Richmond Layover Facility Feasibility Study

April 2023

Table of Contents

EXECUTIVE SUMMARY IV
1 OVERVIEW 1
1.1 Introduction 1
1.2 History and Background 1
1.2.1 Study Area 2
1.2.2 Background Information 2
1.2.3 Summary of Nearby Infrastructure Projects 4
1.3 Study Approach 5
1.3.1 Purpose and Need 5
1.3.2 Screening Analysis 7
1.3.3 Conceptual Designs 9
2 EXISTING CONDITIONS 11
2.1 Brown Street Yard – 25 feet & 50 feet Locations 11
2.2 Fulton Yard – CSX & CSX Realigned Locations 12
2.3 Fulton Yard – VDOT 12
2.4 Manchester Yard 13
2.5 Valley Road Yard 14
3 SCREENING ANALYSIS 16
3.1 Methodology 16
3.2 Location Analysis 16
3.2.1 Brown Street Yard – 25 feet 16
3.2.2 Brown Street Yard – 50 feet 21
3.2.3 Fulton Yard – CSX 25
3.2.4 Fulton Yard – CSX Realigned 29
3.2.5 Fulton Yard – VDOT 29
3.2.6 Manchester Yard 35
3.2.7 Valley Road Yard 39
3.3 Summary 44
4 ALTERNATIVES ANALYSIS 45
4.1 Concept Designs 45
4.1.1 Alternative 1 45
4.1.2 Alternative 2 47
4.2 Constructability 49
5 FINDINGS AND NEXT STEPS 50
5.1 Findings 50

5.2 Next Steps 50

List of Appendices

Appendix A: Environmental Review
Appendix B: Cultural Resources Report
Appendix C: Right-of-Way Matrix
Appendix D: Risk Register

Table of Tables

Table ES-1. Screening Summary vi
Table 1-1. Screening Analysis Criteria 9
Table 3-1. Screening Analysis Summary 44

Table of Figures

Figure ES-1. Screened Locations v
Figure 1-1. Overview of Locations 8
Figure 3-1. Cultural Resources - Brown Street Yard - 25 Feet 18
Figure 3-2. Floodplain - Brown Street Yard - 25 Feet 19
Figure 3-3. Inundation - Brown Street Yard - 25 Feet 20
Figure 3-4. Cultural Resources - Brown Street Yard - 50 Feet 22
Figure 3-5. Floodplain - Brown Street Yard - 50 Feet 23
Figure 3-6. Inundation - Brown Street Yard - 50 Feet 24
Figure 3-7. Cultural Resources - Fulton Yard – CSX 26
Figure 3-8. Floodplain - Fulton Yard – CSX 27
Figure 3-9. No Inundation - Fulton Yard – CSX 28
Figure 3-10. Cultural Resources - Fulton Yard - VDOT 31
Figure 3-11. Floodplain - Fulton Yard – VDOT 32
Figure 3-12. Preliminary Floodplain - Fulton Yard – VDOT 33
Figure 3-13. Inundation - Fulton Yard - VDOT 34
Figure 3-14. Cultural Resources - Manchester Yard 36
Figure 3-15. Floodplain - Manchester Yard 37
Figure 3-16. Inundation - Manchester Yard 38
Figure 3-17. Cultural Resources - Valley Road Yard 41
Figure 3-18. Floodplain - Valley Road Yard 42
Figure 3-19. Inundation - Valley Road Yard 43
Figure 4-1. Alternative 1 - Fulton Yard – CSX 46
Figure 4-2. Alternative 2 - Fulton Yard – CSX 48
Figure 5-1. Project Timeline 51

Executive Summary

The Transforming Rail in Virginia program requires significant investments and improvements to CSX mainline track between Richmond and Washington, D.C., as well as additional facilities and services needed to support the proposed increase in passenger rail service in the corridor. One such need is for a new Richmond layover facility to support Amtrak operations, maintenance, and staffing for their expanded services within the CSX corridor.

The Transforming Rail in Virginia program, by virtue of agreement between the Commonwealth and CSX Transportation, specifically requires that a new layover facility south of Acca Yard be operational by 2026.

The Virginia Passenger Rail Authority (VPRA) identified seven potential sites for a new Richmond area layover facility and initiated a pre-NEPA feasibility screening for each site based on the following criteria:

- Potential cultural resource impacts
- Potential floodplain and high intensity storm impacts
- Potential overhead powerline locations or relocations
- Potential right-of-way impacts, including private property acquisitions
- Potential stream and drainage impacts

The screening process identified fatal flaws in five of the seven potential layover facility sites and identified two of the sites, both at Fulton Yard, for further evaluation. **Further evaluation of the two Fulton Yard sites resulted in their combination into a single "Fulton Yard – CSX" site, including an evaluation of conceptual layouts within the combined site. Based on these evaluations, VPRA determined that the least impactful site for a Richmond layover facility was a Fulton Yard – CSX location that avoided traffic and construction impacts on the adjacent CSX facilities. All seven screening locations and their fatal flaw analyses are summarized below.**

FIGURE ES-1. SCREENED LOCATIONS

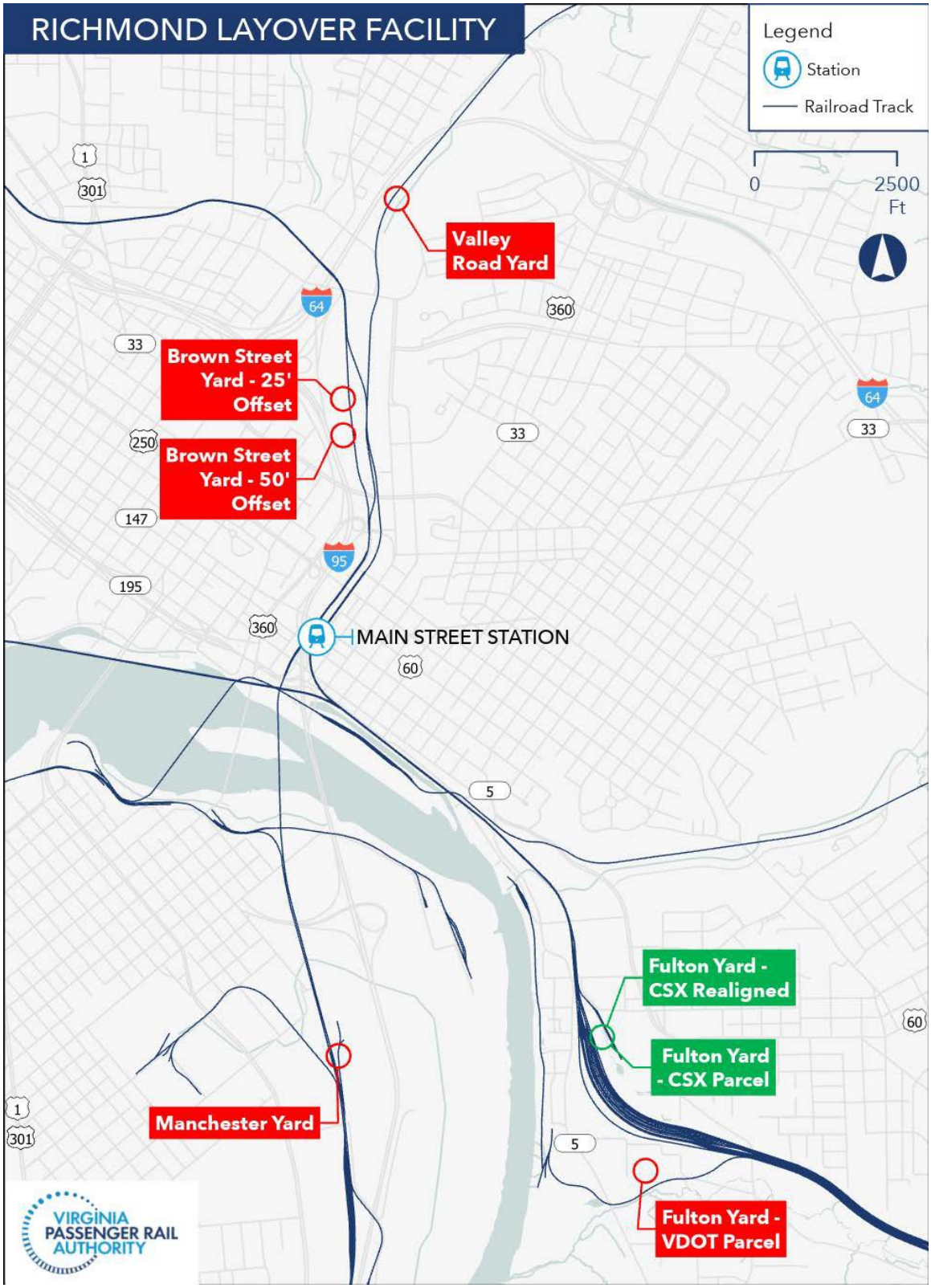


TABLE ES-1. SCREENING SUMMARY

Screening Resource	Brown Street Yard 25 feet	Brown Street Yard 50 feet	Fulton Yard – CSX	Fulton Yard – CSX Realigned	Fulton Yard VDOT*	Manchester Yard	Valley Road Yard
Cultural Resources	✗	✗	●	●	●	✗	✗
Floodplains	✗	✗	●	●	●	✗	✗
Overhead Powerlines	●	●	●	●	●	●	✗
Right-of-way	✗	✗	●	●	●	●	●
Streams	●	●	●	●	●	●	✗
Carry Forward	✗	✗	●	●	✗	✗	✗

1 Overview

Information provided in this section includes an introduction to the Study, a history and background for the Study, and the Study approach.

1.1 Introduction

In 2021, the Governor of Virginia announced that the Commonwealth had finalized a Comprehensive Rail Agreement (CRA) with CSX Transportation (CSXT) to improve reliability and increase rail service in Virginia by reworking passenger and freight rail operations. The new program, known as Transforming Rail in Virginia (TRV), is a rail infrastructure and service improvement program providing a path forward to the separation of passenger and freight rail service in the Richmond, Fredericksburg, and Potomac (RF&P) Corridor and to the preservation of the Buckingham Branch and S-Line rail corridors for future passenger rail service. To achieve these goals, TRV includes the acquisition of right-of-way, track, passenger station facilities, and trackage rights from CSXT. TRV also involves the buildout of infrastructure serving the RF&P Corridor and includes the construction of a new passenger rail layover facility (layover facility) in Richmond, which is the subject of this project.

The Virginia Passenger Rail Authority (VPRA) initiated a Feasibility Study to determine the least impactful location for a layover facility in the Richmond area. The feasibility of potential layover facility sites will be assessed and screened by their ability to meet the elements identified in this document.

This Feasibility Study (the Study) was developed to identify one or more feasible alternatives before implementing the National Environmental Policy Act (NEPA), if necessary. The Study identifies the potential locations for a layover facility, potential site alternatives at each feasible location, the analysis of potential impacts to the existing environment, and the objectives and challenges to be addressed by alternatives development.

1.2 History and Background

As indicated in note 7 of Exhibit D of the CRA, "The Parties will work in good faith to finalize a plan that would allow for the elimination of Phase 1 and Phase 2 deadhead movements by allowing the trains serving Main Street Station to run to Newport News in Phase 1 and building layover tracks, at the Virginia Department of Rail and Public Transportation's (DRPT's) expense, in the CSXT Fulton Yard to accommodate three trains before Phase 2." The Study is the initial step of the "plan" for the elimination of the deadhead movements. Per VPRA's Financial Plan (2022), Phase 1 includes high-priority, near-term projects within the I-95 corridor that are funded for completion by 2026. The activities included in the Financial Plan "will expand and improve passenger and commuter rail service in Virginia and create a vital connection in the national rail network between the Northeast and Southeast Corridors."

To fulfill the objective outlined in the CRA, VPRA prepared the March 2020 Richmond Layover Facility Options Report (the Options Report) to identify potential locations that would meet the design criteria and requirements for the facility. As input to that report, the CRA requires that the proposed VPRA facility provide three yard tracks with approximately 850 feet of storage to accommodate three 10-car trains. This storage capacity is to accommodate operational needs identified in the CRA. Locations identified for further study in the Options Report were:

- Brown Street Yard – 25 feet
- Brown Street Yard – 50 feet
- Fulton Yard – CSX
- Fulton Yard – CSX Realigned
- Fulton Yard – Virginia Department of Transportation (VDOT)
- Manchester Yard

1.2.1 STUDY AREA

Six locations from the Options Report and a seventh location provided by VPRA at the beginning of the Study were the potential locations considered in the Study. Developing a study area at each location required a knowledge of potential site improvements, their potential placement at each location, and a buffer area around site improvements to address unknown conditions, stormwater runoff treatment, and site access.

The Option Report contained layout sketches of potential site improvements and track configurations for each of the six locations. These layout sketches also included potential site access routes and consideration of stormwater best management practices (BMPs). Layout sketches serve as the minimum area required for a layover facility.

Buffer areas were established using Amtrak's ICT L2 Facility Site Plan, a proprietary and confidential document. Dimensions and site improvement elements from this document provided additional areas for improvements as well as buffer areas for potential unknown conditions.

Study areas for each of the seven locations provided the limits of analysis for feasibility screening.

1.2.2 BACKGROUND INFORMATION

In addition to the CRA, VPRA's Financial Plan, and the Options Report, numerous plans and studies have occurred within the vicinity of potential layover locations. Relevant elements to consider and/or accommodate during future alternatives development of the proposed Richmond Layover Facility will be identified, as appropriate at that time. Such plans and studies could include, but are not limited to the following:

- Amtrak Connects US
    - A 15-year plan to expand Amtrack services throughout the US, including Virginia
- DC2RVA Final Environmental Impact Statement (FEIS) and Record of Decision (ROD)
    - NEPA clearance to develop and expand passenger rail service between Washington, DC and Richmond, VA
- City of Richmond - Shockoe Small Area Plan
    - A small area plan focused on future development within the Shockoe neighborhood (an area near the Main Street Train Station), including two of the potential layover facility locations

- Pulse Corridor Plan
    - A corridor plan focused on future development along the Pulse Corridor, including three of the potential layover facility locations
- Richmond 300 Master Plan
    - An update of the City of Richmond's citywide Master Plan
- DRPT 2022 Statewide Rail Plan
    - An update of the Commonwealth's statewide Rail Plan
- Center for Urban and Regional Analysis (CURA): Economic Impact of Passenger Rail Improvements in the Richmond Region - The effects of increased passenger rail service to Main Street Station through 2030
    - A study to "estimate the economic impact of increased passenger rail service and associated infrastructure improvements to Richmond's Main Street Station (RVM) and the larger Richmond region"[1]
- CURA: Shockoe Bottom Memorialization – Community and Economic Impacts
    - A study to "understand the cultural and economic impacts of a commemorative memorial park, museum, and surrounding development in the Shockoe Bottom area of Richmond, Virginia"[2]
- ONE Virginia Commonwealth University (VCU) Master Plan
    - A campus master plan for development of the physical infrastructure
- Lumpkin's Slave Jail Site / Devil's Half Acre Project Site Feasibility Study
    - A feasibility study of the project site to establish space and volume recommendations for the development program
- Neighborhood Resource Center (NRC) Fulton's Greater Fulton Future – Community Vision Agreement 2011
    - A community plan focused on future development in the Fulton Community

---

[1] *MacKenzie, M. (2022, July). Economic impact of passenger rail improvements in the Richmond Region. Retrieved December 23, 2022 from https://cura.vcu.edu/media/cura/CURA-MSS-Economic_Impact_Study_FINAL.pdf*

[2] *VCU Center for Urban and Regional Analysis. (2019, October). Shockoe Bottom Memorialization Community and economic impacts. Retrieved December 23, 2022 from https://docslib.org/doc/2746416/shockoe-bottom-memorialization-community-and-economic-impacts*

- Southeast Rail Plan – Final Report 2020
    - A multi-state rail network plan focused on the development and expansion of high-performance passenger rail in the Southeast United States
- 2021 Commonwealth Corridor Feasibility Study
    - A feasibility study of possible expansion of passenger rail service along the rail corridor from Newport News to New River Valley

These documents informed the Study of potential opportunities and challenges to developing a new layover facility in Richmond.

Richmond has a layover facility at the north end of CSXT's Acca Yard in the Staples Mill Road Station. Previous passenger rail services terminated at Staples Mill Road Station or traveled through Richmond's Main Street Station to terminate in Newport News.

Expanded passenger rail service in the Commonwealth, and specifically between Richmond and Washington, DC, has added Richmond's Main Street Station as a terminal station for passenger rail service. This service causes the passenger train to travel from Main Street Station to Staples Mill Road Station for overnight storage. No passengers are on the train at this time, resulting in what is known as a non-revenue, or deadhead, move. The deadhead move between Main Street Station and Staples Mill Road Station travels approximately 7 miles through the active and congested Acca Yard.

A layover facility south of Acca Yard, or in or near Main Street Station, would eliminate this deadhead movement and is required by the CRA to be in operation by 2026.

The proposed Richmond Layover Facility would be used by Amtrak trains. Therefore, Amtrak has provided input on design requirements for track configuration, platform, facilities, and access roads at the layover facility. According to the Options Report, Amtrak has requested that the design include room for a future fourth track and at least one of the yard tracks be a through track that has two access points to the mainline. Amtrak also provided guidance on track separation as well as site facilities to be utilized during design. Project elements will ultimately be subject to their review and approval and will need to be considered during conceptual design.

1.2.3 SUMMARY OF NEARBY INFRASTRUCTURE PROJECTS

Other challenges and/or opportunities to the development of a layover facility arise from planned, designed, or contracted infrastructure projects in the vicinity of the seven study areas. This summary focuses on rail and road infrastructure projects and includes the following:

- Richmond - I-95 Bridge Rehabilitations – East Broad Street Bridge Rehabilitation
- Richmond - I-95 Corridor Improvements – Maury Street Interchange Improvements
- Richmond/Henrico - I-95/64 Overlap Study
- Henrico - Pedestrian Safety Enhancements on the Virginia Capital Trail (recently completed)
- Richmond - I-95/Maury Street Interchange Improvements (recently completed)
- Virginia Transit Equity and Modernization Study
- 2021 Commonwealth Corridor Feasibility Study
- Transforming Rail in Virginia – Planned Service Enhancements

Capital improvement programs in the City of Richmond and Henrico County include the following projects that may create challenges and/or opportunities to the development of a layover facility:

- Enslaved African Heritage Campus
- East Broad Street Bridge over Ravine Bridge Replacement
- Shockoe Valley Streets Improvement / I-95 Broad Street Area Improvements Project
- Shockoe Bottom Drainage Project (SBD 1-7)
- East Broad Street Gateway – Phase III
- Heritage Center / Lumpkin's Jail (Devil's Half Acre)
- Historic Fulton Community Memorial Park
- Main Street Station Multimodal Transportation Center
- Route 5 Relocation / Williamsburg Road Intersection Improvement
- Shockoe Revitalization Strategy Plan Implementation
- Stone Bistro
- Almond Creek Force Main
- Almond Creek Trunk Sewer Line

1.3 Study Approach

Feasibility studies are a methodical analysis of data and information to assess the feasibility of various options with the objective of eliminating less feasible options and of conducting further analysis of more feasible options. For this Study, the options are the seven potential locations for a layover facility. Methodical analysis for this Study began with developing the Purpose and Need, progressed through the Screening Analysis, and concluded with the Conceptual Designs.

Purpose and Need elements provided an understanding for how the study worked to meet agreement requirements and operational challenges. Screening Analysis provided a method for how the study eliminated locations by identifying fatal flaws that would prevent the facility from being operational in accordance with the agreement requirements. Conceptual designs provided a feasible arrangement of layover facility infrastructure on the most feasible location.

Additional reports that support the feasibility study are included in the appendices. Appendix A contains an environmental review of the most feasible location and is provided to support the next phase of this project. Appendix B contains a cultural resources report of all seven locations and was used in the Screening Analysis. Appendix C contains a right-of-way matrix for the most feasible location indicating the properties within the study area and the areas of potential impacts. Appendix D contains a risk register for the most feasible location indicating potential risks to completing the project on schedule.

1.3.1 PURPOSE AND NEED

This section presents the Purpose and Need elements for the proposed Richmond Layover Facility, which were developed based on agreement requirements and known challenges for operations within the regional rail corridor. Each Purpose statement aligns with and is supported by a detailed existing Need element.

Purpose

Purpose Statement #1: Reduce Deadhead Movements

The proposed Richmond Layover Facility would reduce non-service trips and their associated flow restrictions on the network, thereby improving reliability and capacity of the rail corridor.

Purpose Statement #2: Increase Storage Capacity

The proposed Richmond Layover Facility would provide storage for trains in the Richmond area that is not available today, thereby improving service capacity of the rail corridor.

Purpose Statement #3: Provide a New Layover Facility in Accordance with Approved Plans and Providers

The proposed Richmond Layover Facility would be designed to achieve the goals and objectives of the CRA and meet Amtrak's requirements, as well as accommodate and/or not preclude prior approved plans and studies in the region.

Need

Need Element #1: Deadhead (Non-Service) Movements Reduce Efficiency, Create Flow Restriction in the Vicinity of Acca Yard, and Reduce the Potential for Increased Service

Currently, deadhead movements (i.e., non-service trips) occur two times per day in the Richmond area. To reach Richmond Main Street Station for a morning departure, empty train(s) that must be stored overnight at the Richmond Staples Mill Station must make a deadhead movement south to pick up passengers at Richmond Main Street Station, located approximately 7.5 miles away. Similarly, in the evening, train(s) that terminate service at the Richmond Main Street Station must make an empty deadhead trip north to Richmond Staples Mill Station to be stored overnight. While these deadhead movements cannot be eliminated completely, reduction of the length and duration of the deadhead movements is needed to improve rail operations in the region by removing non-service movements from the network.

Acca Yard is CSXT's major freight yard in the Richmond area serving the CSXT rail network in Virginia and beyond. While recent improvements removed mainline tracks from inside the yard, the empty passenger trains that must make the previously mentioned deadhead movements between the two stations in Richmond not only must cross through Acca Yard, but also cross from the railroad east track to the railroad west track. This crossing between tracks is a flow restriction to the freight and passenger rail network operations that occurs twice per day under current conditions. Elimination of these movements through/near Acca Yard is needed to improve rail operations in the region.

Need Element #2: Insufficient Storage Capacity for Passenger Trains within the Regional Corridor

Early morning passenger train(s) originating at Richmond Main Street Station are stored overnight on the pocket track at Richmond Staples Mill Station. There is currently limited capacity to store a single train overnight at Richmond Staples Mill Station. A storage site with greater capacity and in closer proximity to service origination/termination points is needed to improve rail capacity in the region.

Need Element #3: Requirements of the Comprehensive Rail Agreement (CRA)

Meeting the schedule for completion of the layover facility by 2026, which was established in the agreement with CSXT, is a critical component in the development and screening of potential alternative site location(s) in the Feasibility Study. For example, the complexity of agreements that could be required to acquire right-of-way; additional studies, specific permits, and/or regulatory agency involvement that could be required as part of the future environmental process; and/or the potential for construction of any associated infrastructure beyond the project itself would need to be considered and minimized to meet project milestones, while not compromising the intended benefits or requirements of layover facility design.

1.3.2 SCREENING ANALYSIS

This section describes the Screening Analysis performed for the proposed Richmond Layover Facility. The purpose of the Screening Analysis was to identify potential fatal flaws in the seven project locations at a level of detail appropriate to support the Feasibility Study and to identify the most feasible and least impactful location(s) for a new layover facility that aligns with the Purpose and Need for the project. All seven of the locations align with the Purpose and Need. The seven locations that entered the screening analysis are shown on **Figure 1-1** and identified and described as follows:

Brown Street Yard – 25 feet. Located north of Main Street Station in Richmond, Virginia at approximately milepost (MP) SRN 1.0 and 25 feet west of the CSXT mainline.

Brown Street Yard – 50 feet. Located north of Main Street Station in Richmond, Virginia at approximately MP SRN 1.0 and 50 feet west of the CSXT mainline.

Fulton Yard – CSX. Located on the CSXT Peninsula Subdivision near Richmond, Virginia at approximately MP CA 83.0, 2 miles east of Main Street Station, and north of the existing Fulton Yard.

Fulton Yard – CSX Realigned. Located on the CSXT Peninsula Subdivision near Richmond, Virginia at approximately MP CA 83.0, 2 miles east of Main Street Station, and north of the existing Fulton Yard. This location realigns the existing transload yard.

Fulton Yard – VDOT. Located on the CSXT Peninsula Subdivision near Richmond, Virginia at approximately MP CA 83.0, 2 miles east of Main Street Station, and south of the existing Fulton Yard.

Manchester Yard. Located on the CSXT Bellwood Subdivision near Richmond, Virginia at approximately MP S 1.2 and approximately 1.2 miles south of Main Street Station.

Valley Road Yard. Located on the Buckingham Branch Railroad in Richmond, Virginia at approximately MP 86.0 and approximately 1.4 miles north of Main Street Station.

FIGURE 1-1. OVERVIEW OF LOCATIONS

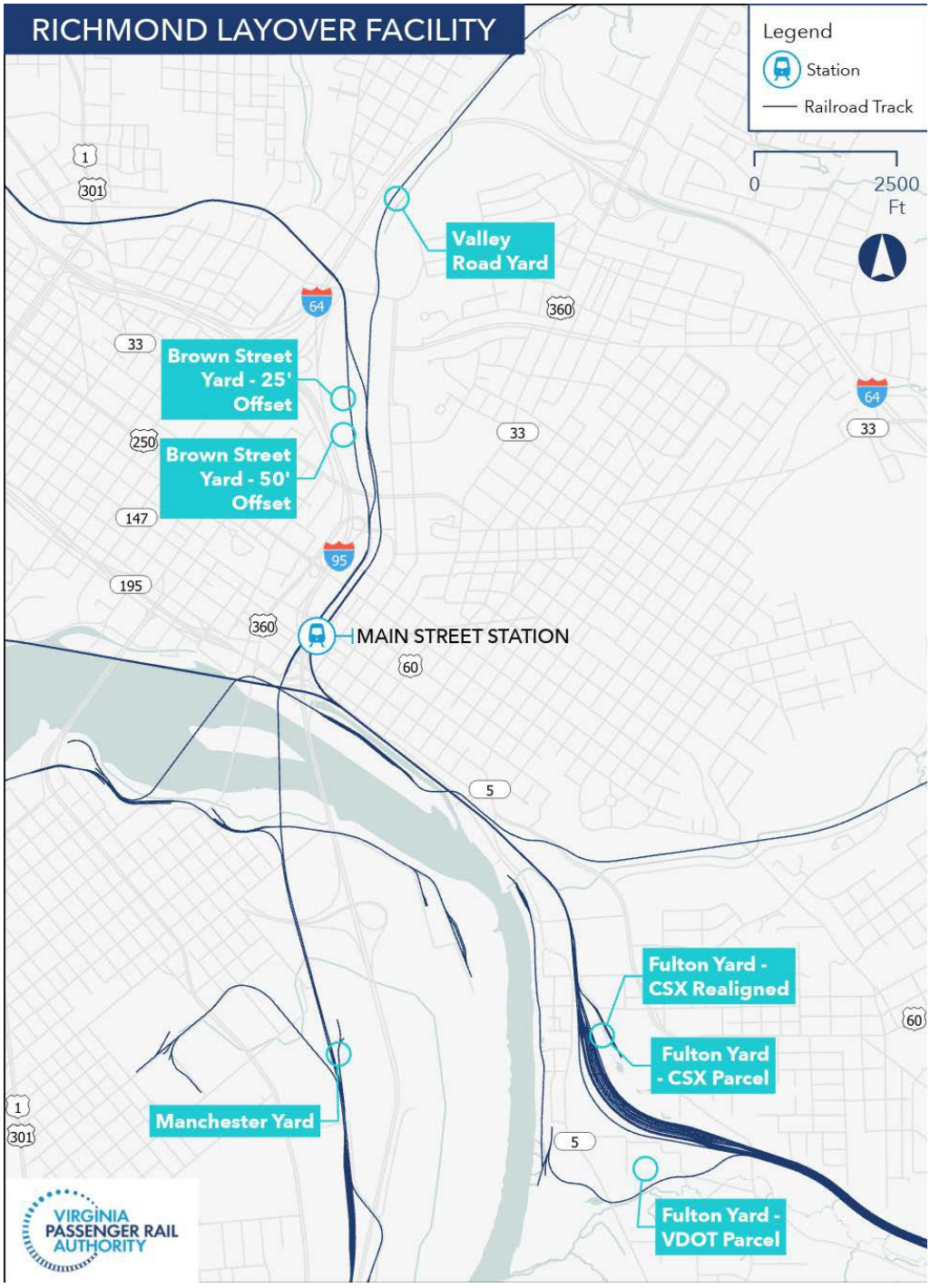


Table 1-1 – Screening Analysis Criteria was developed based on the scope of work for, and workshops during the Study. Screening criteria in **Table 1-1** are intended to be used in an initial screening of seven study areas to provide a comparative basis for determining the initial feasibility of the locations. The impacts to these resources will be considered cumulatively to create an initial feasibility determination.

TABLE 1-1. SCREENING ANALYSIS CRITERIA

Analysis Criteria (Alphabetical)	Inventory to Support Screening
Cultural Resources	Potential for effects within Area of Potential Effect (APE)
Floodplains	Extent of Presence within Study Area (%) Depth of potential inundation if present Presence of floodways
Overhead Powerlines	Presence within Study Area (Yes/No) Location of lines if present Fatal flaw, avoidable, relocatable
Right-of-Way	Extent of different types of ownership within Study Area (number by type)
Streams	Presence of streams within Study Area Location of stream(s) if present

Methodology, analysis, and a summary of the screening is further provided in Section 3.

1.3.3 CONCEPTUAL DESIGNS

This section describes the development of Conceptual Designs for the proposed Richmond Layover Facility. The purpose of the conceptual designs was to further analyze potential sites within the project locations to identify the most feasible and least impactful site(s) for a new layover facility that aligns with the Purpose and Need for the project. Conceptual Designs were prepared for the alternatives within the most feasible project locations identified in the Screening Analysis.

Alternatives were designed based on the ability to accommodate the following infrastructure outlined in the Amtrak Level II Facility Guidelines:

- Three 850-foot storage tracks and a future fourth 850-foot storage track
- Direct connections to a mainline track at both ends to at least one of the tracks
- Two 800-feet-long by approximately 16-feet-wide platforms
- Track centers
    - 26 feet between tracks 1 and 2
    - 15 feet between tracks 2 and 3
    - 26 feet between tracks 3 and 4
- Work trailer with approximately 720 square feet
- Mechanical office trailer
- Area for four 40-foot-long storage containers
- Parking area with approximately 4,620 square feet
- Service and cleaning facilities
- Truck-based services, e.g., water, waste, fueling
- Truck access from designated truck routes
- Minor repairs from the platforms
- Utility service connections
- Wayside power and compressed air
- Area for moveable scaffolding

- Two high-level access locations per track for train access
- Yard and task lighting
- Access roads that are a minimum of 20 feet wide to accommodate WB-62 access for on-site fueling
- Site access roads between tracks that are a minimum of 10 feet wide for passenger vehicle access
- Stormwater BMPs access road(s) that are 10 feet wide from the limits of the BMP

2 Existing Conditions

Information provided in this section includes a general overview of the existing conditions at each of the seven locations, as shown in **Figure 1-1** and the transportation infrastructure supporting access to each location. Figures illustrating existing conditions at each location are in Section 3.2, Location Analysis.

2.1 Brown Street Yard – 25 feet & 50 feet Locations

These study areas are on the CSXT Bellwood Subdivision north of Main Street Station in Richmond, Virginia at approximately MP SRN 1.0 and 25 feet west of the CSXT mainline. I-95 is the west boundary of the location. Brown Street is south, and Hospital Street is north of the location. The shape of the study areas vary due to the difference in offset distances from the CSXT mainline. Brown Street Yard – 25 feet is a 24.8 acre study area. Brown Street Yard – 50 feet is a 24.6 acre study area.

Brown Street Yard is in an area of Richmond known as Shockoe Bottom. This area was a ravine between two of Richmond's seven hills with Shockoe Creek at the bottom of the ravine. Over time, Shockoe Creek was diverted into a large drainage culvert and the ravine was filled. Shockoe Bottom was an industrial area that is currently changing to a mix of industrial, commercial, and residential uses.

Topography at this location is gently sloping in the north-south direction. However, the location has a greater slope from the I-95 embankment down to the CSXT mainline.

Hydrology at this location is dominated by two features, the Shockoe Creek culvert and the James River floodwall. Drainage flows from the top of the hill to the west through a system of inlets and culverts into the Shockoe Creek culvert. At the James River floodwall, the Shockoe Creek culvert empties into a pumpstation to be pumped into James River. The James River floodwall serves to keep the James River from flooding Shockoe Bottom. However, there were occasions when the floodgates were closed and the floodwall caused Shockoe Bottom to flood.

Property ownership at this location is largely CSXT, VDOT, VPRA, and the City of Richmond. There are three private property owners in addition to CSXT along the access to the location.

This location is along the west side of the CSXT mainline between Main Street Station and Acca Yard. Future high speed passenger trains are planned for this mainline. A layover facility at this location should consider the additional train traffic as well as the need to access both sides of Main Street Station from the facility.

Current Amtrak passenger rail equipment will be able to access the location from either end using a through track connected to the mainline at both ends. However, a locomotive will need to be added to the trailing end of the passenger train to pull it in the reverse direction or the train will need to use a railroad wye to turnaround. Future Amtrak passenger rail equipment has a locomotive at both ends in what is called a push-pull configuration. Push-pull trains do not turnaround and do not require a wye to reverse directions.

This location has access to and from I-95 in both directions. Northbound trucks will exit I-95 using the 7th Street exit to 7th Street, Hospital Street, Oliver Hill Way (US 360), and Brown Street. Southbound trucks will exit I-95 using the I-64 east exit to 5th Street, Jackson Street, 7th Street,

Hospital Street, Oliver Hill Way (US 360), and Brown Street. Trucks returning to I-95 will take Brown Street to Oliver Hill Way (US 360), Broad Street (US 250), and the entrance ramps to north and south I-95.

2.2 Fulton Yard – CSX & CSX Realigned Locations

This study area is on the CSXT Peninsula Subdivision near Richmond, Virginia at approximately MP CA 83.0, 2 miles east of Main Street Station, and north of the existing Fulton Yard. The CSXT mainline is the west and south boundary of the location. Goddin Street, a railroad transloading facility, and industrial properties are the east boundary of the location. Orleans Street is north of the location. The combined study areas cover 22.7 acres.

Fulton Yard - CSX is in the Fulton community east of Richmond. This area was an industrial area that is currently changing to a mix of industrial, commercial, and residential uses.

Topography at this location is gently sloping in all directions. However, Orleans Street passes under the railroad just north of the turnout serving the location.

Hydrology at this location flows to the east and south. The location is generally at a crest between two drainage features. Aerial photography appears to indicate a potential low area at the southeast end of the location that may have held stormwater runoff.

Property ownership at this location is largely CSXT, with four other private property owners and an undeveloped road right-of-way.

This location is along the east side of the CSXT mainline between Main Street Station and the eastern end of Fulton Yard. A layover facility at this location will access the east side of Main Street Station directly from the facility. Access to the west side of Main Street Station, if needed, will require movements through an existing crossover between tracks followed by a backing move into the station.

Current Amtrak passenger rail equipment will be able to access the location from either end using a through track connected to the mainline at both ends. However, a locomotive will need to be added to the trailing end of the passenger train to pull it in the reverse direction or the train will need to use a railroad wye to turnaround. Future Amtrak passenger rail equipment has a locomotive at both ends in what is called a push-pull configuration. Push-pull trains do not turnaround and do not require a wye to reverse directions.

This location has access to and from I-95 in both directions. Northbound trucks will exit I-95 using the Broad Street exit to Oliver Hill Way (US 360), Broad Street (US 250), 18th Street, Main Street (US 60), Williamsburg Avenue, and Goddin Street. Southbound trucks will exit I-95 using the I-64 east exit to 5th Street, Jackson Street, 7th Street, Hospital Street, Oliver Hill Way (US 360), Broad Street (US 250), 18th Street, Main Street (US 60), Williamsburg Avenue, and Goddin Street. Trucks returning to I-95 will take Goddin Street to Williamsburg Avenue, Main Street (US 60), 18th Street, Broad Street (US 250), and the entrance ramps to north and south I-95.

2.3 Fulton Yard – VDOT

This study area is on the CSXT Peninsula Subdivision near Richmond, Virginia at approximately MP CA 83.0, 2 miles east of Main Street Station, and south of the existing Fulton Yard. The CSXT Fulton Yard is the north boundary of the location. Bickerstaff Road is the east boundary of the location. Private properties are south and west of the location. The study area covers 25.3 acres.

Fulton Yard – VDOT is in the Fulton community east of Richmond. This area is an industrial area.

Topography at this location is gently sloping away from Fulton Yard in a north-south direction. However, the slope steepens approaching the stream south of the location.

Hydrology at this location flows to the south and west. The location is generally on the south slope of the crest between two drainage features.

Property ownership at this location is largely the Commonwealth of Virginia (VDOT), with five other private property owners and undeveloped road rights-of-way.

This location is along the west side of the CSXT mainline between Main Street Station and the eastern end of Fulton Yard. A layover facility at this location will access the east side of Main Street Station by crossing the tracks to Fulton Yard and the western mainline to get to the eastern mainline and the east side of Main Street Station. Access to the west side of Main Street Station, if needed, will require movements through an existing crossover between tracks followed by a backing move into the station.

Current Amtrak passenger rail equipment will be able to access the location from either end using a through track connected to the mainline at both ends. However, a locomotive will need to be added to the trailing end of the passenger train to pull it in the reverse direction or the train will need to use a railroad wye to turnaround. Future Amtrak passenger rail equipment has a locomotive at both ends in what is called a push-pull configuration. Push-pull trains do not turnaround and do not require a wye to reverse directions.

This location has access to and from I-95 in both directions. Northbound trucks will exit I-95 using the Broad Street exit to Oliver Hill Way (US 360), Broad Street (US 250), 18th Street, Main Street (US 60), and Bickerstaff Road. Southbound trucks will exit I-95 using the I-64 east exit to 5th Street, Jackson Street, 7th Street, Hospital Street, Oliver Hill Way (US 360), Broad Street (US 250), 18th Street, Main Street (US 60), and Bickerstaff Road. Trucks returning to I-95 will take Bickerstaff Road to Main Street (US 60), 18th Street, Broad Street (US 250), and the entrance ramps to north and south I-95.

2.4 Manchester Yard

This study area is on the CSXT Bellwood Subdivision in Richmond, Virginia at approximately MP S 1.2 and approximately 1.2 miles south of Main Street Station. The CSXT mainline is the west boundary of the location. Goodes Street is south of the location and the Maury Street interchange is north of the location. Private properties are east of the location. The study area covers 15.4 acres.

Manchester Yard is in Manchester, south of Richmond. This area is an industrial area.

Topography at this location is relatively flat in all directions. However, there is a levee east of the site.

Hydrology at this location flows to the north and west away from the levee. The location is in a modified drainage area due to the levee.

Property ownership at this location is largely five private property owners, including CSXT, with smaller areas owned by the Commonwealth of Virginia.

This location is along the east side of the CSXT mainline between Bellwood Yard and Main Street Station. Future high speed passenger trains are planned for this mainline. A layover

facility at this location will access the west side of Main Street Station and should consider the additional train traffic. Access to the east side of Main Street Station, if needed, will require movements through an existing crossover between tracks followed by a backing move into the station. It should be noted that passenger trains do not currently use the Bellwood Subdivision. Further investigation is required to determine if a positive train control system (PTC) will be required to make a deadhead move from Main Street Station to this location.

Current Amtrak passenger rail equipment will be able to access the location only from the north end using a stub-end track connected to the mainline. If there is congestion in the yard or along the western mainline, the passenger train will be confined to the layover facility until the congestion clears. A locomotive will need to be added to the trailing end of the passenger train to pull it in the reverse direction or the train will need to use a railroad wye to turnaround. Future Amtrak passenger rail equipment has a locomotive at both ends in what is called a push-pull configuration. Push-pull trains do not turnaround and do not require a wye to reverse directions.

This location has access to and from I-95 in both directions. Northbound and southbound trucks will exit I-95 using the Maury Street exit to Maury Street, E 4th Street, and Gordon Avenue. Trucks returning to I-95 will take Gordon Avenue to E 4th Street and the Maury Street interchange to north and south I-95.

2.5 Valley Road Yard

This study area is on the Buckingham Branch Railroad (BBRR) in Richmond, Virginia at approximately MP 86.0 and approximately 1.4 miles north of Main Street Station. The BBRR mainline is the west boundary of the location. Hospital Street is south and I-64 is north of the location. The study area covers 22.4 acres.

Valley Road Yard is at the northern end of an area of Richmond known as Shockoe Bottom. This area was a ravine between two of Richmond's seven hills with Shockoe Creek at the bottom of the ravine. Over time Shockoe Creek was diverted into a large drainage culvert and the ravine was filled. Shockoe Bottom was an industrial area that is currently changing to a mix of industrial, commercial, and residential uses. A tributary of Shockoe Creek runs along the length of the location and bisects the study area.

Topography at this location is gently sloping in the north-south direction. However, the location has a steep slope from the Shockoe Creek tributary to the private properties east of the location.

Hydrology at this location is dominated by the Shockoe Creek tributary. Drainage flows from the railroad east to the tributary and from the private properties west to the tributary.

Property ownership at this location is largely the City of Richmond with CSXT, VDOT, and three private property owners also within the study area. Access to the location from Hospital Street is across CSXT and City of Richmond properties.

This location is along the east side of the BBRR mainline between Main Street Station and Doswell. A layover facility at this location should consider the need to access both sides of Main Street Station from the facility.

Current Amtrak passenger rail equipment will be able to access the location from either end using a through track connected to the mainline at both ends. However, a locomotive will need to be added to the trailing end of the passenger train to pull it in the reverse direction or the train will need to use a railroad wye to turnaround. Future Amtrak passenger rail equipment has

a locomotive at both ends in what is called a push-pull configuration. Push-pull trains do not turnaround and do not require a wye to reverse directions.

This location has access to and from I-95 in both directions. Northbound trucks will exit I-95 using the 7th Street exit to 7th Street and Hospital Street. Southbound trucks will exit I-95 using the I-64 east exit to 5th Street, Jackson Street, 7th Street, and Hospital Street. Trucks returning to I-95 will take Hospital Street to Oliver Hill Way (US 360), Broad Street (US 250), and the entrance ramps to north and south I-95.

3 Screening Analysis

Information provided in this section describes the analysis methodology, the analysis by location, and a summary of the Screening Analysis results.

3.1 Methodology

The analysis methodology identified known site conditions with potentially lengthy coordination processes or notably higher environmental impacts than other location options. Since the CRA requires that the layover facility be operational by 2026, lengthy coordination processes that could prevent facility operations by 2026 were considered a fatal flaw.

Conditions considered in this screening for fatal flaws included:

- Cultural Resources – potential for effects to cemeteries, historic districts, archaeological sites, and historic properties as identified in the attached Richmond Layover Preliminary Cultural Resource Data prepared by Dovetail and dated November 15, 2022
- Floodplains – potential for effects from 0.2% flood hazards, 1% flood hazards, and inundation using approved FEMA floodplain mapping and considering preliminary FEMA floodplain mapping available at the time of this analysis
- Overhead Powerlines – potential for effects from/to existing local distribution lines and/or high voltage transmission lines
- Right-of-way – potential for effects related to acquisition of private properties delaying construction
- Streams – potential for effects to streams requiring U.S. Army Corps of Engineers approval and permitting

Desktop investigations of site conditions used existing and readily available aerial mapping, geospatial mapping, and environmental data. Additional databases obtained through project-specific coordination with local, state, and federal agencies were included in the analysis. An inventory of resources was developed to identify potential impacts resulting in one or more fatal flaws. This methodology provides an appropriate framework and process as part of VPRA's pre-NEPA consideration of locations in the feasibility stage and could carry forward into a future NEPA phase, should NEPA clearance be required. No fieldwork, detailed surveys, delineations, or transportation modeling that are typically associated with formal NEPA studies were included as part of this Screening Analysis. These activities will be performed for the selected location at a later date if it is determined that NEPA clearance is required.

3.2 Location Analysis

Each location was analyzed using the methodology described above resulting in the following findings.

3.2.1 BROWN STREET YARD – 25 FEET

Cultural Resources

Figure 3-1 shows that this location is adjacent to the Shockoe Hill African American Burying Ground. The cemetery is eligible for the National Register of Historic Places (NRHP) and may extend into the study area as the current boundaries are based on map

projections only; no archaeology has been performed on the resource to verify interment locations. Shockoe Hill Historic District is a historic property of note that may be prohibitive to the use of this location. Interments may be located outside of the resource boundaries and within the project area, thus the project has the potential to have a direct impact on this resource. In addition, indirect impacts through the introduction of additional auditory, visual, and vibration elements to this sensitive site may diminish the characteristics that render this property eligible for the NRHP. Both descendants and public interest groups have expressed concerns about improvements within the vicinity of this resource during previous DRPT/VPRA projects. Given that the extent of the impacts on this significant resource are unknown, as well as previous notes of concern regarding rail projects from vested parties, cultural resources may preclude consideration of this alternative.

Floodplains

Figure 3-2. Floodplain - Brown Street Yard - 25 Feet shows that this location is approximately 50% covered by 1% flood hazard areas with approximately 2 feet of inundation over that area. Approximately 60% is covered by 0.2% flood hazard areas with approximately 5 feet of inundation.

Figure 3-3 shows a cross-section of the location indicating the depths of inundation.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-1 also shows that this location will potentially impact two public properties and 15 private properties. Multiple private properties have the same owner according to tax records.

Streams

Figure 3-2 also shows that this location is adjacent to the Shockoe drainage basin with potential impacts to streams resulting from construction activities and stormwater runoff. Streams are identified as hydrographic features on **Figure 3-2**.

Recommendation

A combination of the following present a fatal flaw to completing a layover facility on this location by 2026:

- Potential cultural resource impacts
- Floodplain impacts and inundation of property, buildings, and equipment
- 15 private property acquisitions

Brown Street Yard – 25 Feet will not be carried forward for further consideration as a feasible location for a layover facility.

FIGURE 3-1. CULTURAL RESOURCES - BROWN STREET YARD - 25 FEET

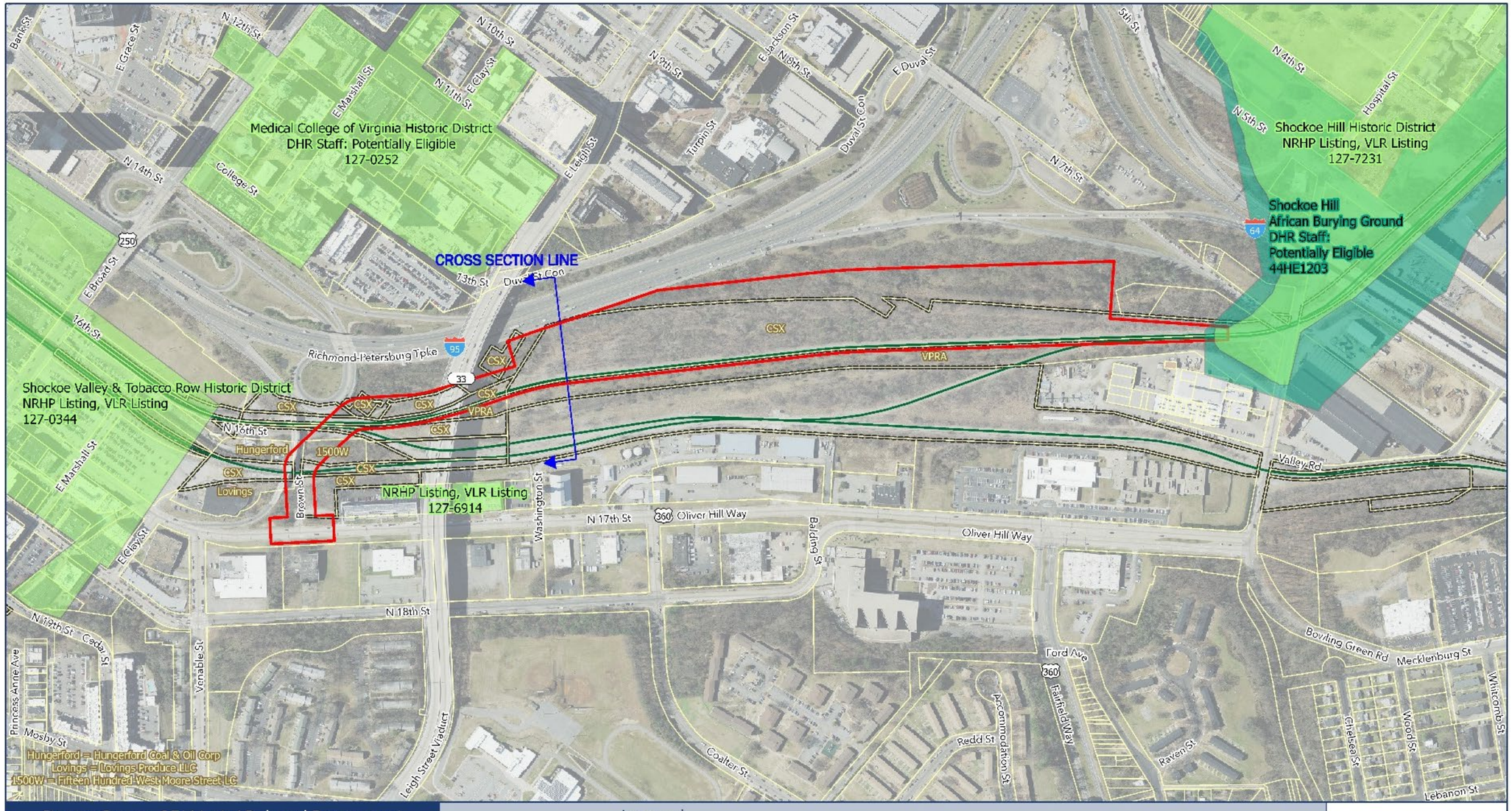
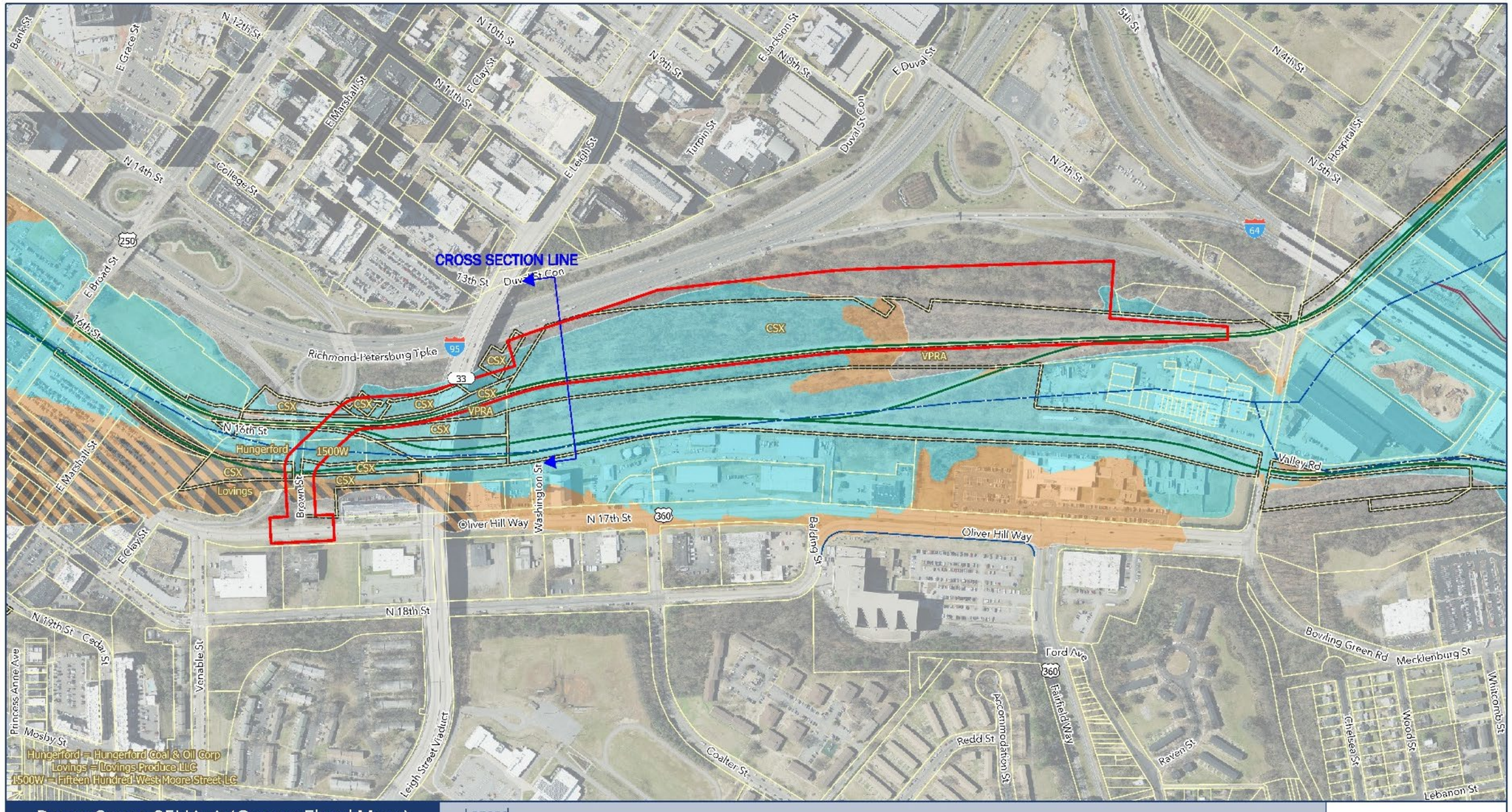


FIGURE 3-2. FLOODPLAIN - BROWN STREET YARD - 25 FEET



Brown Street, 25' Limit (Current Flood Maps)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: City of Richmond - National Historic Districts, Orthoimagery, Parcel Data, FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines

Legend

- Study Area
- CSX Owned Parcel
- Parcel Boundary
- Railroad Track
- Power Transmission Line

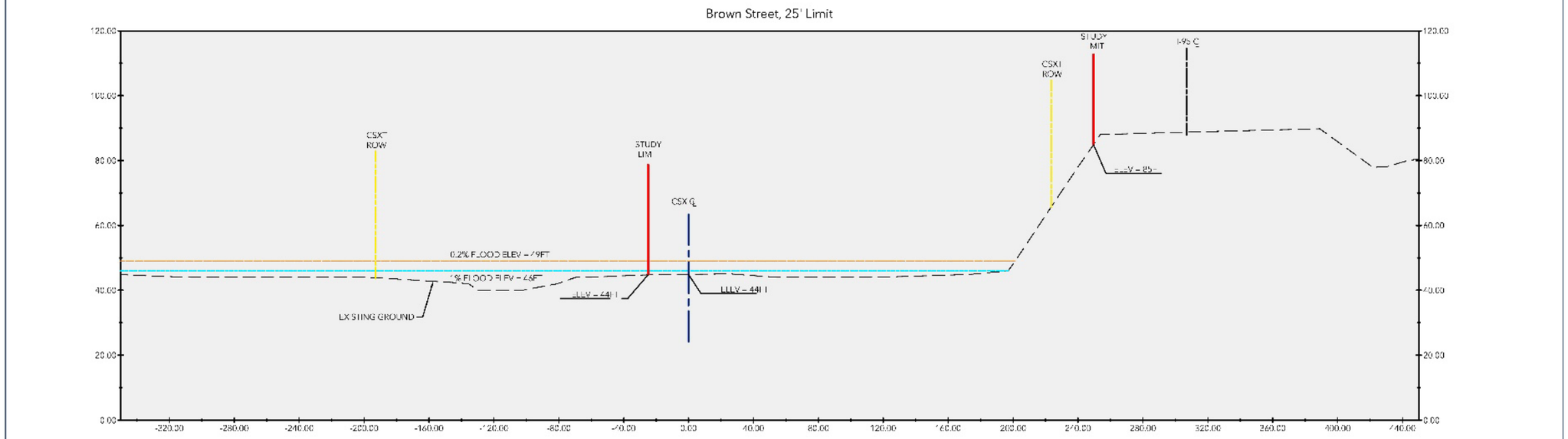
Flood Zones (Currently Approved)

- 1% Annual Chance Flood Hazard Area (Zone A, Zone AE)
- 0.2% Annual Chance Flood Hazard Area (Zone X shaded)
- Area with Reduced Flood Hazard due to Accredited Levee System
- Area of Minimal Flood Hazard (Zone X, unshaded)
- Profile Baseline (FEMA, dashed line)
- Hydrographic Feature (FEMA, solid line)

0 400 Ft

VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-3. INUNDATION - BROWN STREET YARD - 25 FEET

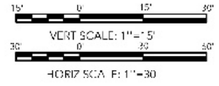


Brown Street, 25' Limit (Current Flood Maps)

Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: City of Richmond - National Historic Districts, Ortoimagery, Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines



VIRGINIA PASSENGER RAIL AUTHORITY

3.2.2 BROWN STREET YARD – 50 FEET

Cultural Resources

Figure 3-4 shows that this location is adjacent to the Shockoe Hill African American Burying Ground. The cemetery is eligible for the NRHP and may extend into the study area. As noted above, the boundaries of this resource were created using historic maps. No archaeological studies have been performed to verify the location of interments, and it is probable that graves extend into the current project area based on historic data. The project has the potential to render both direct and indirect effects to this sensitive and significant resource.

Floodplains

Figure 3-5 shows that this location is approximately 50% covered by 1% flood hazard areas with approximately 2 feet of inundation over that area. Approximately 60% is covered by 0.2% flood hazard areas with approximately 5 feet of inundation.

Figure 3-6 shows a cross-section of the location indicating the depths of inundation.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-4 also shows that this location will potentially impact two public properties and 14 private properties.

Streams

Figure 3-5 also shows that this location is adjacent to the Shockoe drainage basin with potential impacts to streams resulting from construction activities and stormwater runoff. Streams are identified as hydrographic features on **Figure 3-5**.

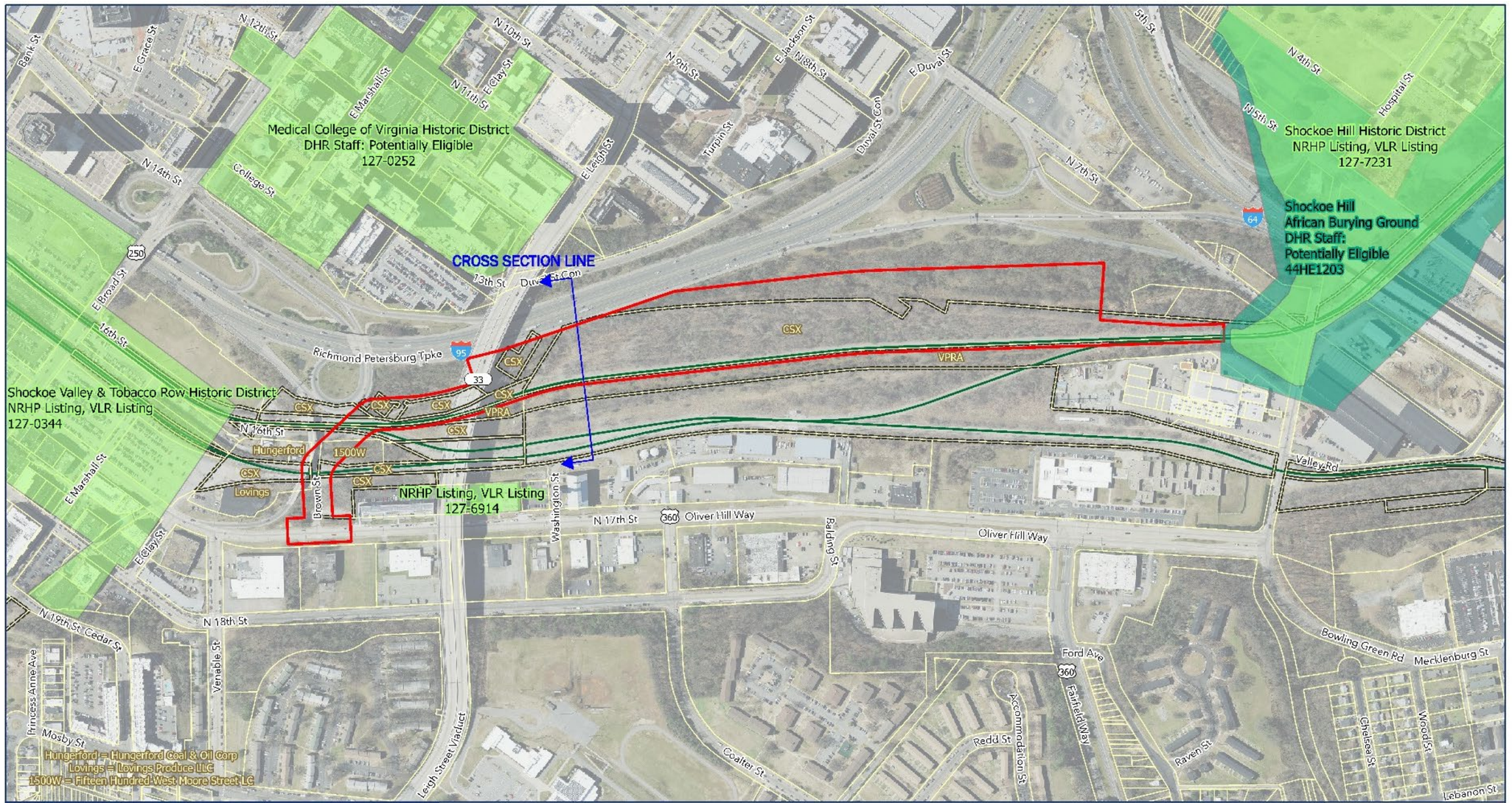
Recommendation

A combination of the following present a fatal flaw to completing a layover facility on this location by 2026:

- Potential cultural resource impacts
- Floodplain impacts and inundation of the property, buildings, and equipment
- 14 private property acquisitions

Brown Street Yard – 50 Feet will not be carried forward for further consideration as a feasible location for a layover facility.

FIGURE 3-4. CULTURAL RESOURCES - BROWN STREET YARD - 50 FEET



Brown Street, 50' Limit (Cultural Resources)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources:
City of Richmond - Orthoimagery, Parcel Data
Dovetail Cultural Resource Group - Cultural Resources
DRPT - Rail Infrastructure Database

Legend
- Study Area
- CSX Owned Parcel
- Parcel Boundary
- Railroad Track
- Architectural Resource
- Archaeological Site

0 400 Ft

VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-5. FLOODPLAIN - BROWN STREET YARD - 50 FEET

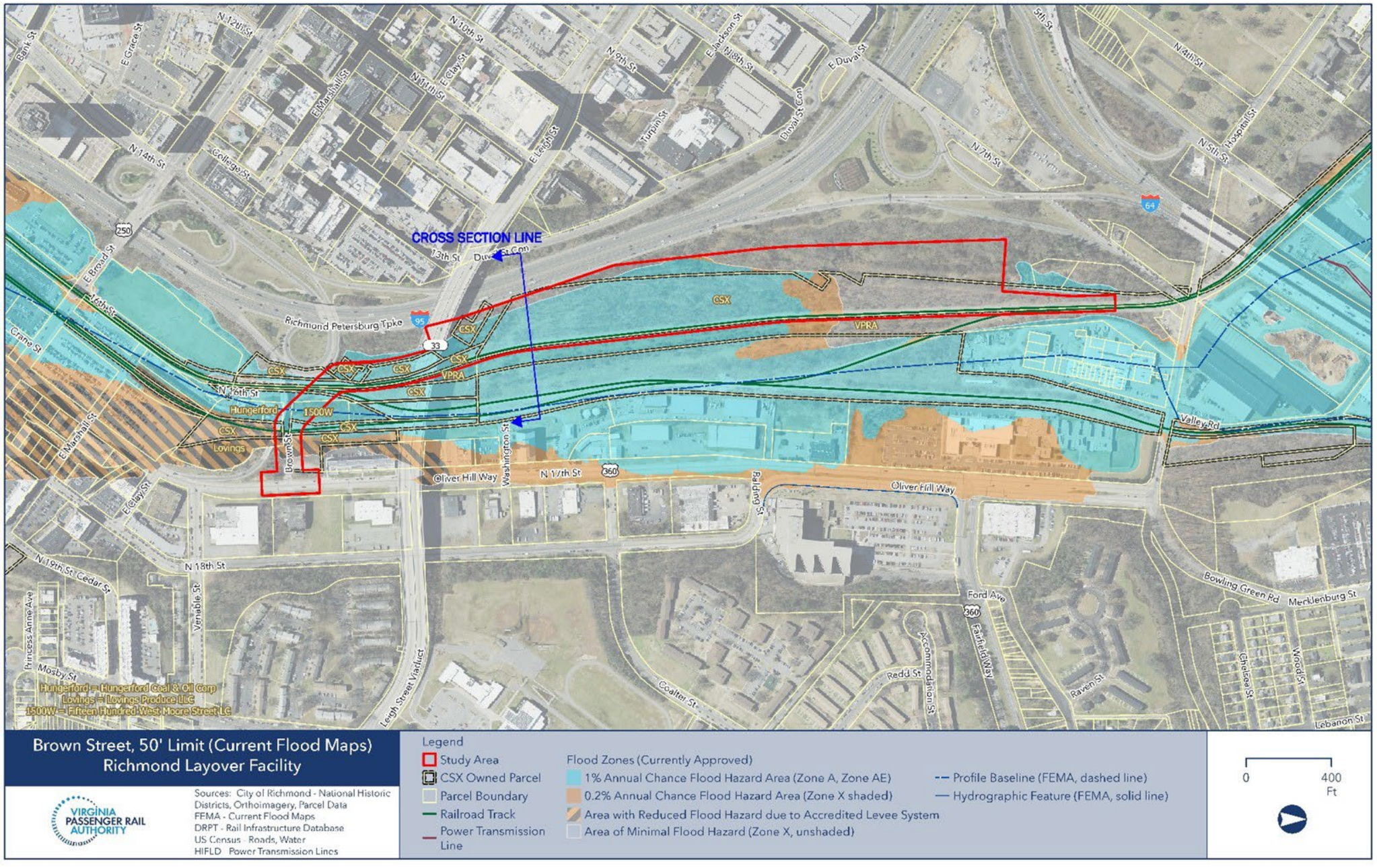


FIGURE 3-6. INUNDATION - BROWN STREET YARD - 50 FEET

Brown Street, 50' Limit (Current Flood Maps)

Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: City of Richmond - National Historic Districts, Orthoimagery, Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines

VERT SCALE: 1"=15'
HORIZ SCALE: 1"=30'

VIRGINIA PASSENGER RAIL AUTHORITY

3.2.3 FULTON YARD – CSX

Due to the relatively similar study areas of Fulton Yard – CSX and Fulton Yard – CSX Realigned, the study areas of the two locations were combined.

Cultural Resources

Figure 3-7 shows that this location is in an industrial area near Richmond. There are historic properties within and adjacent to this location, but the presence of these resources is not considered prohibitive for this location because the project would be consistent with other long-time industrial uses in the area.

Floodplains

Figure 3-8 shows that this location is not currently covered by a flood hazard area, nor is there the potential for inundation.

Figure 3-9 shows a cross-section of the location.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-7 also shows that this location will potentially impact 10 private properties.

Streams

Figure 3-8 also shows that this location is near the James River but will not have potential impacts to streams. Streams are identified as hydrographic features on **Figure 3-8**.

Recommendation

This location does not have fatal flaws revealed by the screening criteria. The number of potentially impacted properties does not vary substantially from the other locations.

Fulton Yard – CSX will be retained for further consideration as a feasible location for a layover facility.

FIGURE 3-7. CULTURAL RESOURCES - FULTON YARD – CSX

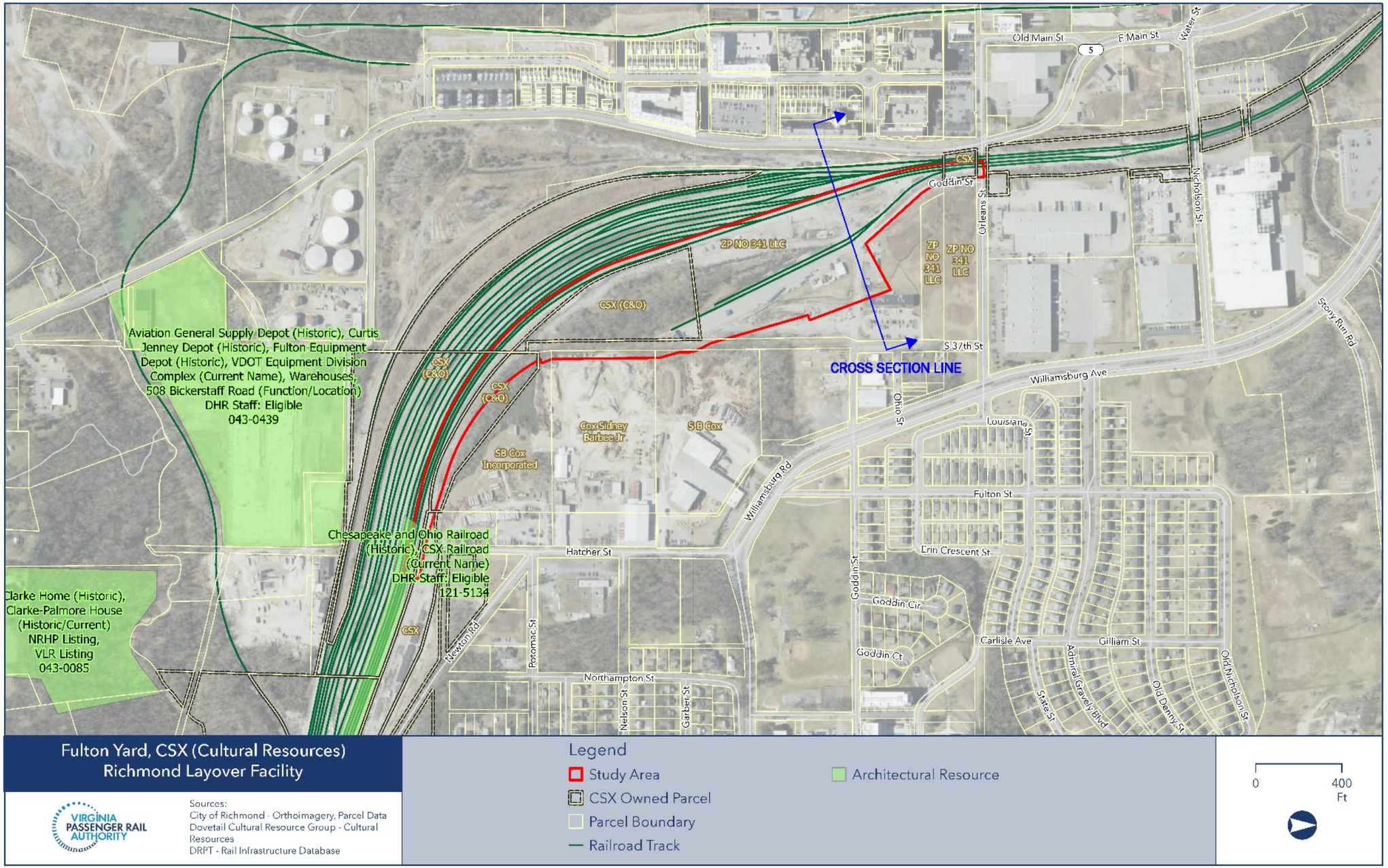
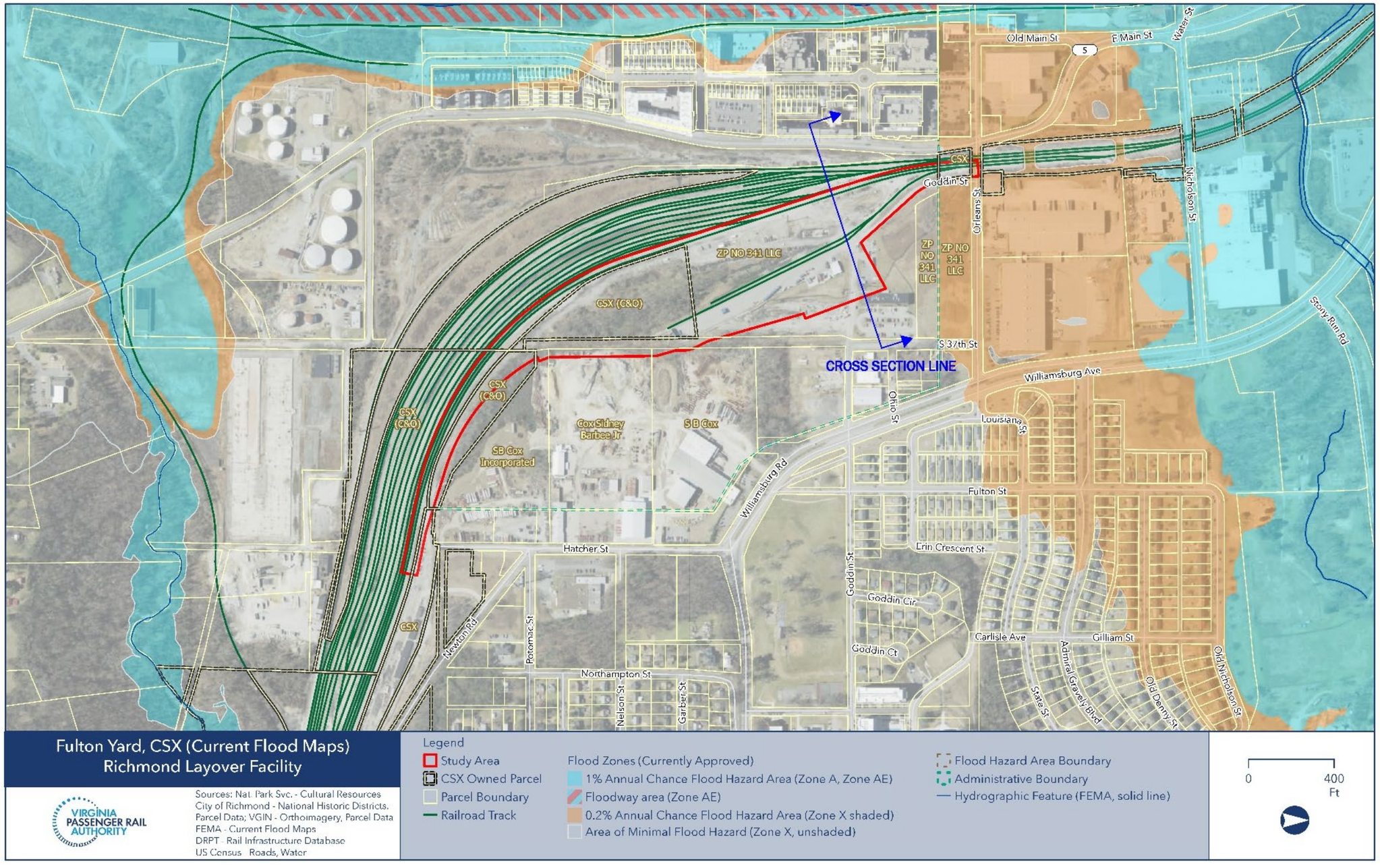
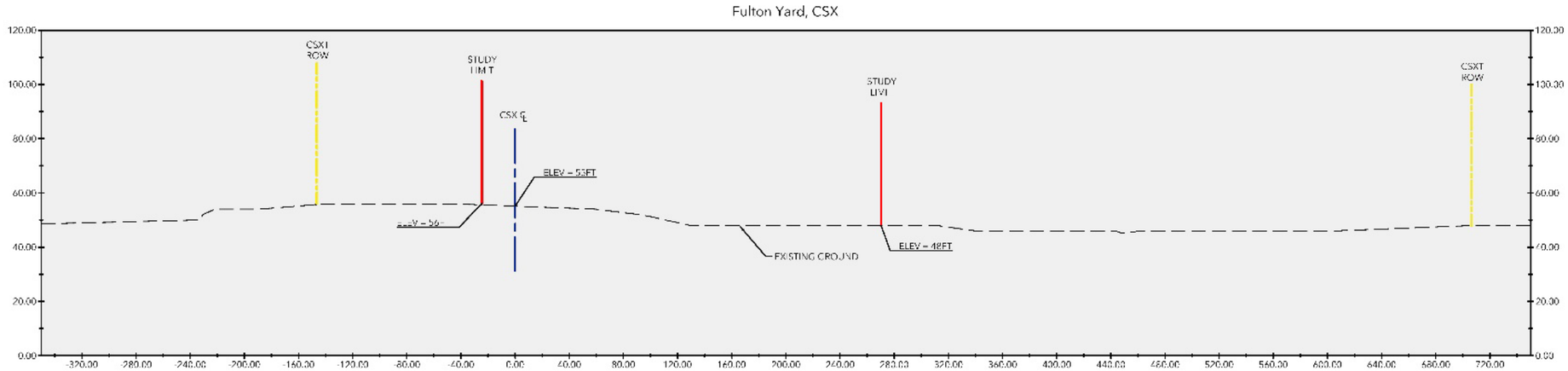


FIGURE 3-8. FLOODPLAIN - FULTON YARD – CSX



VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-9. NO INUNDATION - FULTON YARD – CSX



Fulton Yard, CSX (Current Flood Maps)

Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: Nat. Park Svc. - Cultural Resources
City of Richmond - National Historic Districts
Parcel Data; VGIN - Orthoimagery; Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads; Water

15' 0 15' 30'
VERT SCALE: 1"=20
30' 0 30' 60'
HORIZ SCALE: 1"=40

VIRGINIA PASSENGER RAIL AUTHORITY

3.2.4 FULTON YARD – CSX REALIGNED

Due to the relatively similar study areas of Fulton Yard – CSX and Fulton Yard – CSX Realigned, the study areas of the two locations were combined. These minimal changes to the study areas do not change the analysis or findings.

Cultural Resources

Figure 3-7 shows that this location is in a historically industrial area near Richmond. There are historic properties adjacent to this location and nearby, but the presence of these resources is not considered prohibitive for this location due to the historical industrial use of the area.

Floodplains

Figure 3-8 shows that this location is not currently covered by a flood hazard area nor is there the potential for inundation.

Figure 3-9 shows a cross-section of the location.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-7 also shows that this location will potentially impact 10 private properties.

Streams

Figure 3-8 also shows that this location is near the James River but will not have potential impacts to streams. Streams are identified as hydrographic features on **Figure 3-8**.

Recommendation

This location does not have fatal flaws revealed by the screening criteria. The number of potentially impacted properties is similar to the other locations.

Fulton Yard – CSX Realigned will be retained for further consideration as a feasible location for a layover facility.

3.2.5 FULTON YARD – VDOT

Cultural Resources

Figure 3-10 shows that this location is in a historically industrial area near Richmond. There are historic properties adjacent to and within this location and nearby, but the presence of these resources is not considered prohibitive for this location due to the historical industrial use of the area.

Floodplains

Figure 3-11 shows that this location is not currently covered by a flood hazard area. However, a preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) of this area shows that this location is approximately 15% covered by 1% flood hazard areas with no inundation indicated (**Figure 3-12**). Approximately 50% is covered by 0.2% flood hazard areas with no inundation indicated.

Figure 3-13 shows a cross-section of the location indicating the depths of inundation from the preliminary FEMA study.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-10 shows that this location will potentially impact two public properties and nine private properties. Additionally, alternatives developed on this location will be limited to a stub-end facility due to an ongoing business concern adjacent to the location.

Streams

Figure 3-11 shows that this location is near the James River but will not have potential impacts to streams. Streams are identified as hydrographic features on **Figure 3-11**.

Recommendation

This location does not have fatal flaws revealed by the screening criteria. However, the stub-in facility configuration required at this location has potential impacts to operations due to a single access point for trains to enter/exit the facility and the operational limitations associated with adjacent properties present future operational impacts. Additionally, operations from this location must cross CSXT mainline tracks to access Main Street Station.

Other locations have greater operational feasibility without greater impacts; therefore, Fulton Yard - VDOT will not be carried forward for further consideration as a feasible location for a layover facility.

FIGURE 3-10. CULTURAL RESOURCES - FULTON YARD - VDOT

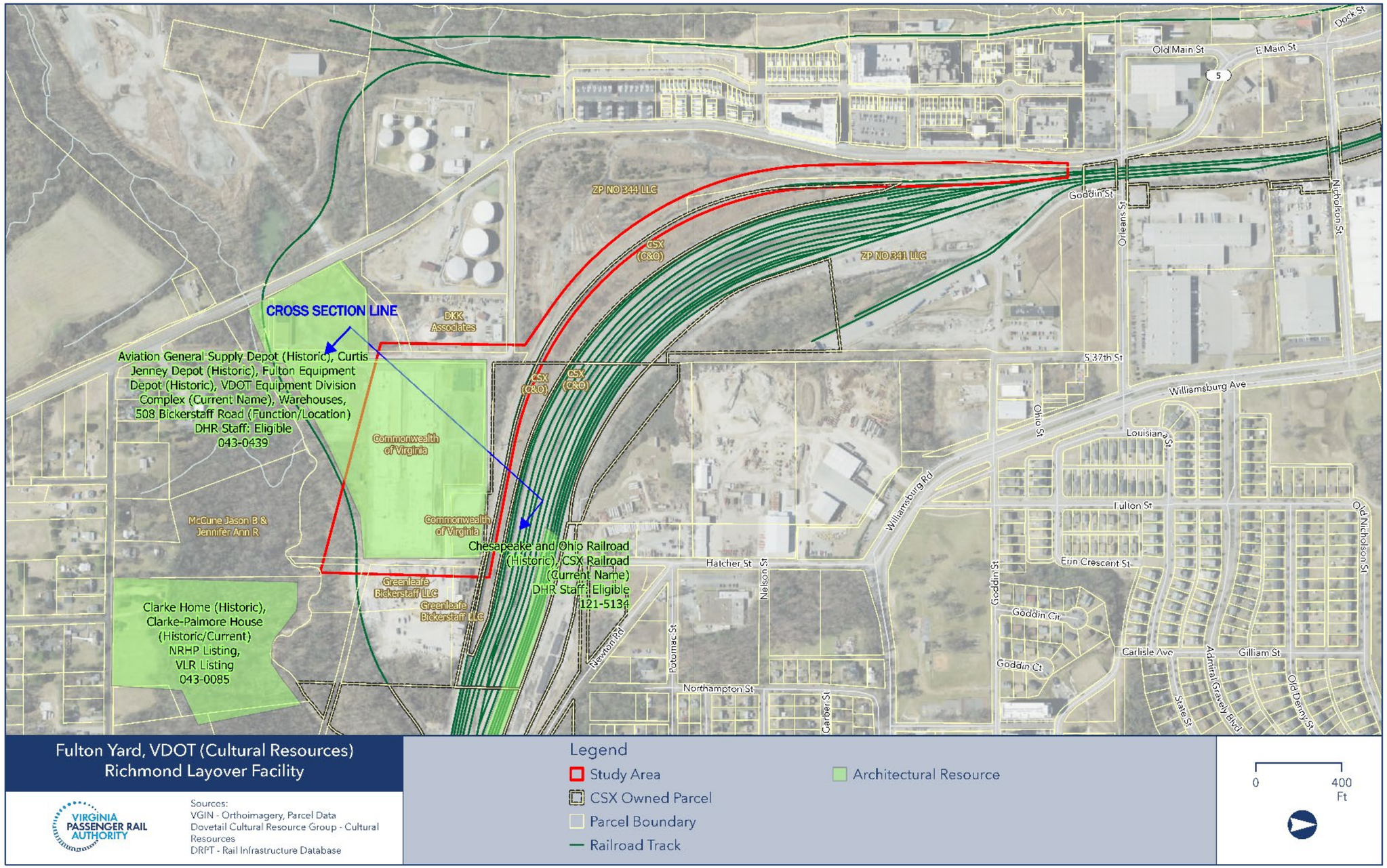


FIGURE 3-11. FLOODPLAIN - FULTON YARD – VDOT

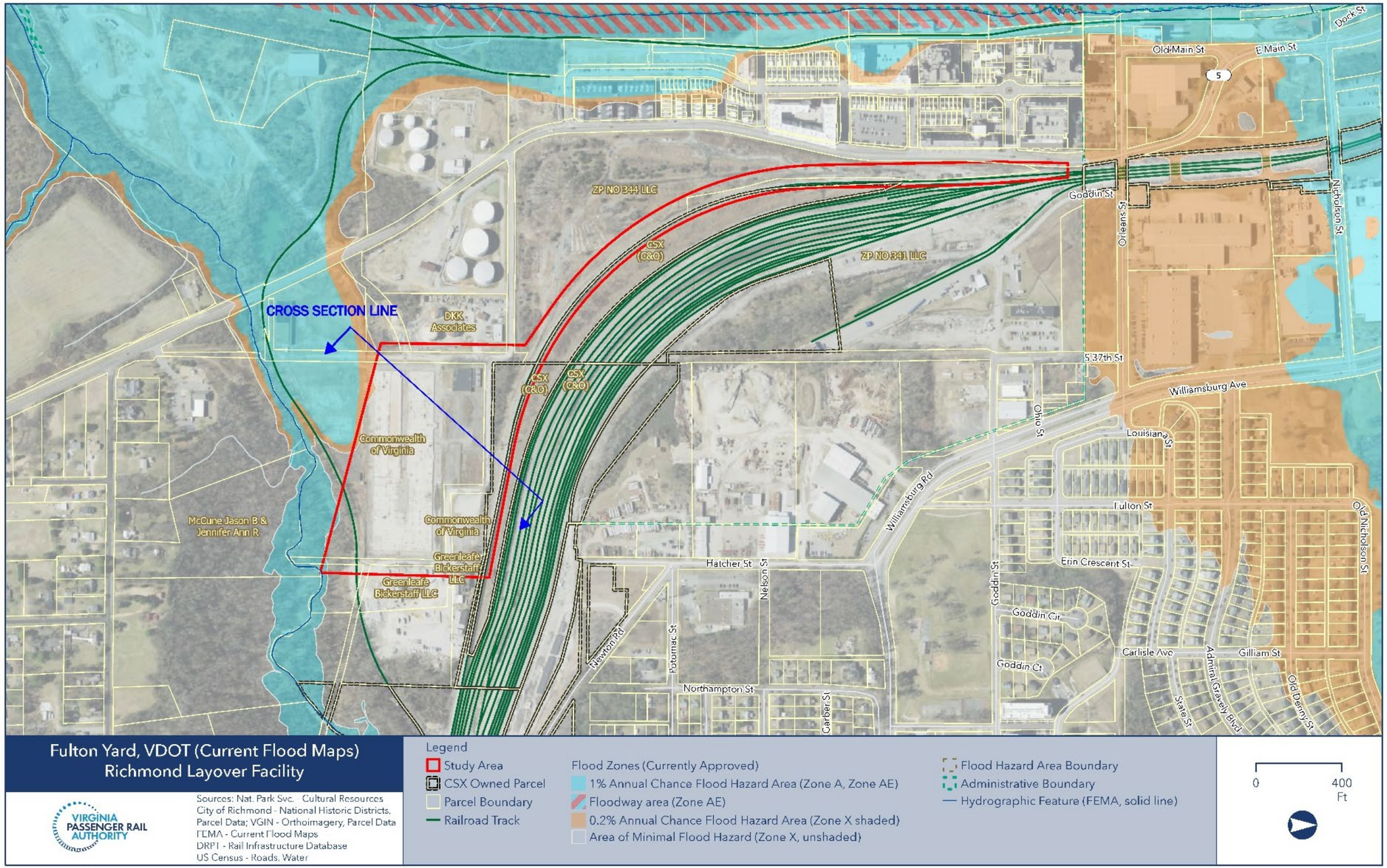


FIGURE 3-12. PRELIMINARY FLOODPLAIN - FULTON YARD – VDOT

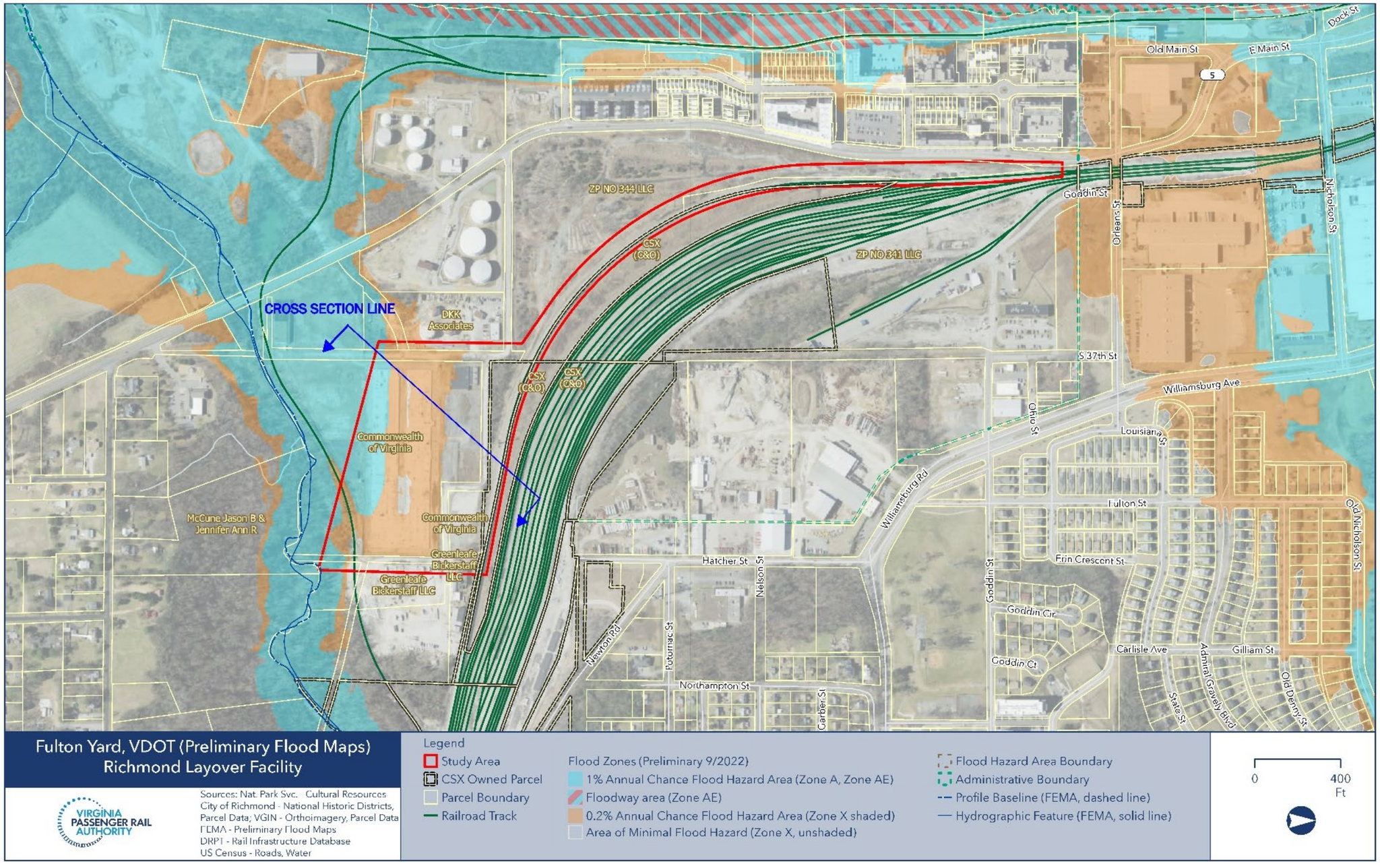
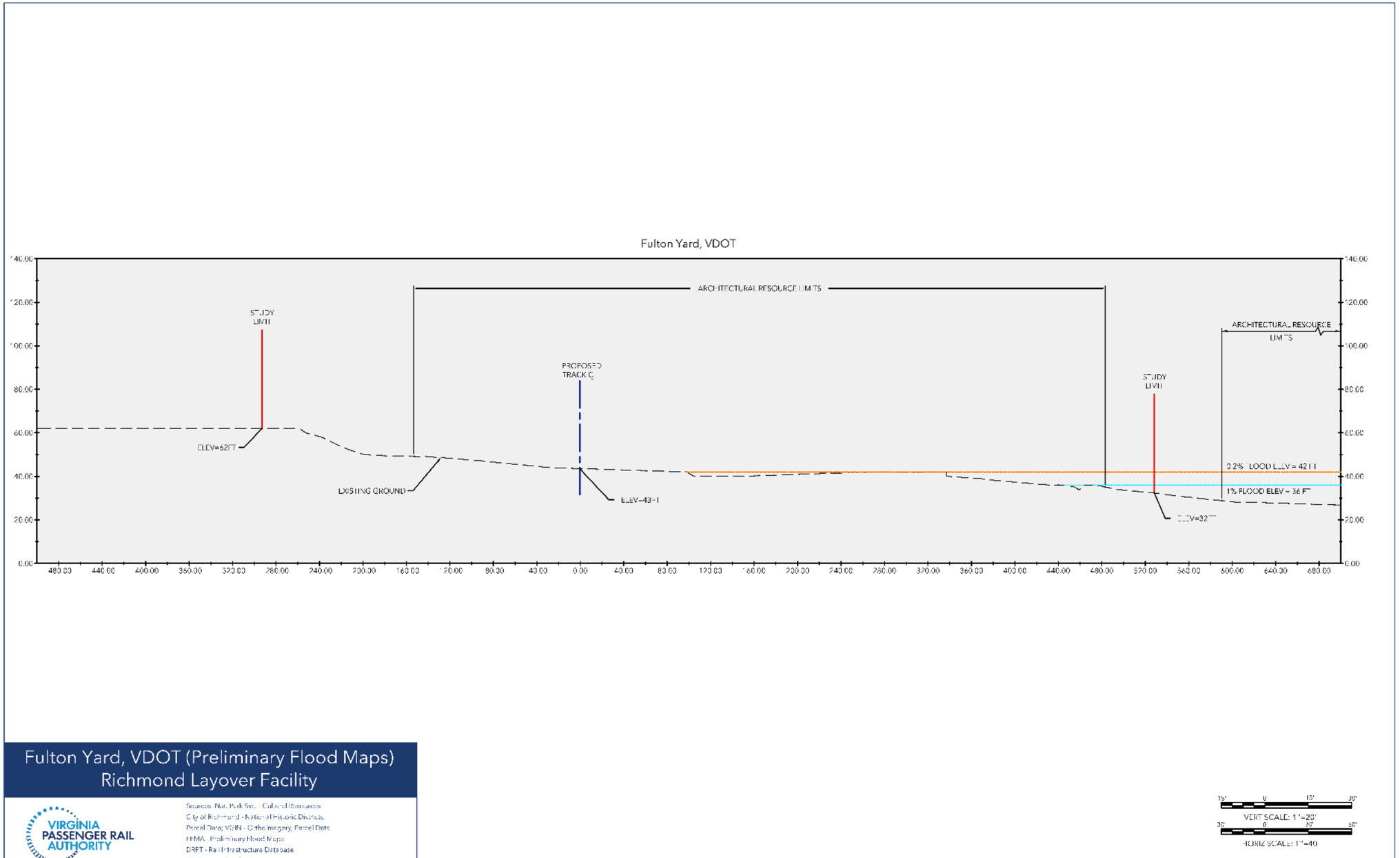


FIGURE 3-13. INUNDATION - FULTON YARD - VDOT



Fulton Yard, VDOT (Preliminary Flood Maps)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: Nat. Park Serv. - Cultural Resources
City of Richmond - National Historic Districts,
Parcel Data; VGIN - Orthoimagery, Parcel Data
FEMA - Preliminary Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water

VIRGINIA PASSENGER RAIL AUTHORITY

3.2.6 MANCHESTER YARD

Cultural Resources

Figure 3-14 shows that this location has three NRHP eligible resources within the boundaries: the Seaboard Air Line Railroad Corridor, the Williams Bridge Company, and archaeological site 44CF0724. The proposed use is industrial and thus mirrors the historic use of this property. Although the project has the potential to impact the archaeological site, as long as the historic buildings remain on the site, the presence of these resources does not preclude the consideration of this location. However, if development would involve building demolition, such activities would result in both direct and indirect impacts to the Williams Bridge Company, which may preclude use of this location.

Floodplains

Figure 3-15 shows that this location is protected from a 1% flood hazard area by an accredited levee system. However, a 0.2% flood hazard exceeds the accredited levee system with approximately 18 feet of inundation covering 100% of the location.

Figure 3-16 shows a cross-section of the location indicating the depths of inundation.

Overhead Powerlines

There appear to be local distribution lines that do not prohibit the use of this location.

Right-of-way

Figure 3-14 also shows that this location will potentially impact four public properties and seven private properties.

Streams

Figure 3-15 also shows that this location is near the James River but will not have potential impacts to streams. Streams are identified as hydrographic features on **Figure 3-15**.

Recommendation

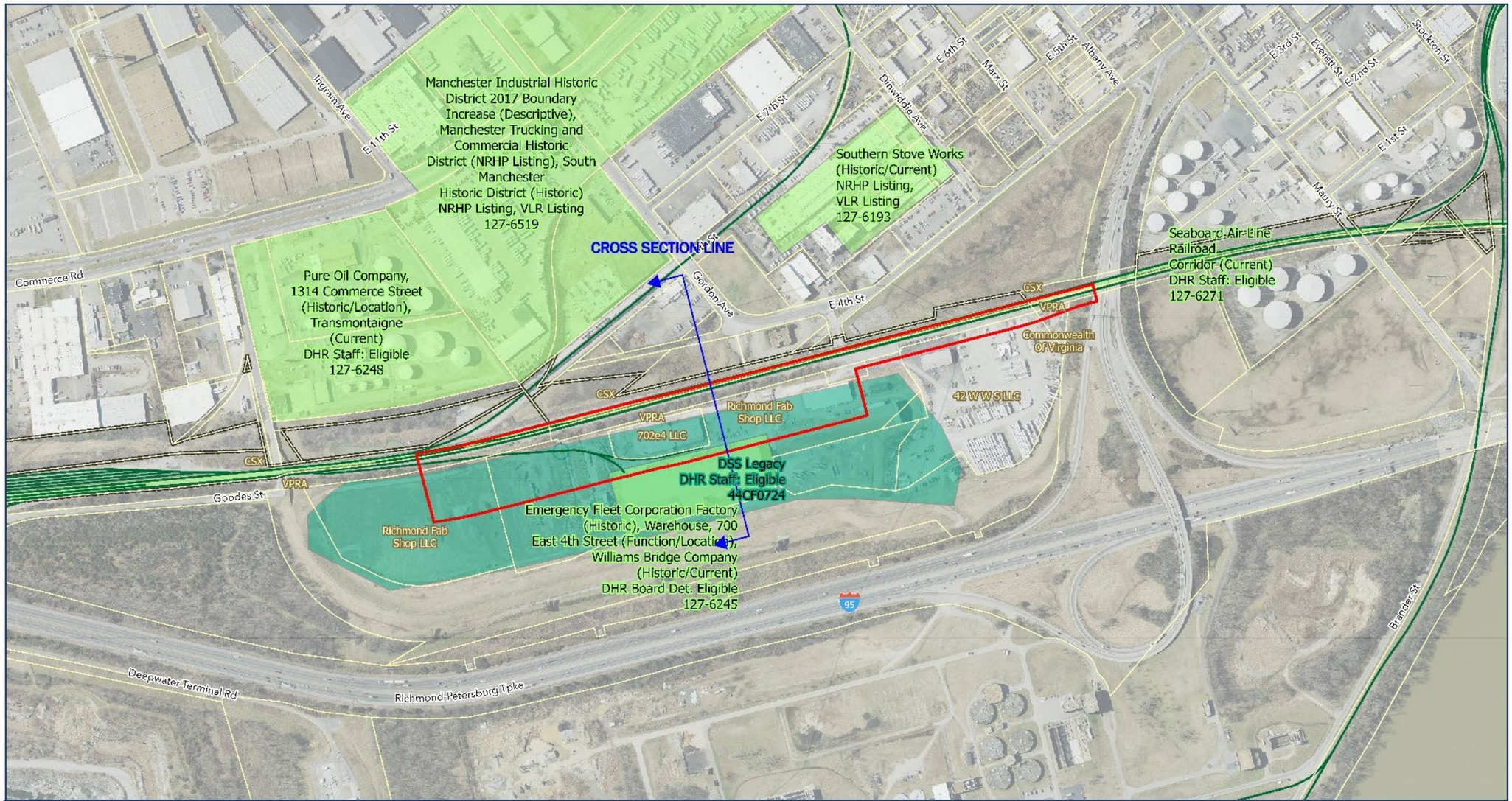
A combination of the following present a fatal flaw to completing a layover facility on this location by 2026:

- Potential cultural resource impacts resulting from building removal
- Floodplain impacts and inundation of property, buildings, and equipment

Brown Street Yard – 25 Feet will not be carried forward for further consideration as a feasible location for a layover facility.

Manchester Yard will not be carried forward for further consideration as a feasible location for a layover facility.

FIGURE 3-14. CULTURAL RESOURCES - MANCHESTER YARD



Manchester Yard (Cultural Resources)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

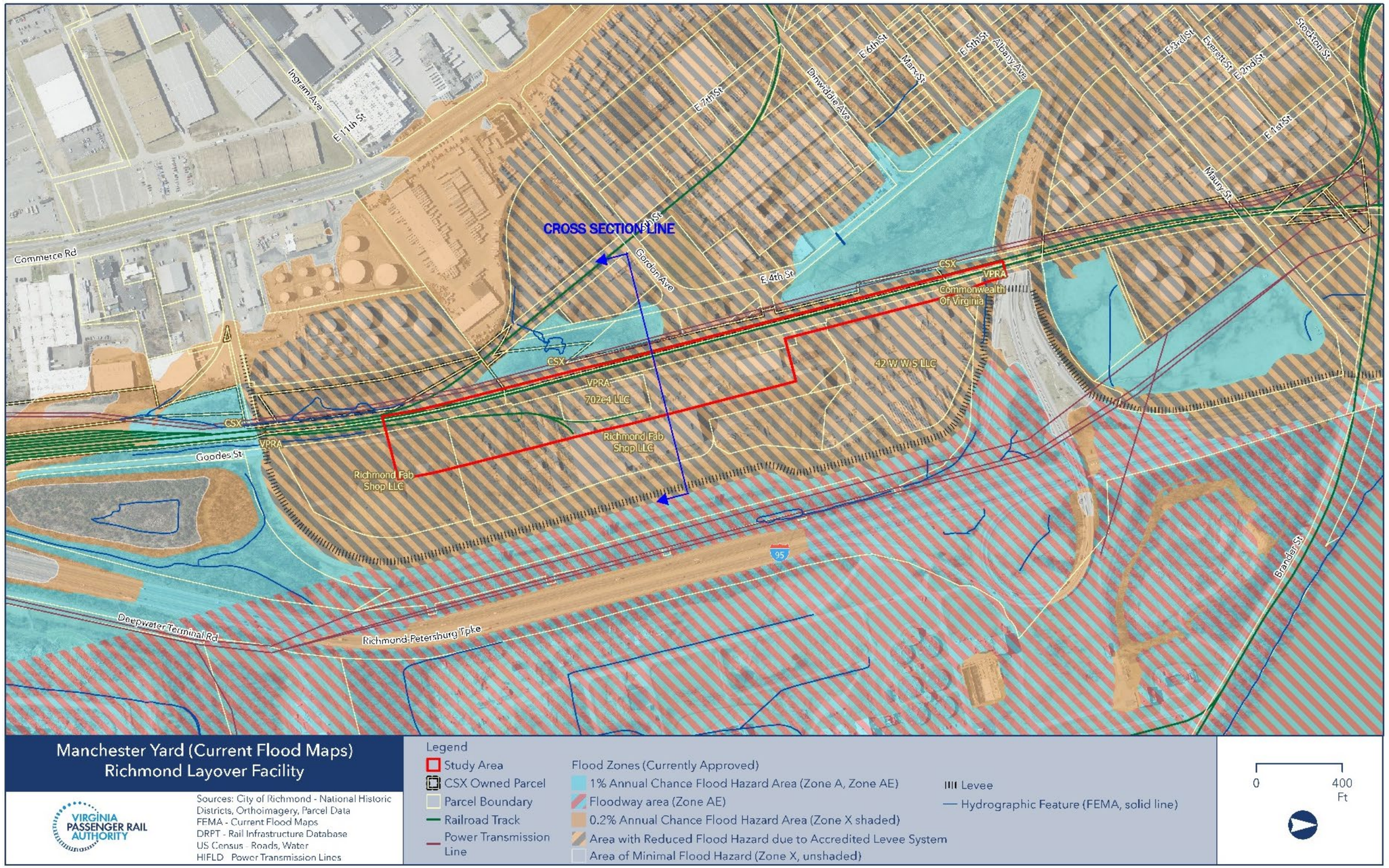
Sources:
City of Richmond - Orthoimagery, Parcel Data
Dovetail Cultural Resource Group - Cultural Resources
DRPT - Rail Infrastructure Database

Legend
- Study Area
- CSX Owned Parcel
- Parcel Boundary
- Railroad Track
- Architectural Resource
- Archaeological Site

0 400 Ft

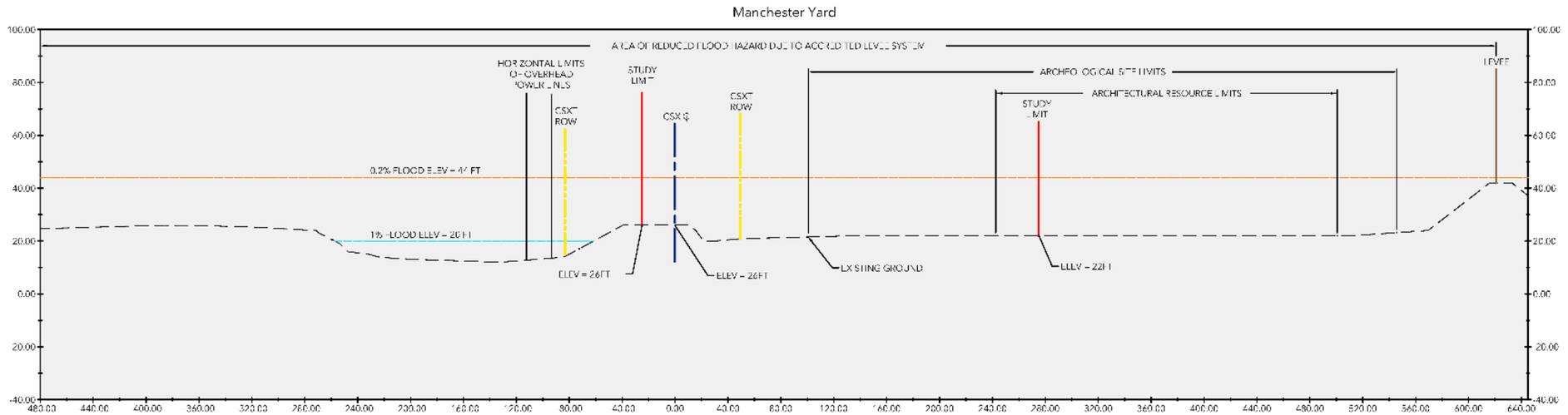
VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-15. FLOODPLAIN - MANCHESTER YARD



VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-16. INUNDATION - MANCHESTER YARD



Manchester Yard (Current Flood Maps)
Richmond Layover Facility

Sources: City of Richmond - National Historic Districts, Ortho imagery, Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines

VERT SCALE: 1"=20'
HORIZ SCALE: 1"=40'

3.2.7 VALLEY ROAD YARD

Cultural Resources

Figure 3-17 shows that this location is approximately 300 feet from the Shockoe Hill African American Burying Ground. The cemetery is eligible for the NRHP and, as noted above, may extend into this location as the boundaries are based on historic maps only. Archaeological studies have not been completed to verify the footprint of interments, and it is probable that graves may extend into the project area. The presence of such a significant and sensitive resource may be prohibitive to the use of this location due to likely direct and indirect impacts. Descendants and interest groups have also repeatedly expressed concerns about rail projects in the vicinity of the cemetery, which is of note to the agencies.

Although the Chestnut Hill-Plateau Historic District is within the vicinity of this alternative, the presence of the highway between the project area and the historic property, combined with other environmental conditions, suggests that the presence of this resource would not preclude the consideration of this alternative.

Floodplains

Figure 3-18 shows that this location is approximately 30% covered by 1% flood hazard areas with approximately 7 feet of inundation over that area. Approximately 30% is covered by 0.2% flood hazard areas with approximately 11 feet of inundation.

Figure 3-19 shows a cross-section of the location indicating the depths of inundation.

Overhead Powerlines

This location has high voltage transmission lines along the long axis of the location where tracks and platforms may be constructed. Relocation of these lines or construction of improvements to avoid these lines will result in a longer construction period, which presents a fatal flaw.

Right-of-way

Figure 3-17 also shows that this location will potentially impact four public properties and seven private properties.

Streams

Figure 3-18 also shows that this location has a tributary of the Shockoe drainage basin along the long axis of the location where the tracks and platforms may be constructed. Streams are identified as hydrographic features on **Figure 3-18**.

Recommendation

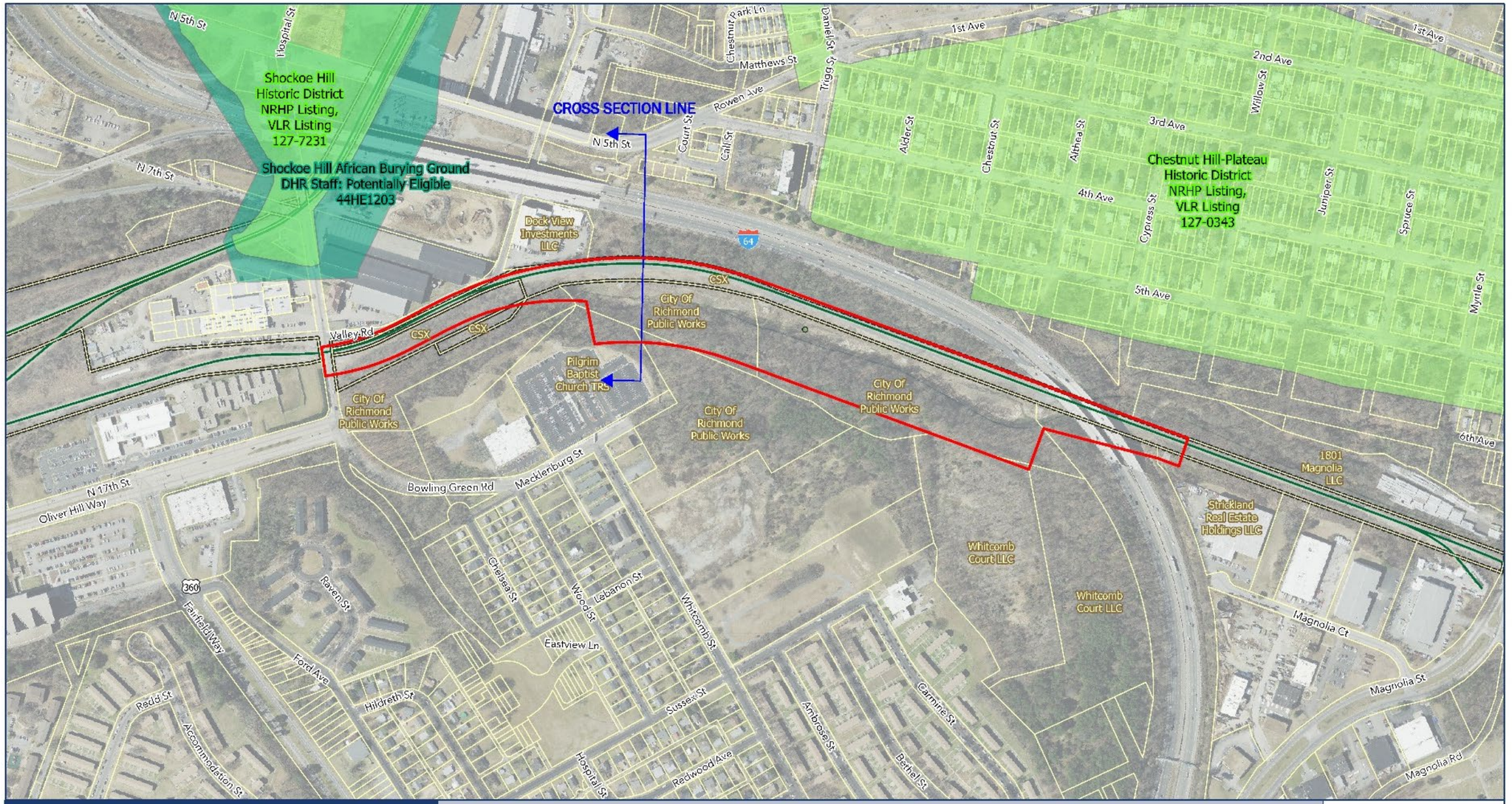
A combination of the following present a fatal flaw to completing a layover facility on this location by 2026:

- Potential cultural resource impacts
- Floodplain impacts and inundation of the property, buildings, and equipment

- Relocation of high voltage transmission lines
- Potential impact to streams

Valley Road Yard will not be carried forward for further consideration as a feasible location for a layover facility.

FIGURE 3-17. CULTURAL RESOURCES - VALLEY ROAD YARD



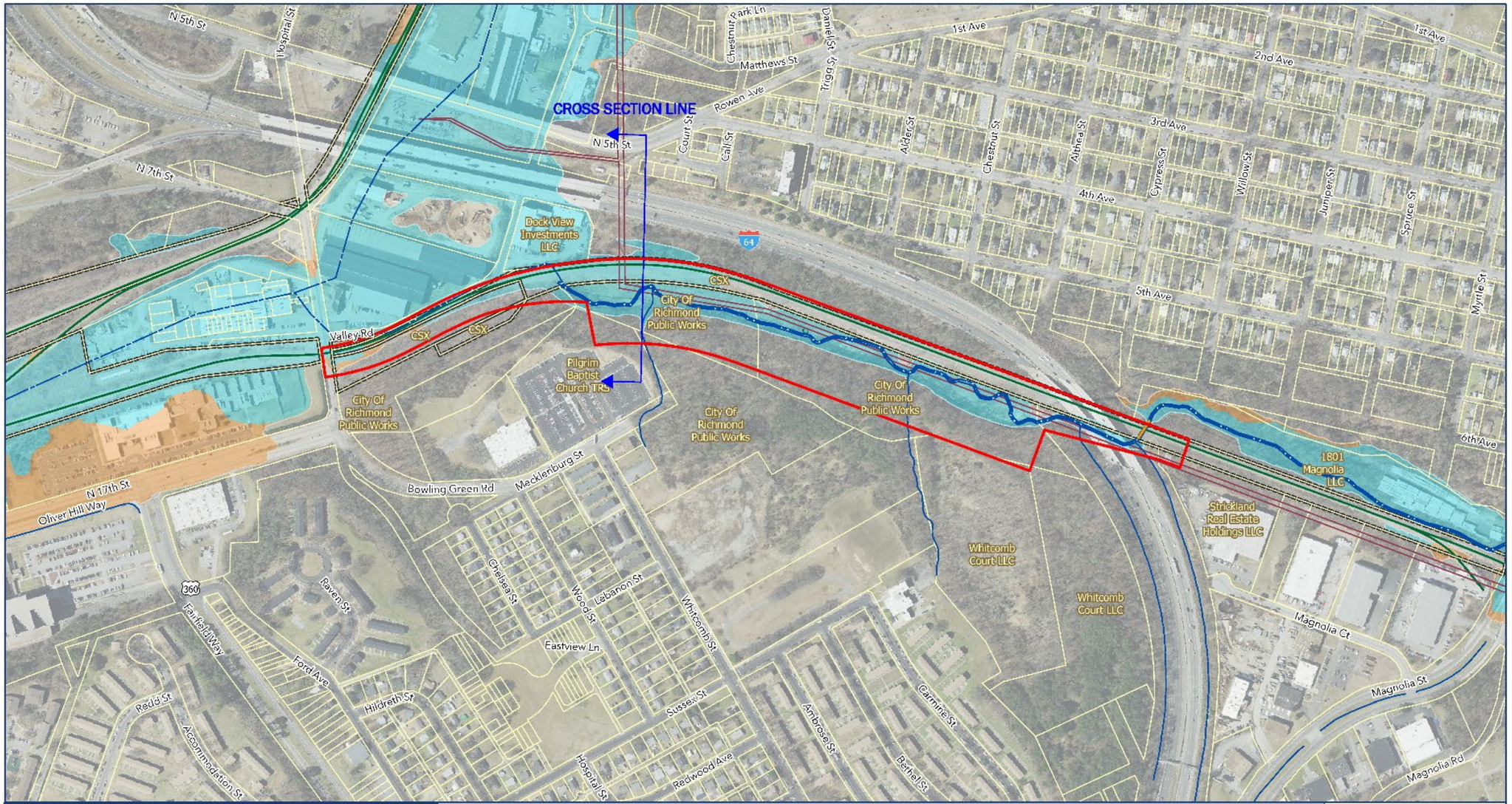
Valley Road (Cultural Resources)
Richmond Layover Facility

Sources:
City of Richmond - Orthoimagery, Parcel Data
Dovetail Cultural Resource Group - Cultural Resources
DRPT - Rail Infrastructure Database

Legend
- Study Area
- CSX Owned Parcel
- Parcel Boundary
- Railroad Track
- Architectural Resource
- Archaeological Site

0 400 Ft

FIGURE 3-18. FLOODPLAIN - VALLEY ROAD YARD



Valley Road (Current Flood Maps)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: City of Richmond - National Historic Districts, Orthoimagery, Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines

Legend

- Study Area
- CSX Owned Parcel
- Parcel Boundary
- Railroad Track
- Power Transmission Line

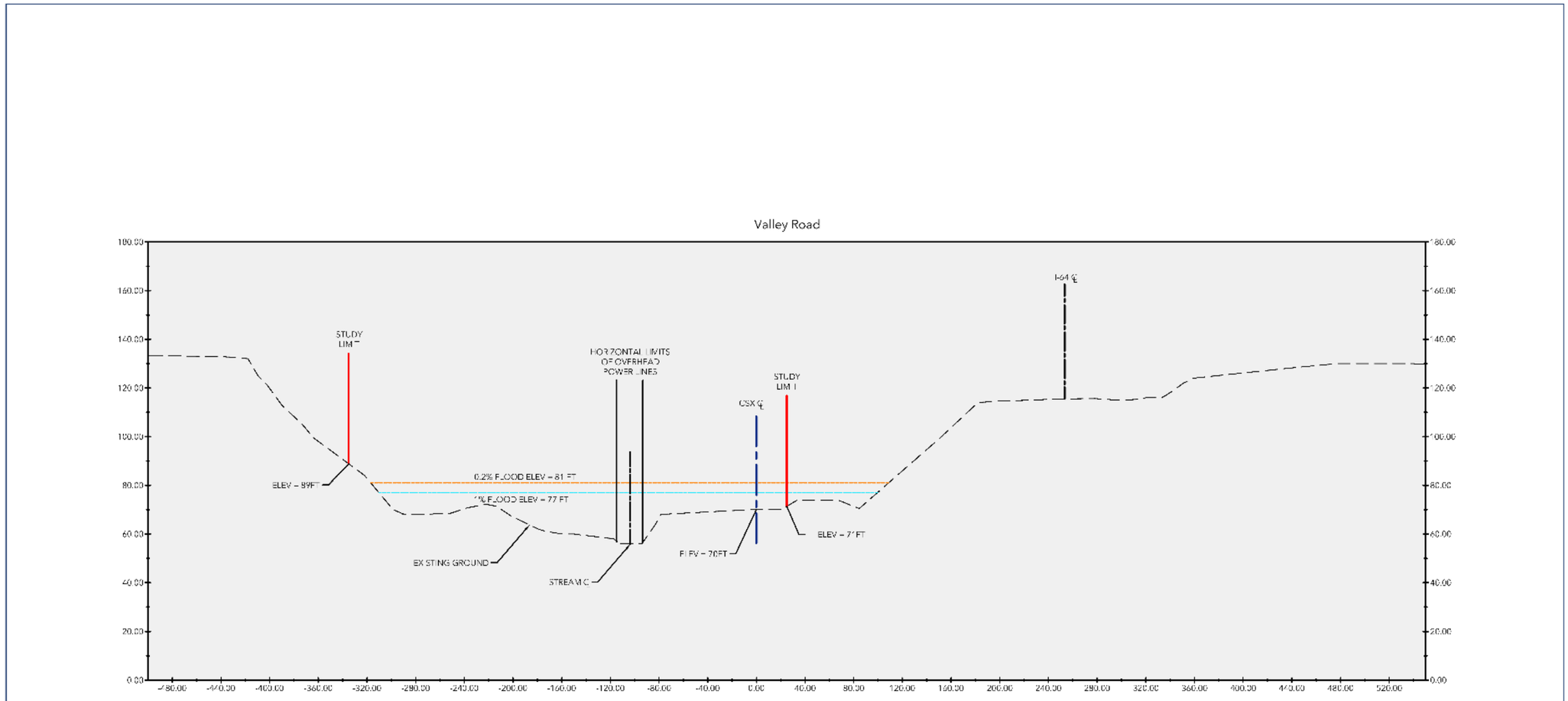
Flood Zones (Currently Approved)

- 1% Annual Chance Flood Hazard Area (Zone A, Zone AE)
- 0.2% Annual Chance Flood Hazard Area (Zone X shaded)
- Area of Minimal Flood Hazard (Zone X, unshaded)
- Culvert
- Profile Baseline (FEMA, dashed line)
- Hydrographic Feature (FEMA, solid line)

0 400 Ft

VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 3-19. INUNDATION - VALLEY ROAD YARD



Valley Road (Current Flood Maps)
Richmond Layover Facility

VIRGINIA PASSENGER RAIL AUTHORITY

Sources: City of Richmond - National Historic Districts, Ortho imagery, Parcel Data
FEMA - Current Flood Maps
DRPT - Rail Infrastructure Database
US Census - Roads, Water
HIFLD - Power Transmission Lines

VERT SCALE: 1"=20'
HORIZ SCALE: 1"=40'

VIRGINIA PASSENGER RAIL AUTHORITY

3.3 Summary

The following table summarizes the screening analysis results with red dots indicating a potential fatal flaw and green dots indicating the absence of a potential fatal flaw at this level of analysis:

TABLE 3-1. SCREENING ANALYSIS SUMMARY

Screening Resource	Brown Street Yard 25 feet	Brown Street Yard 50 feet	Fulton Yard – CSX	Fulton Yard – CSX Realigned	Fulton Yard VDOT*	Manchester Yard	Valley Road Yard
Cultural Resources	✖	✖	●	●	●	✖	✖
Floodplains	✖	✖	●	●	●	✖	✖
Overhead Powerlines	●	●	●	●	●	●	✖
Right-of-way	✖	✖	●	●	●	●	●
Streams	●	●	●	●	●	●	✖
Carry Forward	✖	✖	●	●	✖	✖	✖

*

Note: Fulton Yard – VDOT did not have any fatal flaws. However, it is not being carried forward due to other locations having greater operational feasibility without greater impacts. This was identified during the right-of-way screening.

Screening analysis of the cultural resources, floodplains, overhead powerlines, right-of-way, and streams for the seven locations identified that the following five locations will not be carried forward:

- Brown Street Yard – 25 feet
- Brown Street Yard – 50 feet
- Fulton Yard – VDOT
- Manchester Yard
- Valley Road Yard

The remaining two locations (Fulton – CSX and Fulton – CSX Realigned) were combined into a single location with two alternative concept designs for the Alternatives Analysis (Section 4). Fulton Yard – CSX location will be carried forward for further consideration as a feasible location for a layover facility with two potential alternatives for concept design.

4 Alternatives Analysis

This section describes the concept designs, estimated costs associated with each alternative, and constructability considerations of each alternative at the Fulton Yard – CSX location.

4.1 Concept Designs

Two alternatives were considered for the development of a layover facility at the Fulton Yard – CSX location. One alternative maintained the track configuration of the existing transloading facility and constructed access to the layover facility from that existing track. The second alternative realigned the lead track to the transloading facility and constructed access to the layover facility from the realigned lead track.

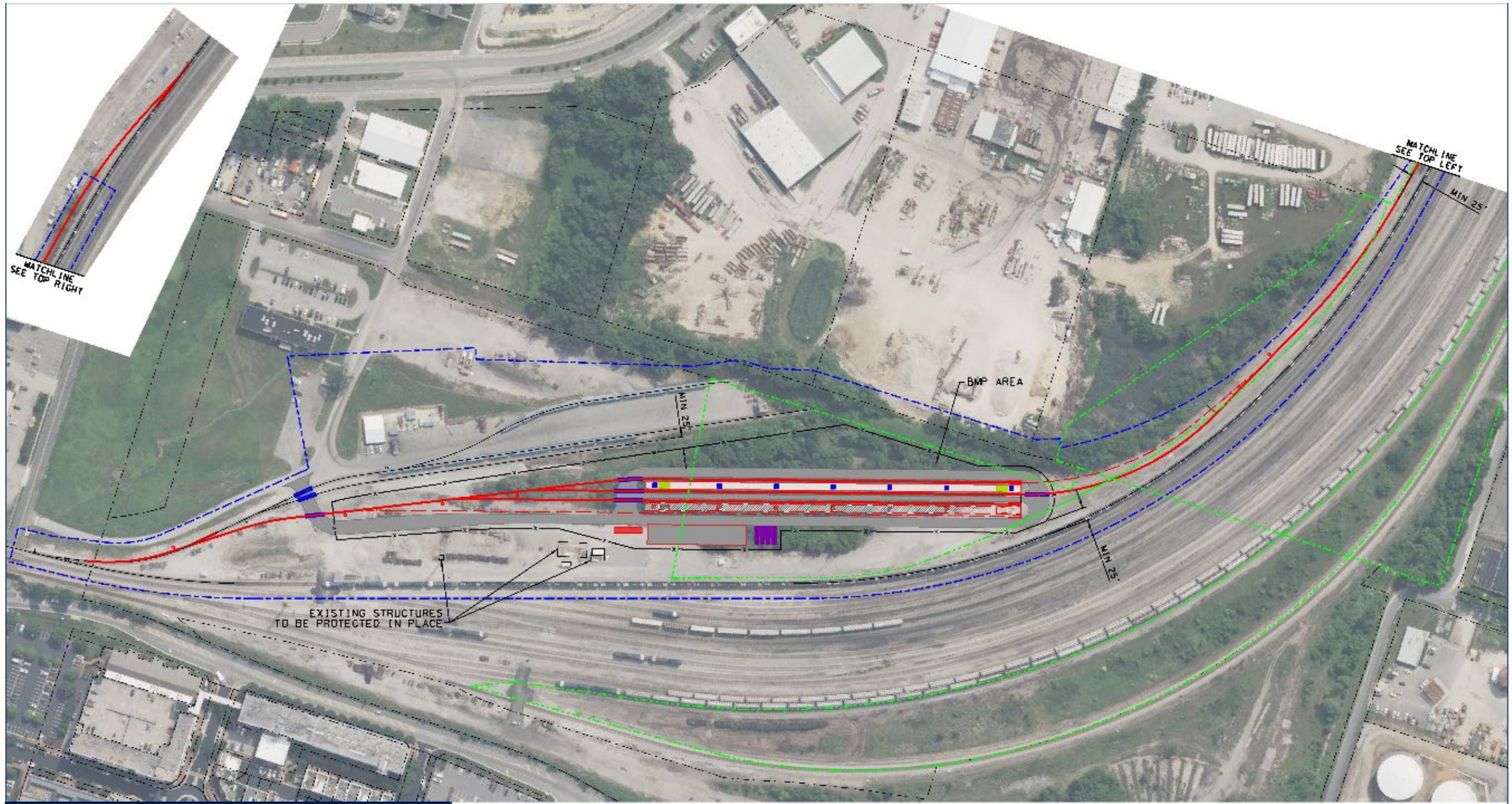
This layover facility is a double-ended yard for both alternatives. A double-ended yard arrangement allows the passenger trains to access the layover facility from either end should transloading operations block the north end or Fulton Yard activities on the mainline block the south end.

4.1.1 ALTERNATIVE 1

Alternative 1 maintains the existing lead track into the transloading facility as shown in **Figure 4-1**. Based on estimations from GIS data, the curvature of these lead tracks appears to be greater than 15 degrees (chord definition). The concept for Alternative 1 was able to improve this to a 14 degree curve, however actual curve improvements will require surveyed track data as a basis for design.

Maintenance and crew base operations are arranged at one end of the yard to minimize conflicts with locomotive refueling and passenger car maintenance. Deliveries are located adjacent to the maintenance office / crew base for staff receipt and monitoring. Staff parking is located near the office but separated from deliveries and refueling and maintenance operations. Security fencing, stormwater BPMs, and future building needs are not shown. However, sufficient area remains to provide for limited expansion to support the future fourth yard track, which is shown in **Figure 4-1**.

FIGURE 4-1. ALTERNATIVE 1 - FULTON YARD – CSX

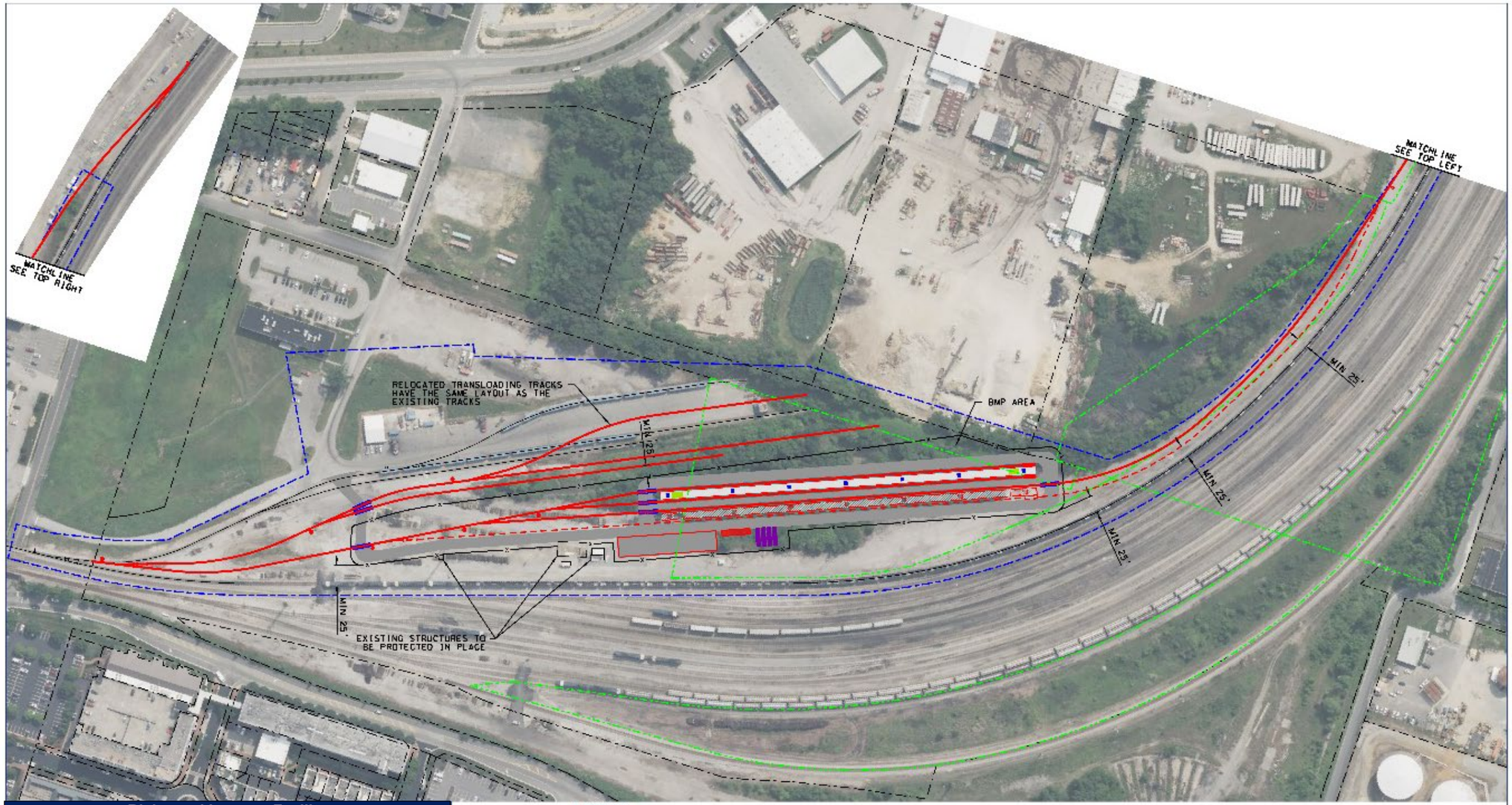


4.1.2 ALTERNATIVE 2

Alternative 2 realigns the lead track to the transloading facility and constructs access to the layover facility from the realigned lead track, as shown in **Figure 4-2**.

Maintenance and crew base operations are arranged centrally on the yard due to the available area between the yard tracks and the mainline tracks. Deliveries are located adjacent to the staff parking for staff receipt and monitoring. Staff parking is located near the office. Security fencing, stormwater BPMs, and future building needs are not shown. However, sufficient area remains to provide for limited expansion to support the future fourth yard track, which is shown in **Figure 4-2**.

FIGURE 4-2. ALTERNATIVE 2 - FULTON YARD – CSX



4.2 Constructability

Constructability addresses the conditions identifiable at this level of study that present challenges and/or opportunities to the construction of a layover facility. A feasible project may or may not be constructable as a result of the construction impacts to the existing public or private infrastructure. Construction impacts may include the duration of the construction and/or the impacts resulting from construction traffic, noise, vibrations, dust, or runoff. Duration of construction varies based on the infrastructure and the existing conditions in which it is being built. Impacts resulting from construction are activities common to most construction sites, e.g., trucks delivering materials, equipment traveling on exposed dirt, excavation, or pile-driving activities.

The Study examined each alternative to identify the ability to construct a layover facility based on the concept designs. Construction duration and impacts will vary between the alternatives due to the differences between the potential infrastructure.

Common construction impacts include, but are not limited to, temporary noise, dust, and traffic impacts. Additional constructability considerations are:

- Railroad operations impacts to install turnouts
    - Both alternatives impact the transloading facility lead track and the mainline track
- Goddin Street traffic impacts are approximately the same for both alternatives
- Impacts to transloading facility operations are greater for Alternative 2
- New water and sewer services will be required for both alternatives

Alternative 1 will have fewer challenges with constructability than Alternative 2. This finding is directly related to the impacts to the transloading facility's operations.

Economic development and Benefit Cost Analysis (BCA) are additional analyses that may be performed to compare locations. These analyses were not performed for this Study since a single location was the most feasible and the alternatives at this location have closely related costs, benefits, and impacts.

5 Findings and Next Steps

This section describes the findings of the Study and next steps in the development of the layover facility.

5.1 Findings

A fatal flaw screening analysis identified impacts to cultural resources, floodplains, overhead powerlines, and streams on four of the seven locations identified for the Study using the completion of the facility by 2026 as a fixed deadline. Right-of-way impacts were a lesser differentiator for two of the locations.

The impacts on the four locations are likely to extend the environmental, permitting, and/or construction of the layover facility beyond completion by 2026. The four locations will not be carried forward for further consideration as a feasible location for a layover facility.

A fifth location will not be carried forward for further consideration as a feasible location for a layover facility due to it being operationally insufficient. A single-ended yard is required at the fifth location, making it less feasible than locations with a double-ended yard.

Two locations were on the same properties, and following the fatal flaw screening analysis, they were combined into two alternatives on one location. Fulton Yard – CSX was the resulting combination of the two locations. Fulton Yard — CSX will be carried forward for further consideration as a feasible location for a layover facility.

Fulton Yard – CSX has at least two alternatives based on how the north end of the layover facility connects to the transloading facility lead track. Concept designs of the two alternatives indicate that fewer disruptions to the transloading facility lead result in improved constructability and reduced costs.

5.2 Next Steps

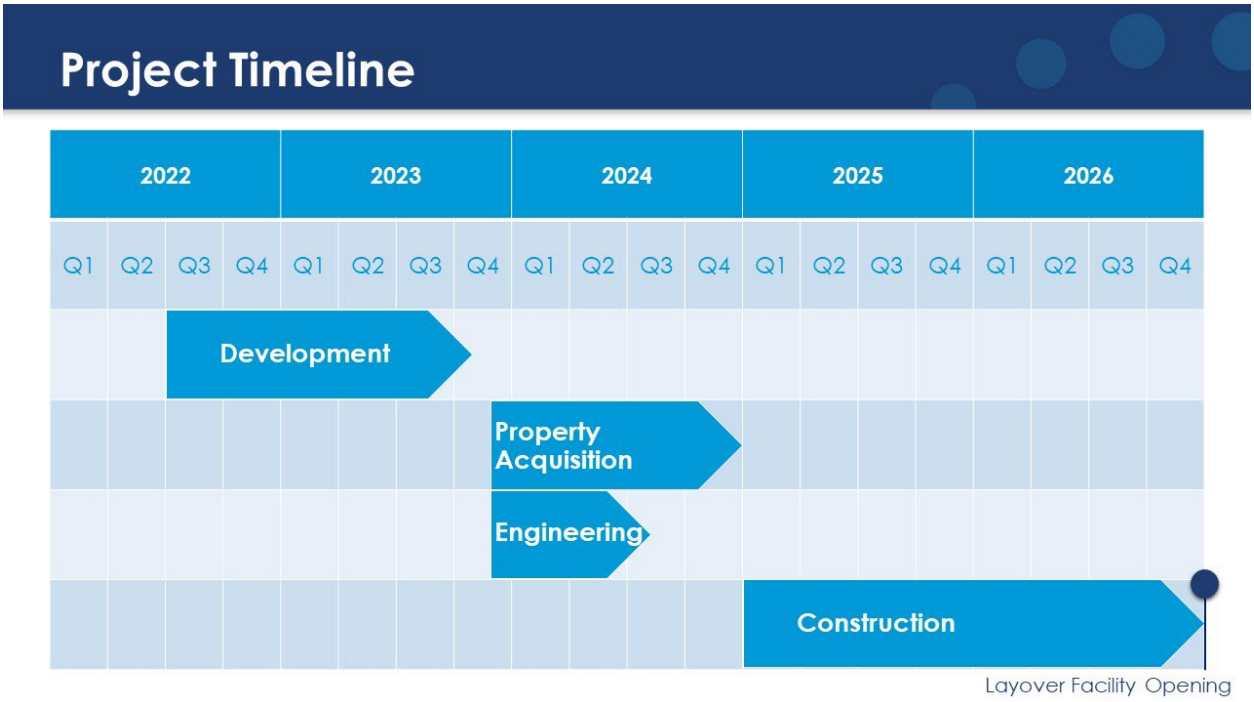
The next steps for the Richmond Layover Facility will be:

- Selection of an alternative in coordination with CSXT for further refinement
- Complete a NEPA document or a Virginia Environmental Impact Report (EIR)
    - If federal funding is awarded, develop and complete a NEPA document
    - Otherwise, develop and complete an EIR
- Architectural/engineering design
- Construction

Proceeding with these steps sequentially poses a risk to completion by 2026, but overlapping activities (where feasible) increases risk of budget increases.

- The following timeline provides a guideline to complete the project in advance of the completion by 2026 requirement.

FIGURE 5-1. PROJECT TIMELINE



Appendix A: Environmental Review

VIRGINIA PASSENGER RAIL AUTHORITY

VIRGINIA PASSENGER RAIL AUTHORITY

Richmond Layover Facility Environmental Review of Fulton Yard CSX Location

January 2023

Table of Contents

1 PURPOSE 1
2 SUMMARY OF POTENTIAL IMPACTS 2
2.1 Air Quality 3
2.2 Community Resources 3
2.3 Environmental Justice 3
2.4 Hazardous Materials 4
2.5 Land Use and Zoning 4
2.6 Land Use Plans 5
2.7 Noise and Vibration 5
2.8 Prime and Unique Farmland 6
2.9 Protected Species and Critical Habitat 7
2.9.1 Northern Long-Eared Bat 7
2.9.2 Monarch Butterfly 8
2.9.3 Migratory Birds, including the Bald Eagle 8
2.10 Right-Of-Way and Relocations 8
2.11 Section 106 Historic Resources 9
2.11.1 Archaeological Sites 9
2.11.2 Architectural/Above-Ground Resources 9
2.12 Section 4(f) Resources 10
2.13 Section 6(f) Resources 10
2.14 Water Resources 10
2.14.1 Wetlands 11
2.14.2 Surface Waters 11
2.14.3 Floodplains 11
3 POTENTIAL REGULATORY AGENCY INVOLVEMENT AND PERMITTING REQUIREMENTS 12
3.1 Environmental Clearance 12
3.1.1 NEPA I Federal Railroad Administration 12
3.1.2 EIR I Virginia Department of Environmental Quality 12
3.2 Section 4(f) of the U.S. Department of Transportation Act Approval | FRA 13
3.3 Section 7 of the Endangered Species Act Consultation | USFWS 13
3.4 Section 106 of the National Historic Preservation Act Consultation and MOA/MOU, if Applicable| DHR and FRA, if Applicable 13
3.5 Clean Water Act Section 404 Permit | USACE 14

3.6 Clean Water Act Section 401 Water Quality Certification | USACE/DEQ 14
3.7 Virginia Water Protection Permit | DEQ 14
3.8 Construction General Permit/Erosion and Sediment Control | EPA/DEQ 14
3.9 Hazardous Materials Management | EPA/DEQ 14
4 FIGURES 15

List of Figures

Figure 1. Summary of Existing Environmental Resources Within Fulton Yard CSX Study Area and the Surrounding Area 16
Figure 2. Summary of Community Resources 17
Figure 3. EJScreen Demographic Index 18
Figure 4. EJScreen for People of Color 19
Figure 5. EJScreen for Low Income 20
Figure 6. Hazardous Material Locations 21
Figure 7. Bald Eagle Nest Locations Near the Study Area 22
Figure 8. Property Owners in the Study Area 23
Figure 9. Previously Recorded Cultural Resources in Project APE 24
Figure 10. Water Resources in the Study Area 25

List of Tables

Table 1. Summary of Environmental Resources - Fulton Yard CSX Location 2
Table 2. Hazardous Material Sites 4
Table 3. Summary of Land Use in the Study Area 5
Table 4. Summary of Potential Noise and Vibration Receptors* 6
Table 5. Farmland Classification 6
Table 6. Potential Threatened and Endangered Species Within the Study Area 7
Table 7. Property Owners in the Study Area 8
Table 8. Listed or Eligible Resources in the Architectural APE 10
Table 9. Summary of Water Resources Within Half-Mile and Within Study Area 10

List of Acronyms

Abbreviation	Definition
APE	Area of Potential Effect
AST	Aboveground Storage Tank
CCB	Center for Conservation Biology
CE	Categorical Exclusion
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEQ	(Virginia) Department of Environmental Quality
DHR	(Virginia) Department of Historic Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
IPaC	Information for Planning and Consultation
LEA	Local Educational Agencies
LWCF	Land and Water Conservation Fund
MOA/MOU	Memoranda of Agreement/ Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SPGP	State Program General Permit
Study area	Fulton Yard CSX Location
TOYR	Time of Year Restriction
UA	Urbanized Area
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VCRIS	Virginia Cultural Resource Information System

1 Purpose

This environmental review was prepared for the Fulton Yard CSX location for inclusion in the Richmond Layover Facility Feasibility Study. The purpose of this review is to document the presence of potential social, economic, and environmental resources within, or near, the study area. The environmental methodology, including screening process and sources to be used, was documented previously, and is not repeated herein.

This review considers existing resources within the entire Fulton Yard CSX location study area, as described in the Feasibility Study.

2 Summary of Potential Impacts

The social, economic, and environmental resources present within, or near, the study area are summarized in **Table 1** below. The 22.7-acre study area and nearby land uses are illustrated on **Figure 1** at the end of this report. Additional details are provided in resource-specific subsections following the table. Resource figures, which are referenced throughout the subsection, are also provided at the end of this report.

TABLE 1. SUMMARY OF ENVIRONMENTAL RESOURCES - FULTON YARD CSX LOCATION

Resource	Environmental Review Results
Air Quality (National Ambient Air Quality Standards Attainment)	Henrico County in attainment for all six criteria pollutants
Community Resources	None within study area; 3 parks, 1 community center, 1 fire station, and 1 trail within half-mile
Communities with Environmental Justice (EJ) Concerns	Present in areas surrounding study area
Hazardous Materials Sites (within half-mile of study area)	42 unique hazardous materials sites consisting of: RCRA-registered facilities: 17 State-regulated Brownfields: 16 Registered Petroleum tank facilities: 21
Land Use and Zoning (within study area)	Industrial: 1.02 Acres (5%) Transportation Right-of-Way: 0.93 Acres (4%) Public Service Corporation: 14.31 Acres (63%) Vacant: 6.43 Acres (28%)
	Consistent with Local Land Use Plans
Noise and Vibration (location of nearby sensitive receptors)	High-Sensitivity/Special Consideration: None Residential: 200 feet Institutional: 850 feet
Prime and Unique Farmland (within study area)	7.6 acres of Prime Farmland and 2.3 acres of Farmland of Statewide Importance; all considered "urbanized area"
Protected Species & Critical Habitat (species potentially present)	Northern Long-eared Bat (endangered) & Monarch Butterfly (candidate)
Right-of-Way and Relocations	10 parcels, 5 of which belong to CSX (36.65% of the study area) and ZP No 341 LLC (56.54% of the study area), along with slivers of 3 industrial parcels
Section 106 Historic Resources	Phase I archaeological survey recommended; the potential to uncover intact sites is anticipated to be low Three architectural/above-ground resources in the area of potential effect (APE) that have been determined to be eligible for or are listed in the National Register of Historic Places (NRHP); 1 located in study area
Section 4(f) Resources	No park or recreational facilities present in study area; see above row regarding historic properties identified within project APE
Section 6(f) Resources	None present

Resource	Environmental Review Results
Water Resources	
Wetlands (within study area)	Yes – 1 palustrine scrub/shrub (0.2 acre)
Open Water (within study area)	No streams in study area; 1 freshwater pond (0.15 acre)
Floodplains (within study area)	No

2.1 Air Quality

Per the U.S. Environmental Protection Agency (EPA) Green Book, which publishes a list of all geographic areas in compliance with the National Ambient Air Quality Standards (NAAQS), Henrico County is in attainment for all six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution, and sulfur dioxide.

2.2 Community Resources

Schools, religious facilities, cemeteries, community centers, parks and recreational facilities, trails, and police and fire stations were inventoried in the area surrounding the Fulton Yard CSX location, as shown on **Figure 2**. There are no community resources within the study area.

Nearby resources include:

- Three recreation areas, the Powhatan Park and Powhatan Community Center, Gillies Creek Park, and Chimborazo Park, within a half-mile of the study area.
- One fire station, Richmond Fire Station No. 8, within a half-mile of the study area.
- One trail, the Virginia Capital Trail, within 1,000 feet of the study area along the James River.

2.3 Environmental Justice

The EPA developed an EJ mapping and screening tool called EJScreen, which combines environmental and demographic indicators in maps. In the census tract that contains the Fulton Yard CSX location, the EJScreen Demographic Index is in the 58th percentile when compared to the national index. In the east, towards Montrose Heights, the census tracts are in the 87-89th percentile. To the west, between Old Osborne Turnpike and the James River, the census tract is in the 13th percentile (**Figure 3**).

The EJScreen Demographic Index is an average of the percentages of people of color and low-income persons. To provide better detail on each of these factors, the individual indicators for people of color and low-income persons were also examined within EJScreen. For people of color, the census tract that contains the Fulton Yard CSX location is in the 68th percentile when compared to the national index. In the east, towards Montrose Heights, the census tracts are in the 83-85th percentile. To the west, between Old Osborne Turnpike and the James River, the census tract is in the 35th percentile (**Figure 4**). For low-income persons, the census tract that contains the Fulton Yard CSX location is in the 33rd percentile when compared to the national index. In the east, towards Montrose Heights, the census tracts are in the 78th and 88th percentile. To the west, between Old Osborne Turnpike and the James River, the census tract is in the 9th percentile (**Figure 5**).

Locations of public schools with Title 1 status or with 40 percent or higher percentages of low-income students were also identified. Title I, Part A (Title I) of the Elementary and Secondary Education Act, as amended, provides financial assistance to local educational agencies (LEA) and schools with 40 percent or higher of children from low-income families to help ensure that all children meet state academic standards. There are two City of Richmond elementary schools that have attendance zones surrounding the Fulton Yard CSX location: Chimborazo Elementary at 3000 E Marshall Street and Bellevue Elementary at 2301 East Grace Street. Both are Title 1 schools and are approximately 2 miles north of the study area. This is a confirmation that there are low-income populations and communities surrounding the study area. There are two Henrico County elementary schools with attendance zones surrounding the Fulton Yard CSX location: Mehfoud Elementary at 8320 Buffin Road and Varina Elementary at 2551 New Market Road. There is currently no data for the Title 1 status of these two schools. Both are approximately 6 miles south of the study area.

2.4 Hazardous Materials

According to EPA's Facility Registry Service, there are 42 unique hazardous materials sites within a half-mile of the Fulton Yard CSX location, as reported in **Table 2** and **Figure 6**. The area surrounding the study area was historically heavily industrialized and a facility with aboveground storage tanks (ASTs) is located within a half-mile of the study area; no impacts are expected to this site.

The Fulton Yard property is an actively used railroad yard that contains registered petroleum tanks. The CSX Intermodal Terminal, located on the parcel at 4900 Old Osborn Turnpike, is a Resource Conservation and Recovery Act (RCRA) registered facility. The exact location of the petroleum tanks and other hazardous materials within the study area would need to be identified appropriately during the conceptual design phase for any potential remediation or contamination issues.

TABLE 2. HAZARDOUS MATERIAL SITES

Classification	Number within Half-Mile
RCRA-registered Facility	17
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	0
State-Regulated Brownfield	16
Registered Petroleum Tank Facility	21

**The total number of types of sites is greater than the number of actual facilities/parcels potentially affected because some of the sites have multiple attributes, e.g., they are both hazardous waste generators and contain ASTs or underground storage tanks (UST).*

2.5 Land Use and Zoning

The study area is located in a historically industrialized area of Henrico County; land use within the study area is summarized in **Table 3**. A small portion of the study area (0.55 acres, or 2%) is located within the City of Richmond, as shown on **Figure 1**, near the northern limit of the study area, just south of Orleans Street. The study area is primarily composed of Public Service Corporation (63% of study area) land use in Henrico County, followed by vacant land (28% of study area). As defined by Virginia Code Section 56.1, a Public Service Corporation is a non-governmental business entity that provides a public service such as gas, pipeline, heat, power

and water, as well as "all persons authorized to transport passengers or property as a common carrier". The study area also includes transportation right-of-way extending south from 37th Street.

TABLE 3. SUMMARY OF LAND USE IN THE STUDY AREA

Land Use Type	Acreage (% of Study Area)
Industrial	1.02 (5%)
Transportation Right-of-Way	0.93 (4%)
Public Service Corporation	14.31 (63%)
Vacant	6.43 (28%)
Total	**22.70**

West of the Fulton Yard CSX location, across the rail corridor is Rocketts Landing, a new mixed-use residential development with luxury apartment complexes, retail, and dining, as well as access to the Virginia Capital Trail and James River. This new development is still under construction with more apartment complexes and facilities being added southwest of the study area.

2.6 Land Use Plans

The most recent Henrico County comprehensive plan, Vision 2026 (2009), states that the County should "*Continue to participate in regional efforts to evaluate potential investments of State and Federal funds to improve rail cargo facilities in the region and encourage service that benefits the general welfare of county residents and businesses*".

The most recent City of Richmond comprehensive plan, Richmond 300: A Guide for Growth (2020), states that the City wishes to "*implement strategies to support … freight rail as an economic development engine*" for the city.

Both jurisdictions continue to promote freight rail access. Although the proposed project is not specifically shown on the local plans, the proposed transportation land use at the Fulton Yard CSX location would be consistent with the existing and future land uses and goals in the area.

2.7 Noise and Vibration

Since the study area is located along existing railroad track, the proposed infrastructure is not anticipated to introduce an unfamiliar type of noise and vibration to the surrounding areas. Notwithstanding, potential sensitive receptors for noise and vibration in proximity to the Fulton Yard CSX location are summarized in **Table 4**. Noise and vibration impacts typically decrease with distance from the source, and other factors such as number, type, and speed of trains, movements made, and obstructions between the source and receptor can also affect noise and vibration levels.

- No High-Sensitivity or Special Consideration receptors have been identified within 1,000 feet of the study area.
- Three Residential receptors within 1,000 feet of the study area:
    - Rocketts Landing in Henrico County, located approximately 200 feet west of the study area. This area includes apartment complexes with multiple receptors within a single structure.
    - A single-family residential area in Richmond, located approximately 750 feet to the northeast of the study area.

- A single-family residential area in Richmond, located approximately 500 feet to the east of the study area.

- One Institutional receptor is the Powhatan Park and Powhatan Community Center, located approximately 850 feet to the east of the study area.

TABLE 4. SUMMARY OF POTENTIAL NOISE AND VIBRATION RECEPTORS*

Land Use Receptor Type	Examples	Presence within 1,000 feet of Study Area**
High-Sensitivity/ Special Consideration	Recording studios, concert halls, outdoor amphitheaters and concert pavilions, national historic landmarks	None
Residential	Houses, hospitals, hotels	Rocketts Landing residential complex and two single-family residential areas
Institutional	Schools, libraries, theaters, churches, cemeteries, museums, monuments, campgrounds, parks	Powhatan Park and Powhatan Community Center

**Land use receptor types and examples per the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual. That manual provides screening distances for noise and vibration assessments; the unobstructed distance for yards and shops for noise was the most conservative and used for this review (i.e., 1,000 feet).*
*** Distances to potential receptors were estimated from the edge of the study area boundary.*

2.8 Prime and Unique Farmland

Natural Resources Conservation Service (NRCS) farmland classification data for the Fulton Yard CSX location is provided in **Table 5** and summarized in **Figure 1**.

The study area is primarily composed of land not considered Prime Farmland; rather, Urban Land, Lenoir silt loam, or dump pits comprise approximately 56% of the study area. A portion of the railroad yard and the tree stand, covering approximately 7.6 acres, is classified as Prime Farmland, which amounts to approximately 34% of the study area. An additional 2.3 acres (approximately 10% of the study area) is classified as Farmland of Statewide Importance.

TABLE 5. FARMLAND CLASSIFICATION

Farmland Classification	Acreage (% of Study Area)
Prime Farmland	7.6 (34%)
Farmland of Statewide Importance	2.3 (10%)
Not Prime Farmland	12.8 (56%)
Total	**22.7**

However, since the Census Bureau identifies the entire study area as "urbanized area" (UA), no additional Farmland Protection Policy Act (FPPA) coordination would be required (per FPPA Rule 7 CFR 658.2, which states that farmland does not include "land already in or committed to urban development").

2.9 Protected Species and Critical Habitat

The study area is a combination of railroad right-of-way that contains railroad tracks and associated infrastructure, a maintained grass-covered area, and a forested tree stand. As shown on **Figure 1**, the tree stand is located in the central portion of the study area and is approximately 5 acres in size (approximately 20% of the total study area); it is surrounded by rail infrastructure and an industrial facility that borders the study area to the southeast. As such, wildlife present in and around the study area would be acclimated to the urban environment and existing rail operations.

Information regarding sensitive species and resources that have been recorded or have the potential to occur within the vicinity of the study area was obtained from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system. As detailed in **Table 6**, based on the IPaC online review database, one federally listed species, the northern long-eared bat, and one candidate species, the monarch butterfly, may potentially occur within the study area. The online database indicates there are no known critical habitats at the location.

TABLE 6. POTENTIAL THREATENED AND ENDANGERED SPECIES WITHIN THE STUDY AREA

Common Name	Scientific Name	Status
Northern Long-eared Bat	*Myotis septentrionalis*	Endangered*
Monarch Butterfly	*Danaus plexippus*	Candidate
Critical Habitat	N/A	None

**The USFWS published the final endangered species listing for the northern long-eared bat on November 30, 2022, which changes the legal status of this species from threatened to endangered. The final rule will go in effect on March 31, 2023; this environmental review assumes those changes are in effect.*

2.9.1 NORTHERN LONG-EARED BAT

The final rule for the northern long-eared bat is defining suitable habitat as: forested/wooded habitat containing potential roosts (i.e., live trees or snags greater or equal to 3 inches in diameter at breast height that have exfoliating bark, cracks, crevices, or cavities), as well as forested linear features such as wooded fencerows, riparian forests, and other wooded corridors. The final rule mentions a number of actions that would not constitute a taking for this species, however, and those actions that are potentially applicable to the Fulton Yard CSX location include the following:

- Minimal tree removal and vegetation management activities that occur any time of the year outside of suitable forested/wooded habitat and more than 5 miles from known or potential hibernacula. (Note: known hibernacula for this species occurs in the Allegheny Mountain area of Virginia, more than 100 miles away.)
- Insignificant amounts of suitable forested/wooded habitat removal, provided it occurs during the hibernation period and the modification of habitat does not significantly impair an essential behavior pattern such that it is likely to result in the actual killing or injury of northern long-eared bats after hibernation.
- Tree removal that occurs at any time of year in highly developed urban areas.

Refer to the Potential Regulatory Agency Involvement and Permitting Requirements section for more information on coordination efforts that may be required for the northern long-eared bat.

2.9.2 MONARCH BUTTERFLY

The monarch butterfly is currently a "candidate" species and is not yet proposed for listing; however, USFWS intends to develop a proposed rule to list the monarch butterfly as its priorities allow. Potential habitat includes areas of herbaceous vegetation that could potentially support milkweed and other nectar-producing plants. Monarch butterflies require open fields or meadows with healthy and abundant milkweed and other nectar-producing flowers during the breeding season and migration, and groves of roosting trees with proximity to those open fields or meadows with nectar sources during migration and overwintering. The study area does not provide suitable habitat for the butterfly due to the lack of open fields or meadows that would support milkweed or other nectar-producing flowers. Additionally, open areas in and around the study area are regularly mowed and maintained; therefore, herbaceous communities with milkweed and other nectar-producing flowers would not have the opportunity to establish.

2.9.3 MIGRATORY BIRDS, INCLUDING THE BALD EAGLE

IPaC identified 14 migratory birds, including the bald eagle, which are potentially present in the study area. According to the Center for Conservation Biology (CCB) Bald Eagle nest locator mapping portal, the closest known bald eagle nests, as shown in **Figure 7**, are approximately two miles from the Fulton Yard CSX location.

2.10 Right-Of-Way and Relocations

Property owners of parcels within the study area are summarized in **Table 7** and shown in **Figure 8**, per the City of Richmond and Henrico County online GIS databases. The study area is comprised primarily of five parcels belonging to CSX (listed as CSX and Chesapeake & Ohio RR Co. in the table, 36.65% of the study area) and two belonging to ZP No 341 LLC (56.54% of the study area), along with slivers of three industrial parcels across from the extended 37th Street right-of-way. The existing CSX Fulton Yard office and maintenance building are both within the study area and would need to be relocated if the structures cannot be avoided during conceptual design. No residential, community, or business parcels are located within the study area, and no impacts to community cohesiveness or character are anticipated.

TABLE 7. PROPERTY OWNERS IN THE STUDY AREA

Parcel Number	Jurisdiction	Owner	% Study Area
E0001145002	City of Richmond	CSX Transportation Inc Tax Department J910	1.19%
E0001145001	City of Richmond	ZP No 341 LLC	0.05%
798-713-3911	Henrico County	ZP No 341 LLC	56.49%
798-712-6126	Henrico County	Chesapeake & Ohio RR Co.	22.53%
799-712-1461	Henrico County	S B COX	0.34%
799-712-1815	Henrico County	COX SIDNEY BARBEE JR	1.76%
799-711-3171	Henrico County	SB COX INCORPORATED	0.27%
799-711-1156	Henrico County	Chesapeake & Ohio RR Co.	5.54%
799-711-5915	Henrico County	Chesapeake & Ohio RR Co.	6.57%
E0100160002	City of Richmond	CSX Transportation Inc Tax Department J910	0.82%
N/A	Henrico County	Transportation Right-of-Way	4.44%

2.11 Section 106 Historic Resources

Preliminary investigation of historic resources included the identification and evaluation of all resources over 45 years in age within the project's APE, including buildings, structures, objects, historic districts, and archaeological sites, as separately documented in the *Summary of Cultural Resource Background Review* for the Fulton Yard CSX location (see Appendix B). Although the Section 106 evaluation considers resources 50 years in age or older, the 45-year threshold is used to allow for time for the project to progress through the planning and design phases prior to construction. For this Feasibility Study, the APE for archaeological resources includes the limits of disturbance for the new facility. For architectural history, the APE includes the limits of disturbance plus a 500-foot buffer to include the area's viewshed where the project could impact a resource's setting and feeling.

To date, a background literature and records review and a historic map study have been completed on the Fulton Yard CSX location but no Phase I identification-level surveys have been completed, as documented in Appendix B. This area was the subject of Phase I study between 2015 and 2018 as part of the DC to Richmond (DC2RVA) high speed rail improvement studies completed in 2019 along the rail corridor (Virginia Department of Historic Resources [DHR] Review #2014-0666). As such, data presented here reflects the current background review as well as studies conducted as part of DC2RVA. It is anticipated that additional Section 106 coordination will be required as part of the current project (see Section 3.4).

2.11.1 ARCHAEOLOGICAL SITES

Archaeological studies were completed in a portion of the archaeological APE between 2015 and 2017 as part of the DC2RVA project. Work involved Phase IA reconnaissance and Phase IB pedestrian and subsurface studies to identify sites. Based on the background review documented in Appendix B, Phase I archaeological survey of the unstudied portions of the APE is recommended. However, due to the lengthy use of this area as an industrial facility with repeated modifications, the potential to uncover intact sites is anticipated to be low.

2.11.2 ARCHITECTURAL/ABOVE-GROUND RESOURCES

The study area is located within a historically industrial area of Richmond. A limited background review (see Appendix B) identified three resources in the APE that have been determined to be eligible for or are listed in the NRHP. These are listed in **Table 8** and shown in **Figure 9**. A portion of the NRHP-eligible Chesapeake and Ohio Railroad (121-5134) intersects the proposed project area in the southern segment of the site. Immediately adjacent to the extant rail tracks is a warehouse constructed in 1917 (043-0439). This warehouse was a depot at which Curtis Jenney aircraft parts were stored and distributed during World War I. It was determined eligible by DHR staff in 2003. One dwelling, the Clarke-Palmore House (043- 0085), is on the outskirts of the architectural APE. The circa 1819 dwelling was listed in the NRHP in 2004. In addition, numerous nearby resources have not been recorded and/or evaluated for the NRHP. Their eligibility status is unknown.

TABLE 8. LISTED OR ELIGIBLE RESOURCES IN THE ARCHITECTURAL APE

DHR #	Name	Status
043-0085	Clarke-Palmore House	NRHP/Virginia Landmarks Register (VLR) Listed
043-0439	Aviation General Supply Depot, Curtis Jenney Depot	Eligible
121-5134	Chesapeake and Ohio Railroad	Eligible

2.12 Section 4(f) Resources

Section 4(f) provides for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic resources during transportation project development. The Fulton Yard CSX study area contains one recorded 4(f) resource, which is a historic resource (see Section 2.11): the Chesapeake and Ohio Railroad.

There are two additional historic resources in the vicinity of the study area, as documented in **Table 8** above: the Clarke-Palmore House and the Aviation General Supply Depot, Curtis Jenney Depot. It is possible that additional historic properties may be identified during ensuing Phase I survey, but the potential for the study area to contain such additional historic properties is low.

Public park and recreational resources within a half-mile of the study area include:

- Powhatan Park and Powhatan Community Center are located approximately 850 feet east of the study area.
- The Virginia Capital Trail, a 51.7-mile trail that runs from Williamsburg to Richmond, is located approximately 700 feet west of the study area. While the trail at this location appears to be located within the private Rocketts Landing development, allowing the public to use the trail can be interpreted as public ownership for Section 4(f) purposes.

2.13 Section 6(f) Resources

There are no properties funded by the Land and Water Conservation Fund (LWCF) within the study area.

A portion of Chimborazo Park, which is located just over a half mile north of the study area, was funded by the National Park Service (NPS) and is a listed Section 6(f) resource.

2.14 Water Resources

Water resources are shown in **Figure 10** and summarized in **Table 9**. Details for water resources within the study area are summarized in the subsections below the table.

TABLE 9. SUMMARY OF WATER RESOURCES WITHIN HALF-MILE AND WITHIN STUDY AREA

Water Resources	Within Half-Mile	Within Study Area
Wetlands	7.27 acres	0.20 acre
Surface Waters (Open Waters)	2.41 acres	0.15 acre
Streams	18,244.88 linear feet	0.00 linear feet
Flood Hazard Zones (A & AE)	473.81 acres	0.00 acre

2.14.1 WETLANDS

According to the National Wetlands Inventory (NWI), the study area contains one palustrine scrub/shrub wetland (0.20 acre), which is located within the wooded area in the central portion of the location. There are no other wetlands present within, nor directly adjacent to, the study area.

2.14.2 SURFACE WATERS

The James River is approximately 700 feet west of the study area. According to the National Hydrography Dataset (NHD), the study area contains one open water freshwater pond (0.15 acre). There are no streams or additional surface waters within the study area.

2.14.3 FLOODPLAINS

According to the Federal Emergency Management Agency (FEMA), there are no flood hazard zones within the study area nor is there the potential for inundation.

3 Potential Regulatory Agency Involvement and Permitting Requirements

Coordination with resource and regulatory agencies may be required for unavoidable impacts to the following resources within or near the area, as described in the preceding sections: environmental justice communities; hazardous materials; forests; rare, threatened, and endangered species; cultural resources; wetlands; and surface and groundwaters. In addition, during construction, the project will require careful consideration and protection for these environmental resources as recognized in the NEPA documentation, if applicable; Memoranda of Agreement/ Understanding (MOA/MOU) per Section 106 of the National Historic Preservation Act, if applicable; Clean Water Act Section 404 permits and Section 401 water quality certificates; other Federal/State/local permits and approvals; and all other necessary authorizations and/or approvals required by the project.

The following subsections summarize the potential permitting and approvals that may be required as part of the project and identifies the responsible/permitting agency in each heading.

3.1 Environmental Clearance

Depending on the funding sources, the National Environmental Policy Act (NEPA) process or an Environmental Impact Review (EIR) would be completed for the project.

3.1.1 NEPA I FEDERAL RAILROAD ADMINISTRATION

If the project is federally funded, a NEPA Class of Action determination of probable recommended NEPA document type (Categorical Exclusion [CE], Environmental Assessment [EA]/Finding of No Significant Impact [FONSI), or Environmental Impact Statement [EIS]/Record of Decision [ROD]) would need to be prepared. The determination of class of action will depend on the scope and elements of the alternative identified in the Feasibility Study process, potential environmental impacts, potential public/stakeholder involvement or controversy, and other circumstances. Based on the scope of the project and the resources in the study area that may be impacted, it is anticipated that the appropriate level of NEPA documentation would be a CE. The final decision on appropriate document type rests with the Federal Railroad Administration (FRA).

3.1.2 EIR I VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

If the project is state funded, an EIR would be completed to identify and evaluate the environmental effects of the proposed facility. The analysis would assess the effects of the facility on environmental resources and consider alternative actions and mitigating measures to avoid or reduce adverse impacts. Review of the EIR provides the Virginia Department of Environmental Quality (DEQ) and other state agencies with information that can be used to recommend

project modifications, if needed, and ensure consistency with existing land use policies, including local plans and ordinances.

3.2 Section 4(f) of the U.S. Department of Transportation Act Approval | FRA

Section 4(f) provides for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. In this case, there is one Section 4(f) property within the study area: the Chesapeake and Ohio Railroad. Two architectural/above-ground historic resources have also been identified within the project APE. Cultural resources investigations are ongoing and applicability of Section 4(f) would be determined after a determination of project effects is rendered.

3.3 Section 7 of the Endangered Species Act Consultation | USFWS

Coordination with USFWS will take place through the responsible federal agency (e.g., FRA if a NEPA document is prepared or U.S. Army Corps of Engineers [USACE] as part of the permitting process) regarding potential impacts to the northern long-eared bat. At this time, coordination is expected to result in one of two options:

- Early indications are that projects will need to adhere to a Time of Year Restriction (TOYR) of April 1 to November 15 (no tree clearing during this time).
- Perform a presence/absence survey. If the survey is negative for the northern long-eared bat (and other federally listed bat species), then the TOYR may be lifted.

Additional regulatory information from USFWS will be available in the near future to assist with determinations regarding the potential to affect this species.

3.4 Section 106 of the National Historic Preservation Act Consultation and MOA/MOU, if Applicable | DHR and FRA, if Applicable

Section 106 requires that each federal agency identify and assess the effects its actions may have on historic properties. Although formal cultural resource coordination and technical studies have not yet been completed for the current project, the limited background review and information gleaned from the DC2RVA project provides data to outline next steps. The project requires compliance with DHR, the Virginia State Historic Preservation Office, through project initiation, determination of APE, and coordination with consulting parties. If federally funded, the project will also require compliance with Section 106 of the National Historic Preservation Act of 1966. Coordination will also include resource eligibility and project effect once a roster of historic properties has been rendered.

The technical studies will revolve around both above- and below-ground resources. Archaeological survey will include Phase I study in areas that have not been previously surveyed and do no exhibit disturbances. The architectural survey will include the recordation of resources 45 years in age or more within the study area and surrounding 500-foot buffer. The technical studies will be summarized in a project report, and DHR Virginia Cultural Resource Information System (VCRIS) packets will be completed for each resource as required by state guidelines.

3.5 Clean Water Act Section 404 Permit | USACE

Section 404 of the Clean Water Act requires authorization from U.S. Army Corps of Engineers (USACE) for the discharge of dredged or fill material into all waters of the United States, including wetlands. If the 0.2 acres of wetlands in the study area cannot be avoided during design, a Section 404 permit will be required.

3.6 Clean Water Act Section 401 Water Quality Certification | USACE/DEQ

Section 401 of the Clean Water Act gives states the authority to grant, deny, or waive certification of proposed Federal licenses or permits that may discharge into waters of the United States. If the 0.2 acres of wetlands in the study area cannot be avoided during design, a Section 401 water quality certification will be required.

3.7 Virginia Water Protection Permit | DEQ

Activities within wetlands or the alteration of the physical, chemical, or biological properties of state waters are regulated and cannot occur without this permit. The State Program General Permit (SPGP) authorizes DEQ to issue a USACE general permit to projects that qualify for the most recent SPGP. The projects must be below applicable wetland and stream impact thresholds and meet all other limitations and conditions of the SPGP. If a project meets the eligibility criteria and conditions of the permit, then coverage under the SPGP will be issued by DEQ in conjunction with a Virginia Water Protection (VWP) permit. If the 0.2 acres of wetlands in the study area or the 0.15 acres of open water cannot be avoided during design, a VWP permit will be required.

3.8 Construction General Permit/Erosion and Sediment Control | EPA/DEQ

DEQ requires development sites to manage stormwater runoff during and after construction. This permit would be applicable as it is required for construction activities resulting in land disturbance equal to or greater than one acre; or less than one acre and part of a larger common plan of development or sale that ultimately disturbs one or more acres.

Projects requiring coverage under the Construction General Permit also require approvals from the local government Erosion and Sediment Control Program. State and federal projects require approvals from DEQ's Erosion and Sediment Control Program.

3.9 Hazardous Materials Management | EPA/DEQ

Hazardous materials and wastes are regulated at the federal level by EPA under RCRA, Subtitle C. At the state level, it is regulated under the Virginia Hazardous Waste Management Regulations by DEQ. Prior to the acquisition of right of way and construction, additional studies would be conducted to determine whether any areas of the study area are potentially contaminated. All solid waste material resulting from clearing and grubbing, demolition, or other construction operations would be removed from the project area and disposed of according to regulations. Coordination with DEQ will be required to determine appropriate management procedures if hazardous substances are encountered during construction.

4 Figures

FIGURE 1. SUMMARY OF EXISTING ENVIRONMENTAL RESOURCES WITHIN FULTON YARD CSX STUDY AREA AND THE SURROUNDING AREA

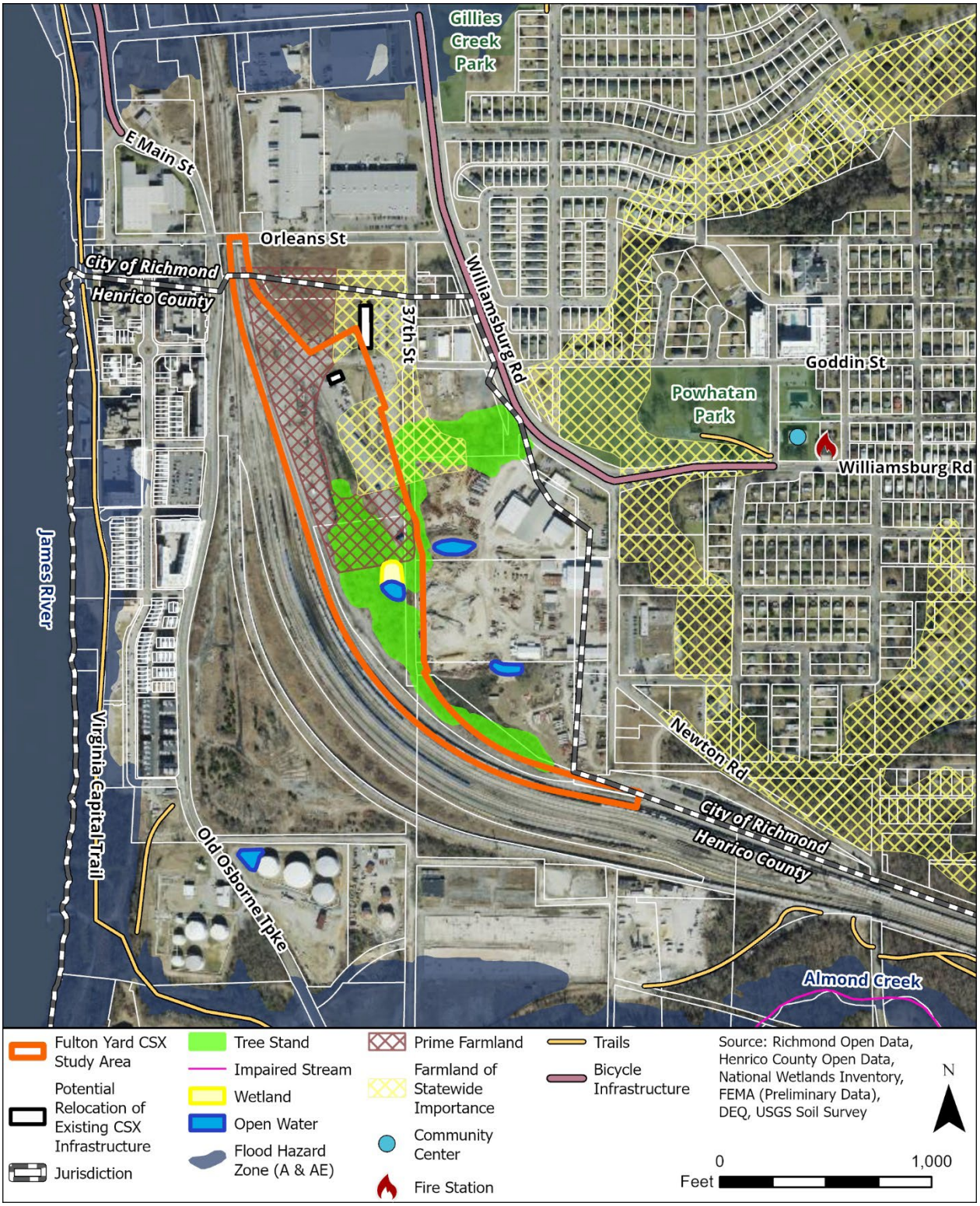


FIGURE 2. SUMMARY OF COMMUNITY RESOURCES

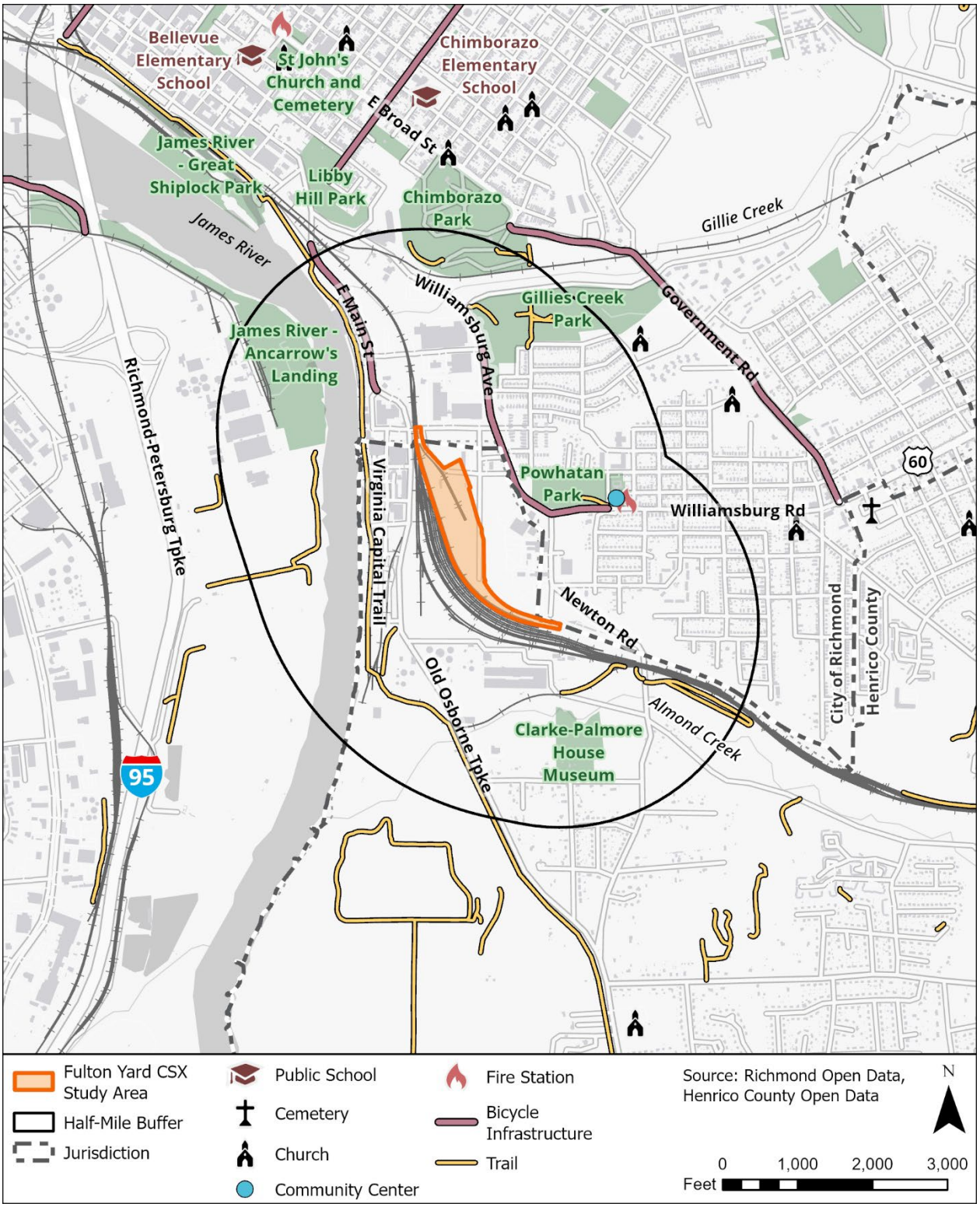
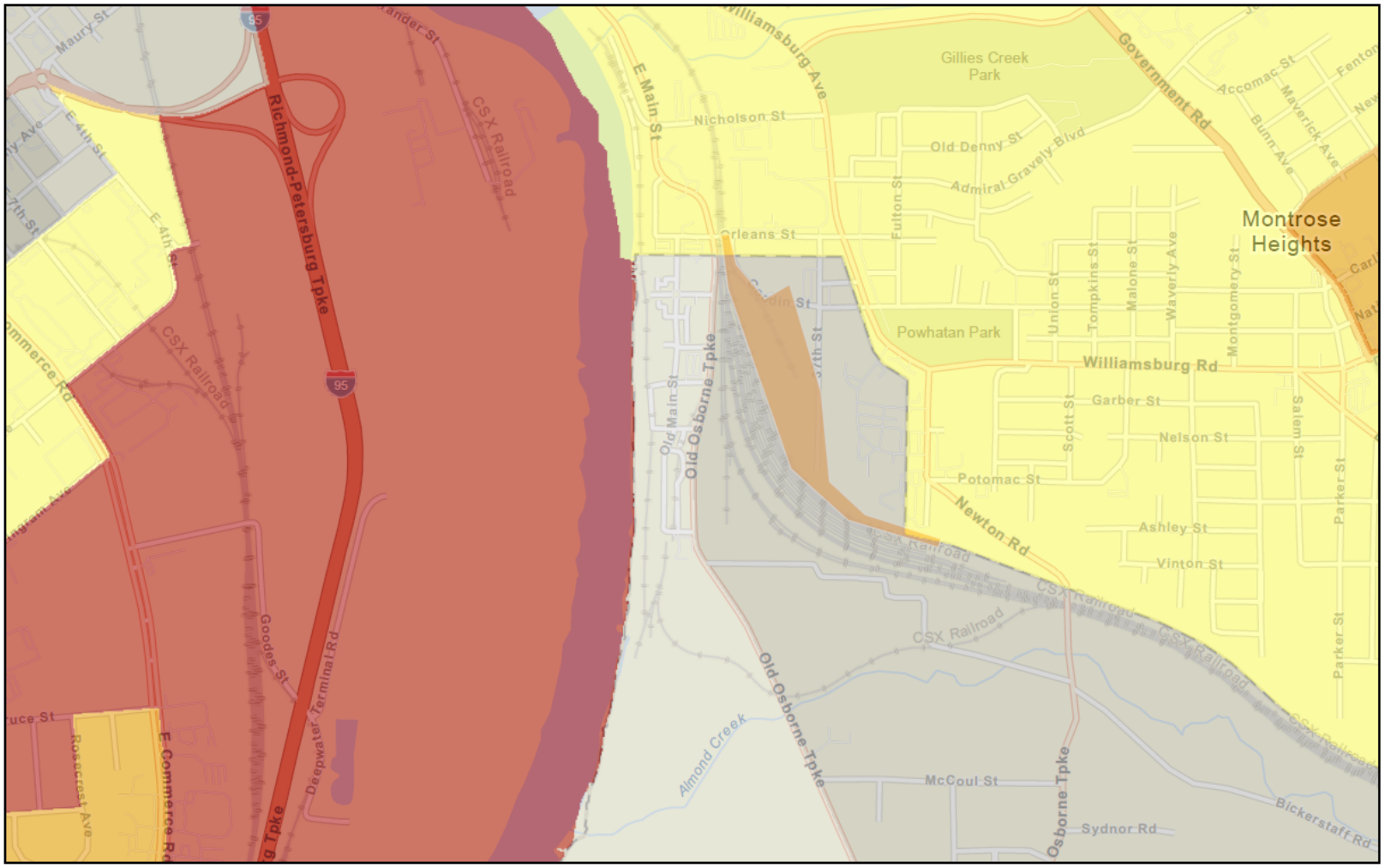
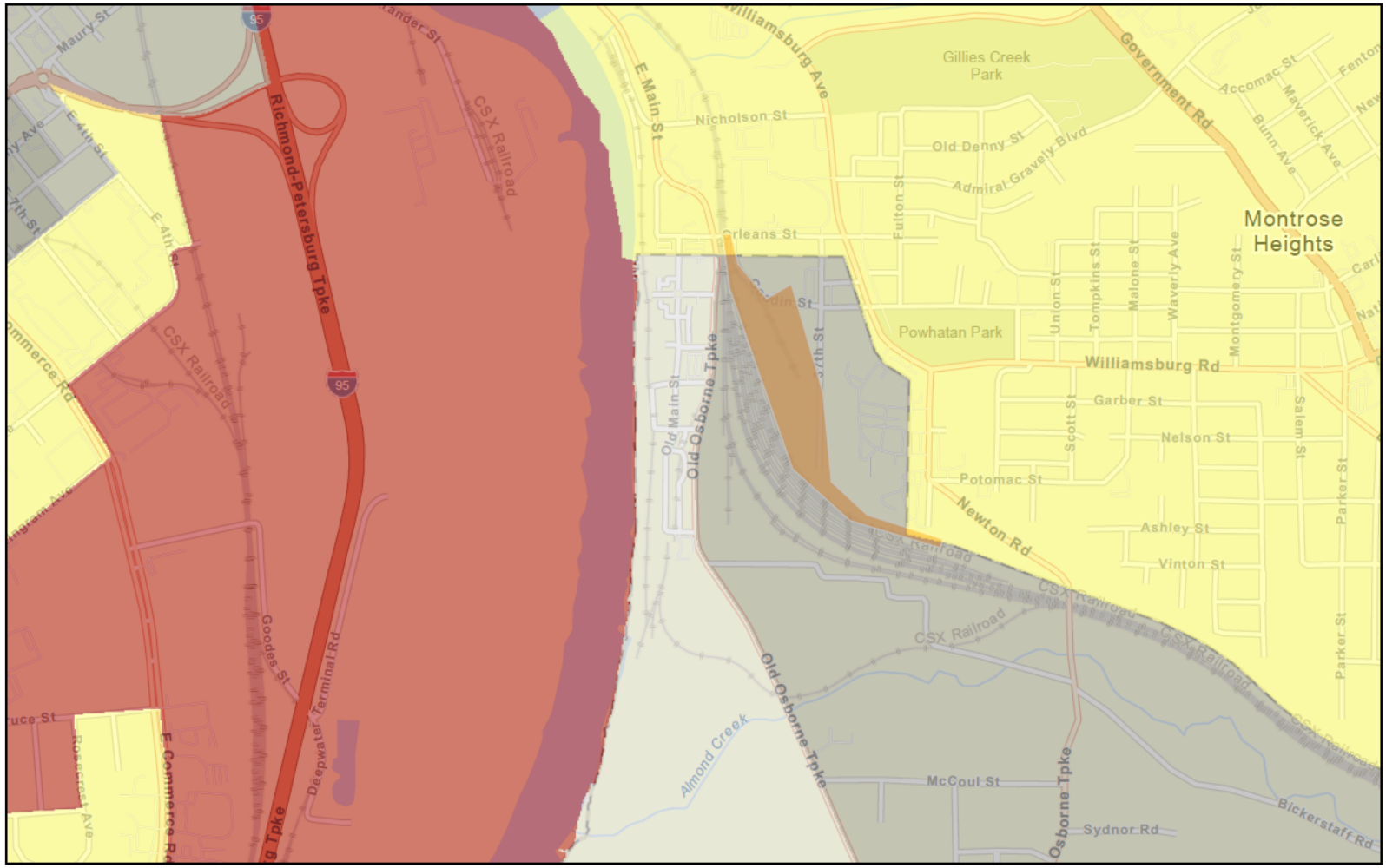


FIGURE 3. EJSCREEN DEMOGRAPHIC INDEX



VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 4. EJSCREEN FOR PEOPLE OF COLOR



11/30/2022

People of Color (National Percentiles)

- Less than 50 percentile
- 50 - 60 percentile
- 60 - 70 percentile
- 70 - 80 percentile
- 80 - 90 percentile
- 90 - 95 percentile
- 95 - 100 percentile
- Data not available
- Fulton Yard CSX Study Area

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Esri Community Maps Contributors, City of Richmond, County of Henrico, VGIN, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA,

VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 5. EJSCREEN FOR LOW INCOME

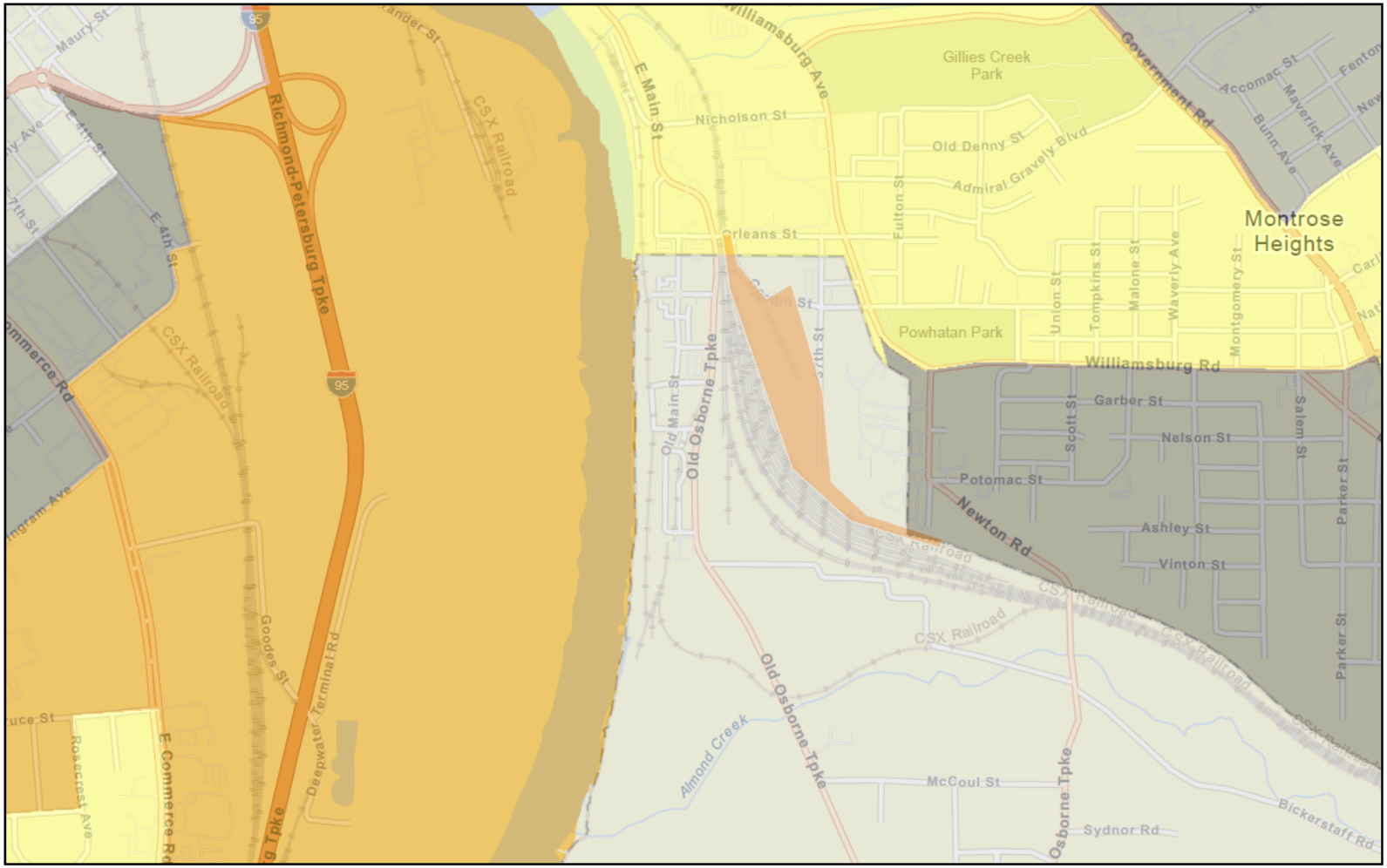


FIGURE 6. HAZARDOUS MATERIAL LOCATIONS

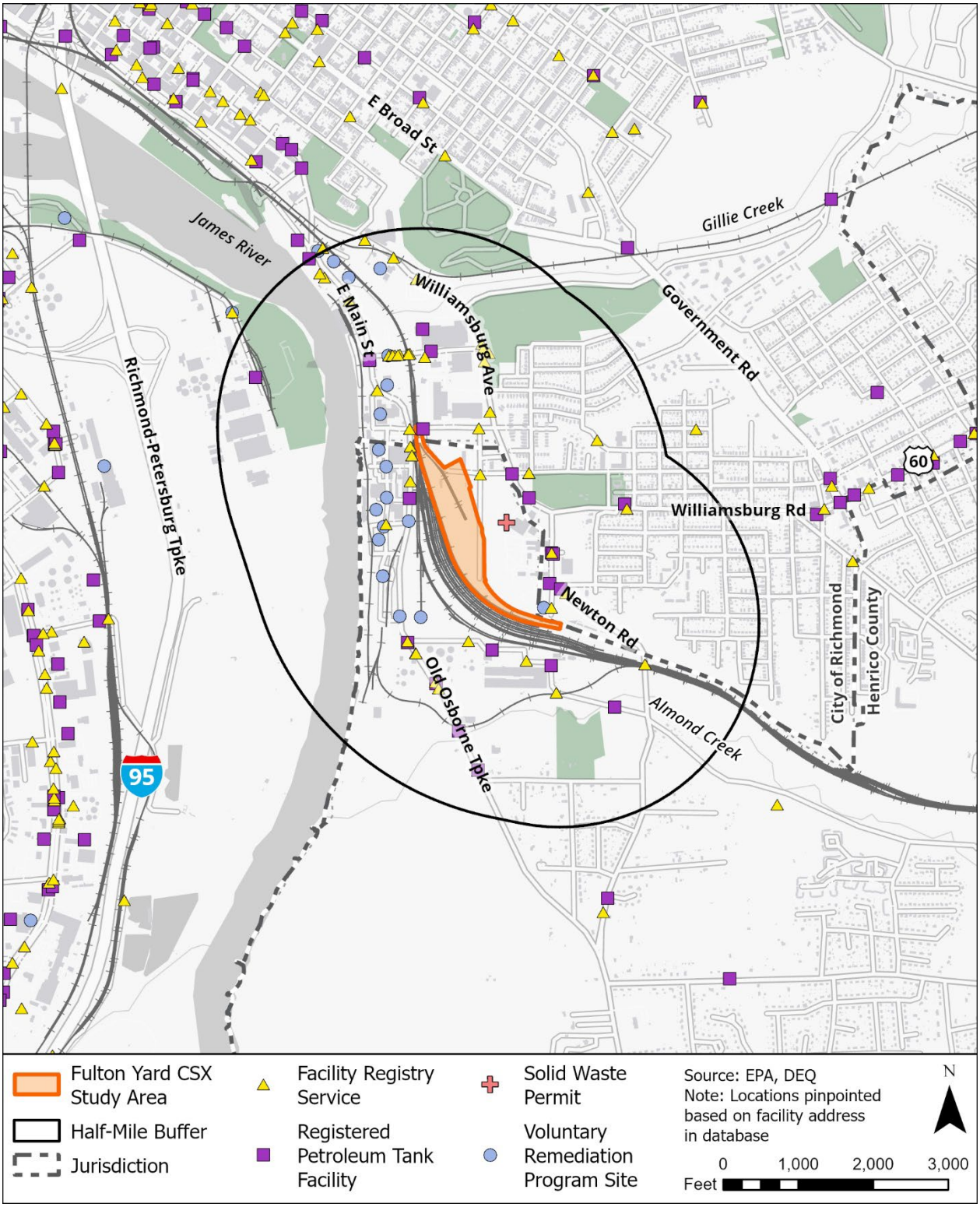


FIGURE 7. BALD EAGLE NEST LOCATIONS NEAR THE STUDY AREA

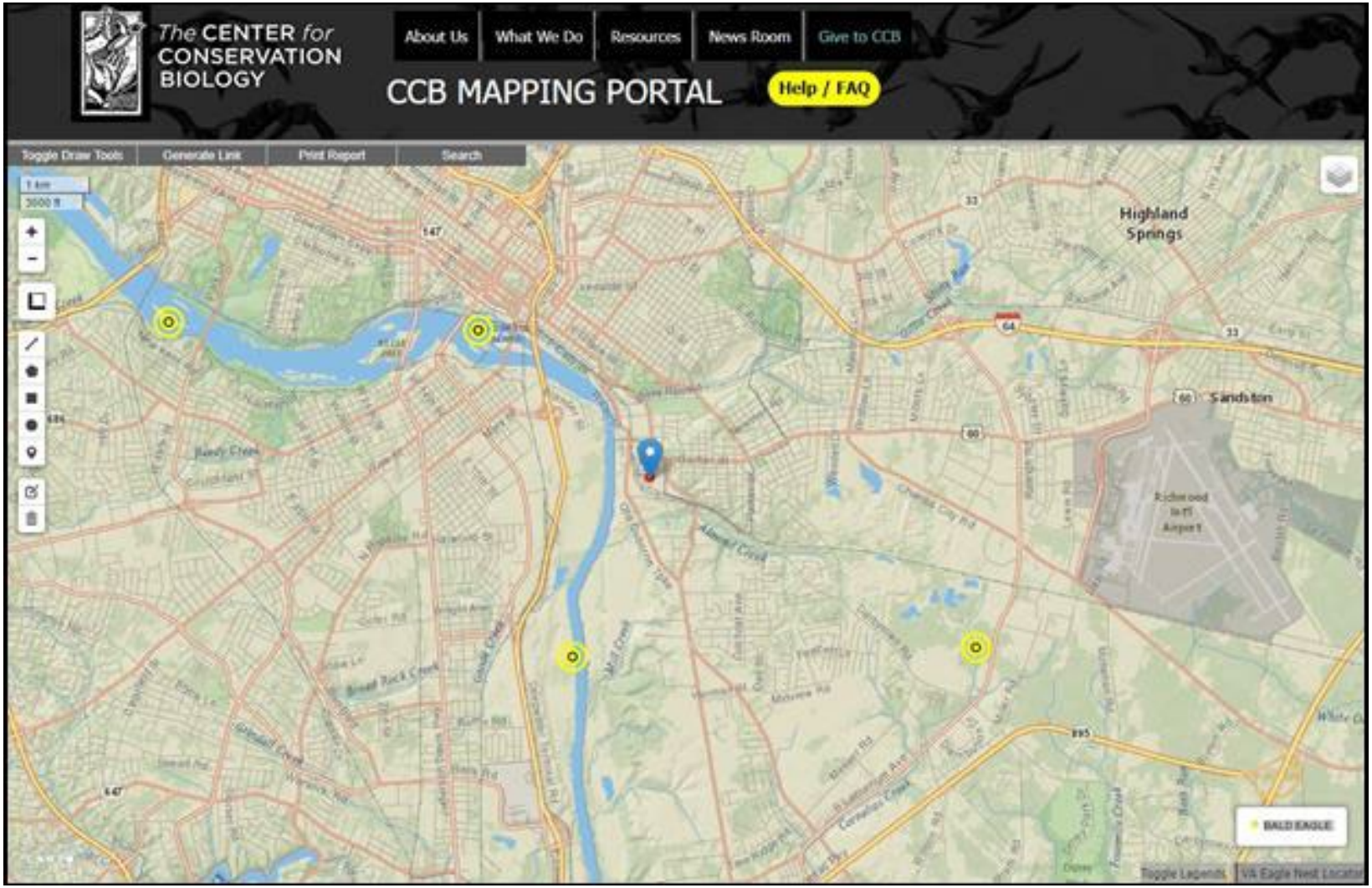


FIGURE 8. PROPERTY OWNERS IN THE STUDY AREA

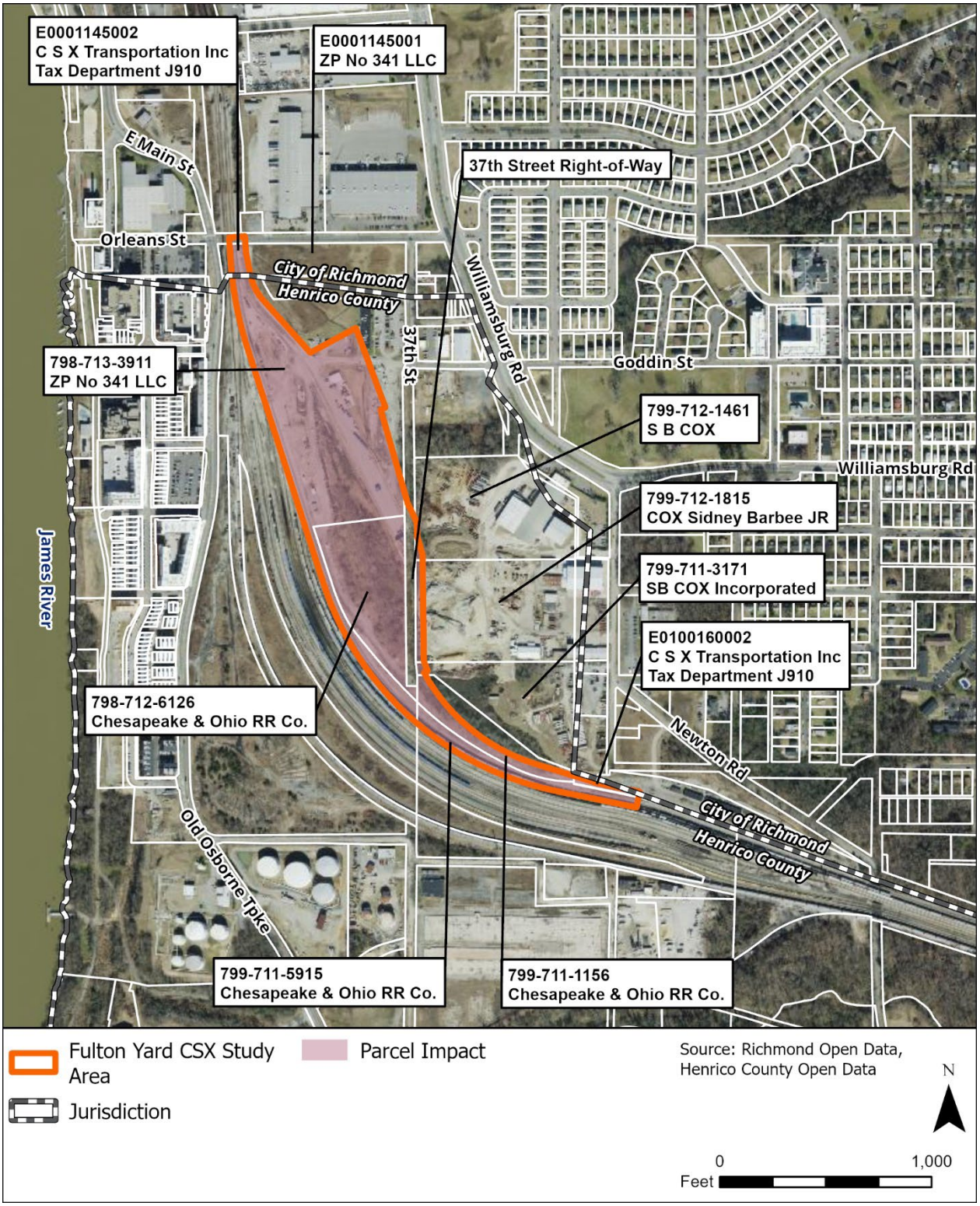
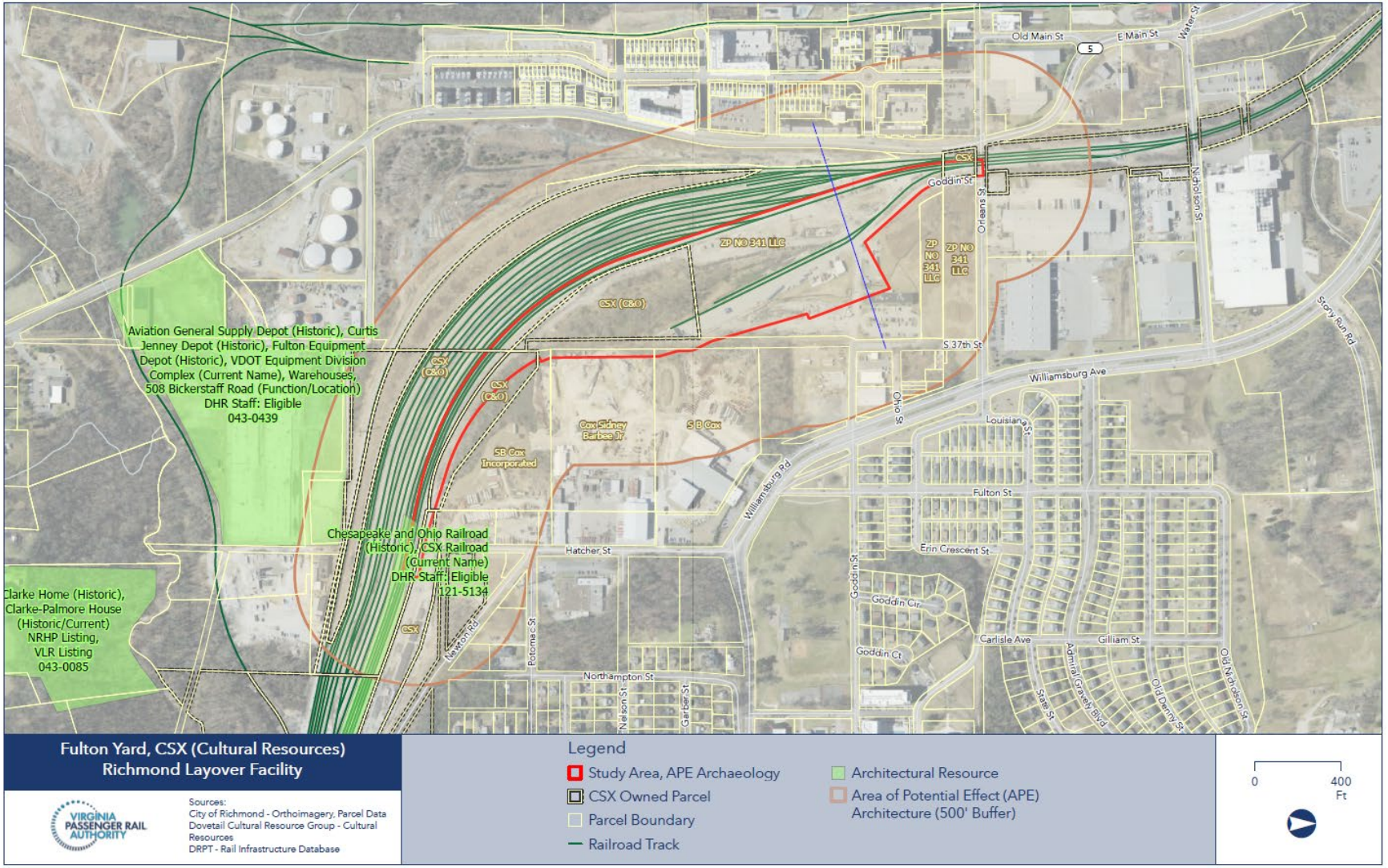
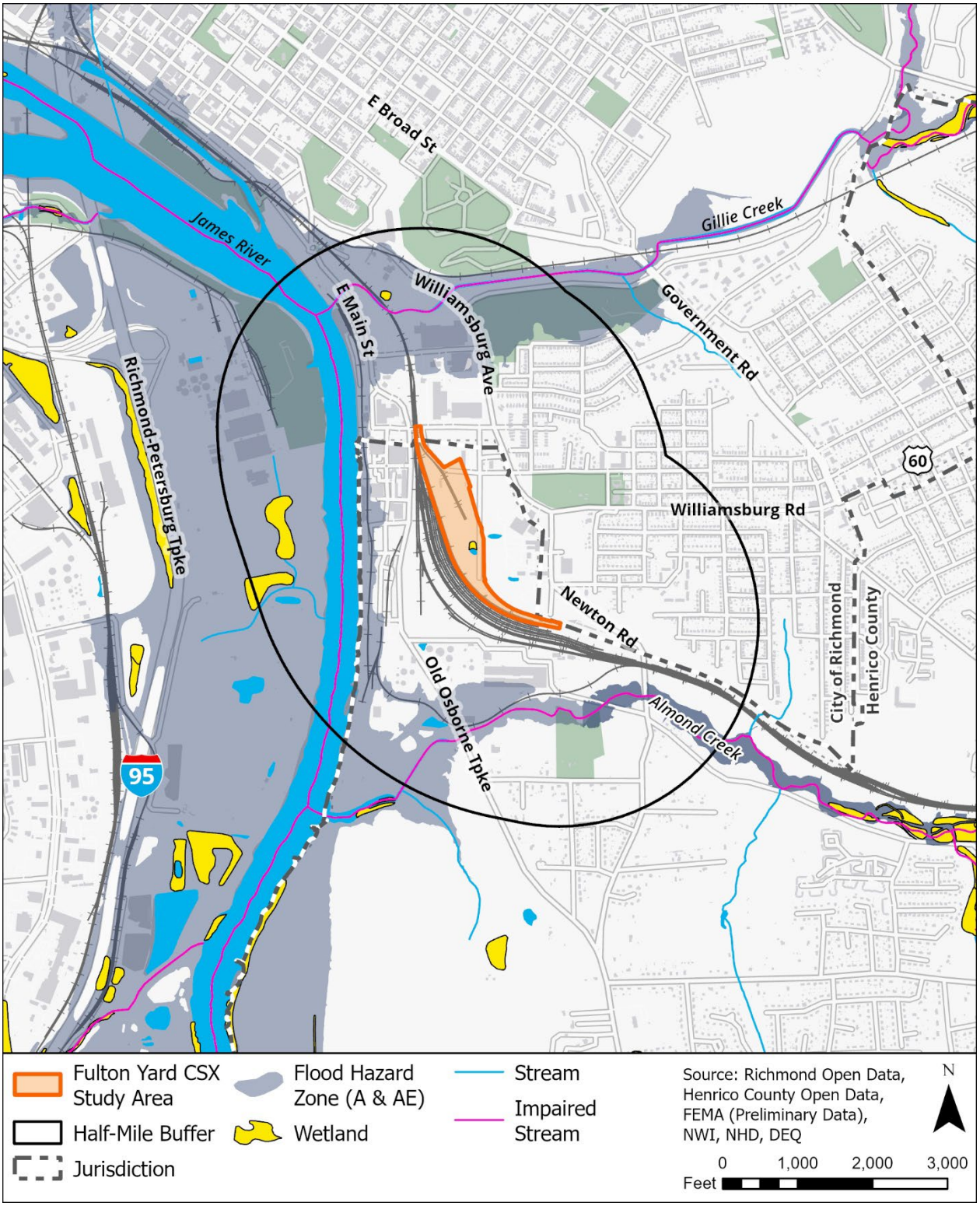


FIGURE 9. PREVIOUSLY RECORDED CULTURAL RESOURCES IN PROJECT APE



VIRGINIA PASSENGER RAIL AUTHORITY

FIGURE 10. WATER RESOURCES IN THE STUDY AREA



Appendix B: Cultural Resources Report

TRANSFORMING RAILINVIRGINIA

Cultural Resource Background Review/ Richmond Layover Facility Feasibility Study, Fulton Yard CSX Location, City of Richmond and Henrico County, Virginia

January 2023

Cultural Resource Background Review/ Richmond Layover Facility Feasibility Study, Fulton Yard CSX Location, City of Richmond and Henrico County, Virginia

January 2023

Prepared for

Virginia Passenger Rail Authority

Prepared by

Richmond Layover Project Team

Kerri S. Barile, PhD, Principal Investigator

January 30, 2023

Date

TRANSFORMING RAIL IN VIRGINIA

Table of Contents

1 Introduction 1
2 Project Methodology 6
3 Results 7
3.1 Previous Cultural Resource Surveys 7
3.2 Previously Recorded Archaeological Sites 8
3.3 Previously Recorded Architectural Resources 11
3.4 Historic Map Review 17
4 Summary and Recommendations 31
4.1 Summary 31
4.2 Recommendations 32
5 References 33

1 Introduction

On behalf of the Virginia Passenger Rail Authority (VPRA) and as a subconsultant to Moffatt & Nichol, Dovetail Cultural Resource Group (Dovetail) conducted a background review of a potential layover facility location in the City of Richmond and Henrico County, Virginia (Figure 1-1, p. 2). The project includes gathering preliminary data to determine the technical feasibility and possible location of a rail yard near downtown Richmond to reduce non-service trips and their associated flow restrictions on the network and increase storage capacity, in accordance with approved plans and providers. Preliminary cultural resource screening was performed on seven location options for the layover facility in the fall of 2022 to identify potential areas of concern. Based on this data, VPRA selected the 22.5-acre (9.1-ha) Fulton Yard CSX location for additional study, herein referred to as the "study area." The location is south of the downtown core and east of the James River in the Rocketts Landing part of Richmond, straddling the City of Richmond and Henrico County line (Figure 1-2–Figure 1-4, pp. 3–5).

Development of the facility may eventually require compliance with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act of 1966, as amended. This preliminary study was devised to aid in the design process by providing details on previous cultural resource studies and previously recorded resources in the study area and a 0.25-mile (0.4-km) background review buffer, as well as conduct a limited historic map review to ascertain the potential for unrecorded resources (see Figure 1-2–Figure 1-4 for details). In instances where a previously recorded resource has not been evaluated for the National Register of Historic Places (NRHP), preliminary recommendations on data potential were given to help identify areas of concern or locations that may require additional studies.

The background review and historic map research was completed between October and December 2022, by Kerri Barile, Luke Donohue, and Elise Norquist with Dovetail. All three individuals meet the Secretary of the Interior Standards for their respective fields. Dr. Barile served as the project Principal Investigator.

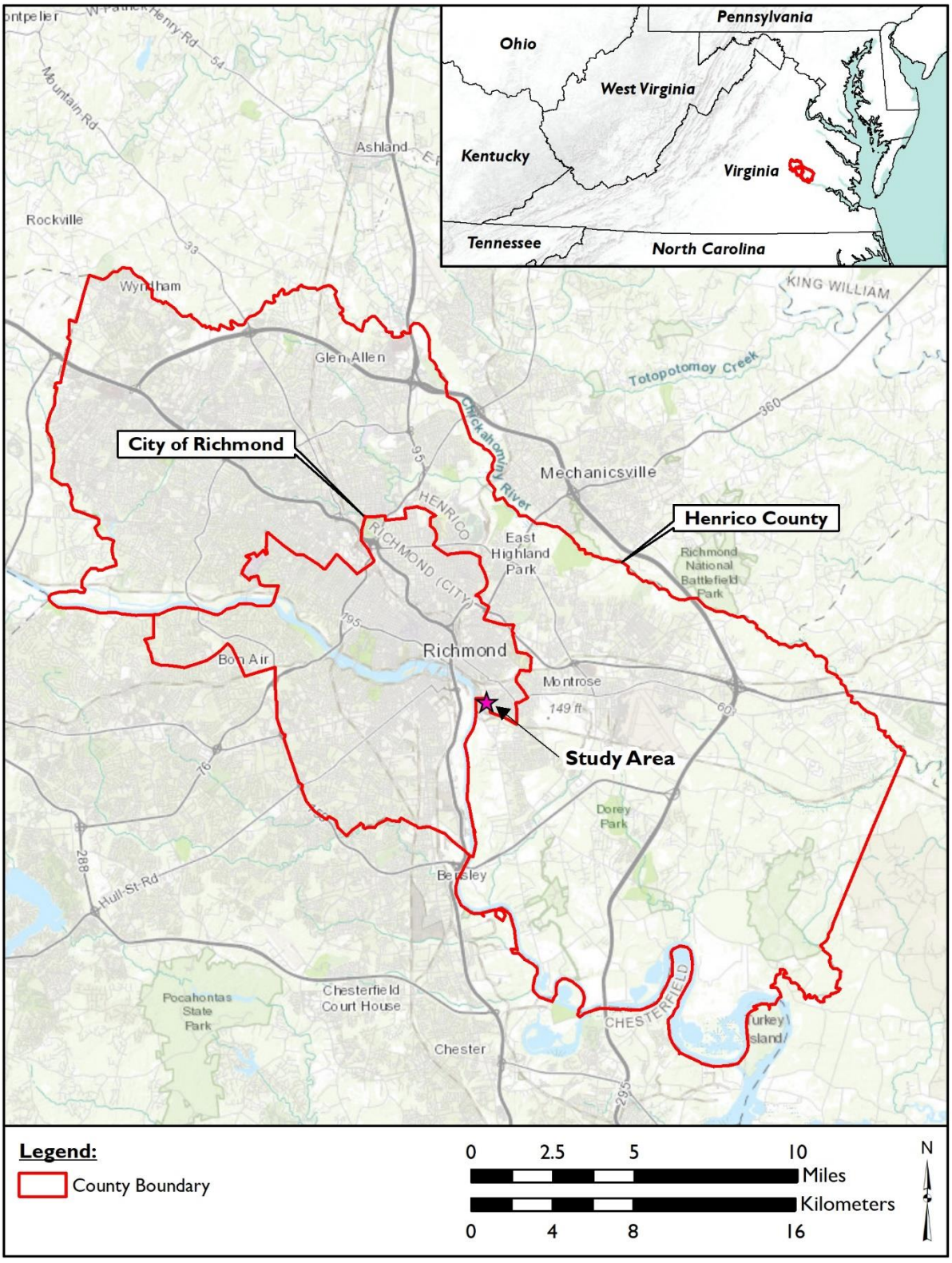


FIGURE 1-1: LOCATION OF STUDY AREA IN THE CITY OF RICHMOND AND HENRICO COUNTY, VIRGINIA (ESRI 2021)

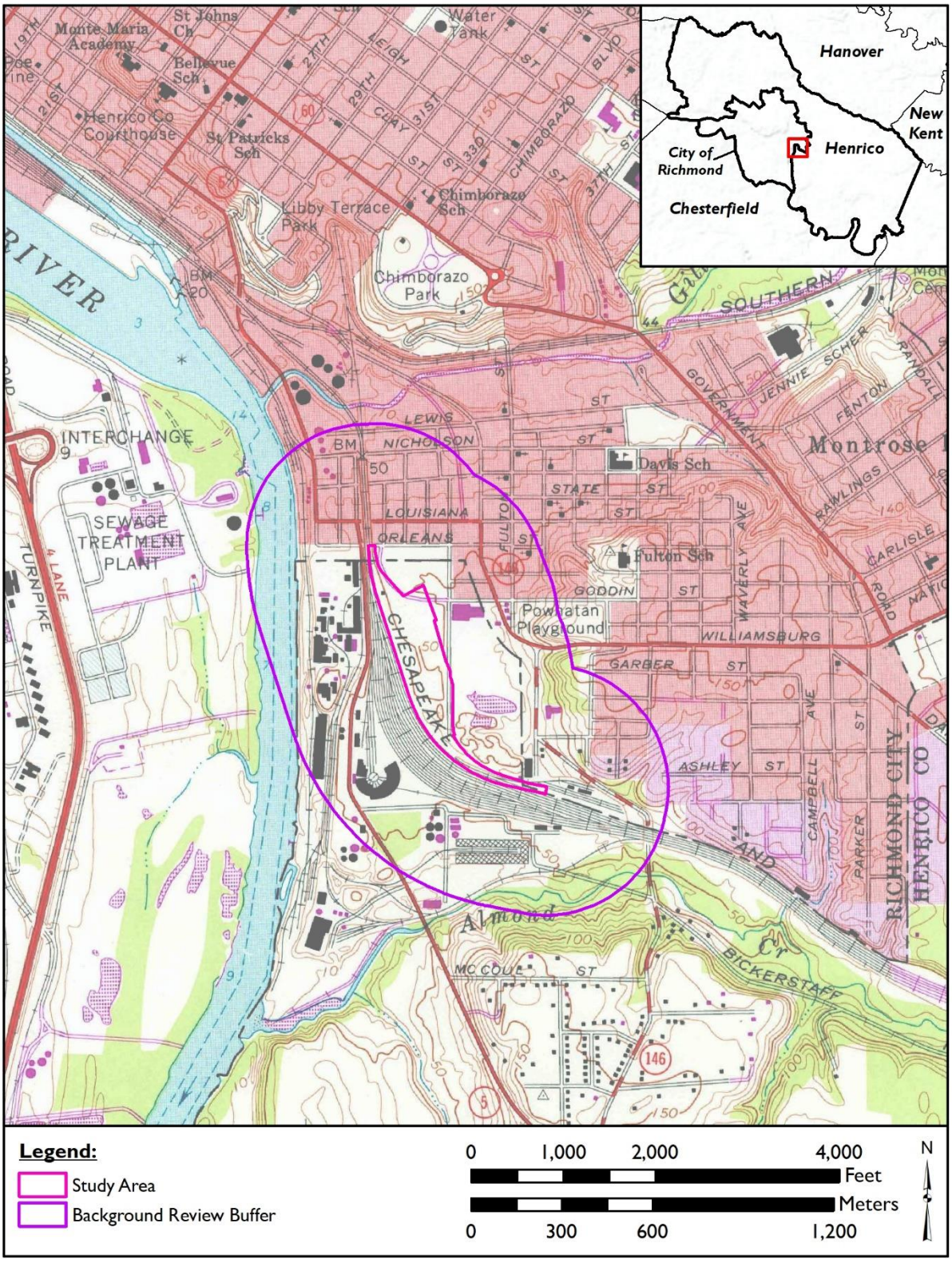


FIGURE 1-2: STUDY AREA AND BACKGROUND REVIEW BUFFER AS SHOWN ON A UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC MAP (USGS 1964)

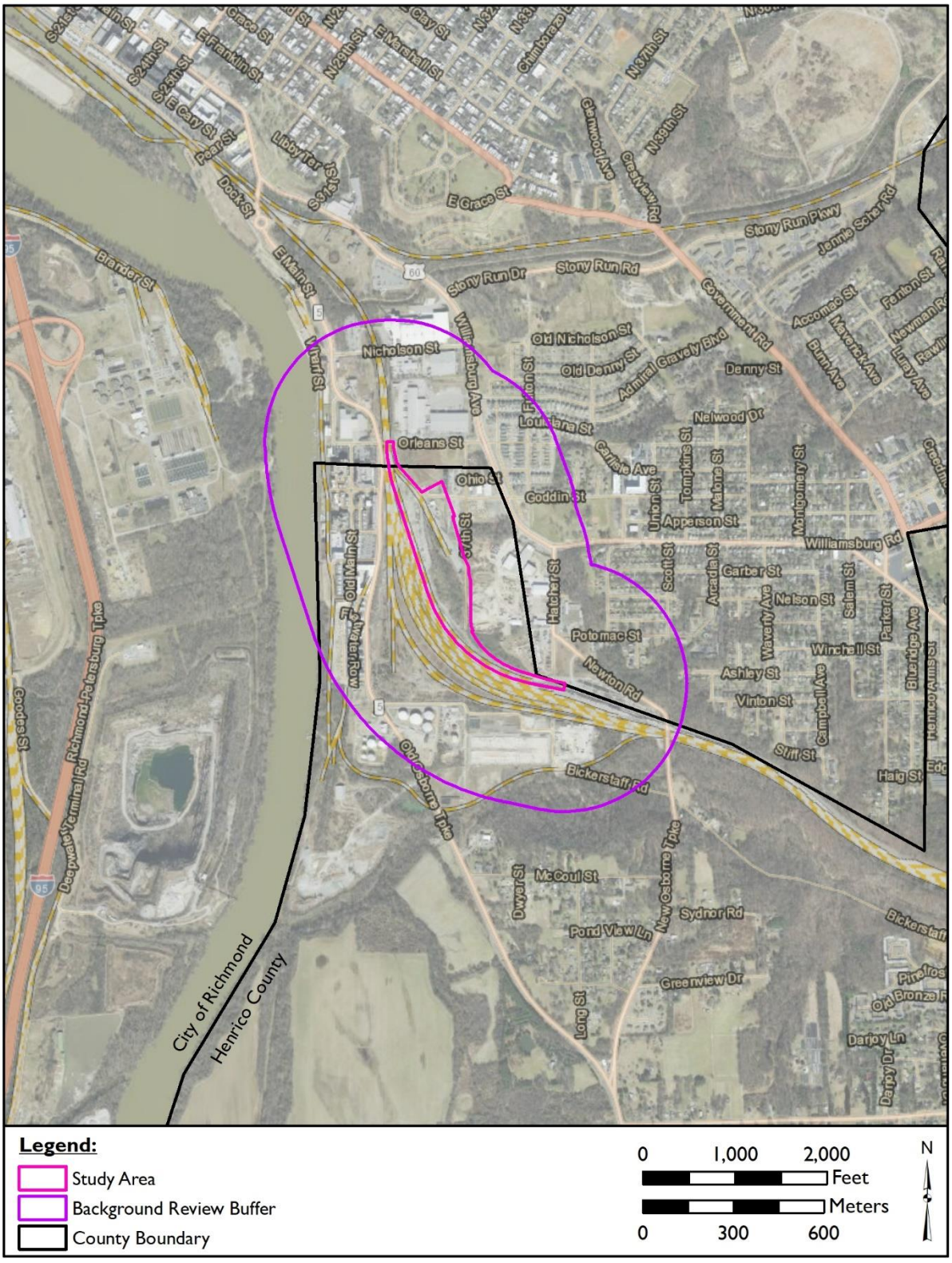


FIGURE 1-3: STUDY AREA, BACKGROUND REVIEW BUFFER, AND LOCALITY DIVISIONS AS SHOWN ON AERIAL IMAGERY (VGIN 2021)

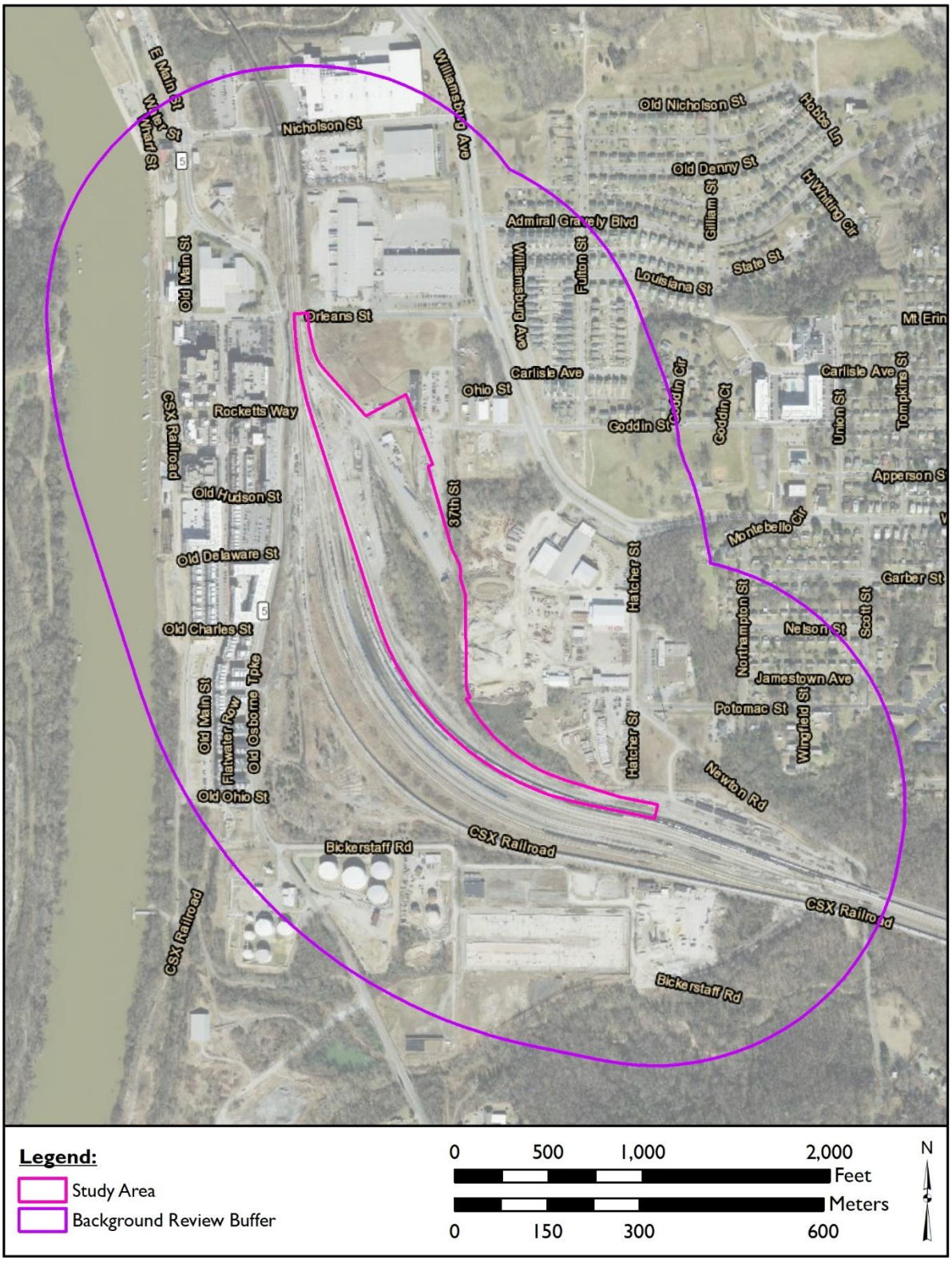


FIGURE 1-4: CLOSE UP VIEW OF STUDY AREA AND BACKGROUND REVIEW BUFFER AS SHOWN ON AERIAL IMAGERY (VIRGINIA GEOGRAPHIC INFORMATION NETWORK [VGIN] 2021). LOCALITY DIVISION IS NOT SHOWN DUE TO SCALE.

2 Project Methodology

Dovetail conducted a background literature and records review using records on file at the Virginia Department of Historic Resources (DHR), including an investigation of records on previous cultural resource studies and previously recorded archaeological sites and architectural resources within the study area. In addition, research was completed on resources within a larger 0.25-mile (0.4-km) buffer to understand the context of cultural resources in the project vicinity and thus the potential for the study area to contain unrecorded resources (referred to in this report as the "background review buffer"). The purpose of this work was to obtain information to aid in future project planning, namely to identify potential cultural resource issues at the outset of the decision-making process. Text on the research potential of key resources that have not been evaluated for NRHP potential was included to provide data on possible future cultural resource studies/areas of concern.

Although this task did not include in-depth historical research on the study area, an abbreviated historic map and historic aerial review was conducted. Images from the seventeenth through the twentieth century were examined to note any areas with a high potential to contain buried historic deposits. This review also relied on data obtained during the Washington, D.C. to Richmond, Virginia (DC2RVA) high speed rail study sponsored by the Virginia Department of Rail and Public Transportation (DRPT) and the Broad Street Bus Rapid Transit (BRT) project by DRPT and Greater Richmond Transit Company (GRTC), as these projects overlapped with the current undertaking.

3 Results

The following chapter presents the results of the background review performed on the Fulton Yard CSX location study area and the 0.25-mile (0.4-km) background review buffer, as well as the historic map review. The potential of the study area to contain significant archaeological or architectural resources was assessed by searching the DHR site and survey file records, and by examining maps and aerial imagery for the area. In total, 10 previous cultural resource surveys are on file with the DHR and were located within the 0.25-mile (0.4-km) background review buffer. In addition, 11 previously identified archaeological sites and 28 recorded architectural resources have been recorded within the background review buffer.

3.1 Previous Cultural Resource Surveys

Ten total previous cultural resource surveys were identified within the 0.25-mile (0.4-km) background review buffer within DHR files and Dovetail records (Table 3-1, p. 8). Five of those surveys overlap the study area. In 2007, Coastal Carolina Research (CCR) completed a cultural resources survey on the Route 5 improvement project, which intersects the northernmost tip of the study area. The CCR survey identified a total of nine previously recorded and 10 newly recorded architectural resources, including two resources (043-0436 and 127-6257) located within the study area, and seven resources (043-0306, 127-0258, 127-6258, 127-6259, 127-6260, 127-6261, and 127-6260) located within the background review buffer. CCR also identified one previously identified archaeological site (44HE0057) and three newly identified archaeological sites (44HE1079, 44HE1080, and 44HE1081) within the background review buffer that are outside the study area (James et al. 2007).

Dovetail has conducted four surveys that intersect the study area. In 2010, Dovetail completed a cultural resource survey for the BRT project by DRPT and the GRTC. This survey included multiple volumes, including one on "Area I" which intersected the northern boundary of the study area and the accompanying archaeological reconnaissance for the entire corridor. The survey identified two previously recorded resources within the background review buffer (043-0403 and 127-0413). No archaeological sites were identified during the survey (Peckler et al. 2010). The remaining three surveys were done as part of the DC2RVA high speed rail project sponsored by the DRPT. Two of these surveys were archaeological studies, including a Phase IA analysis completed in 2015 (Klein et al. 2015) and a Phase IB study done in 2016 (McCloskey et al. 2016). No sites were recorded in the study area as part of this work. In 2016, Dovetail completed a reconnaissance-level architectural survey on proposed improvements as part of the DC2RVA high speed rail study. The AM junction to Fulton Yard (AMFY) segment included the study area and intersected the background review buffer; however, the only changes proposed within the portions of that survey within the background review buffer were associated with signal lighting and gates. Per the DHR, such actions do not have the potential to affect historic properties so this area was excluded from subsequent Phase I-level architectural studies within the project area of potential effects (APE). Therefore, no architectural resources within the background review buffer were evaluated during the 2016 survey (Anderson and Staton 2016).

The remaining five cultural resource surveys within the background review buffer do not intersect the study area. They encompass a wide variety of project types, including preliminary excavations for an archaeological site, a general Henrico County survey, work along the Richmond Marina, trail improvements, and general development.

TABLE 3-1: PREVIOUS CULTURAL RESOURCE SURVEYS WITHIN THE STUDY AREA AND BACKGROUND REVIEW BUFFER. THOSE WITHIN THE STUDY AREA ARE IN BLUE TEXT.

DHR #	Title	Author/Affiliation	Year
NA	*Cultural Resource Survey of the Broad Street Bus Rapid Transit System, City of Richmond and Henrico County, Virginia, Volume V: Area I & Archaeological Reconnaissance*	Danae Peckler, Tom Roberts, & Kerri Barile/Dovetail	2010
NA	*Architectural Reconnaissance Survey for the Washington, D.C. to Richmond, Virginia High Speed Rail Project AM Jct to Centralia: S Line (AMCE) and AM Jct to Fulton Yard (AMFY) Segments, City of Richmond and Chesterfield County*	Emily K. Anderson & Heather D. Staton/Dovetail	2016
NA	*Archaeological Background Review and Predictive Model for the Washington, D.C. to Richmond, Virginia, Southeast High Speed Rail Corridor*	Mike Klein, Emily Calhoun, Marco González, and Earl E. Proper/ Dovetail	2015
NA	*Phase IB Archaeological Survey for the Washington, D.C. to Richmond, Virginia High Speed Rail Project Rosslyn to Alexandria (ROAF) through Buckingham Branch/Hospital Wye (BBHW) Segment*	Kevin McCloskey, Earl Proper, Curtis McCoy, Emily Calhoun, Morgan MacKenzie, and Joseph Blondino	2016
HE-006	*Preliminary Excavations at the Site of the Richmond Glass Manufacturing Company*	Alain C. Outlaw	1974
HE-013	*Archeology in Henrico, Volume 1: Identification and Evaluation of Archaeological and Historic Resources for the Henrico County, Virginia Regional Wastewater System*	L. Daniel Mouer, Robert R. Hunter, Elizabeth G. Johnson, Laurence W. Lindberg, & John Saunders/Virginia Commonwealth University Archaeology Research Center	1978
HE-242	*A Cultural Resources Survey of Proposed Improvements to Route 5 in the City of Richmond, Virginia*	Tiffany James, Jennifer Stewart, Bill Hall, & Loretta Lautzenheiser/CCR	2007
HE-243	*Submerged Cultural Resources Archaeological Survey, Richmond Harbor Marina, Richmond, Virginia and Rocketts Landing Marina, Henrico County, Virginia and Architectural Survey of the Richmond Cedar Works Piers (043-0306), Henrico County, Virginia*	Megan Rupnik, Michael Yengling, & Eric Voigt/Louis Berger Group	2008
HE-325	*Cultural Resources Survey of the Rocketts Landing Phase of the Virginia Capital Trail Project, Henrico County, Virginia*	William H. Moore & Sarah M. Clarke/Virginia Department of Transportation (VDOT)	2014
HE-432	*Phase IB Cultural Resource Survey of the East Main Street and Williamsburg Avenue Project Area, City of Richmond, Virginia*	Kevin McCloskey, Lenora Wiggs, & Mical Tawney/Dovetail	2020

3.2 Previously Recorded Archaeological Sites

A total of 11 archaeological sites was identified within the 0.25-mile (0.4-km) background review

buffer (Table 3-2, p. 9; Figure 3-1, p. 10). One archaeological site (44HE0413) is located within the study area. Site 44HE0413 is a previously recorded site with little information in Virginia Cultural Resource Information System (VCRIS) files beyond its name as the "Powhatan Town Site" on a 1981 written site form. It is also listed as an architectural resource, 043-0172 (see mapped location for 44HE0413). In the architectural resource listing for the site, it is recorded as dating to the Late Woodland period. Site 44HE0413 has not been evaluated for the NRHP.

Of the 11 total archaeological sites within the background review buffer, there are three precontact sites (44HE0057, 44HE0413, and 44HE1081) and two multicomponent sites (44HE0058 and 44HE1079) with precontact components. Precontact sites with diagnostic artifacts dated to either the Archaic or Woodland periods, with only one site (44HE1081) having no diagnostic artifacts. Sites with a historic component within the background review buffer included the abovementioned two multicomponent sites and six additional sites (44CF0411, 44HE0236, 44HE0430, 44HE0806, 44HE1080, and 44HE1177). Historic artifacts generally dated to the eighteenth and nineteenth centuries, with a few sites having twentieth-century components.

Four of the previously recorded archaeological sites (44HE0057, 44HE1079, 44HE1080, and 44HE1081) have been determined potentially eligible for the NRHP by DHR staff. Site 44HE0057 represents a precontact temporary camp with artifacts dating from the Middle Archaic to the Late Woodland period. Site 44HE1079 is a multicomponent camp and trash scatter with precontact artifacts from the Late Archaic to Late Woodland periods and historic artifacts from the Early National to Reconstruction and Growth Periods. Site 44HE1080 is a historic single dwelling from the eighteenth to nineteenth century and site 44HE1081 is a precontact camp of indeterminate age. One site (44HE1177) has been determined ineligible for the NRHP. The remaining six previously recorded archaeological sites (44CF0411, 44HE0058, 44HE0236, 44HE0413, 44HE0430, and 44HE0806) have not been evaluated for the NRHP.

TABLE 3-2: PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN THE STUDY AREA AND BACKGROUND REVIEW BUFFER. RESOURCES IN THE STUDY AREA ARE IN BLUE TEXT.

DHR #	Type	Period	DHR Evaluation
44CF0411	Dwelling, single; Well	Eighteenth Century, Nineteenth Century	Not Evaluated
44HE0057	Camp, temporary	Middle Archaic, Early Woodland, Middle Woodland, Late Woodland	DHR Staff: Potentially Eligible
44HE0058	Camp, temporary; Dwelling, multiple	Woodland, Nineteenth Century: third quarter, Twentieth Century	Not Evaluated
44HE0236	Factory	Antebellum Period, Civil War, Reconstruction and Growth	Not Evaluated
44HE0413 (043-0172)	Village/Town	Late Woodland	Not Evaluated
44HE0430	Kiln, brick	Historic/Unknown	Not Evaluated
44HE0806	Kiln, pottery	Nineteenth Century	Not Evaluated
44HE1079	Camp, Trash scatter	Late Archaic Period, Early Woodland, Middle Woodland, Late Woodland, Early National Period, Antebellum Period, Civil War, Reconstruction and Growth	DHR Staff: Potentially Eligible
44HE1080	Dwelling, single	Early National Period, Antebellum Period, Civil War, Reconstruction and Growth	DHR Staff: Potentially Eligible
44HE1081	Camp	Precontact/Unknown	DHR Staff: Potentially Eligible
44HE1177	Railroad bed	Reconstruction and Growth, World War I to World War II	DHR Staff: Not Eligible

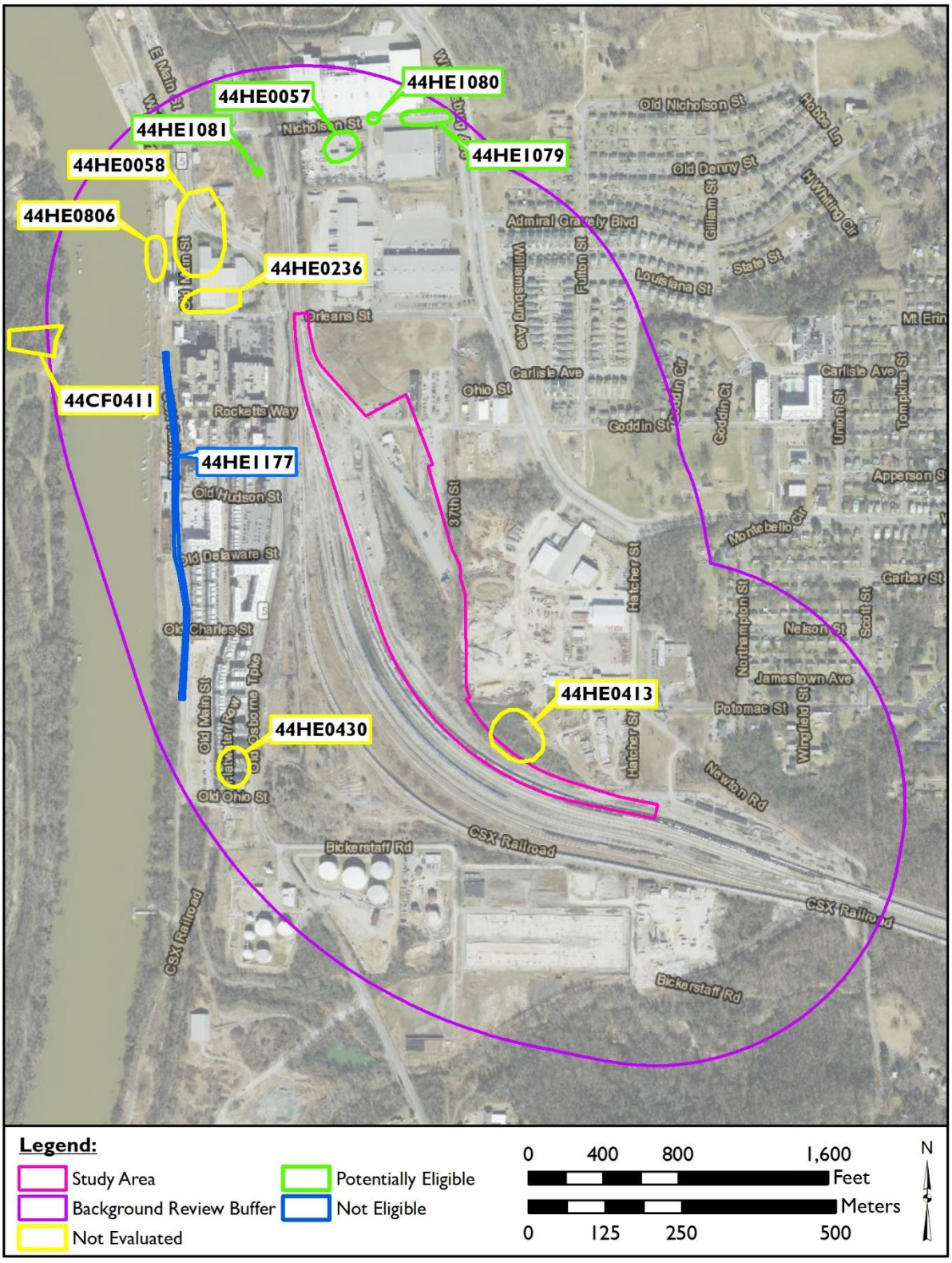


FIGURE 3-1: PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES IN THE STUDY AREA AND BACKGROUND REVIEW BUFFER (VGIN 2021)

3.3 Previously Recorded Architectural Resources

There are 28 above-ground resources located within the 0.25-mile (0.4-km) background review buffer (Table 3-3; Figure 3-2–Figure 3-4, pp. 13–15). Six of these resources are located within the 22.5-acre (9.1-ha) study area. The CSX Fulton Yard complex (043-0436), constructed circa 1850, was used for a variety of material processing operations, which made the rail shipping facility ideal for business. Very little remains of the complex as many of the contributing resources (e.g., tracks and associated buildings) have been demolished. Three buildings within the complex and study area were demolished circa 2003. Two of these buildings were offices, one constructed circa 1920 (043-0436-0003) and the other circa 1930 (043-0436-0001). The third building, an employee facility (043-0436-0002), was constructed circa 1920 and was of a vernacular Italianate style. The CSX Fulton Yard complex was determined not eligible for listing in the NRHP and Virginia Landmarks Register (VLR) in 2014 and the three remaining associated buildings have not been evaluated. The CSX bridge (127-6257) that traverses Orleans Street is also located within the study area. While not within the bounds of the CSX Fulton Yard complex, it leads trains in and out of the area. This resource was determined not eligible for listing in the NRHP and VLR in 2015.

Another resource that crosses into the study area is a segment of the former Chesapeake & Ohio Railroad (present-day CSX) (121-5134), specifically a section of the Peninsula Extension that runs from Fulton Yard to the port of Newport News. This track was completed by Collis P. Huntington in 1881 and facilitated the movement of coal from West Virginia to ships in Newport News, Virginia. In 2020, it was determined eligible for listing in the NRHP and VLR under Criterion A for trends in history related to transportation.

TABLE 3-3: PREVIOUSLY RECORDED ARCHITECTURAL RESOURCES WITHIN THE STUDY AREA AND BACKGROUND REVIEW BUFFER. RESOURCES IN THE STUDY AREA ARE IN BLUE TEXT.

DHR ID	Property Names	Date of Construction	Evaluation Status
043-0085	Clarke Home, Clarke-Palmore House, 904 McCoul Street	1819	NRHP Listing, VLR Listing (2004)
043-0241	Brick Kiln Site, Old Osborne Turnpike, Route 5 West	N/A	Not Evaluated
043-0306	Richmond Cedar Works, Old Osborne Turnpike, Rocketts Landing Development, Old Osborne Turnpike - Alt Route 5	ca. 1885	Not Eligible (2015)
043-0436	CSX Fulton Yard, Old Osborne Turnpike	ca. 1850 (per VCRIS form)	Not Eligible (2014)
043-0436-0001	Office Building, CSX Fulton Yard, Old Osbourne Turnpike	ca. 1930	Not Evaluated
043-0436-0002	Employee Facility, CSX Fulton Yard, Old Osbourne Turnpike	ca. 1920	Not Evaluated
043-0436-0003	Office Building, CSX Fulton Yard, Old Osbourne Turnpike	ca. 1920	Not Evaluated
043-0436-0004	Office and Equipment Building, 37th Street	ca. 1920	Not Evaluated
043-0436-0005	Chemical Plant and Tank, CSX Fulton Yard, Old Osbourne Turnpike	ca. 1920	Not Evaluated
043-0436-0006	Shop, CSX Fulton Yard, 5225 Old Osborne Turnpike	1930	Not Evaluated

DHR ID	Property Names	Date of Construction	Evaluation Status
043-0436-0007	Coal Loading Tower, CSX Fulton Yard, 5225 Old Osborne Turnpike	1920	Not Evaluated
043-0436-0009	Equipment Shed, CSX Fulton Yard, Old Osborne Turnpike	1920	Not Evaluated
043-0437	Knight Terminal, Terminal, 5500 Old Osborne Turnpike	ca. 1920	Not Evaluated
043-0438	Fuel Terminal, 413 Bickerstaff Road	ca. 1930	Not Evaluated
043-0439	Aviation General Supply Depot, Curtis Jenney Depot, Fulton Equipment Depot, VDOT Equipment Division Complex, Warehouses, 508 Bickerstaff Road	1917	Eligible (2003)
043-0440	Airco, 900 Bickerstaff Road	ca. 1903	Not Evaluated
043-0441	Bridge New Osborne Turnpike, Railroad Bridge	1901	Not Evaluated
043-0450	Industrial Complex, Stancraft Road	ca. 1940	Not Eligible (2014)
043-5313	James River Steam Brewery Cellars, 4920 Old Main Street	1866	NRHP Listing (2014), VLR Listing (2013)
121-5134	Chesapeake and Ohio Railroad, CSX Railroad, Railroad Corridor	ca. 1881	Eligible (2020)
127-0258	Richmond Glass Works, Orleans Street	Pre 1844	Not Evaluated
127-0413	Power Plant, 4708-4712 Old Main Street, The Boathouse	ca. 1910	Not Eligible (2015)
127-6252	Industrial Building, 4400 East Main Street	1929	Not Eligible (2015)
127-6257	CSX Bridge, Orleans Street	1956	Not Eligible (2015)
127-6258	CSX Bridge, North of Orleans Street	1956	Not Eligible (2015)
127-6259	CSX Bridge, Nicholson Street	1956	Eligible (2016); No longer eligible as the bridge was removed and replaced
127-6260	CSX Building, Intersection of East Main Street and Orleans Street	ca. 1945	Not Eligible (2015)
127-6261	CSX Bridge, East Main Street	1956	Not Eligible (2015)

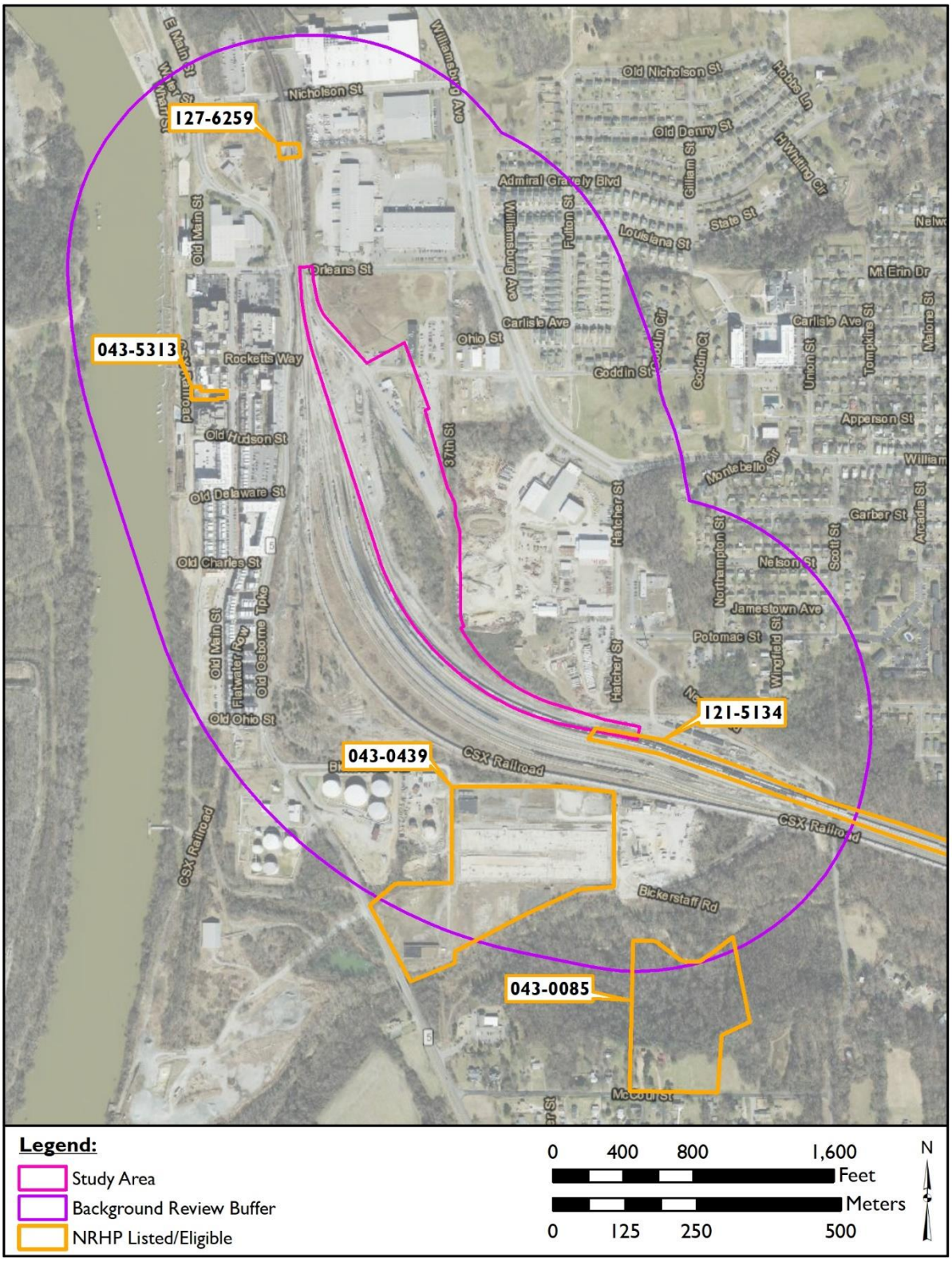


FIGURE 3-2: PREVIOUSLY RECORDED NRHP LISTED/ELIGIBLE ARCHITECTURAL RESOURCES IN THE STUDY AREA AND BACKGROUND REVIEW BUFFER (VGIN 2021)

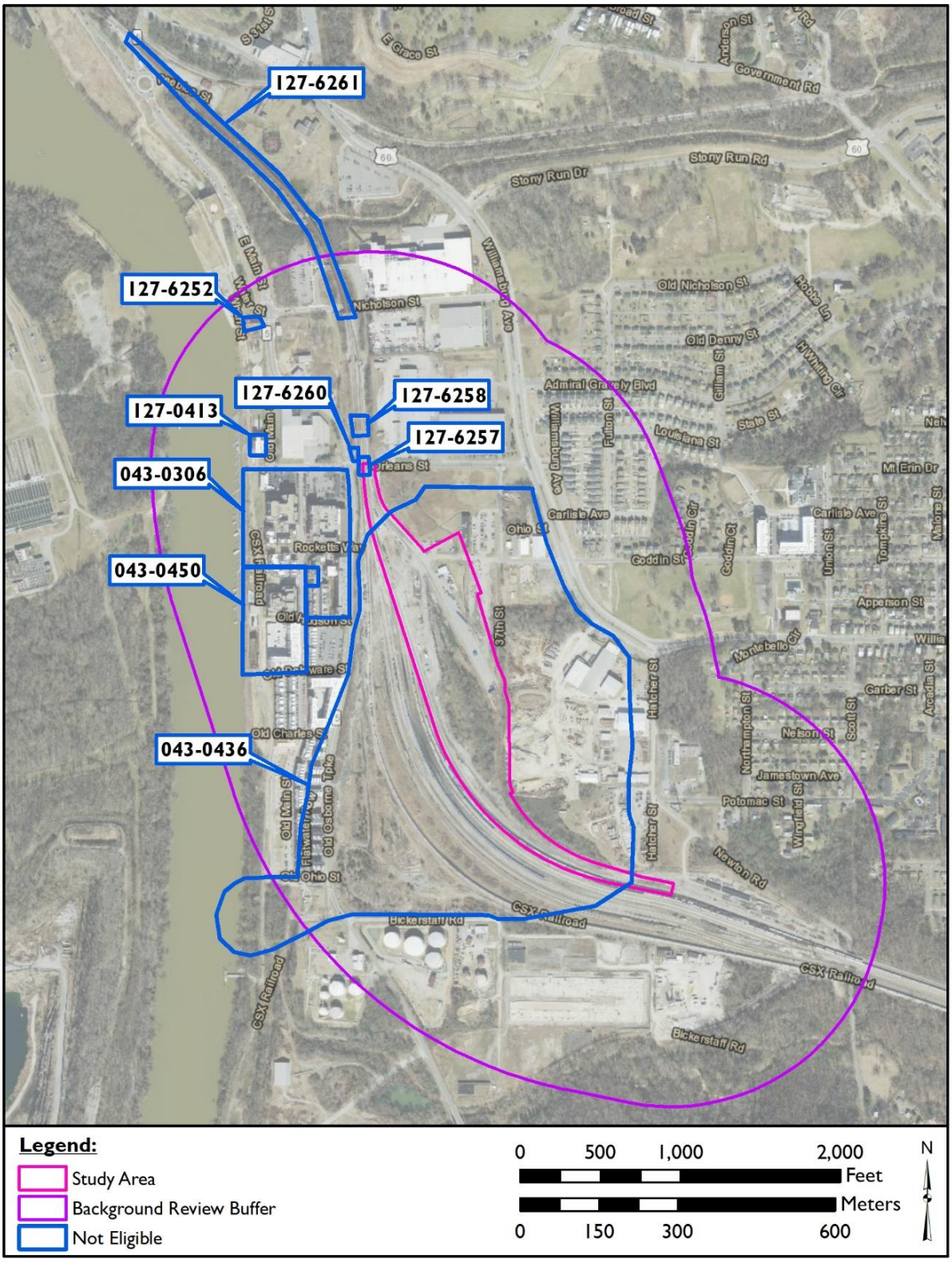


FIGURE 3-3: PREVIOUSLY RECORDED ARCHITECTURAL RESOURCES DETERMINED NOT ELIGIBLE IN THE STUDY AREA AND BACKGROUND REVIEW BUFFER (VGIN 2021)

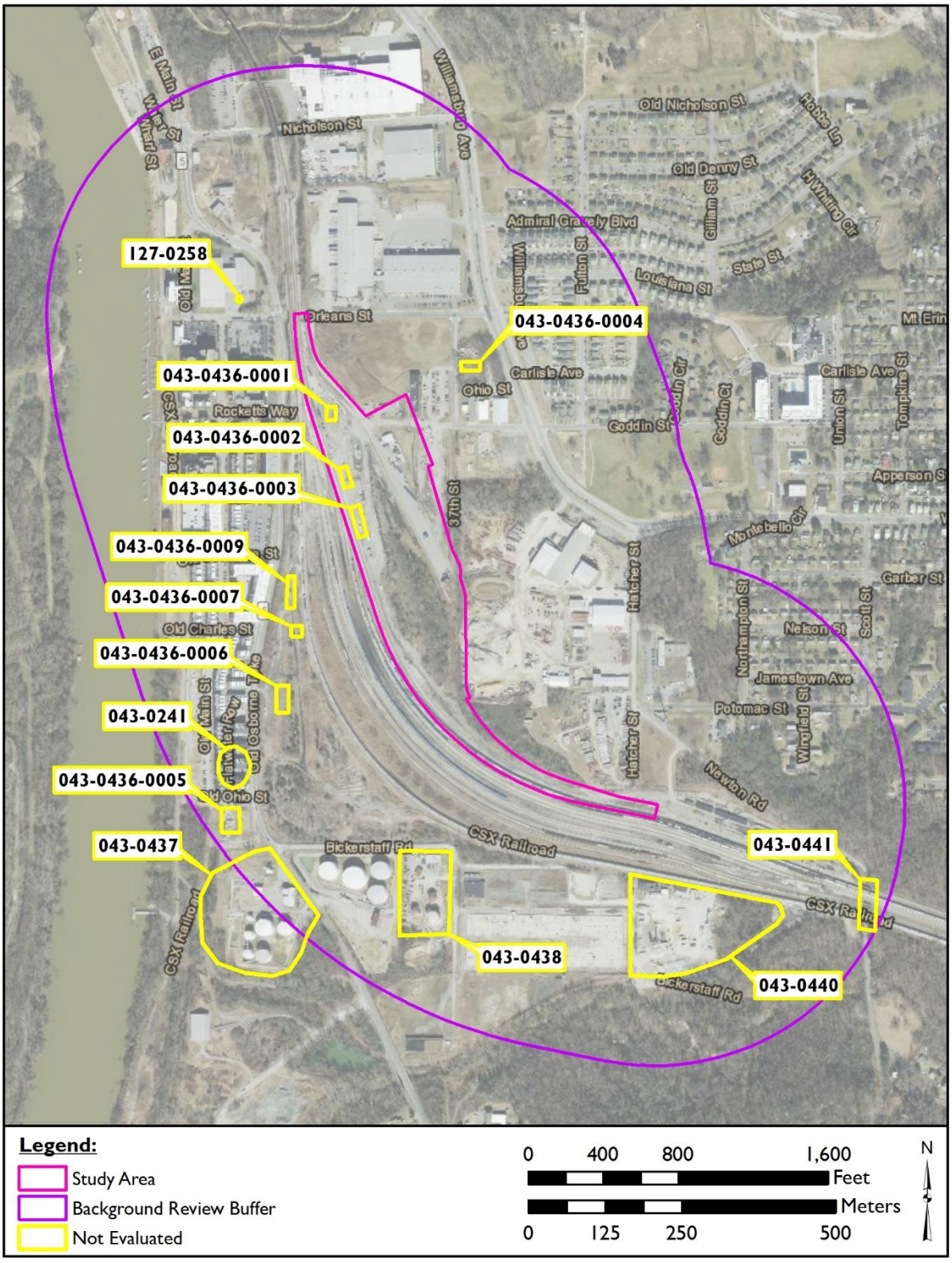


FIGURE 3-4: PREVIOUSLY RECORDED ARCHITECTURAL RESOURCES THAT HAVE NOT BEEN EVALUATED IN THE STUDY AREA AND BACKGROUND REVIEW BUFFER (VGIN 2021)

There are two resources within the background review buffer that have been listed in the VLR and NRHP. The Clarke Home (043-0085) is a two-story, three-bay house of the Greek Revival style. It was built in two phases, the first part constructed in 1819 and the second in 1855. This resource was determined eligible under Criterion C (design/construction) because the farm complex represents the style and construction techniques characteristic of Henrico County in the nineteenth and early-twentieth centuries. The James River Steam Brewery Cellars (043-5313) are a series of vaulted tunnels with a granite block façade pierced by round-arched openings and cellars with granite block foundations and end walls, brick piers, and brick vaults. Constructed in 1866 for David G. Yuengling, Jr., John F. Betz, and John A. Beyer, the cellars served as the below-grade storage and fermentation space for the five-story, brick, James River Steam Brewery building above. While the brewery was destroyed in a fire in 1891, the underground cellars were spared and have survived as a unique illustration of how local beer was once fermented and warehoused. The cellars were listed in the VLR in 2013 and the NRHP in 2014 under Criterion A (event) and Criterion C (architecture and invention). The cellars were determined locally significant under Criterion A as they contribute to our understanding of local commerce and industry related to beer brewing during Reconstruction. They were determined locally significant under Criterion C as the cellars embody engineering ingenuity in the steam beer brewing and storage processes prior to the advent of mechanical refrigeration in 1870.

Nine resources within the 0.25-mile (0.4-km) background review buffer were determined not eligible for listing in the VLR and NRHP. Many of these resources have been modified and repurposed for condos, housing, and restaurants. These resources include Richmond Cedar Works (043-0306); a circa-1940 industrial complex (043-0450) potentially associated with Richmond Cedar Works or another large industrial company; a circa-1910 power plant (127-0413) of vernacular industrial style, constructed to house a steam driven electric power generating plant; a two-story vernacular industrial building (127-6252); two CSX bridges, one north of Orleans Street (127-6258) and the other at East Main Street (127-6261), both constructed in 1956 to replace earlier wooden bridges; and a three-story, concrete building (127-6260) associated with the CSX Fulton Yard complex.

One resource within the buffer area was determined eligible for listing in the VLR and NRHP in 2016. This resource, a CSX bridge at Nicholson Street (127-6259), is associated with the Chesapeake and Ohio Railroad (C&O Railroad) Historic District. The steel, single-span bridge is one of several in the Rocketts Landing area of Richmond that was constructed by the Lackawanna Iron and Steel Company to replace the previous wooden bridges. On each side of Nicholson Street, the bridge is supported by vertical concrete embankments. The bridge is no longer eligible as it was removed and replaced.

The remaining resources (n=14) have not been evaluated for listing in the NRHP or VLR. These resources include a brick kiln site (043-0241); an office building (043-0436-0003) that is part of the CSX Fulton Yard complex; a circa-1920 fuel terminal (043-0437); a circa-1930 fuel terminal (043-0438); a circa-1902, two-story Airco processing plant (043-0440); and a railroad bridge (043-0441) constructed in 1901 at the New Osborne Turnpike. Six of these resources have been demolished, including the Richmond Glass Works Building at Orleans Street (127-0258). Five of the six were located within the CSX Fulton Yard Complex and include an office and equipment building (043-0436-0004), chemical plant and tank (043-0436-0005), shop (043-0436-0006), coal loading tower (043-0436-0007), and equipment shed (043-0436-0009).

3.4 Historic Map Review

The Algonquian-speaking Powhatan and Arrohatteck inhabited Richmond and the surrounding region along the coastal portion of the James and York River Valleys before European settlement. Both tribes were part of the Powhatan Chiefdom, which was ruled by Wahunsuncaugh (Chief Powhatan). The site of Powhatan Town (44HE0413/043-0172) is located within the study area, which is southeast of Richmond, east of Rocketts, and along the low grounds of Almond Creek (Mouer 1992:71). Captain John Smith documented the Powhatan Chiefdom and Powhatan Town on his 1606 map of Virginia (Figure 3-5) (Smith and Hole 1624).

In 1733, at the request of William Byrd, one of the colony's leading landowners, Colonel William Mayo, a county surveyor, laid out a new town which was to be called Richmond. The 1737 plat created by Mayo lists the names of the individuals who purchased lots in the new town, which was formally accepted by the General Assembly in 1742 (Library of Virginia n.d.). The study area and background review buffer are located east of Gillies Creek, outside of the original boundaries of the city, which extended as far east as today's 25th Street.

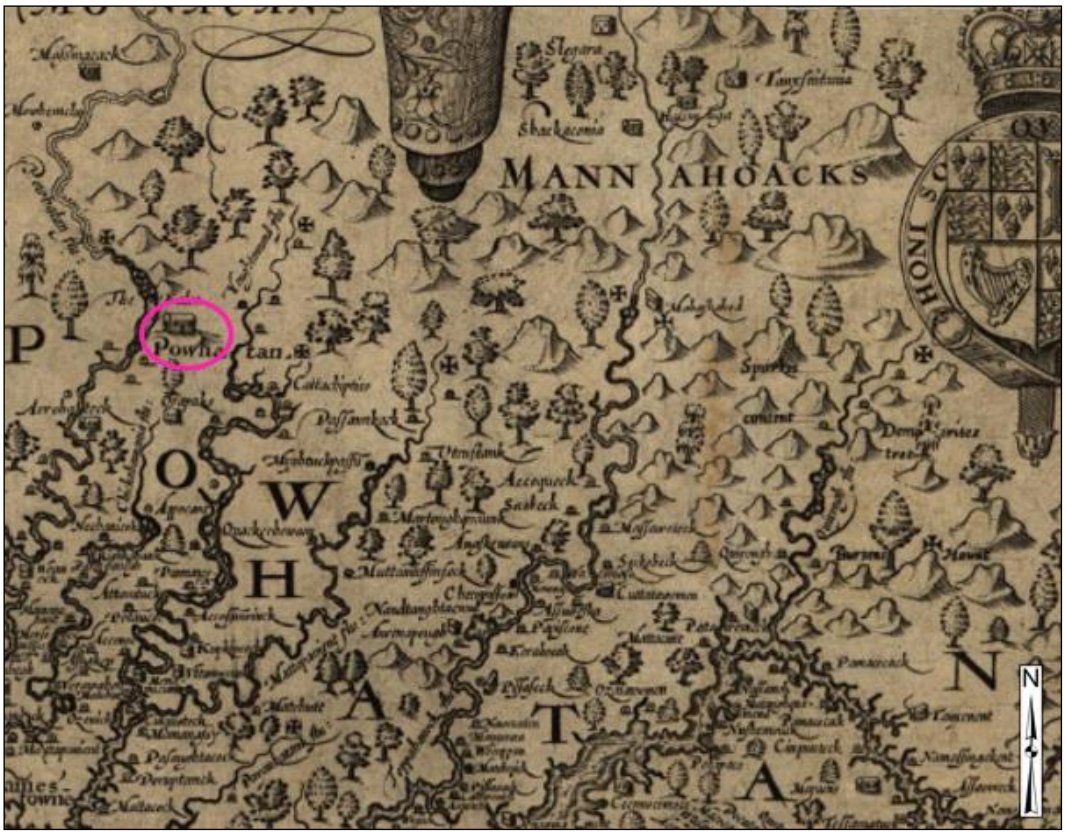


FIGURE 3-5: SECTION OF CAPTAIN JOHN SMITH AND WILLIAM HOLE'S 1606 MAP WITH POWHATAN TOWN (SMITH AND HOLE 1624). THE APPROXIMATE LOCATION OF THE STUDY AREA IS CIRCLED IN PINK

At the confluence of Gillies Creek and the James River, a ferry had been established in 1730 by Robert Rocketts. In this area, known as Rocketts, a small community developed to the west of Gillies Creek (Dutton and Friedberg 2017:4–7). Fry's 1755 map of the inhabited parts of Virginia depicts Richmond as being settled between Shockoe Creek to the west and Gillies Creek to the east. The study area and background review buffer, located to the east of Gillies Creek, appears to have been unsettled (Figure 3-6).

FIGURE 3-6: SECTION OF FRY'S 1755 MAP OF THE INHABITED PARTS OF VIRGINIA (FRY ET AL. 1755). THE APPROXIMATE LOCATION OF THE STUDY AREA IS CIRCLED IN PINK

By 1771, sea-going vessels docked at the Port of Rocketts. Tobacco and shipping were the two major industries in Rocketts, though there were also hemp, lumber, and auction houses as well as a rope walk, mills, and a tavern (VHLCS 1974). In 1781, Virginia's House of Delegates petitioned to establish a tobacco inspection station at Rocketts. The inspection station was constructed at Dock and Peach Streets, west of the study area and downstream from the developing Kanawha Canal (Figure 3-7, p. 19) (James et al. 2007:15–16). In 1780, the City of Richmond (incorporated 1782) annexed Rocketts (ArcGIS 2011). A small group of men in the mercantile and maritime trades (John Hague, George Nicholson, John Lester, and Joseph Simpson) sought to develop Rocketts east of Gillies Creek (Mouer 1992:77). They petitioned the City of Richmond in 1790 to construct a drawbridge over Gillies Creek to connect the planned lots with the city (Mouer 1992:94).

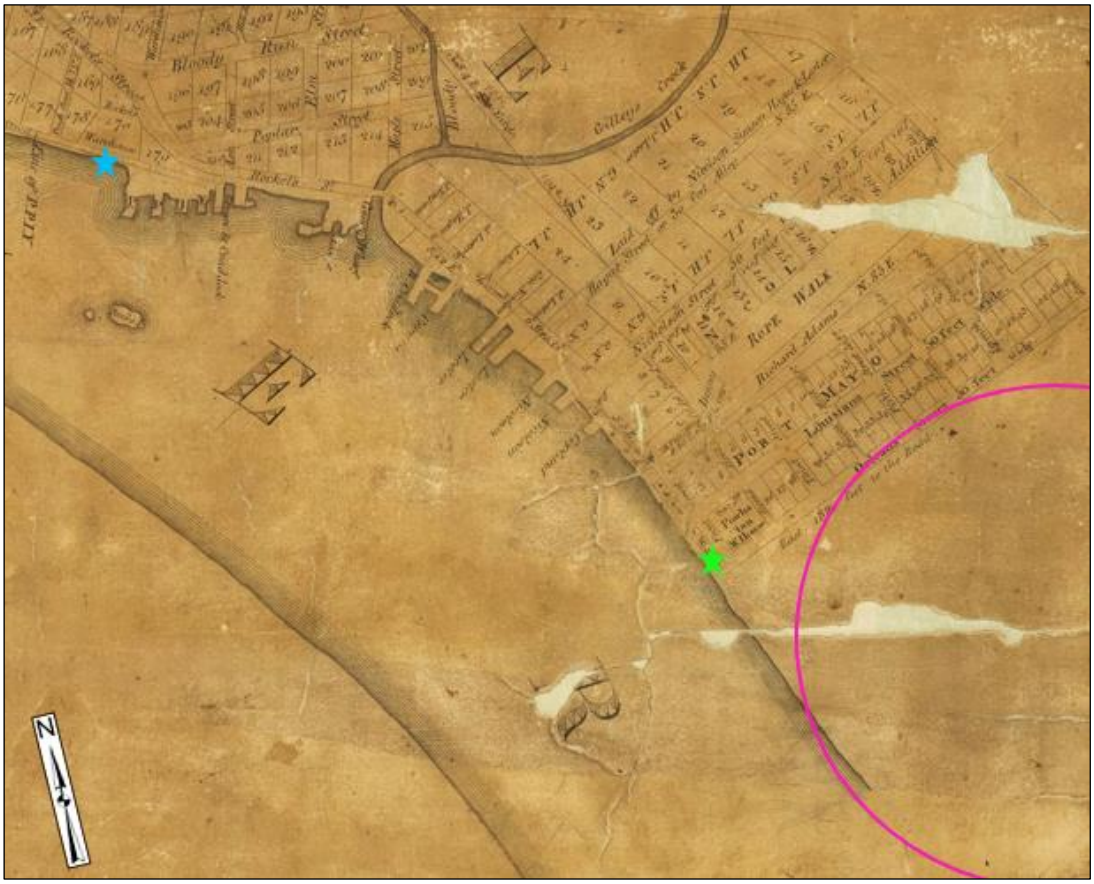


FIGURE 3-7: SECTION OF RICHARD YOUNG'S 1809 PLAN OF THE CITY OF RICHMOND (YOUNG 1809). THE APPROXIMATE LOCATION OF STUDY AREA, EAST OF GILLES CREEK AND ORLEANS STREET, IS CIRCLED IN PINK AND EXTENDS BEYOND THE MAP AREA. THE POWHATAN WAREHOUSE NORTH OF ORLEANS STREET IS IDENTIFIED BY A GREEN STAR, WHILE THE TOBACCO INSPECTION STATION WEST OF GILLIES CREEK IS IDENTIFIED BY A BLUE STAR

Rocketts was officially defined as part of the city by a series of laws and ordinances between 1798–1808 (Mouer 1992:77). Orleans Street was the eastern limit of Rocketts, so the project area and background review buffer remained outside of the limits of the City of Richmond (Figure 3-8, p. 20). This area would eventually be named Fulton, named for James Alexander Fulton, who around 1800 married William Mayo's great-great-granddaughter, Elizabeth Mayo. The Fulton's home was built on the site of Powhatan Village (043-0172/44HE0413), which has been mapped within the study area in DHR records but not verified (James et al. 2007:17). This site is potentially identified on Hergesheimer's 1862 map (Figure 3-9, p. 21). Also identified on this map is the Richmond and York River Railroad, which ran parallel to the James River then curved east at Gillies Creek, north of the study area. The Clarke Home (043-0085) and associated farm buildings, constructed in 1819 and modified in 1855, are likely the buildings marked south of Almond Creek, within the background review buffer.

After the Civil War, the area south of Gillies Creek and Orleans Street began to be developed (Figure 3-10, p. 21). In 1866, David G. Yuengling, Jr., John F. Betz, and John A. Beyer constructed the James River Steam Brewery (043-5313), a five-story brick building, south of Orleans Street within the background review buffer. A wharf was constructed on the James River to serve the brewery (Figure 3-11, p. 22). The brewery was destroyed in a fire in 1891, but the underground cellars (043-5313) were spared. Another development after the Civil War was the construction of the Church Hill Tunnel (completed in 1873) from 18th Street under Church Hill to Rocketts

(Richmond Railroad Museum n.d.). This tunnel allowed for the extension of the C&O Railroad, initially known as the Louisa Railroad and then the Virginia Central Railroad, from Broad Street, between 16th and 17th Street, to a site on the James River (Daily 2021; Griggs 1976:46; Mouer 1992:139–140). A wharf was constructed on the James River by the C&O Railroad and the James River facility was built near the current site of Fulton Yard (Figure 3-12, p. 23 and Figure 3-13, p. 24). By 1873, 414 miles (666.3 km) of rail connected Richmond to West Virginia's coal mines (Daily 2021; Mouer 1992:139–140). Caracristi's 1873 map of Richmond shows the C&O line south of Orleans Street and several buildings and businesses within the background review buffer, including Bower's Brickyard (see Figure 3-11, p. 22).

FIGURE 3-8: PLAN OF RICHMOND WITH THE APPROXIMATE LOCATION OF THE STUDY AREA CIRCLED IN PINK (MORGAN 1849). THE SEAT OF KING POWHATAN, OR POWHATAN TOWN (043-0172/ 44HE0413), IS DOCUMENTED AS 0.5 MILES (0.8 KM) SOUTH OF ORLEANS STREET, THEREFORE WITHIN THE STUDY AREA

FIGURE 3-9: 1862 MAP OF RICHMOND CREATED FOR MAJOR GENERAL GEORGE B. MCCLELLAN (HERGESHEIMER 1862). THE APPROXIMATE LOCATION OF THE STUDY AREA IS CIRCLED IN PINK

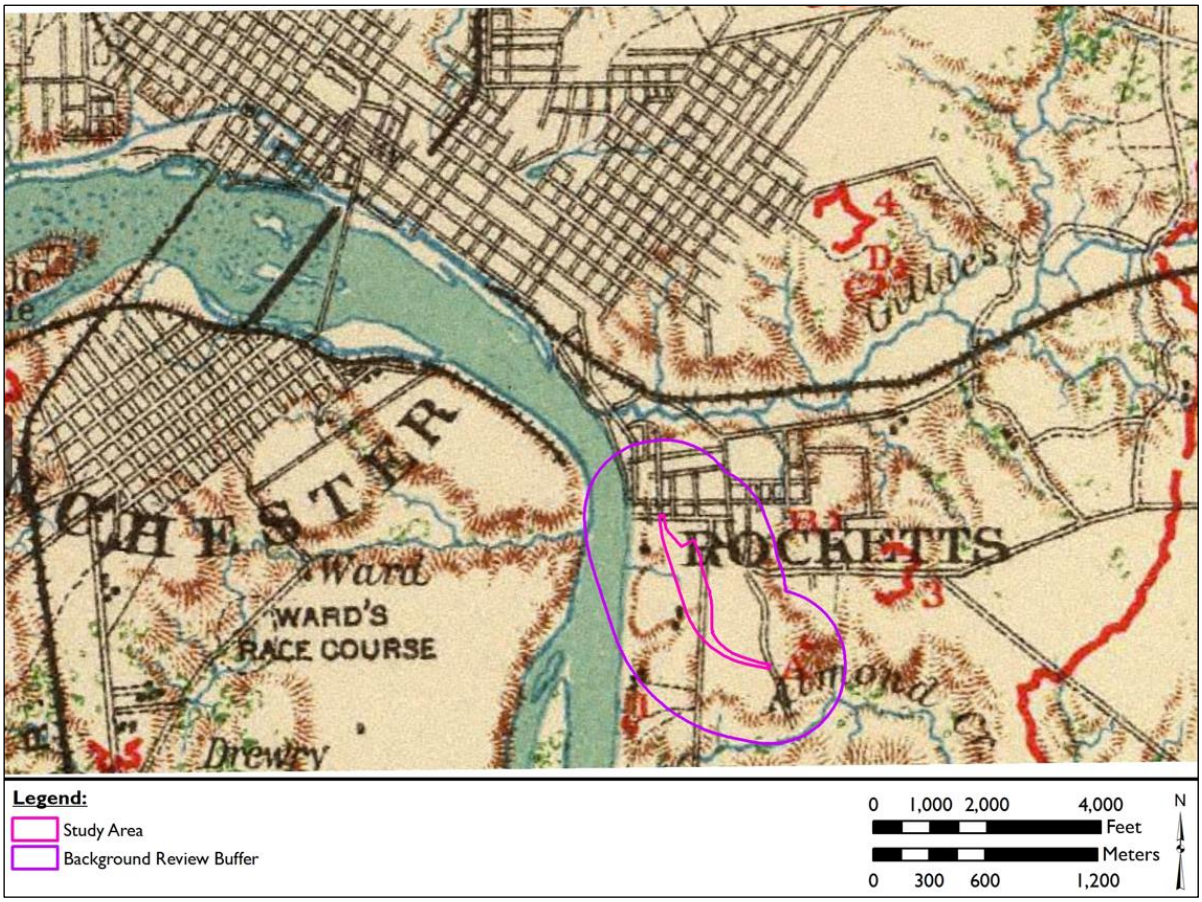


FIGURE 3-10: SECTION OF AN 1867 SURVEY MAP WITH THE STUDY AREA MARKED IN PINK AND THE BACKGROUND REVIEW BUFFER IN PURPLE (MITCHIE ET AL. 1895)

FIGURE 3-11: 1873 MAP OF RICHMOND AND ITS VICINITY (CARACRISTI 1873). THE STUDY AREA, LOCATED SOUTH OF ORLEANS STREET, WAS LOCATED OUTSIDE OF THE CITY OF RICHMOND AT THIS TIME. WITHIN THE STUDY AREA IS THE C&O RAILROAD TRACK AND WITHIN THE BACKGROUND REVIEW BUFFER ARE SEVERAL BUILDINGS, POWHATAN FARM, AND BOWERS BRICKYARD

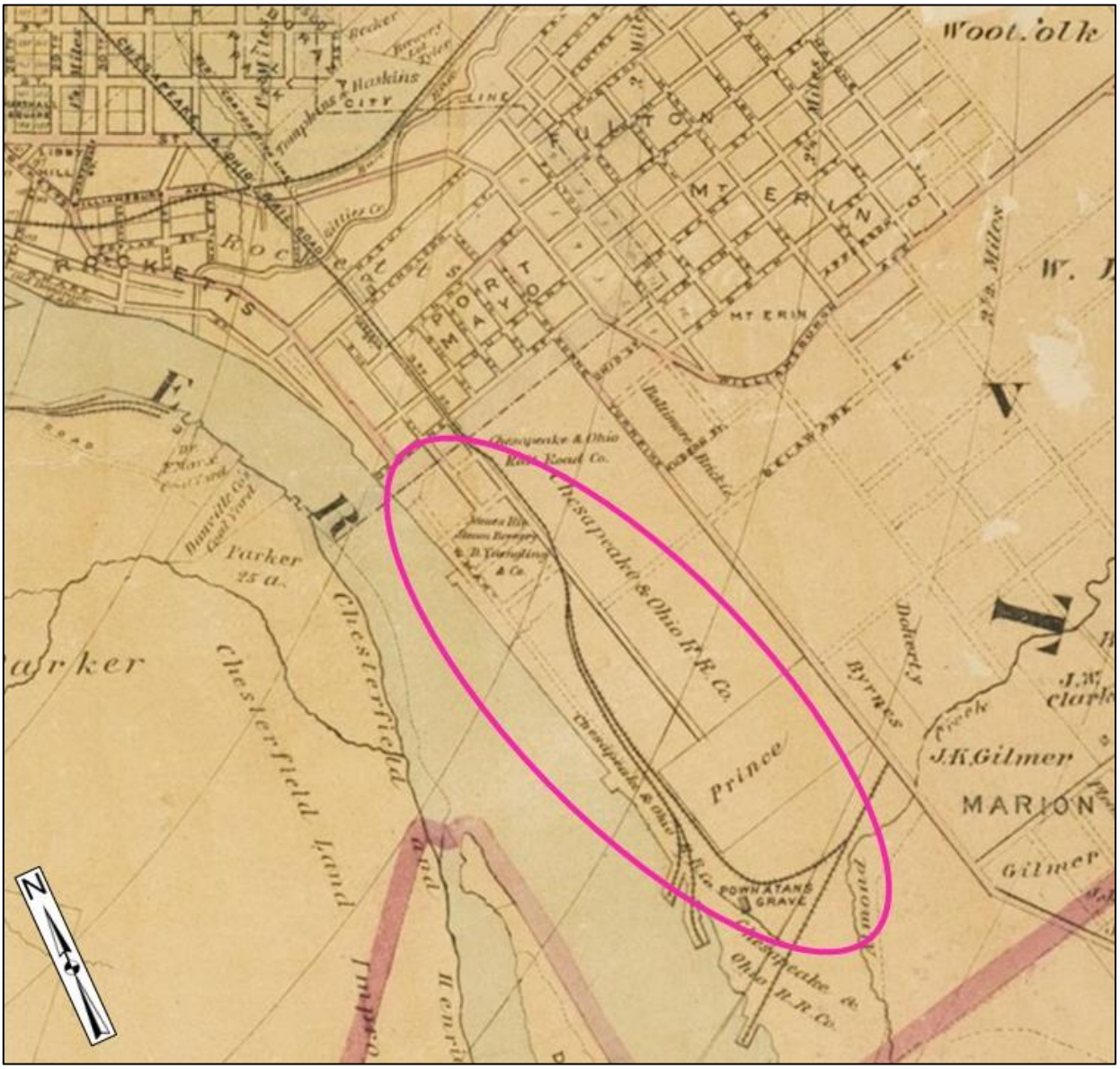


FIGURE 3-12: 1877 MAP OF RICHMOND AND ITS VICINITY WITH THE APPROXIMATE STUDY AREA CIRCLED IN PINK (BEERS 1877)

A section of railroad within the project area (121-5134) was part of the C&O Railroad's Peninsula Extension, which created the Peninsula Subdivision, running from Fulton Yard in the City of Richmond to the deep-water port of Newport News on Hampton Roads. Between 1878 and 1880 the subdivision was under construction. In 1881, it was completed, connecting Richmond to the East's largest ice-free port where coal could be loaded for coastwide shipping (Castro 2006; C&O Historical Society 2022). The Richmond Cedar Works (043-0306), located within the project area buffer, was constructed circa 1885 and is documented on Baist's 1889 map of Richmond. Also documented on Baist's 1889 map is the addition of tracks (see Figure 3-13, p. 24). The C&O Railroad tracks in Fulton, which eventually total approximately 35 tracks, served the Peninsula Subdivision and James River Line (Daily 2021). They also served businesses adjacent to the lines, including Richmond Cedar Works (Figure 3-14, p. 24).

FIGURE 3-13: SECTION OF BAIST'S 1889 MAP OF RICHMOND AND VICINITY (BAIST 1889). THE APPROXIMATE LOCATION OF THE STUDY AREA IS CIRCLED IN PINK

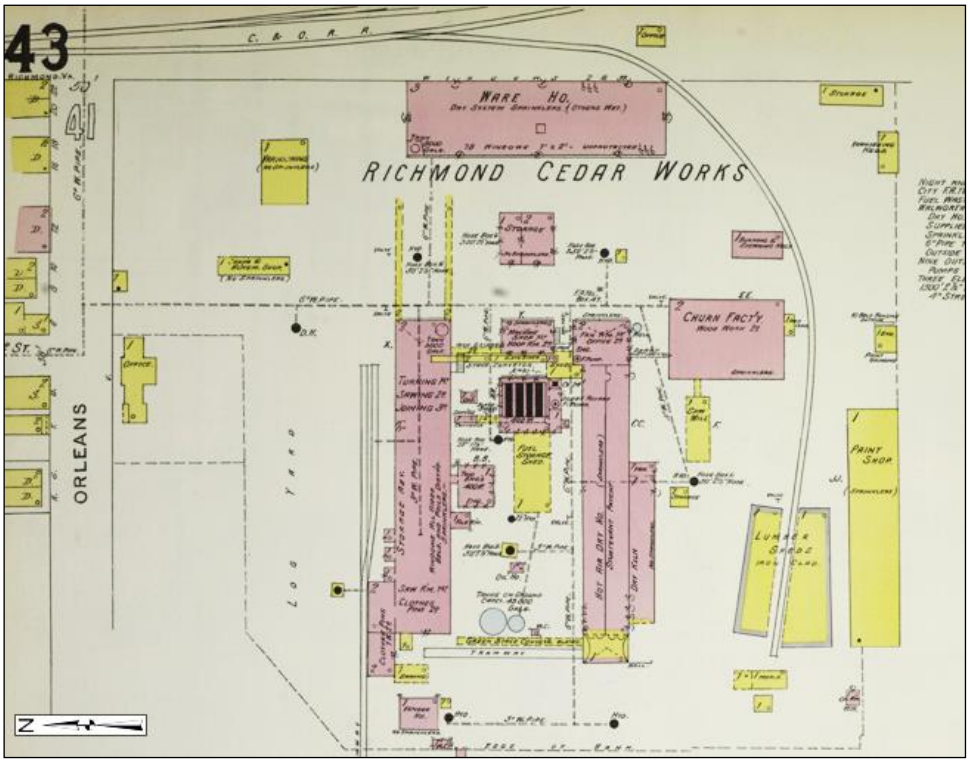


FIGURE 3-14: SECTION OF 1895 SANBORN MAP OF RICHMOND AND VICINITY (SANBORN MAP COMPANY 1895). THE STUDY AREA AND BACKGROUND REVIEW BUFFER EXTEND SOUTH OF ORLEANS STREET AND ECOMPASSES RICHMOND CEDAR WORKS. A TRACK APPEARS TO CONNECT RICHMOND CEDAR WORKS' LUMBAR SHEDS TO THE MAIN C&O LINE

Sometime after 1895, the C&O's Fulton Yard complex was constructed within the study area. The plans originally called for a much larger facility, but a smaller facility was ultimately built. The facility included a 100-foot (30.5-m) turntable and roundhouse, which was built in three stages. The first stage was completed in 1900 and had eight 120-foot (36.6-m) deep stalls. Eight additional 120-foot (36.6-m) deep stalls were added in 1902 and 10 130-foot (39.6-m) deep stalls in 1930 (Daily 2021). Additional facilities associated with the Fulton Yard complex include a carpenter's shop, paint shop, tin shop, store room and office, machine shop, and blacksmith (Figure 3-15). Within the background review buffer were Richmond Cedar Works and the Kentucky Tobacco Product Co. (Figure 3-16, p. 26). These facilities are also shown on a 1925 map of Richmond and its vicinity (Sanborn Map Company 1925).

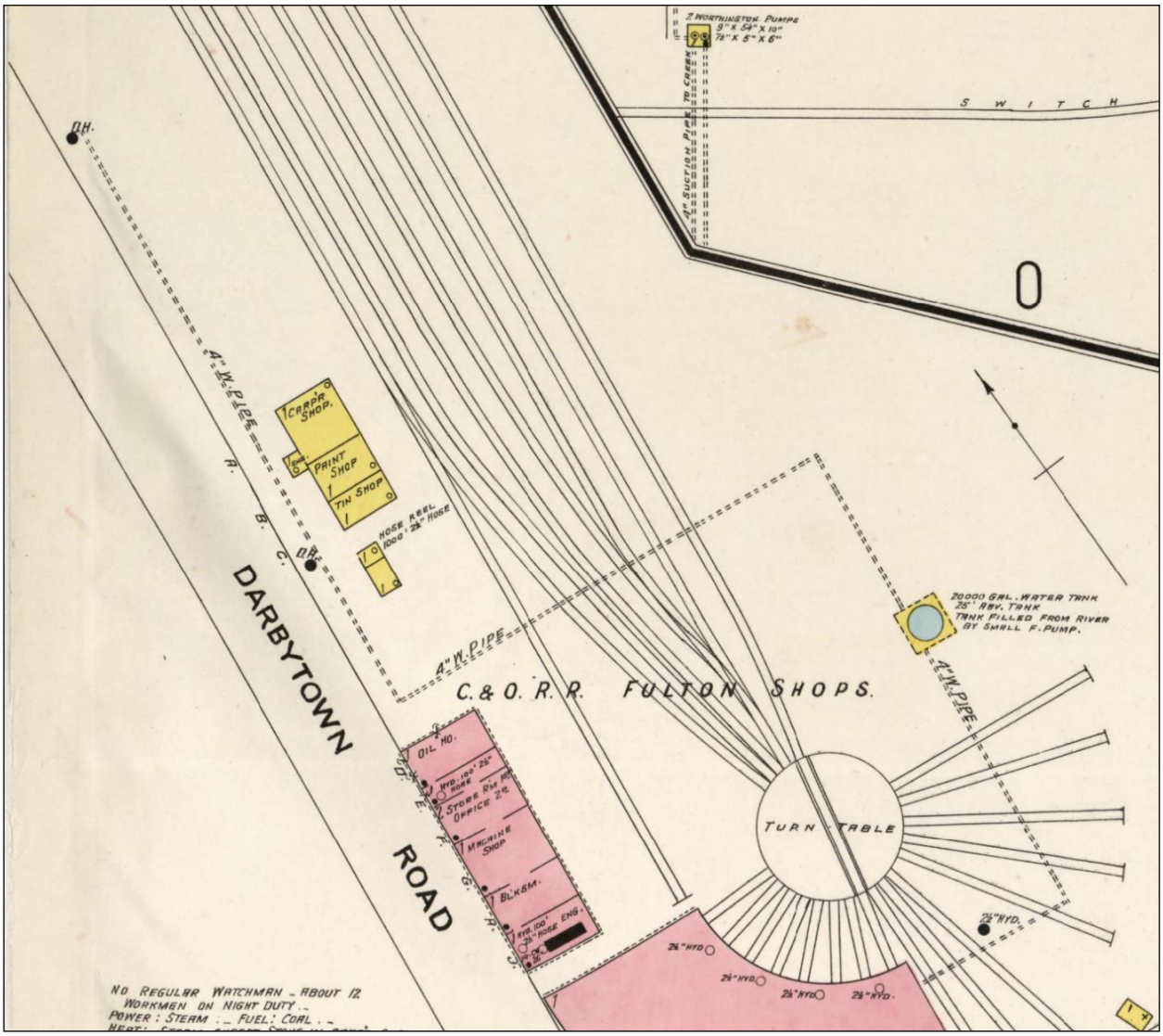


FIGURE 3-15: SECTION OF A 1905 SANBORN MAP SHOWING THE C&O RAILWAY'S FULTON SHOPS, LOCATED WITHIN THE STUDY AREA (SANBORN MAP COMPANY 1905)

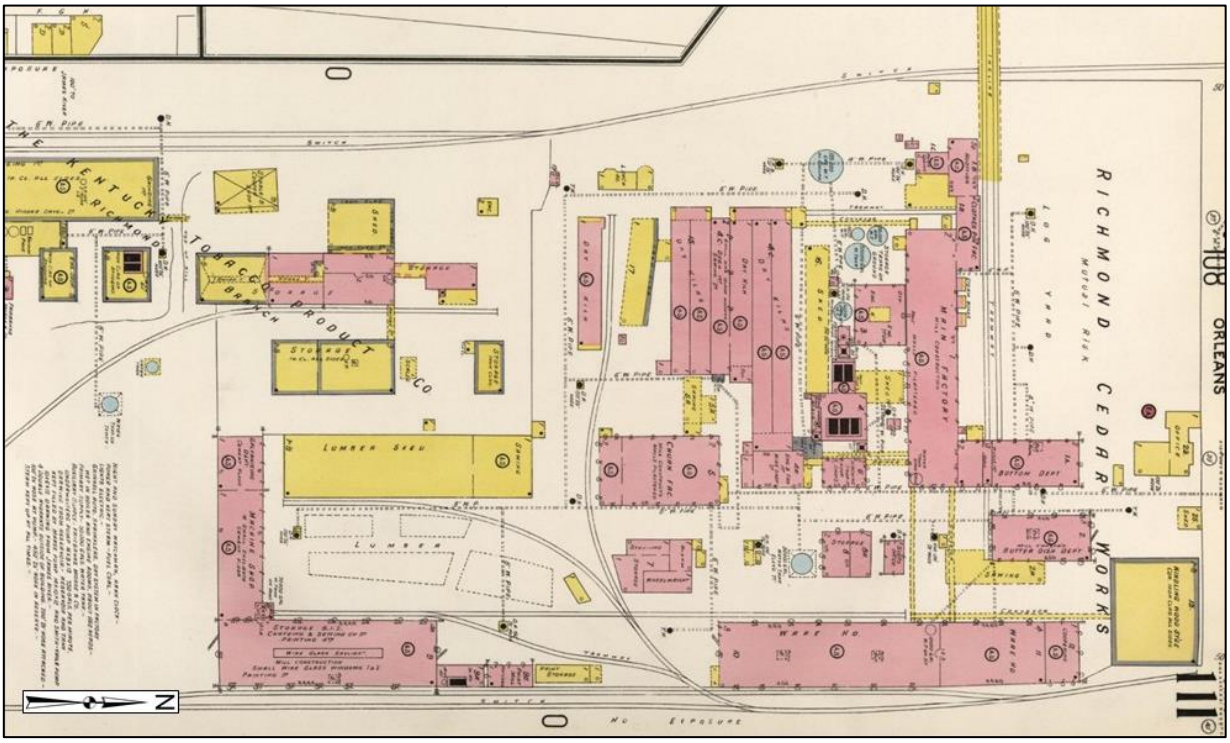


FIGURE 3-16: 1905 SANBORN MAP SHOWING BUSINESSES IN THE BACKGROUND REVIEW BUFFER, INCLUDING RICHMOND CEDAR WORKS AND KENTUCKY TOBACCO PRODUCT CO. (SANBORN MAP COMPANY 1905)

The original roundhouse at Fulton Yard was replaced with a 115-foot (35.1-m) roundhouse in 1927 (Daily 2021). This roundhouse and other buildings associated with the C&O Fulton Yard complex (043-0436-0001, 043-0436-0002, 043-0436-0003–043-0436-0007, and 043-0436-0009) are documented on a 1939 USGS topographical map of Richmond. Other resources likely documented on the 1939 USGS topographical map are the Fuel Terminal (043-0438), Aviation General Supply Depot (043-0439), and Airco (Figure 3-17, p. 27). The Knight Terminal (043-0437), constructed circa 1920, is located in the background review buffer and is visible on a 1974 aerial. The roundtable associated with the Fulton Yard complex was demolished in 1970 and thus is not visible in the 1974 aerial (Figure 3-18, p. 28).

By the mid-1970s, Fulton Yard had 16 tracks on its east-bound side and the west-bound side had 10 tracks (see Figure 3-18, p. 28) (Daily 2021). Many of the buildings associated with the Fulton Yard complex were demolished circa 2003 (043-0436-0001–043-0436-0007 and 043-0436-0009) (Figure 3-19 and Figure 3-20, p. 29). Aerials show that there was no development within the study area between 2003 and 2022 (Google 2003; 2006; 2007; 2021). However, the area south of Orleans Street and west of the study area in the background review buffer was developed between 2006 and 2007 (Figure 3-21 and Figure 3-22, p. 30) (Google 2006, 2007). After 2010, the area continued to be developed with the conversion of the circa-1910 power plant (127-0413) south of Orleans Street and east of the study area into a restaurant called The Boathouse (Figure 3-23, p. 30)(Google 2021).

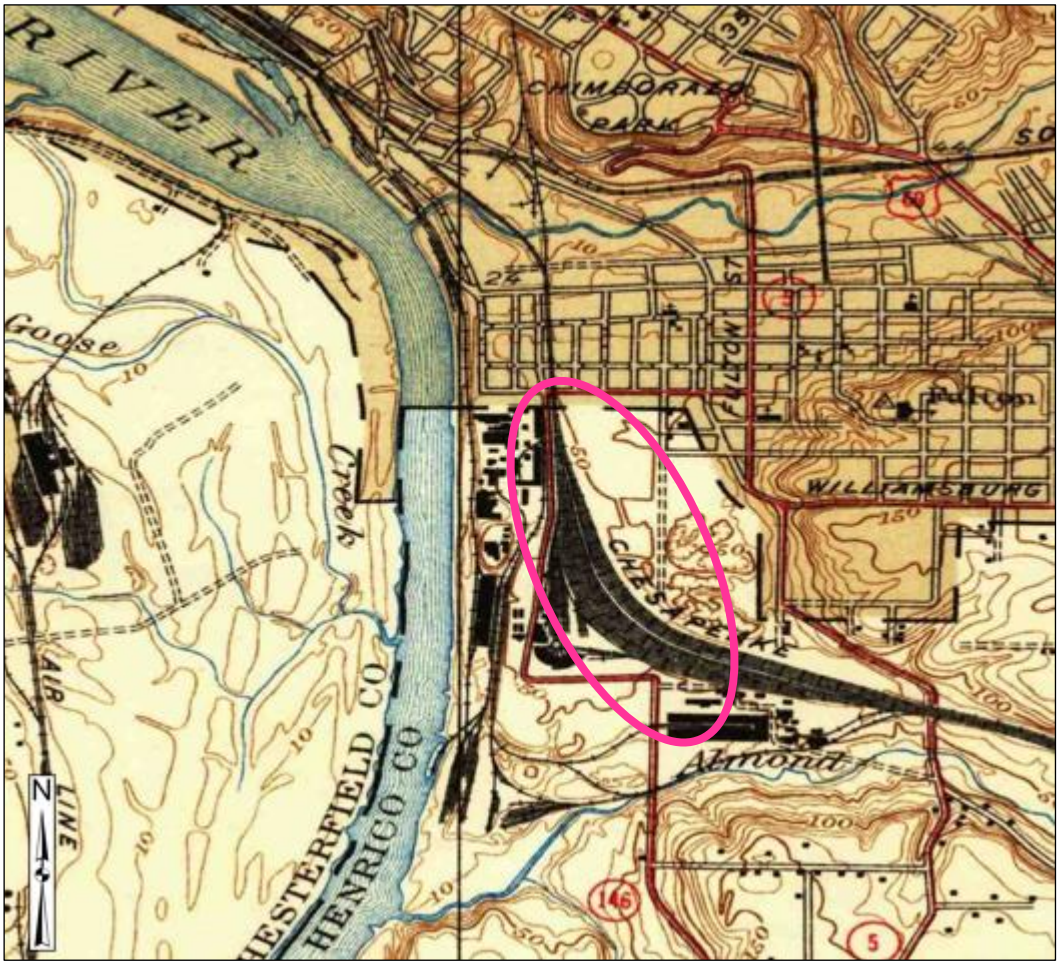


FIGURE 3-17: 1939 TOPOGRAPHICAL MAP SHOWING THE ROUNDHOUSE AND OTHER BUILDINGS ASSOCIATED WITH THE C&O FULTON YARD COMPLEX TOPOGRAPHICAL MAP (USGS 1939). STUDY AREA CIRCLED IN PINK

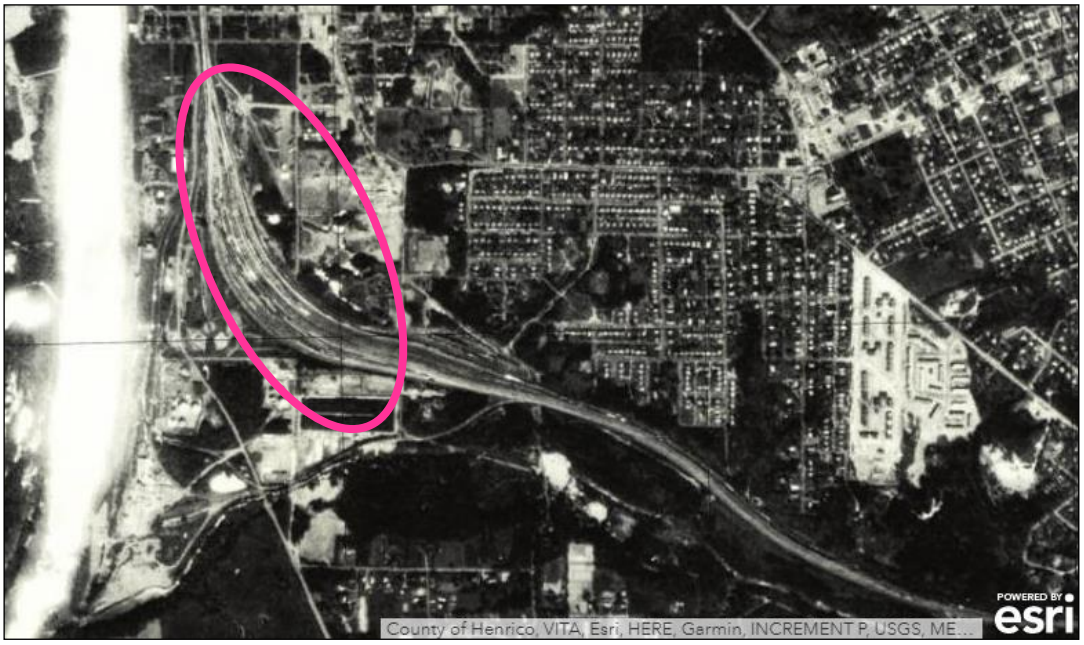


FIGURE 3-18: 1974 AERIAL SHOWING THE ROUNDHOUSE ASSOCIATED WITH THE FULTON YARD COMPLEX (USGS 1977). STUDY AREA CIRCLED IN PINK

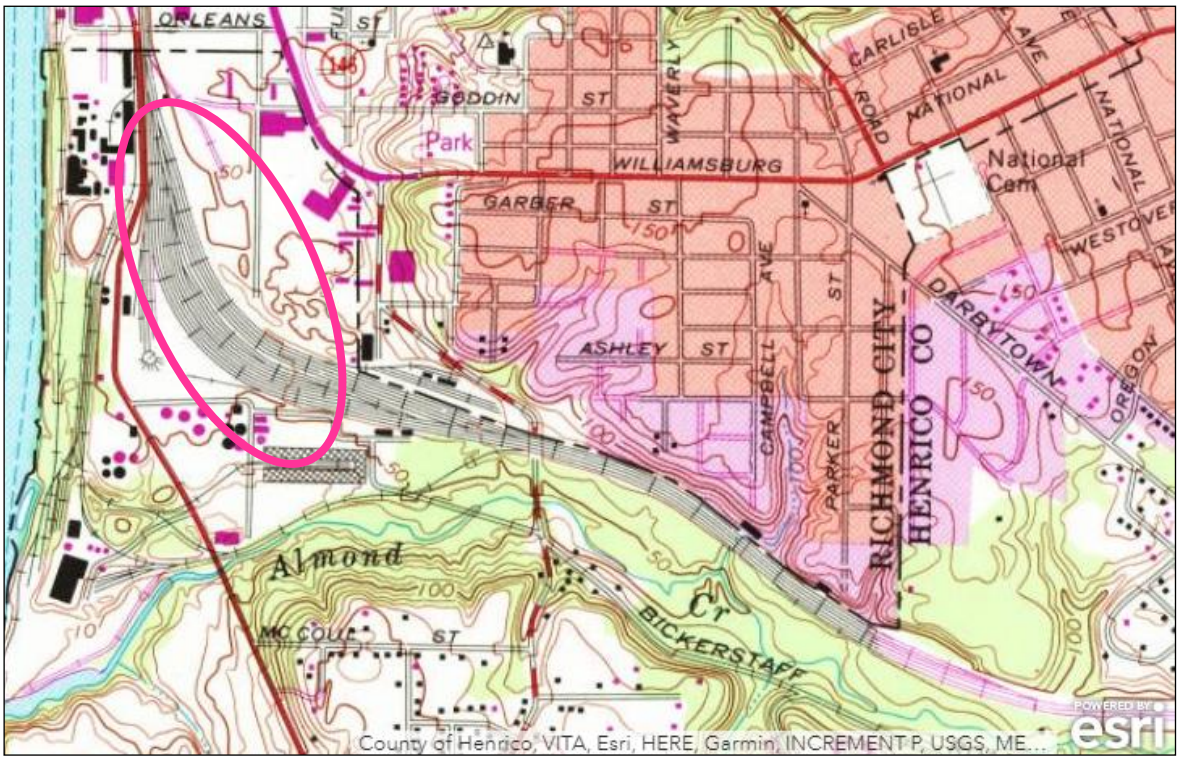


FIGURE 3-19: 1994 TOPOGRAPHIC MAP OF THE STUDY AREA IN PINK (USGS 1994). THE ROUNDHOUSE ASSOCIATED WITH THE FULTON YARD COMPLEX IS NO LONGER EVIDENCED AS IT WAS DEMOLISHED IN THE MID-1970S

FIGURE 3-20: 2003 AERIAL OF FULTON WITH THE STUDY AREA IN PINK AND THE BACKGROUND REVIEW BUFFER IN PURPLE (GOOGLE 2003). MANY OF THE BUILDINGS ASSOCIATED WITH THE FULTON YARD COMPLEX HAD BEEN DEMOLISHED BY 2003

FIGURE 3-21: 2006 AERIAL OF FULTON WITH THE STUDY AREA IN PINK AND THE BACKGROUND REVIEW BUFFER IN PURPLE (GOOGLE 2006)

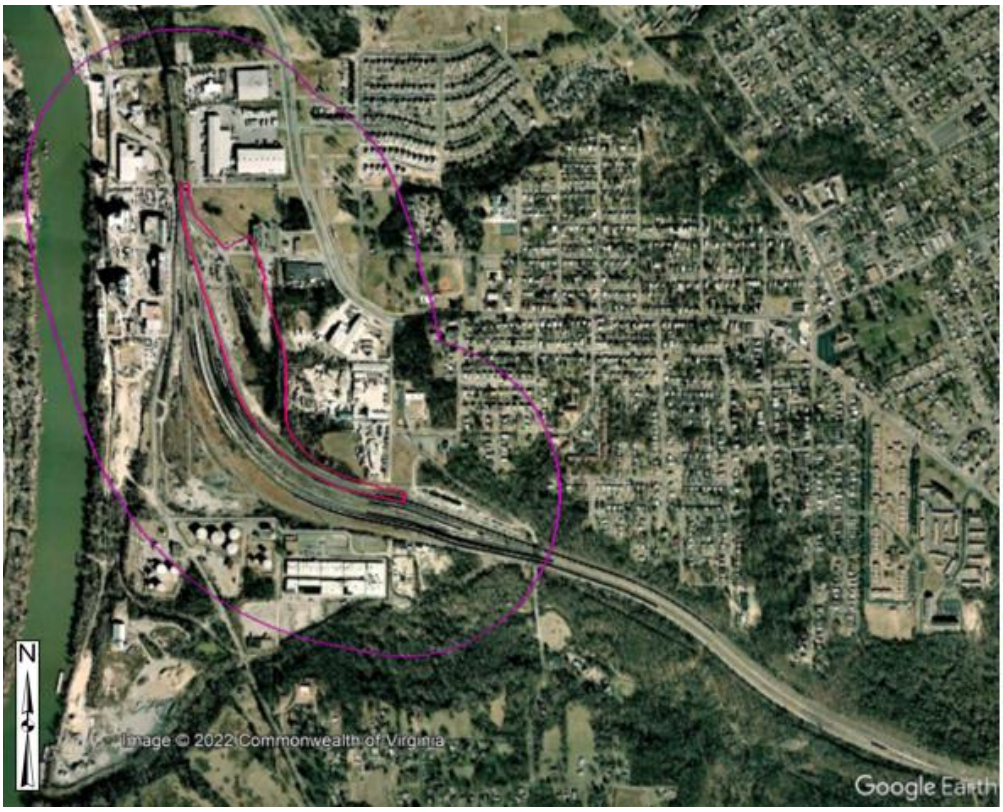


FIGURE 3-22: 2007 AERIAL OF FULTON WITH THE STUDY AREA IN PINK AND THE BACKGROUND REVIEW BUFFER IN PURPLE (GOOGLE 2007)

FIGURE 3-23: 2021 AERIAL OF FULTON WITH THE STUDY AREA IN PINK AND THE BACKGROUND REVIEW BUFFER IN PURPLE (GOOGLE 2021)

4 Summary and Recommendations

The cultural resource studies for the Richmond Layover Facility Feasibility Study included a background literature and records review and an evaluation of historic maps related to the Fulton Yard CSX location to ascertain the potential for historic properties.

4.1 Summary

The study area has been partially surveyed several times over the past 50 years, most notably with work associated with the DC2RVA project. In 2015, Dovetail completed a Phase IA review and predictive model of the active rail corridor within the study area and determined that the corridor itself did not have the potential to contain intact sites. The area was also included in the 2016 Phase IB archaeological survey of the DC2VA corridor, and no sites were identified in the study area during this work. The area was also part of the architectural work done for DC2RVA in 2016 as well as a study done prior to improvements along Route 5 in 2007 and studies associated with the BRT project in 2010.

Through this work as well as independent research projects, one archaeological site and six architectural resources have been recorded within the study area. The archaeological site (44HE0413/043-0172) is the map-projected location of "Powhatan Town Site," a Late Woodland-period village. The site was recorded in 1981 but no archaeological evidence has been uncovered to support this identification. "Seat of King Powhatan" is noted on an 1894 map in the general project area and "Powhatan's Grave" is shown on an 1877 map south of the study area, but the exact location of these resources is unknown and rampant, rail-related development occurred in the nineteenth and twentieth centuries that likely impacted any resources should they have been present. The potential for intact Late Woodland period resources to be located in the study area is low.

The architectural resources include four properties associated with CSX Fulton Yard, including the yard as a whole (043-0436), two office buildings (043-0436-0001 and 043-0436-0003), and one employee facility (043-0436-0002). Fulton Yard was determined to be not eligible in 2014, and the three individual resources have not been formally evaluated for the NRHP; they were demolished in 2003. The CSX bridge over Orlean Street (127-6257) was determined not eligible for the NRHP in 2015. The remaining recorded resource in the study area is the C&O Railroad (121-5134); it was determined to be eligible for the NRHP in 2020.

The historic map review confirmed that the area was sparsely populated until the area was enveloped within Richmond in the early-nineteenth century. Osborn's Old Turnpike is noted traversing north-south through the area in the first half of the nineteenth century and is a primary transportation corridor shown throughout the Civil War on area mapping. In 1873, the general vicinity contained Bower's Brickyard, Powhatan Farm, and several other buildings. These resources were partially removed by 1877 when the C&O Railroad was established in this area. By 1895, several businesses had been established along the railway transforming the study area, including the expansive Richmond Cedar Works. This business was removed, and the landscape was notably modified in the late-nineteenth and early-twentieth century when the C&O

established Fulton Yard there, comprising numerous buildings, additional tracks, and a turntable. The yard remained intact through the 1970s, with most above-ground resources demolished in 2003.

In sum, the background review and the historic map review highlight the potential for unrecorded resources in the project vicinity. Several NRHP-eligible resources can be found within 0.25 miles (0.4 km) of the study area. The historic map review highlights the limited development in the eighteenth and early-nineteenth century but identified notable improvements in the late-nineteenth and early-twentieth century in association with the railroad, including the former presence of numerous, no-longer-extant, rail-related resources such as the turntable.

4.2 Recommendations

Based on the background review and historic map research, one historic property (a resource that is eligible for or listed in the NRHP) has been recorded in the study area, the C&O Railroad (121-5134). No additional work is recommended on this resource as it was determined to be eligible in 2020.

Several architectural studies have taken place within and around the study area but most were done more than five years ago. As such, a Phase I architectural survey is recommended to meet DHR guidelines and assure that no additional above-ground resources are eligible for or listed in the NRHP within the architectural APE (recommended to be the study area plus a 500-foot [152.4-m] buffer to account for viewshed and match similar rail-related studies in the area).

Similarly, while two archaeological surveys have crossed portions of the study area, the full study area has not been part of a comprehensive cultural resource survey. It is suggested that areas that have not been surveyed and/or do not show signs of notable disturbance be the subject of Phase I archaeological survey to identify and evaluate resources in the project footprint. While it is probable that no intact sites will be identified due to repeated disturbance, such studies are required to comply with DHR guidelines and the National Historic Preservation Act of 1966.

5 References

Anderson, Emily K., and Heather D. Staton

2016 Architectural Reconnaissance Survey for the Washington, D.C. to Richmond, Virginia High Speed Rail Project AM Jct to Centralia - S Line (AMCE) and AM Jct to Fulton Yard (AMFY) Segments, City of Richmond and Chesterfield County. Dovetail Cultural Resource Group, Fredericksburg, Virginia.

ArcGIS

2011 Annexation History Map. Department of IT, City of Richmond. Electronic document, https://www.arcgis.com/home/item.html?id=2c2cc30aec1b4c8b8ccdbdbfdc5b9116, accessed December 2022.

Baist, George William

1889 Atlas of the city of Richmond, Virginia and vicinity; from actual surveys, official records & private plans. Philadelphia, Pennsylvania. VCU Libraries Digital Collections. Electronic document, https://digital.library.vcu.edu/islandora/object/vcu%3A34079, accessed December 2022.

Beers, F.W.

1877 Map of Richmond Manchester and Suburbs from Surveys by Jas. T. Redd, County Surveyor, Henrico County, Va. On file at the Library of Virginia. Richmond.

C&O Historical Society

2022 History of the C&O Railway. Electronic document, https://cohs.org/history/, accessed December 2022.

Caracristi, J.F.Z.

1873 Office Map of the City of Richmond, Va. And Surroundings. On file at the Library of Virginia. Richmond.

Castro, James E.

2006 *The Chesapeake and Ohio Railway*. Arcadia Publishing, Charleston, South Carolina.

Daily, Larry Z.

2021 Richmond C&O Milepost 85. Chesapeake & Ohio Piedmont Subdivision. Electronic document, http://www.piedmontsub.com/Richmond.shtml, accessed December 2022.

Dutton, David H., and Dara A. Friedberg

2017 Fulton Gas Works Site Cultural Resource Assessment and Current Conditions Report in the City of Richmond, Virginia. Dutton & Associates, Midlothian Virginia.

Esri

2021 World Topo. Electronic document, http://services.arcgisonline.com/arcgis/services, accessed December 2022.

Fry, Joshua, Peter Jefferson, and Thomas Jeffreys

1755 A map of the most inhabited part of Virginia containing the whole province of Maryland with part of Pensilvania, New Jersey and North Carolina. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/74693166/, accessed December 2022.

Google

2003 Google Earth [Computer Program], Historic Aerial Imagine. Original database: USDA/FPAC/GEO. Electronic document. http:///www.google.com/earth/download/ge/agree.html, accessed December 2022.

2006 Google Earth [Computer Program], Electronic document. http:///www.google.com/earth/download/ge/agree.html, accessed December 2022.

2007 Google Earth [Computer Program], Historic Aerial Imagine. Original database: Commonwealth of Virginia. Electronic document. http:///www.google.com/earth/download/ge/agree.html, accessed December 2022.

2021 Google Earth [Computer Program]. Electronic document. http:///www.google.com/earth/download/ge/agree.html, accessed December 2022.

Griggs, Jr., Walter S.

1976 The Church Hill Tunnel. Railroad History 135:43–58. Electronic document, https://www.jstor.org/stable/43520605, accessed December 2022.

Hergesheimer, Edwin

1862 Henrico County, Virginia: Prepared under the direction of Lieut. Col. J.N. Nacomb, A.D.C., Chf. Topl. Engr. For the use of Maj. Gen. Geo. McClellan, commanding Army of the Potomac. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/2006626061/, accessed December 2022.

James, Tiffany, Jennifer Stewart, Bill Hall, and Loretta Lautzenheiser

2007 A Cultural Resources Survey of Proposed Improvements to Route 5 in the City of Richmond, Virginia. CCR, Tarboro, North Carolina.

Klein, Mike, Emily Calhoun, Marco González, and Earl E. Proper

2015 Archaeological Background Review and Predictive Model for the Washington, D.C. to Richmond, Virginia, Southeast High Speed Rail Corridor. Dovetail Cultural Resource Group, Fredericksburg, Virginia.

Library of Virginia

n.d. Richmond: Evolution of a City as shown through Maps in the Library of Congress. Electronic document, https://artsandculture.google.com/story/richmond-library-of-virginia/7gXB1B41Dh5EJw?hl=en, accessed December 2022.

McCloskey, Kevin, Earl Proper, Curtis McCoy, Emily Calhoun, Morgan MacKenzie, and Joseph Blondino

2016 Phase IB Archaeological Survey for the Washington, D.C. to Richmond, Virginia High Speed Rail Project Rosslyn to Alexandria (ROAF) through Buckingham Branch/Hospital Wye (BBHW) Segment. Dovetail Cultural Resource Group, Fredericksburg, Virginia.

McCloskey, Kevin, Lenora Wiggs, and Mical Tawney

2020 Phase IB Cultural Resource Survey of the East Main Street and Williamsburg Avenue Project Area, City of Richmond, Virginia. Dovetail Cultural Resource Group, Fredericksburg, Virginia.

Mitchie, Peter S., Nathaniel Michler, and the United States War Department

1895 Atlas to accompany the official records of the Union and Confederate armies. Published under the direction of the Hons. Redfield Proctor, Stephen B. Elkins and Daniel S. Lamont, secretaries of war, by Maj. George B. Davis, U.S. Army, Mr. Leslie J. Perry, civilian expert, Mr. Joseph W. Kirkley, civilian expert, Board of Publication. Compiled by Capt. Calvin D. Cowles, 23d U.S. Infantry. Government Printing Office, Washington, D.C. David Rumsey Historical Map Collection. Electronic document, davidrumsey.com, accessed December 2022.

Moore, William H., and Sarah M. Clarke

2014 Cultural Resources Survey of the Rockett's Landing Phase of the Virginia Capital Trail Project, Henrico County, Virginia. VDOT, Richmond, Virginia.

Mouer, L. Daniel, Robert R. Hunter, Elizabeth G. Johnson, Laurence W. Lindberg, and John Saunders

1978 Archeology in Henrico, Volume 1: Identification and Evaluation of Archaeological and Historic Resources for the Henrico County, Virginia Regional Wastewater System. Virginia Commonwealth University Archaeology Research Center, Richmond, Virginia.

Mouer, L. Daniel

1992 Rocketts: The Archaeology of the Rocketts Number 1 Site (44He671) Lot 203 in the City of Richmond, Virginia. Virginia Commonwealth University Archaeological Research Center, Richmond, Virginia.

Morgan, Charles S.

1849 Plan of Richmond (Henrico County) Manchester & Springhill, Virginia. Electronic document, https://artsandculture.google.com/asset/plan-of-richmond-henrico-county-manchester-springhill-virginia-charles-s-morgan/jAEBAXQbc6BRMw?hl=en, accessed December 2022.

Outlaw, Alain C.

1974 Preliminary Excavations at the Site of the Richmond Glass Manufacturing Company. Richmond, Virginia.

Peckler, Danae, Tom Roberts, and Kerri Barile

2010 Cultural Resource Survey of the Broad Street Bus Rapid Transit System Project, City of Richmond and Henrico County, Virginia, Vol. V. Dovetail Cultural Resource Group, Fredericksburg, Virginia.

Richmond Railroad Museum

n.d. Richmond Railroad History. Electronic document, https://www.richmondrailroadmuseum.com/railroad-history, accessed December 2022.

Rupnik, Megan, Michael Yengling, and Eric Voigt

2008 Submerged Cultural Resources Archaeological Survey, Richmond Harbor Marina, Richmond, Virginia and Rocketts Landing Marina, Henrico County, Virginia and Architectural Survey of the Richmond Cedar Works Piers (043-0306), Henrico County, Virginia. Louis Berger Group, Richmond, Virginia.

Sanborn Map Company

1895 Sanborn Fire Insurance Map Company from Richmond, Independent Cities, Virginia. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/sanborn09064_002/, accessed December 2022.

1905 Sanborn Fire Insurance Map Company from Richmond, Independent Cities, Virginia. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/sanborn09064_003/, accessed December 2022.

1925 Sanborn Fire Insurance Map Company from Richmond, Independent Cities, Virginia. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/sanborn09064_007/, accessed December 2022.

Smith, John, and William Hole

1624 Virginia. Library of Congress, Geography and Maps Division, Washington, D.C. Electronic document, https://www.loc.gov/item/99446115/, accessed December 2022.

United States Geological Survey (USGS)

1964 USGS 1:24000-scale Quadrangle for Richmond, Virginia. Electronic document, https://apps.nationalmap.gov/downloader/#/, accessed December 2022.

1939 Richmond 1:31680 Topographic Quadrangle. Richmond, Virginia. Electronic document, https://livingatlas.arcgis.com/topoexplorer/index.html, accessed December 2022.

1977 1974. Richmond 1:24000 Topographic Quadrangle. Richmond, Virginia. Electronic document, https://livingatlas.arcgis.com/topoexplorer/index.html, accessed December 2022.

1994 Richmond 1:24000 Topographic Quadrangle. Richmond, Virginia. Electronic document, https://livingatlas.arcgis.com/topoexplorer/index.html, accessed December 2022.

Virginia Geographic Information Network (VGIN)

2021 VBMP Most Recent Imagery Service – WGS Web Mercator (VGIN). Electronic document, http://services.arcgisonline.com/arcgis/services accessed December 2022.

Virginia Historic Landmarks Commission Staff (VHLCS)

1974 Woodard, National Register of Historic Places nomination form. Electronic document, https://www.dhr.virginia.gov/VLR_to_transfer/PDFNoms/127-0119_Woodward_House_1974_Final_Nomination.pdf, accessed January 2023.

Young, Richard

1809 Plan of the City of Richmond. On file at the Library of Virginia, Richmond.

Appendix C: Right-of-Way Matrix

RICHMOND LAYOVER FACILITY
Right-of-Way Matrix

Location	Tax Map ID	Property Owner Name(s)	Total Acreage (ac)	Impacted Acreage (ac)
Fulton Yard - CSX	799-712-1461	SB Cox Incorporated	7.8	0.1
	799-712-1815	Cox Sidney Barbee Jr	8.3	0.4
	799-711-3171	SB Cox Incorporated	4.9	0.1
	798-712-6126	Chesapeake & Ohio RR CO	5.1	5.1
	798-713-3911	Zp No. 341 LLC	28.7	12.8
	799-711-1156	Chesapeake & Ohio RR CO	2.4	1.2
	799-711-5915	Chesapeake & Ohio RR CO	12.2	1.6
	E0100160002	CSX Transportation Inc Tax Department J910	3.2	0.2
	E0001145002	CSX Transportation Inc Tax Department J910	0.4	0.3
	E0001145001	Zp No. 341 LLC	2.7	<0.1
	N/A	37th St R/W	1.7	<0.1
			Totals	**21.8**

* Tax values of impacts are based on the total tax value divided by the total acreage and multiplied by the impacted acreage. This does not constitute an appraisal for estimating property costs.

Note: Tax value impacts for Tax Map ID 799-711-5915 are based on the highest adjoining tax value per acre. Henrico County does not provide a total tax value for this parcel.

Note: Tax value impacts for the 37th St R/W are based on the highest adjoining tax value per acre. Henrico County does not provide a total tax value for this parcel.

Appendix D: Risk Register

0 *** Press the 'Insert New Row' Button to insert row below*** 0

Risk Information						Risk Description				Qualitative Risk Impact						Risk Response and Monitoring							
Project_Name	Project_ID	Risk_Cat_ID	Sequence Number	ID	SCC	Risk Category	Date Identified	Status	Risk Description	Probability of Occurrence	Cost Impact of Risk	Schedule Impact of Risk	Risk Rating	Risk Level	Impact Description	Mitigation Type	Mitigation and Control Action	Responsible Party	Ball in Court	Review Frequency	Last Review Date	Next Review Date	Notes on Risk Response Effectiveness
*** Press the 'Insert New Row' Button to insert row below***																						-	
Richmond Layover Facility	R14D	3	11	R14D-3.11		CONSTRUCTION RISK	11/7/2022	Active	Flagging Availability: Reduced Flagging Availability could impact Utility Relocation, which could delay Construction.	Significant - 5	Very High - 4	Very High - 4	20	Significant	Schedule is extended; possible change to scope due to change in phasing.	Risk Reduction	Ongoing coordination with CSXT, with emphasis on need for commitment to schedule/end date.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	10	R14D-3.10		CONSTRUCTION RISK	2/11/2020	Active	Delays executing CSX/VPRA Construction Agreement Execution could delay construction.	Very High - 4	Very High - 4	Very High - 4	16	Very High	Schedule is extended; possible change to scope.	Risk Acceptance	Ongoing coordination with CSXT, with emphasis on need for commitment to schedule/end date.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	09	R14D-1.09		REQUIREMENTS RISK	12/23/2022	Active	Site Railroad Access: Delays due to process/negotiations for construction impacting transload facility lead track could delay construction.	Very High - 4	High - 3	Very High - 4	14	High	Schedule is extended.	Risk Reduction	Initiate construction impact discussions/negotiations during environmental clearance.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	08	R14D-1.08		REQUIREMENTS RISK	12/23/2022	Active	Site Roadway Access: Delays due to process/negotiations for crossing transload facility tracks could delay construction.	Very High - 4	High - 3	Very High - 4	14	High	Schedule is extended.	Risk Reduction	Initiate crossing negotiations during environmental clearance.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	09	R14D-3.09		CONSTRUCTION RISK	2/11/2020	Active	Utility Relocation: Delays in utility relocation could delay start of construction.	High - 3	Very High - 4	Significant - 5	13.5	Very High	Construction is delayed, possibility of project not being complete by 2026.	Risk Transfer	Work with CSXT to accelerate utility relocation.	CSX		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	08	R14D-3.08		CONSTRUCTION RISK	12/23/2022	Active	Hazardous Material Removal: Discovery of hazardous materials in soil could delay construction.	High - 3	Very High - 4	Very High - 4	12	Very High	Construction is delayed, possibility of project not being complete by 2026.	Risk Reduction	Identify the exact location of petroleum tanks and other hazardous materials during environmental clearance for any potential remediation or contamination issues.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	07	R14D-3.07		CONSTRUCTION RISK	1/4/2023	Active	ROW Acquistion: Delays due to process/negotiations could delay the start of construction.	High - 3	Very High - 4	Very High - 4	12	Very High	Construction is delayed, possibility of project not being complete by 2026.	Risk Reduction	Initiate discussion with impacted property owners early in the environmental phase.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	06	R14D-3.06		CONSTRUCTION RISK	2/11/2020	Active	Limited access to ROW: Limited access to ROW could restrict construction and operations/maintenance.	Very High - 4	High - 3	High - 3	12	High	Project schedule is extended.	Risk Reduction	Work with CSXT and localities to identify temporary and permanent access points. Work with VDOT to secure easements.	CSX		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	05	R14D-3.05		CONSTRUCTION RISK	12/23/2022	Active	Construction Materials Lead Time: Lead times for turnouts and prefabricated buildings or materials could delay construction.	Very High - 4	Medium - 2	Very High - 4	12	Medium	Schedule is extended.	Risk Reduction	Identify critical path construction schedule and long-lead time construction materials during 30% preliminary engineering and procure any materials that may delay construction.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	07	R14D-1.07		REQUIREMENTS RISK	2/11/2020	Active	Federal, state, and local permit approvals on schedule: Delays in obtaining federal, state, and local water resources and construction permits could delay project.	High - 3	High - 3	Very High - 4	10.5	High	Schedule is extended; possible change to scope.	Risk Reduction	Initiate permit coordination with Final Design; submit permit applications after 60% design is complete.	CSX		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	06	R14D-1.06		REQUIREMENTS RISK	11/7/2022	Active	Public Opposition/Reaction to Proposed Projects: Public opposition could delay the start of construction.	High - 3	Medium - 2	High - 3	7.5	Medium	Schedule is extended.	Risk Reduction	Select location for facility that complies with zoning and avoids areas of public sensitivity.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	04	R14D-3.04		CONSTRUCTION RISK	11/7/2022	Active	Outage Coordination/Maintaining Operations: Track outage coordination with Construction Phasing could delay phases of construction.	High - 3	Medium - 2	Very High - 4	9	High	Schedule is extended.	Risk Reduction	Coordinate construction schedule with CSX as soon as the contractor provides the schedule.	Construction Contractor		Quarterly	19-Jan-23	20-Apr-23	
Richmond Layover Facility	R14D	3	03	R14D-3.03		CONSTRUCTION RISK	12/23/2022	Active	Qualified Contractor Availability: Limited number of contractors qualified to perform both vertical construction and track construction could delay construction or increase construction costs.	High - 3	Medium - 2	Very High - 4	9	Medium	Costs increase due to limited supply of contractors and/or schedule is extended.	Risk Reduction	Identify contractors with ability and interest to perform work during industry day events.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	02	R14D-3.02		CONSTRUCTION RISK	12/16/2022	Active	Wetlands and Surface Waters: Surface waters of less than one-half acre, located in the center of the site, contains a freshwater pond and wetlands that could extend the tim required to obtain permits and delay construction.	Very High - 4	Medium - 2	Medium - 2	8	Medium	Schedule is extended.	Risk Reduction	Identify the exact location of the wetlands and surface waters during environmental clearance and site surveys to develop mitigation, if needed.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	05	R14D-1.05		REQUIREMENTS RISK	12/16/2022	Active	Noise and Vibration: Opposition from local community that operations will increase noise and vibrations to nearby receptors could delay construction.	Very High - 4	Medium - 2	Medium - 2	8	Medium	Schedule is extended	Risk Reduction	Take noise and vibration measurements during environmental clearance to provide distacnes to receptors and assess possible impacts of noise and vibration.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	3	01	R14D-3.01		CONSTRUCTION RISK	12/23/2022	Active	Skilled Laborers: Decreasing availability of skilled manual laborers to perform construction activities could delay construction.	High - 3	Low - 1	Very High - 4	7.5	Medium	Costs increase due to limited supply of skilled laborers and/or schedule is extended.	Risk Reduction	Provide advance information about scope of construction to contractors to give them time to augment their labor pool.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	2	02	R14D-2.02		DESIGN RISK	12/16/2022	Active	Modifications to the Project Basis of Design by stakeholders: Changing the Project's engineering Basis of Design could delay Final Design, e.g., Amtrak requests direct sewer dumps vs. the use of honey wagons.	High - 3	Medium - 2	High - 3	7.5	Medium	Schedule is extended; possible change in scope due to change in basis of design.	Risk Avoidance	Early and ongoing coordination of design element criteria with stakeholders.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	04	R14D-1.04		REQUIREMENTS RISK	1/6/2022	Active	Cultural Resources: Presence of architectural and archaeological resources could delay the project as additional research and excavation occurs.	Medium - 2	Medium - 2	Significant - 5	7	Medium	Schedule is extended.	Risk Reduction	Conduct Phase I architectural and archaeological surveys during environmental clearance to assess impacts to project.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	03	R14D-1.03		REQUIREMENTS RISK	12/16/2022	Active	Northern Long-Eared Bat: Tree removal that would constitute a taking for this species could delay construction.	Medium - 2	High - 3	Very High - 4	7	Medium	Schedule is extended.	Risk Avoidance	Schedule site clearing and tree removal during hibernation period of this species.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	02	R14D-1.02		REQUIREMENTS RISK	2/11/2020	Active	Meeting ROD commitments prior to start of construction: VPRA must meet commitments in ROD prior to start of construction, including mitigation for cultural resources impacts to RF&P, that could delay construction.	Medium - 2	Medium - 2	Significant - 5	7	Medium	Schedule is extended; possible change to scope.	Risk Reduction	Advance procurement of cultural resources mitigation measures; address other commitments applicable to Alexandria 4th track.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	2	01	R14D-2.01		DESIGN RISK	12/16/2022	Active	City of Richmond/Henrico County Coordination: Delays in obtaining City/County support and completing public involvement process could delay design and construction.	High - 3	Medium - 2	Medium - 2	6	Medium	Schedule is extended.	Risk Avoidance	Early and ongoing coordination of project development with stakeholders.	VPRA		Monthly	19-Jan-23	18-Feb-23	
Richmond Layover Facility	R14D	1	01	R14D-1.01		REQUIREMENTS RISK	12/16/2022	Active	Monarch Butterfly: Habitat removal that would violate a future USFWS proposed rule could delay construction.	Medium - 2	Medium - 2	High - 3	5	Medium	Schedule is extended.	Risk Avoidance	Schedule site clearing and habitat removal during period when this species is not present.	VPRA		Monthly	19-Jan-23	18-Feb-23	