all analyzed alternatives. The analysis is found in Chapter 2, Subsection: Elements Common to All Alternatives and describes alternative waste management technologies that will continue in operation and are supplemental to landfilling. Technologies include source reduction, materials reuse, recycling, composting, and resource recovery (waste to energy). See prior responses to Comments 48, 50, and 150 regarding the evaluation of the development of additional alternative technologies, source reduction, recycling/composting, and resource recovery as alternatives to landfilling.*

**153. SELC, CBF, WW Comment:** Finally, a reasonable project purpose and need could also make a significantly more limited expansion of disposal capacity at the existing Regional Landfill a feasible alternative that warrants close consideration. To be sure, we remain convinced (as we expressed in our two scoping comment letters) that SPSA's desire to use the proposed expansion area for soil stockpile as it constructs additional waste disposal capacity is the driving force behind this application at this time, and we doubt that SPSA would favor an option that would preclude its ability to do so by significantly reducing the size of its proposed expansion area. However, that does not relieve the Corps' duty to consider feasible and practicable alternatives under NEPA and the Clean Water Act.

***Response:*** *The Norfolk District has evaluated two scenarios under a Hybrid Alternative that involves smaller landfill footprints in conjunction with off-site hauling. The analysis is found throughout Chapter 3, Subsection: Topics Retained for Detailed Analysis. The Norfolk District's understanding is that SPSA could utilize off-site sources for soil storage and for borrow material; however, it would be more cost effective to utilize Cells VIII and IX and practice good soil management if the proposed project was authorized. In order to develop the landfill Cell VIII, excavation and dewatering would begin in 2028, so construction could begin in 2034. The Phasing Plan for construction is shown on Figures 22 and 23.*

**154. SELC, CBF, WW Comment:** However, a substantial portion of the estimated cost for Alternative A consists of operational costs that are incurred on an annual basis—and therefore multiplied out by 25 years in the cost analysis so that Alternative A would meet the purpose and need's 40-year disposal horizon. Alternative A's overall capital cost, on the other hand, is substantially less than that of Alternatives B and C. As a result, if the Corps were to compare the costs of the alternatives based on a 20-year disposal horizon that begins in 2025 and ends in 2045, Alternative A would cost approximately $340 million, and Alternative C would cost approximately $307 million—a much smaller difference of only $33 million—or about 10.7%. Thus, we are concerned that the Draft EIS's incorporation of the unreasonably prescriptive 40-year disposal capacity horizon into the project purpose and need has significantly distorted the assessment of Alternative A's potential cost to such a degree that SPSA will argue that it is an impracticable alternative during Section 404 permitting. This distortion is a further reason why we urge the Corps to revise the project purpose and need to incorporate a less prescriptive waste-disposal horizon.

***Response:*** *The cost of hauling for Alternative A was calculated beginning in 2037, when Cell VII is projected to reach capacity, through approximately 2060. Analyzing costs from the year 2025 until 2045 would be inconsistent with disposal needs, as capacity exists until roughly 2037. See previous responses to Comments 142, 144, and 145 for additional detail about the project Purpose and Need.*

**155. SELC, CBF, WW Comment:** While the alternatives analysis section of the Draft EIS looks at the potential costs and challenges associated with continuing to run the RDF Plant or building a new one, the Draft EIS then summarily dismisses these options due to cost, uncertainty, and low expected revenue. Especially in light of the fact that processing waste through the RDF plant is such a vital component of SPSA's current waste management strategy, NEPA requires the Corps to exercise independent judgment in evaluating this assumption that is significantly shaping the assessment of capacity and thus heavily factoring into the purported purpose and need for the project.

***Response:*** *The Norfolk District has independently reviewed and evaluated the complexities associated with development of a waste to energy facility and* *does not believe that revitalizing the RDF plant or construction of a new WTE facility would be practicable due to high costs, long project development duration, permitting, locality and public opposition. The FEIS has been revised to reflect updated costs to construct a WTE facility in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

156. **SELC, CBF, WW Comment:** SPSA's mission also requires consideration of outsourcing, but the potential for outsourcing waste disposal is not meaningfully considered in determining the capacity projections underlying the purpose and need—despite the fact that SPSA currently outsources some waste disposal to private landfills to preserve capacity at the Regional Landfill. Some private landfill outsourcing, as well as additional reasonable strategies to further reduce capacity demand, should have been assumed in the capacity evaluation.

    ***Response:*** *SPSA currently disposes the equivalent tonnage of commercial waste that is received at their transfer stations to private landfills. SPSA may also haul some MSW from the farthest western localities to private facilities in order to extend the life of the current landfill. As part of initial reviews of Alternative E, the Hybrid Alternative, consideration was given to hauling from the farthest western localities and the lower tonnages did not affect the overall disposal needs in the future. Norfolk District further evaluated two scenarios under a Hybrid Alternative that involves smaller landfill footprints in conjunction with off-site hauling. The analysis is found throughout Chapter 3, Subsection: Topics Retained for Detailed Analysis.*

157. **SELC, CBF, WW Comment:** The Draft EIS fails to independently evaluate whether outsourcing at least some portions of SPSA's current waste stream could reduce some of the annual waste volumes, thereby extending the amount of existing capacity that the Draft EIS assumes at the Regional Landfill.

    ***Response:*** *The Norfolk District has evaluated two scenarios under a Hybrid Alternative that involves smaller landfill footprints in conjunction with off-site hauling. The analysis is found throughout Chapter 3, Subsection: Topics Retained for Detailed Analysis.*

158. **SELC, CBF, WW Comment:** However, if the purpose and need were based instead on a shorter disposal capacity horizon (such as 25 or 30 years instead of 40), then presumably the minimum size threshold for potential off-site alternatives could be reduced, and alternatives dismissed from further consideration in the screening analysis because they were smaller than 300 acres may in fact be feasible.

    ***Response:*** *Please see previous responses to Comments 142, 144, and 145 for additional detail about the project Purpose and Need. The Norfolk District has independently determined that the underlying project purpose is to provide cost effective and responsible waste management from when Cell VII reaches capacity (approximately 2037) through 2060, to allow SPSA to maintain at least 20 years of solid waste disposal capacity. The Norfolk District has further clarified the Purpose and Need for the project in Chapter 1,* *Subsection: Purpose of and Need for Action. In coordination with their third-party team, including landfill engineers, the Norfolk District determined that at least 300 acres of contiguous undeveloped land would be needed to develop landfill disposal boundary geometries and supporting infrastructure such as roadways, stormwater management facilities, a scale facility, and operations and vehicle maintenance buildings.*

159. **SELC, CBF, WW Comment:** The need for these protections is particularly acute as SPSA's most recent SOP of July 1, 2023—approved subsequent to the issuance of this Draft EIS—includes a Conceptual Plan for the development of Cells X, XI, and XII on the same property being proposed as mitigation. The Draft EIS notes that "[a]t the time of writing, SPSA is not planning additional expansion beyond what is proposed at the existing landfill in this EIS." This statement conflicts with SPSA's recent approval of its SOP.

***Response:*** *SPSA's more recent SOP dated July 1, 2024, reflects that these cells may be subject to preservation: "A conceptual plan has also been developed for the potential expansion of Cells 8 – 12, which would provide an additional 264-plus acres of potential expansion areas at the Regional Landfill. SPSA owns the applicable land; however, the additional cells have yet to be permitted, and may be subject to preservation for future permitting mitigation. This additional capacity, unless subject to preservation, could provide enough capacity for the region for 100 plus years, based on the estimated annual Solid Waste tonnage noted above." If granted a permit from the Norfolk District, SPSA would preserve Cells X-XII as detailed in Appendix G.*

160. **SELC, CBF, WW Comment:** Given that Regional Landfill site is located along the coastal plain where many climate-driven hazards are concentrated, it is imperative that the Draft EIS appropriately account for the alternatives' potential vulnerability to the impacts of climate change. We are concerned that although the Draft EIS purports to assess impacts such as storm surge, sea level rise, and rainstorms, the analyses only evaluate each impact in isolation rather than considering the risks from the combined effects of these hazards. As a result, the Draft EIS has failed to take the required "hard look" at the potential impacts that climate change could have on this project.

***Response:*** *Given the site's landscape position at the headwaters of Burnetts Mill Creek and that it is higher in elevation than most land leading to the tidal shoreline to the north, east, and west, most adjacent lands would be affected by sea level rise and potential storm surges well before the project area; further, no amount of flood storage lost would improve flooding impacts at lower elevations in a storm surge event where flooding originates from the surrounding tidal water bodies. The landfill stormwater system is currently designed to handle a 100-year storm event but knowing that future events may exceed that standard as the climate adapts, continuous management of the landfill facility and its support systems including the stormwater management facilities provides a moderate level of adaptability. Continuous* *management includes maintenance of vegetative cover, routine removal of sediment buildup in conveyance ditches, moderation of water levels in the leachate ponds, installation of a wastewater concentrator which will reduce wastewater hauling and pumping, all of which are critical for a facility in this region where heavy rainfall, high wind, or hurricane level forces are somewhat common across the lifespan of a landfill facility.*

161. **SELC, CBF, WW Comment:** The Corps must assess the potential impacts on the project area that storm surge could inflict in combination with sea level rise, and it should use updated projections of sea level rise in doing so. Those impacts should also be assessed for off-site alternatives, and a comparison of those impacts among alternatives must be provided.

***Response:*** *Additional details on storm surges in combination with sea level rise has been provided in Chapter 3, Subsection: Floodplains. The Norfolk District has dismissed SH30 from further review. The dismissal is discussed in Chapter 2, Subsection: Alternatives Considered but Dismissed.*

162. **SELC, CBF, WW Comment:** Similarly, the effects of sea level rise on groundwater levels, and the effects of more frequent extreme rain events on floodplain hazards, are not considered in the Draft EIS. However, these are dynamics that will certainly impact the proposed expansion area in the foreseeable future, and the risks that these compound climate threats pose need to be assessed—particularly when the proposed action is to expand a regional landfill where municipal waste is disposed.

***Response:*** *All alternatives analyzed anticipate that sea level rise may raise groundwater levels above present elevations but would not significantly alter groundwater flow directions, velocities, or discharge locations. Additional detail regarding anticipated precipitation events has been included in Chapter 3, Subsection: Floodplains and states that although an increase in flood depths and boundary may occur, they are not anticipated to rise appreciably due to the location of the proposed expansion in relation to the contributing watershed.*

163. **SELC, CBF, WW Comment:** In short, the proposed expansion area will be increasingly subject to various compound flooding threats in the foreseeable future as a result of climate change, and these impacts need to be properly evaluated so that an informed decision can be made among alternatives.

***Response:*** *Impacts from storm surge, sea level rise, and storm related flooding have been analyzed and are detailed in the FEIS. See Chapter 3, Subsection Water Resources.*