APPALACHIAN POWER COMPANY
BEFORE THE
VIRGINIA STATE CORPORATION COMMISSION
CASE NO. PUR-2023-00024

APPLICATION FOR APPROVAL AND CERTIFICATION OF ELECTRICAL TRANSMISSION LINE

Stuart Area 138-kV Transmission Improvements Project

VOLUME 2 OF 4

Siting Studies

July 2023

VOLUME 2 – Siting Studies

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Siting Study

Stuart Area 138-kV Transmission Improvements Project: Component 1: Mayo River (Stuart) to Willis Gap Transmission Improvements
SCC Case No. PUR-2023-00024

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Key Terminology

Alternative Routes	Assemblage of Study Segments that form routes for analysis and comparison.
Conceptual Routes	Initial routes for the project that adhere to a series of general siting and technical guidelines.
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process.
Distribution Line	An electric line that delivers power from a substation to households and businesses.
Diversion	A minor adjustment to the existing route where no other alternative is considered.
Encroachment	Any structure or activity within an existing right-of-way that could interfere with the safe, reliable operation of transmission facilities is called an encroachment and is prohibited under the terms of a right-of-way.
Endpoints	The project starting and ending point(s) (“Project Endpoints), which may include substations, switch stations, tap points, or other locations defined by the Company’s planners and engineers.
Environmental Justice	The fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy (VA Code § 2.2-234).
Focus Area	Areas along the existing route where rebuilding may not be feasible due to the presence of constraints.
Greenfield	New transmission line route or substation site constructed in an area or along a route where no previous substation or transmission line route existed.
Incompatible Use	Any structure or activity in close proximity to a transmission line that could interfere with the safe, reliable operation of transmission facilities.
Land Use	Describes the human use of the land and activities at a given location such as agricultural, residential, industrial, mining, commercial, and recreational uses. It differs from land cover which only describes the physical characteristics (summarized from EPA.gov).
Opportunity Feature(s)	Areas or existing linear features along which the transmission line may have less disruption to area land uses and the natural and cultural environment.
Project	The proposed transmission facilities studied in the siting report.

Proposed Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Proposed Route (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a safe, timely, and reliable manner.
Segment Endpoint	The intersection of two or more Study Segments.
Siting Team	A multidisciplinary team of experts in transmission line routing, environmental impact assessment, impact mitigation, engineering, and construction management.
Study Area	The territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental impacts and Project costs.
Study Segments	Study Segments are partial alignments that when combined form a complete route.
Study Segment Network	The assemblage of study segments between project endpoints.
Substation or Station	Substations or stations are facilities that transform bulk electric voltage down to distribution levels and/or provide protection and controls for the transmission electric grid. Typical equipment includes switches, circuit breakers, buses, and transformers.
Substation Study Site	Potential substation locations.
Switching Station	A particular type of substation without transformers and cannot increase or reduce the voltage.
Tap Point	The location where power is tapped from an existing transmission line to source a substation or customer.
Transmission Line	An electric line that operates at 69 kilovolts and/or above and has the purpose of moving power from a generation facility to a substation or between substations.
Transmission Line Extension	An electric transmission line from a tap point on an existing transmission line to a substation or customer.

ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power (parent company for Appalachian Power)
Appalachian Power or Company	Appalachian Power Company
CBG	Census Block Group
Component or Component 1	Mayo River (Stuart) to Willis Gap Transmission Improvements Component
EJ	Environmental Justice
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
IPaC	Information for Planning and Consultation
kV	Kilovolt
LiDAR	Light Detection and Ranging
NCED	National Conservation Easement Database
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PEM/PSS	Palustrine Emergent/Palustrine Shrub Scrub Wetland
ROW	Right-of-way
Siting Study	Component 1 Siting Study
SSC	State Corporation Commission
SSURGO	Soil Survey Geographic Database
Stuart Project or Project	Stuart Area 138-kV Transmission Improvements Project
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCRIS	Virginia Cultural Resources Information System
VDHR	Virginia Department of Historical Resources
VDWR	Virginia Department of Wildlife Resources

1.0 INTRODUCTION

1.1 Project Description

The Stuart Area 138-kV Transmission Improvements Project ("Stuart Project" or the "Project") is Appalachian Power Company's ("Appalachian Power" or "Company") proposed project to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades equipment voltage from 69-kilovolt ("kV") to 138-kV, improves the local distribution system, and addresses deteriorating infrastructure. The Project will ensure adequate power delivery to the area to support today's electrical load and provide continued support during an extended outage.

The Mayo River (Stuart) to Willis Gap Transmission Improvements Component ("Component" or "Component 1") is the first component of three included in the Project (**Figure 1, Project Location Map**). Component 1 consists of approximately 24.5 miles of new 138-kV transmission line between the existing Willis Gap 138-kV Substation, the proposed Claudville 138-kV Substation, and the proposed Mayo River 138-kV Substation in Carroll (less than 0.1 mile) and Patrick (approximately 24.4 miles) Counties. The proposed Mayo River Substation will replace the existing Stuart 69-kV Substation, which will be retired. The proposed Claudville Substation will serve as the midpoint between the two end points of Component 1. Component 1 will be constructed within newly acquired right-of-way ("ROW") typically 100 feet wide.

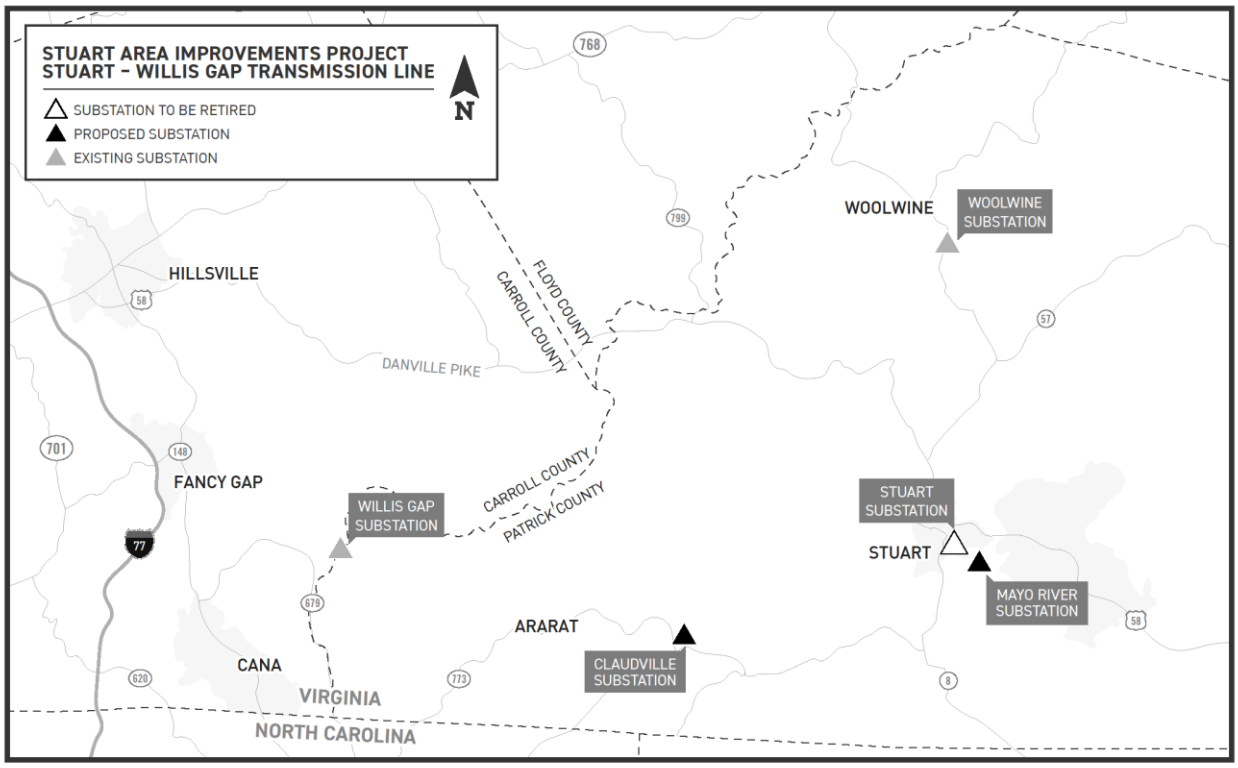


Figure 1. Project Location Map

1.2 Proposed Transmission Facilities Description

Component 1 will consist of approximately 24.5 miles of new single-circuit 138-kV transmission line between the existing Willis Gap Substation and the proposed Claudville and Mayo River substations. Proposed structure types will primarily be single circuit steel H-frames averaging 80 feet tall with possible variations depending on topography, design, and Component needs (**Figure 2**). Please see Exhibit 37, which are Visual Simulations within the Company's Application, for more detailed visuals showing existing and proposed structures**.**

A Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC") is required for the Project. The Company will seek approval from the SCC to construct the new transmission line and associated ROW within a 600-foot-wide filing corridor (300 feet on either side of the route centerline) in which the final route centerline and ROW will be located. The Company needs the flexibility to shift the centerline of the 100-foot ROW for the transmission lines up to 250 feet in either direction from the centerline shown in Exhibit 7 of the Company's Application as necessary to address issues that become evident only after completion of ground surveys, geotechnical and environmental studies, additional interviews with landowners and final engineering. The filing corridor is expanded at certain locations where ongoing options are being coordinated with a landowner.

If approved, the Company will complete preliminary engineering, work with property owners to determine the final centerline alignment for the proposed 138-kV transmission line, and acquire easements across private lands for the new transmission line ROWs. The Company then will finalize proposed structure locations and define a 100-foot-wide ROW within the SCC-approved 600-foot-wide filing corridor, and work with the necessary local, state, and federal agencies during the permitting and construction phases.



Figure 2. Typical Transmission Line Structure (Steel H-Frame) approximately 80 feet tall (average).

1.3 Proposed Construction Activities

Ground surveying and environmental field surveys are necessary to prepare for transmission line construction. Typical transmission line construction activities include ROW clearing, erosion and sediment control installation, temporary access road construction, crane pad grading, foundation installation, structure assembly and erection, conductor and shield wire installation, and restoration after construction is completed (**Figure 3**). Construction activities sometimes create temporary inconveniences such traffic delays and detours, brief electrical outages to customers, increased heavy equipment traffic, dust, and noise.



Figure 3. Temporary Access Road Construction

The Company will make every effort to be respectful of the natural and human environment during construction. All work will be conducted in accordance with applicable federal, state, and/or local requirements. General maintenance after construction includes periodic ROW vegetative management and inspections to ensure safe and reliable transmission line operation.

1.4 Project Timeline and Overview of Regulatory Approvals

Appalachian Power initiated the siting process in 2018, beginning with substation site selection, followed by transmission siting in 2019, and then developed study segments to be considered in greater detail throughout 2020. Study segments were refined and presented to the public during open house meetings on October 20 and 21, 2021. Using input from the open house forums, the Company refined the study segments to develop and analyze alternative routes throughout 2022. A proposed route was selected in September of 2022, and the Company announced it to the public and worked with affected landowners with more logical route refinements. The Company initiated the Certificate of Public Convenience and Necessity application preparation during the fall of 2022. Pending SCC approval, construction is expected to begin in fall 2025 to meet a December 2029 in-service date.

1.5 Goal of the Siting Study

The goal of the Component 1 Mayo River (Stuart) to Willis Gap Siting Study (the "**Siting Study**") is to gain an understanding of the constraints and opportunities within the defined study area to

facilitate the development of study segments, evaluate potential impacts associated with the study segments, and identify a proposed route and one or more alternative routes. The proposed route is the route that (1) is most consistent with the siting guidelines (Section 2.4), (2) reasonably minimizes adverse impacts on the natural and human environments, (3) minimizes special design requirements and unreasonable costs, and (4) can be constructed and operated in a safe, timely, and reliable manner. This Siting Study describes the route development process and rationale for the proposed route selection.

2.0 ROUTE DEVELOPMENT PROCESS

2.1 Siting Team

The route development process was initiated in 2018 when a siting team was assembled. It included American Electric Power ("AEP") employees and external consultants with diverse expertise including transmission line and substation siting, distribution planning, impact assessment for natural and human environments, impact mitigation, engineering, construction management, project management, ROW, and public relations (the "**Siting Team**").

The Siting Team works together to develop siting criteria, identify siting constraints and opportunities, collect and analyze environmental and design data, coordinate with stakeholders and collect input, coordinate with resource and permitting agencies, develop and revise study segments and alternative routes, and analyze and report on proposed route selection.

2.2 Route Development Process Overview

Route development is an inherently iterative process with frequent modifications made throughout the siting study. Iterations result from identifying new constraints; inputs from agencies, landowners, residents, and other stakeholders; periodic route re-assessments with respect to siting criteria; and adjustments to the overall route network. The Siting Team uses specific vocabulary to describe routes at various stages of development. An overview of the route development process and related vocabulary follows.

Initial route development starts with identifying the **Project Endpoints**. Endpoints may include substations, switch stations, tap points, or other locations defined by the Company's planners and engineers. Next, **Constraints and Opportunity Features** are identified within a defined **Study Area**, which encompasses the Project Endpoints and the area in between **(Figure 4, Step 1)**. Initial constraints and opportunity features typically are identified using readily available public data sources supplemented with stakeholder input and field inspections.

Once the Project Endpoints, Study Area and Constraints and Opportunity Features are identified, the **Siting Team** develops an array of **Conceptual Routes** for the Project that adhere to a series of general siting and technical guidelines **(Step 2)**.

Where two or more of these Conceptual Routes intersect, **Study Segments** are formed between two common intersection points. Together, the assemblage of Study Segments is referred to as the **Study Segment Network (Step 3)**.

As route development progresses, the Siting Team continues to evaluate new data (e.g., public and stakeholder input and field inspections) and modifies Study Segments in the network, if necessary, to develop a **Refined Study Segment Network (Step 4)**. Eventually, **Alternative Routes** are developed by assembling Study Segments that reasonably meet the **Siting Guidelines** into individual routes to be analyzed further **(Step 5)**. Assessment and comparison of Alternative Routes are undertaken by considering potential natural and cultural resources, land uses, and engineering and construction concerns. Ultimately, through a quantitative and qualitative analysis and comparison of Alternative Routes, the Siting Team identifies a **Proposed Route (Step 6),** which is the route that best meets Siting Study goals (Section 1.5).

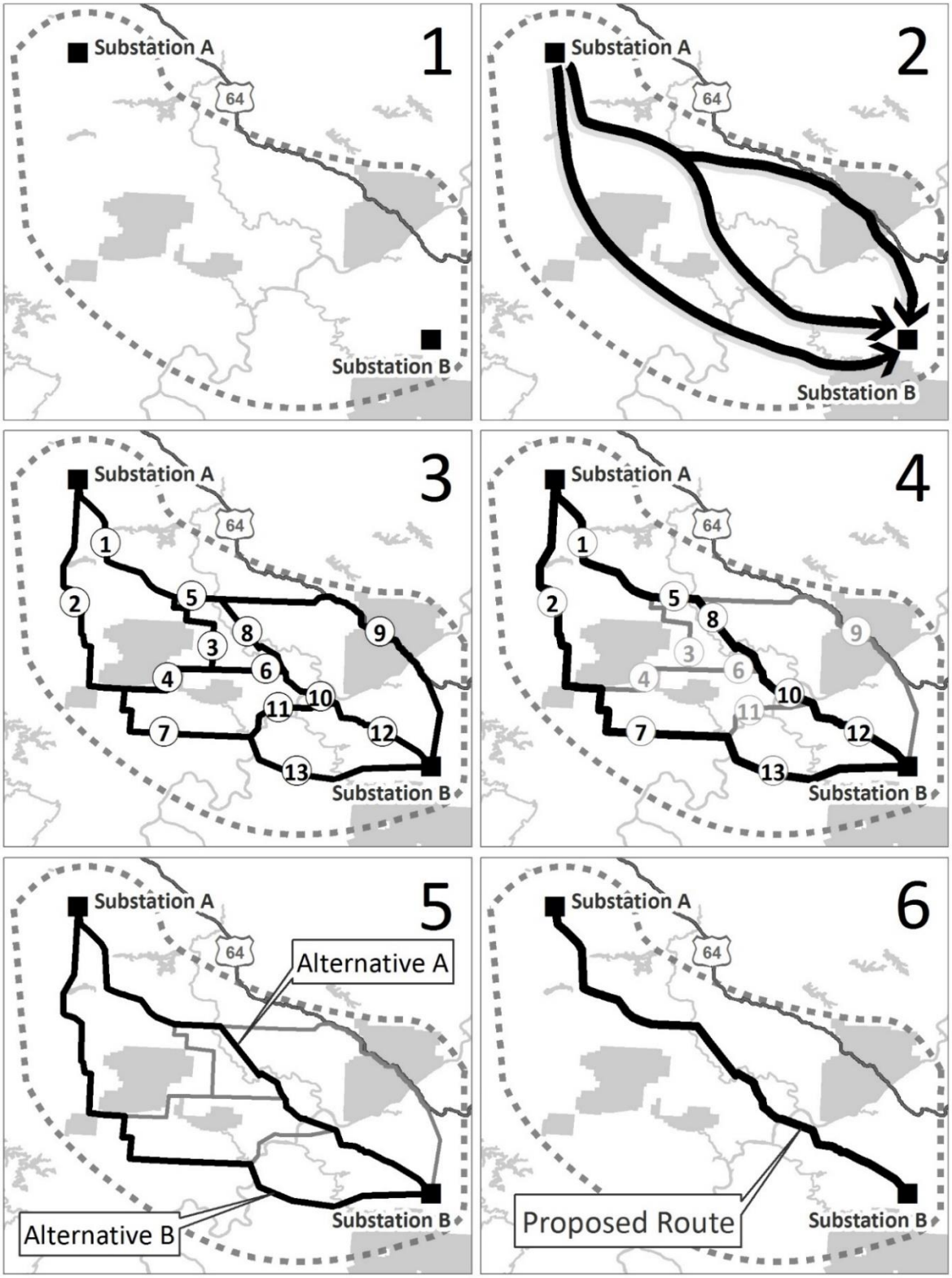


Figure 4. Route Development Steps

This figure illustrates the route development process and does not depict Project routes or segments.

2.3 Data Collection

The Siting Team used numerous information sources to develop data for the Siting Study. These data allowed collection and review of existing and proposed land uses, natural resources, cultural resources, transportation facilities, and existing utility and linear features. A table of data sources is provided in Attachment C – GIS Data Sources.

2.3.1 Geographic Information System ("GIS") Data Collection

Aerial photography is an important route selection tool, and primary aerial imagery sources used in Project route identification, analysis, and selection include:

- Esri (Imagery dates vary by location)
- Google (Imagery dates vary by location)
- Light Detection and Ranging ("LiDAR") (flown in June 2020)

Photography was updated with new information identified during field inspections (*i.e.*, location of additional residences and other constraints), and photographs were annotated using paper maps for public meetings and then transferred into the GIS database.

Existing GIS data sets obtained from many sources including federal, state, and local governments were used extensively during the siting study. Much of this information was obtained through official agency GIS data access websites, some was provided directly by government agencies, and the Siting Team created some by digitizing information from paper-based maps, aerial photo interpretation, stakeholder interviews, and field inspections.

GIS data sources vary with respect to their accuracy and precision; therefore, GIS-based calculations and maps presented throughout this study should be considered reasonable approximations of the resource or geographic feature they represent and not absolute measures or counts. The data and calculations presented in this study allow for relative comparisons among Project alternatives. Field reconnaissance is conducted to verify certain features (*e.g.*, residential, commercial, and industrial building locations)

2.3.2 Federal, State and Local Government Coordination

The Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route development process. Agencies contacted are listed below, and copies of agency correspondence are included as Attachment F.

Federal Agencies

- United States Army Corps of Engineers
- United States Environmental Protection Agency
- United States Fish and Wildlife Services ("USFWS")
- United States Department of Agriculture - Natural Resources Conservation Service ("USDA-NRCS")
- United States Department of Transportation Federal Highway Administration
- United States Department of Transportation Federal Aviation Administration

State Agencies

- Virginia Department of Wildlife Resources ("VDWR")
- Virginia Department of Conservation and Recreation
- Virginia Department of Environmental Quality
- Virginia Marine Resources Commission
- Virginia Department of Agriculture and Consumer Services
- Virginia Department of Historical Resources ("VDHR")
- Virginia Outdoors Foundation
- Virginia Department of Forestry
- Virginia Department of Aviation
- Virginia Department of Mines, Minerals, and Energy
- Virginia Department of Health
- Virginia Department of Transportation

Local Agencies and/or Officials

The Siting Team coordinated with local government agencies/officials to aid the route development process. These entities included:

- Carroll County Administration
- Patrick County Administration and Director of Economic Development

Other stakeholders and individual landowners were also identified and contacted as part of the siting process. Input received from landowner meetings and public open houses was used in the development and modification of line routes and is discussed further in Section 3.0.

2.3.3 Field Reconnaissance

Siting Team members conducted field inspections within the Study Area throughout the siting process (May 2018 through March 2022). Team members examined Study Segments by automobile from public roads and other points of public access and correlated observed features to information shown on aerial photography, United States Geological Survey ("USGS") 7.5-minute topographic maps, road maps, and GIS sources. Some key features (i.e., residences, outbuildings, places of worship, cemeteries, and commercial and industrial areas) were identified from desktop reviews and mapped in GIS before field inspections. These features were field-verified and added to the GIS database typically by using laptops/tablets running GIS software supported by real-time Global Positioning System ("GPS"). Field visits provided the Siting Team with a high-level understanding of the Project area and the opportunity to review Study Segments in the field from points of public access. Additionally, LiDAR imagery from flying alternative routes for the Project was used to verify building and structure locations and was considered the best available data before filing with the Virginia SCC.

2.3.4 Public and Stakeholder Input

Public and stakeholder input is critical to the route development process; specifically, when landowners and stakeholders provide information and recommendations to aid the Siting Team in developing and refining study segments and alternative routes. Typically, a project-specific outreach plan that may include open houses, websites, mailings, advertising, etc. is developed. Public and stakeholder input for the Project is described in greater detail in Section 3.6.

2.4 Siting Guidelines

2.4.1 General Guidelines

The Siting Team used these general siting guidelines to help develop study segments and routes to the extent reasonable and practical:

- Consider line routes that feasibly connect and minimize impact between the existing Willis Gap Substation and the proposed sites for the Claudville and Mayo River 138-kV substations.
- Consider using or paralleling existing ROWs or other linear features and infrastructure when feasible, noting that when paralleling existing facilities, reliability issues and mitigation requirements must be evaluated.
- Maximize the separation distance from and/or minimize impact on dwellings and community facilities, cemeteries, schools, daycare facilities, hospitals, historic resources, and designated landmarks.

- Avoid crossing or minimize conflict with designated public conservation and protected lands such as national and state forests and parks and local conservation easements.
- Avoid or minimize new crossings of large lakes, rivers, and large wetland complexes; critical and protected habitats; and other unique or distinct natural resources.
- Avoid or minimize habitat fragmentation in unfragmented areas and impacts on designated areas of biodiversity concern.
- Avoid or minimize visibility from designated scenic resources.
- Avoid or minimize conflict with existing land uses and future development that has a proposed plan, schedule, and permitting process underway.
- Minimize interference with existing and future economic activities, natural gas activities, and industrial facilities.
- Consider paralleling property lines, land use breaks, and land cover edges.
- Consider stakeholder input.
- Avoid conflicts with designated public and community facilities.
- Minimize environmental impact and construction/maintenance costs by selecting shorter, direct routes.
- Consider safety with respect to construction, maintenance, and operation of the facilities.
- Consider construction concerns such as access, road traffic control, outages, pipeline mitigations, railroad interactions, existing telecommunication line and distribution line conflicts, etc.
- Consider routes through terrain and land use where economical construction and environmental best management practices can be employed.
- Minimize environmental impact by considering routes that minimize the overall length of access roads, length on steep slopes, and waterbody crossings.
- Consider state-specific regulatory siting guidelines.
- The fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy (VA Code § 2.2-234).

2.4.2 Technical Guidelines

Technical guidelines are driven by the physical characteristics and engineering limitations of the structures and lines, design criteria necessary to meet AEP design standards, North American Electric Reliability Corporation reliability standards, National Electric Safety Code standards, and industry best practices for construction. The technical guidelines were informed by (1) the technical expertise of engineers and other industry professionals responsible for the reliable, safe and economical construction, operation, and maintenance of electric system facilities, (2) North American Electric Reliability Corporation reliability standards as implemented by PJM (the regional transmission organization that monitors the electric grid in 13 states), and (3) industry best practices.

The Siting Team considered these technical guidelines during study segment and route development to the extent practical:

- Minimize crossing lines of higher voltage and/or other utility-owned facilities.
- Maintain a minimum of 100 feet of centerline-to-centerline separation when paralleling 138-kV or lower voltage transmission lines.
- When paralleling existing transmission lines, verify there are no reliability issues by locating ROWs adjacent to one another.
- Minimize structure angles greater than 65 degrees.
- Minimize structures on steep slopes (generally, this is more than 20% slopes for angle structures and more than 30% for tangent structures), particularly if guy wires are required for construction.
- Locate proposed lines near future load growth areas.
- Minimize distribution underbuild or co-location on transmission structures if possible.

3.0 ALTERNATIVE ROUTE IDENTIFICATION

3.1 Project Endpoints

The Project Endpoints include the Company's existing Willis Gap 138-kV Substation and the proposed Claudville and Mayo River 138-kV Substations, which will be connected by the proposed new 138-kV transmission line (see Exhibit 7 Component 1 GIS Constraints Map within the Company's SCC Application). The Siting Team conducted a substation site selection process to determine the proposed Claudville and Mayo River Substations locations.

Mayo River Substation replaces the Stuart Substation. The existing Stuart 69-kV Substation, located in the Town of Stuart, is constrained by existing development, topography, and an existing major sewer line (see Exhibit 25, Existing Stuart Substation within the Company's SCC Application). Additionally, bringing the new 138-kV transmission line from Willis Gap into the Town of Stuart and rebuilding the two existing 69-kV transmission lines from Woolwine and Fieldale would have engineering challenges and high land use and environmental impacts. Adjacent parcels were reviewed but dismissed due to size constraints. Therefore, a new endpoint and substation site, the proposed Mayo River 138-kV Substation, was identified after reviewing numerous potential sites in the area. The proposed Mayo River site, located on Commerce Drive just outside and southeast of the Town of Stuart, is generally flat and rural, has plenty of space and a buffer, and is adjacent to the existing distribution circuits. Additionally, the three 138-kV transmission line circuits can connect to the substation at this location without significant impacts.

The Siting Team evaluated numerous potential sites in the Claudville community area for the Claudville Substation, which is an intermediate point between the existing Willis Gap and proposed Mayo River Substations. Ultimately, a 24-acre parcel off Hookers Creek Road was selected as the proposed substation site, which is located approximately 0.5 mile north of the community of Claudville in a rural area and will be buffered from any major roads or residences. The site was selected based on purchase availability, site development feasibility, transmission line entrance and exit feasibility, and ability to minimize overall viewshed impacts to the surrounding Claudville community (Attachment B, Map 1).

3.2 Study Area Description

The Study Area is the territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and reasonably minimize environmental impacts and reduce Project costs. Study area boundaries were defined by the geographic area encompassing the existing Willis Gap and proposed Claudville and Mayo River Substations and intends to include all practical conceptual routes between these substation endpoints (the "Study Area," Attachment B, Map 1). The Study Area is characterized by forested, agricultural, recreational, residential, and commercial land uses (Attachment D, Photos 1-4).

Between the existing Willis Gap and proposed Claudville substations the Study Area is generally bounded by the Blue Ridge Parkway and the Blue Ridge Mountain range to the north, the community of Stuart to the east, the Virginia – North Carolina state border to the south, and the Carroll and Patrick County boundary to the west along Route 679. Between the proposed Claudville and Mayo River substations, the Study Area is generally bounded by Highway 103 (Dry Pond Highway), rolling hills and mountainous terrain to the north, Route 8 and the Town of Stuart

to the east, the Virginia – North Carolina state border to the south, and the community of Claudville to the west. The Study Area is bounded by rolling hills and mountainous terrain to the north that would create potential engineering and constructability challenges associated with constructing on steep terrain with limited access. To the northeast, U.S. Route 58 and developed areas near the towns of Stuart and Patrick Springs act as a boundary because of dense development there. Finally, the existing City of Danville 69-kV transmission line serves as general boundary for the Study Area between the Claudville and Mayo River substations.

3.3 Constraints and Opportunity Features

The Siting Team identified and mapped siting constraints and opportunity features within the Study Area as described below and shown on the Study Area map (Attachment B, Map 1).

Constraints

Constraints are specific areas that should be avoided to the extent practical during the route development process. Major constraints were identified by the Siting Team during initiation of the route development process using readily available public data sources, including, but not limited to:

- Populated areas, including towns, small villages, urban areas, and other high concentrations of residential, commercial, and industrial development areas.
- National Register of Historic Places (“NRHP”) resources (listed and eligible).
- VDHR’s Virginia Cultural Resources Information System (“VCRIS”) architectural and archaeological resources.
- Recreational areas such as parks and community gathering areas.
- Large rivers (including the Ararat River, streams, wetlands, floodplains) or unique natural resource features and critical habitat areas.
- Designated federal or state forests, parks, state game lands, and other natural and conservation areas.
- Future land use plans and developments.

The Study Area includes these constraints: residential and commercial development in the towns of Ararat, Claudville, Stuart; mountainous terrain including Mill Mountain, Little Mountain, Carter Mountain; and the area south of the Blue Ridge Parkway; the Ararat River, Dan River, South Mayo River water resources; cultural resources; conservation easements; and existing infrastructure.

As the Siting Team developed Study Segments, smaller site-specific constraints were identified using readily available public data sources, stakeholder input, and field inspections. Study Segments were adjusted throughout the iterative route development process to avoid small constraints, where feasible, including but not limited to:

- Individual residences (*e.g.*, houses, mobile homes, etc.)
- Commercial and industrial buildings
- Outbuildings and barns
- Cemeteries
- Places of worship
- Schools
- Hospitals
- Designated historic resources and landmarks
- Small National Wetlands Inventory ("NWI") wetlands
- Specific recreational sites, facilities, and trails
- Radio and communications towers
- Designated scenic vistas
- Site-specific future land use plans
- Conservation easements

Opportunity Features

Opportunity features are typically existing corridors, areas, or edges where a transmission line would be considered compatible land use or its presence would be reduced by an existing linear feature. Opportunity features typically considered include other linear infrastructure and utility corridors, rail lines, and roads, and may include land cover edges, unused portions of industrial or commercial areas, or parcel boundaries. Siting opportunities identified within the Study Area are listed below and presented on the Study Area map (Attachment B, Map 1).

- The City of Danville's Pinnacles – Hydro 69-kV Transmission Line running generally west to east between the proposed Claudville and Mayo River substations
- The Huffman – Willis Gap 138-kV Transmission Line out of the existing Willis Gap Substation

- Portions of Dry Pond Highway running generally east to west between the proposed Claudville and Mayo River substations
- Portions of Ararat Highway generally running east to west between the existing Willis Gap Substation and proposed Claudville Substation

There are limited siting opportunities available within the Study Area. A few existing transmission lines bisect the Study Area from west to east in addition to the City of Danville's Pinnacles – Hydro 69-kV Transmission Line, which is available only for routes considered between the proposed Mayo River and Claudville substations. At the Willis Gap Substation, AEP's existing Huffman – Willis Gap 138-kV line is available to parallel for a short distance but continues west and away from the Project endpoints. The Ararat Highway and Dry Pond Highway generally run east to west in parts of the Study Area and present potential siting opportunities; however, they are considered limited opportunities due to potential impacts to existing residences and development along these roadways. After field visits, the smaller, local roads within the Study Area were dismissed as opportunity features because of residential development along those corridors. Where practicable, the Siting Team considered paralleling parcel boundaries as an opportunity to avoid residences and minimize bisecting parcels that could impact future development or land use.

3.4 Routing Concepts

Routing concepts that considered opportunities and constraints for the proposed transmission line were identified by the Siting Team at the onset of the route development process and were considered with general routing and technical guidelines. Routing concepts considered for the Component 1 proposed Mayo River – Willis Gap 138-kV Transmission Line are shown in Attachment B, Map 2. The route development study is organized into two parts (i) Willis Gap to Claudville and (ii) Claudville to Mayo River.

3.4.1 Willis Gap - Claudville Routing Concepts

Routing concepts between the existing Willis Gap Substation and proposed Claudville Substation must cross Willis Gap Road and Ararat Highway. The area between the two substations is generally scenic and characterized by forested and horticultural areas around the Willis Gap Road area, and open agricultural lands and scattered residential areas around Doe Run Road and Ararat Highway. The topography is generally rolling hills with mountainous terrain to the north towards the Blue Ridge Parkway and Blue Ridge Mountain range. Orchards and farmland appear east of the existing Willis Gap Substation and, continuing east toward the community of Ararat, pockets of residential and commercial development are present along roadways. Ararat and the surrounding community is populated with schools, churches, Dan River Park, commercial

businesses, and more farmland. Continuing east toward the community of Claudville, the Study Area contains timber land and mountainous terrain.

The residential and commercial development along major roadways in the Study Area limited the potential routing concepts to parallel local roadways. Routing concepts were developed to minimize potential impacts to residents and businesses along these existing transportation corridors while maximizing existing linear corridors to the extent possible. Northern routing concepts near the base of the Blue Ridge Mountains were considered along ridgelines to try to avoid residential and commercial development; however, due to engineering and constructability constraints associated with the difficult mountainous terrain, these northern routing concepts were dismissed. There were limited opportunities to span from ridge top to ridge top, and the terrain south of the mountain range proved to be more favorable in comparison.

Overall, three general routing concepts were considered for the Study Area: routes traveling north of, through, or south of the community of Ararat, respectively. Initial routing concepts that approached the community of Claudville from the south were dismissed when the proposed Claudville Substation site was selected since it is located north of Claudville, and more transmission line length would create additional impacts to residents and the surrounding community. The northern routing concepts into the proposed Claudville Substation were carried forward since it follows a more direct route to the proposed substation site with fewer potential impacts to residents.

3.4.2 Claudville – Mayo River Routing Concepts

Routing concepts between the proposed Claudville and Mayo River substation sites were developed to try to balance minimizing potential impacts to residences and commercial businesses while using existing linear corridors where possible, such as roadways or the City of Danville's Pinnacles – Hydro 69-kV Transmission Line (Attachment D, Photo 4). East of the proposed Claudville Substation, Dry Pond Highway travels through the Study Area toward the Town of Stuart and the Mayo River Substation site. Routing Concepts were not developed along Dry Pond Highway because of residential and commercial uses along the highway. Instead, routing concepts were developed north of Dry Pond Highway to minimize impacts to existing residences and current land use.

Routing concepts primarily exit the proposed Claudville Substation site and travel east crossing Route 8 traveling in a general east to northeast direction toward the proposed Mayo River Substation site. Several routing concepts were developed to identify optimal local road crossings (*i.e.*, County Road 644 and Route 8) that travel north to south through the Study Area.

Northern routing concepts are direct, short, and cross the steep Blue Ridge Mountain foothills in an unfragmented forested area with scattered residences. After introducing the Project to Patrick County officials, another southern routing concept was developed that parallels the existing City of Danville's Pinnacles – Hydro 69-kV Transmission Line. Even though the Pinnacles – Hydro 69-kV Transmission Line is further south of Dry Pond Highway and the other routing concepts, the line provides a siting opportunity as an existing linear corridor to parallel. In addition, this routing concept is consistent with existing land use throughout the area since the line has existing ROW and structures.

3.5 Study Segment Development

The Siting Team developed a series of Study Segments based on the route development process and criteria described in Section 2.0. The resulting Study Segments network was used to collect public and stakeholder input (Attachment B, Map 3). Study Segments were evaluated and refined after public and stakeholder input as described in Section 3.7.

3.5.1 Willis Gap – Claudville Study Segments

The Siting Team developed Study Segment 1, which exits the Company's existing Willis Gap Substation from the north and turns east across Orchard View Drive.

Study segments that continue east toward the proposed Claudville Substation and remain in the northern extents of the Study Area were developed to minimize transmission line length. Study Segments 2 and 10 continue east for approximately 10 miles across foothills south of the Blue Ridge Parkway and span across ridgetops and open agricultural areas. Study Segment 10 crosses scattered residential development along Squirrel Spur Road, Ararat Highway, and County Road 872 to avoid steeper rugged terrain to the north near the Blue Ridge Parkway.

The most central Study Segments continue east across Willis Gap Road and consider options on either side of the Ararat community along Ararat Highway. Exiting the Willis Gap Substation, Study Segment 3 continues south and parallels the western side of AEP's existing Huffman - Willis Gap 138-kV Transmission Line for a short distance (about 0.2 mile). Several options to continue east and across Ararat Ridge Road were considered. Study Segment 4 turns east from Study Segment 3, while Study Segment 5 continues south paralleling parcel boundaries. Study Segment 4 travels east across Ararat Ridge Road for 0.7 mile then continues north (Study Segment 6) or south (Study Segment 7). Study Segment 6 turns north to avoid development along Route 677 before connecting to Study Segment 10 along the northern portion of the Study Area. Study Segment 7 continues southeast and then turns east when it connects to Study Segment 11. Study Segment 11 follows the central path, crossing Willis Gap Road, County Road 767, Doe Run Road, and Birds Branch. Study Segment 11 ends after approximately three miles, and Study Segment

12 continues due east while Study Segment 13 travels southeast to serve as a connector segment to the southern path. Study Segment 12 travels north of Ararat and Dan River Park for four miles, crossing Old Farm Road and Ararat Highway before connecting with the southern path at Study Segment 15. Study Segment 15 travels east and connects with Study Segment 16 entering the proposed Claudville Substation from the west.

For the southern path, Study Segment 5 continues south of Study Segment 3 before splitting just east of Route 676. Study Segment 8 continues east serving as a connector segment with the central route and connecting with Study Segment 11. Study Segment 9 continues south and turns east, southeast after crossing Willis Gap Road. Study Segment 9 continues in a southeast trajectory until crossing Farmers Road and turning east. Study Segment 9 crosses Ararat Highway south of the community of Ararat and continues east for 6.3 miles. Study Segment 14 connects to Study Segment 9 and travels northeast for approximately two miles before connecting to Study Segment 15, which travels east and connects with Study Segment 16 entering the Proposed Claudville Substation from the west.

3.5.2 Claudville – Mayo River Study Segments

For the Claudville – Mayo River portion, two northern paths and one southern path of study segments that travel east from the Proposed Claudville Substation to the Proposed Mayo River Substation were developed and considered. Study Segment 17 exits the proposed Claudville Substation to the north and travels approximately 325 feet before turning due east before splitting into the different Study Segment routes. The northernmost route follows Study Segment 20 after Study Segment 17. Study Segment 20 travels in a northeast trajectory for approximately three miles, crossing County Roads 647 and 645. Study Segment 20 then diverges as Study Segment 21 travels in a northeast direction while Study Segment 22 continues due east. Both Study Segment 21 and 22 travel east crossing County Road 644 and 778 for approximately 4.5 miles. Study Segment 22 continues east and connects to Study Segment 23. Study Segment 23 travels east for 0.75 mile and then turns northeast with Study Segment 24, which continues for 0.8 mile and serves as a connector segment. Study Segment 21 and Study Segment 24 converge at Study Segment 25 east of Salem Highway, which travels north to south in the Study Area. Study Segment 25 crosses Salem Highway traveling for approximately 0.75 mile. Study Segment 25 meets with Study Segment 31, which turns northeast and travels for 1.4 miles crossing Wayside Road and Big A School Road. Study Segment 31 turns into Study Segment 33, which enters the proposed Mayo River Substation from the south.

Multiple Salem Highway crossing locations were considered to minimize potential impacts to residential development along the highway and to residences and the surrounding community south of the town of Stuart. A network of connector Study Segments was developed to consider

multiple crossing locations along Salem Highway (Study Segments 24 through 29). Study Segment 25 is the northernmost crossing, Study Segment 26 is the middle crossing, and Study Segment 27 is the southernmost crossing along Salem Highway (Attachment B, Map 3).

The second northern route follows Study Segment 17 and then Study Segment 19, which travels southeast along an existing ROW before turning east after 0.8 mile. Study Segment 19 continues northeast until it crosses County Road 644 and converges with the northernmost route at Study Segment 23. Study Segment 23 connects with Study Segment 27 which is the southern crossing of Salem Highway. After crossing Salem Highway, Study Segment 27 connects with Study Segment 30 and travels northeast crossing Wayside Road. Study Segment 30 then connects with Study Segment 32, which turns north and crosses Big A School Road. Study Segment 32 converges with Study Segment 31 and then Study Segment 33 enters the proposed Mayo River Substation from the south.

Similar to the other two, the southern path begins with Study Segment 17 and connects to Study Segment 18, which turns further south than the other two paths. Study Segment 18 follows the existing Pinnacles – Hydro 69 kV Transmission Line ROW and continues southeast crossing Claudville Highway and continues south of the City of Danville transmission line. Study Segment 18 mostly parallels the Pinnacles – Hydro 69-kV Transmission Line with minor diversions or additional crossings to account for residences and development along Dry Pond Highway. Study Segment 18 crosses Dry Pond Highway on the south side of the City of Danville transmission line and continues east. Study Segment 18 crosses the Pinnacles – Hydro 69-kV Transmission Line east of a Collinstown Road crossing and then continues to parallel the existing transmission line on the north. Study Segment 18 continues east crossing Salem Highway and then turns north after Russel Creek. Study Segment 18 continues north for 1.8 miles crossing Wayside Road before connecting with Study Segment 32. Study Segment 32 travels north and connects with Study Segment 33 entering the proposed Mayo River Substation from the south.

3.6 Public and Stakeholder Input

3.6.1 Public Communications and In-Person Open House

Given the geographical size of the Project, team members conducted two in-person open houses at different locations held on October 20 and 21, 2021, from 3:00 to 7:00 p.m. (EST) in the communities of Stuart and Ararat, respectively, to gather landowner and community feedback. The Stuart Open House was held at the Stuart Rotary Club (264 Woodland Drive, Stuart, Virginia, 24171), and the Ararat Open House was held at the Ararat Ruritan Club (4711 Ararat Highway, Ararat, Virginia, 24053). The Siting Team set up stations at the meeting locations and provided

information on structure engineering and design, environmental and forestry, Project need, real estate and ROW, and the siting process.

Notifications to the community on the meeting time and location were made through:

1. A news release announcing the Project and virtual open house was distributed by the Company on October 6, 2021. Appalachian Power representatives requested input on the Project by November 12, 2021.

2. Separate Project mailings were sent to 665 landowner addresses located within a 1,000-foot corridor (500 feet on either side of a Study Segment centerline) on October 13, 2021. Outreach mailings included a postcard mailed October 7, 2021, a cover letter, Component 1 fact sheet, detailed flyer about transmission line routing, comment card with a prepaid postage return envelope, and 11 by 17-inch individual map page(s) showing Study Segments (See Attachment A – Outreach Fact Sheet).

3. Automated DAVOX telephone notifications from the Company were made on October 12, 19, and 26, 2021, to remind landowners about the open houses and virtual town halls. Messages were delivered as follows: 233 messages from the October 12 notification, 231 messages from the October 19 notification, and 231 messages from the October 26 notification. Maps printed at a scale of 1 inch = 400 feet were provided at the open house for public review and were used to record written comments about sensitive resources known locally. Participants were encouraged to document on printed maps their dwelling locations, places of business, property of concern, or other sensitive resources. Handwritten comments were digitized and entered into a GIS database after the open house. During the open house Siting Team members greeted meeting attendees, answered questions about the Project, and assisted participants in locating their property or other features of concern on maps showing the Study Segments under consideration.

Comment sheets were distributed to meeting attendees, who were asked to fill out the sheet and include contact information. Comment sheets were reviewed, scanned, and stored in the Project database as a record of meeting attendance and public comments. Sixty-seven people attended the Stuart Open House and 77 people attended the Ararat Open House. Eighteen comment cards were collected at the Stuart Open House, and 27 were collected in Ararat for a total of 45 comment cards submitted at the in-person open houses.

On March 25, 2022, three different mailings were sent to 644 landowners within 1,000 feet of Alternative Routes (500 feet on either side of Alternative Routes shown in Attachment B, Map 5). These mailings included:

- A general Component 1 update to notify landowners of Study Segment progress, introduce the land agent representative, and provide a Component 1 factsheet.
- A Project Factsheet and parcel map for landowners within Alternative Routes E and F who may be affected by Study Segment adjustments made since the Open Houses.
- A Project Factsheet and parcel map for new landowners within Alternative Routes E and F who were not contacted previously during the Open House, but who may be affected by Study Segment adjustments made since the Open Houses.

An updated Project mailing was sent to 673 landowners within 1,000 feet of the Proposed Route on October 3, 2022, notifying them of the selected route (Attachment B, Map 7).

3.6.2 Project Website, Virtual Open House, and Virtual Town Hall Meetings

A Project website was created and launched on October 6, 2021, to announce the Stuart Area 138-kV Transmission Improvements Project and provide Component 1 information including updates, news releases, interactive map, fact sheet, and schedule (**https://aeptransmission.com/virginia/Stuart-WillisGap/**). In addition to the Project website, a virtual open house for the Stuart – Willis Gap Component was launched to allow landowners to provide input on the Project website. Content provided during the virtual open house was similar to that provided at in-person open houses including content related to structure engineering and design, Project need, ROW, and construction. The virtual open house also allowed landowners and the public to submit comments to the Siting Team and identify properties through an address search tool.

Aerial maps at a scale of one-inch equals 400 feet were posted on the Project website during the virtual open house and available to download. Map features included existing infrastructure and the Component 1 138-kV transmission line Study Segments. Participants were encouraged to identify the location of their houses, places of business, properties of concern, or other sensitive resources on maps and submit comments to the Siting Team. The official comment period ran from October 6, 2021, to November 12, 2021. Comments received through the virtual open house also were digitized and entered into a GIS database.

In addition to the in-person open houses and virtual open house, two virtual town hall meetings via WebEx were hosted to solicit feedback and allow landowners to ask questions about the Project. Virtual town halls were held on October 28, 2021, 12:00 to 1:00 p.m. and 5:00 to 6:00 p.m. (EST) and a total of eight landowners attended the virtual town halls.

3.6.3 Other Stakeholder Input

In addition to soliciting input from landowners via the in-person and virtual open houses, the Siting Team met with numerous landowners at their request to review routes on their property and Company ROW agents contacted numerous landowners at key locations as necessary to collect additional information. Additionally, the Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route planning process. Letters were sent to 22 agencies on November 23, 2021, as part of the data collection effort and nine responses have been received to date. Copies of agency letters, contact list, and correspondence are included as Attachment F.

The Siting Team also coordinated with local government agencies/officials to aid the route review process. Carroll County officials were notified of the Project via email in October 2021; they indicated support for Component 1's need and confirmed no future development plans were identified as potential impacts to Component 1. Siting Team members met virtually on June 8, 2021, with Patrick County officials including the County Administrator and Building Inspector. The purpose of the meeting was to introduce the Project and Component 1 and obtain information to aid in the route review process. The Siting Team reviewed the municipality's future land uses and specific comprehensive plan goals to evaluate potential constraints and opportunities. Local officials provided information about potential stakeholders such as the City of Danville and the local Economic Development Authority. Overall, local officials were supportive of the need for Component 1 and identified no future development plans as potential impacts to the Project. The County encouraged the Siting Team to consider a routing concept that parallels the existing City of Danville's Pinnacles – Hydro 69-kV Transmission Line. The Siting Team communicated with City of Danville officials in July 2021, and the City had no concerns with this potential routing option and it was determined that paralleling the existing line is feasible. The Siting Team met with Patrick County officials again on September 9, 2021, to review Study Segments before presenting them at public open houses.

3.6.4 Consideration of Public and Stakeholder Input

In addition to the 45 comment cards submitted on the Project at the in-person public open houses, approximately 265 comments were received via phone call, US mail, email, or the Project website. All comments were cataloged and digitized into a GIS database, categorized by general area of expertise (e.g., outreach, ROW, engineering, siting, etc.), and assigned to relevant subject matter experts and team members to follow up as necessary. After reviewing comments, the Siting Team incorporated the information, where applicable when reviewing, revising, and comparing Study Segments during evaluation and refinement.

3.7 Study Segment Evaluation and Refinement

Study Segments were evaluated and refined using public and stakeholder input, updated mapping, and additional field inspections in an attempt to avoid or minimize impacts to Study Area resources. As a result, some Study Segments were removed, added, and modified as described below (Attachment B, Map 4).

3.7.1 Willis Gap – Claudville Revised Study Segments

During initial Study Segment review and refinement following the October 2021 open house, the northern study segments (Study Segments 2 and 10) were adjusted to the north to account for landowner feedback received during the open house. Study Segments 2 and 10 were shifted to the north and angles were added to minimize potential impacts to existing residences, potential cemeteries, and future development along the Study Segments. There is a high prevalence of cultural resources in the mountain foothills as they are rich with historic artifacts and other resources. Shifting these study segments north to avoid these historic and cultural resources was limited due to the topography of the Blue Ridge Mountain Range to the north and development to the south.

The central route and associated Study Segments were adjusted substantially based on input from landowners. Study Segments 4 and 7 were adjusted to follow parcel lines more definitively and to minimize impacts to development plans. Study Segment 11 was shifted to the north due to better terrain. Study Segment 12 was shifted south and additional angles were added to follow parcel lines and minimize potential impacts to development plans and conflicting land uses. Study Segment 13 was shifted to improve road crossing locations and minimize potential human environment impacts. Overall, the central route travels through the Ararat community, so impacts to landowners and the surrounding community are prevalent.

The southern route and associated Study Segments cross more undeveloped land compared with the central and northern routes. This route does not go through the Ararat community, and it avoids residential areas along the mountain foothills. Study Segments 5, 9, and 14 were adjusted to better follow parcel lines, avoid future residential development plans, and avoid a cemetery, respectively.

The Siting Team met on January 20, 2022, to analyze the refined Study Segments further based on additional quantitative data and GIS-based calculations. GIS-calculations were computed for certain routes that follow similar trajectories to begin consolidating preliminary Alternative Routes into a refined Study Segment Network (Attachment B, Map 4). Study Segments 4 and 7 were dismissed based on visual impacts from crossing cleared residential areas, bisecting parcels, and potential landowner impacts when compared with Study Segments 5 and 8. Study Segment

12 was dismissed based on potential impacts to the Ararat community, including the Dan River Park area, and identification of surrounding future development sites including residences and an air strip. As a result, three routes emerged: a northern route (Study Segments 1, 2, 10 and 16), a central route (Study Segments 1, 3, 5, 8, 11, 13, 14, 15, and 16) and a southern route (Study Segments 1, 3, 5, 9, 14, 15, and 16).

3.7.2 Claudville – Mayo River Revised Study Segments

During initial Study Segment review and refinement following the October 2021 open house, the Siting Team made multiple shifts and dismissed certain Study Segments. Study Segment 20 was shifted to the north outside of the proposed Claudville Substation due to planned future residential development. Study Segment 19 was shifted slightly south due to terrain and constructability. Study Segment 23 was shifted slightly south to avoid residential development and use the optimal terrain. Study Segments 26 and 29 were dismissed due to potential impacts to planned future development, and as a result Study Segment 28 which served as a connector was also dismissed. Study Segments 21, 24, and 25 were shifted to the south due to planned residential development and potential impacts to landowners and the human environment. Study Segment 27 was shifted slightly north to avoid a family cemetery. As a result, a new connector segment, Study Segment 39 was developed to travel north and connect to Study Segment 31. Study Segment 18 had minor shifts due to terrain, potential historic resources, and planned future development. As a result, minor adjustments were made to Study Segment 32 to shift west and the new connector segment, Study Segment 40, was added. The intersection of Study Segments 31 and 32 were shifted to the south, thus adjusting Study Segment 33 as well.

On January 20, 2022, the Siting Team further analyzed the refined Study Segments based on additional quantitative data and calculations. GIS-based calculations were run on the refined Study Segments, further depicted in Attachment B, Map 4. Study Segment 21 was dismissed due to potential impacts to historic and cultural resources as well as potential impacts to the human environment and landowners when compared to Study Segments 22, 23, and 24. Study Segment 19 was also dismissed due to potential impacts to the human environment and residences, the potential for encroachments within a proposed ROW, and potential visual impacts to landowners compared to Study Segments 18 and 20. Study Segments 24 and 25 were dismissed due to potential constructability issues associated with terrain and potential impacts to landowners and future development. Study Segments 30 and 40 were dismissed due to additional length compared against a similar Study Segment, 31, and potential impacts to landowners. As a result, two routes began to emerge: a northern route (Study Segments 17, 20, 22, 23, 27, 39, 31, and 33) and a southern route (Study Segments 17, 18, 32, and 33).

3.8 Alternative Routes

The Siting Team met frequently after the January 20, 2022 meeting continually reviewing, modifying, and eliminating Study Segments based on field inspections, engineering requirements, and stakeholder input. The Team concluded the process by compiling Study Segments into five preliminary Alternative Routes for analysis and comparison. Of the five Alternative Routes, three routes are between Willis Gap and Claudville, and two between Claudville to Mayo River. During discussions, the Siting Team added a sixth Alternative Route between the proposed Claudville and Mayo River substations to consider additional landowner input.

The common route segment for all three of the Willis Gap to Claudville Alternative Routes into the Claudville Substation (former Study Segment 16) crosses large, undeveloped tracts of land on Simmons Mountain (just west of the Claudville Substation site). The owner/developer indicated they have plans to develop these tracts in the future, provided an existing approximately 15-year-old master plan, and has started some activities including construction on the primary road. Therefore, this common Alternative Routes segment was moved to the north on the same parcel out of the center of the proposed land use, which was more preferrable to the developer, had less impact on future development plans, and was reasonable to the Siting Team (Attachment B, Map 5). The six resulting Alternative Routes are described in the following sections and are shown on Attachment B, Map 5.

3.8.1 Willis Gap – Claudville Alternative Routes

3.8.1.1 Alternative Route A

Following the northern route, Alternative Route A exits the Willis Gap Substation to the east and travels east along the base of the Blue Ridge Mountains. This route continues east crossing mostly cleared farm or forested land avoiding pockets of residential development along county roadways. Alternative A continues to the east and then shifts south before crossing Squirrel Spur Road to avoid mountainous terrain. The route continues in a southeast direction before turning east to cross Simmons Mountain. It then continues to the east and enters the west side of the Proposed Claudville Substation.

3.8.1.2 Alternative Route B

Following the central route, Alternative Route B exits the existing Willis Gap Substation to the east, similar to Alternative Route A, but then turns south after crossing Route 677. Alternative Route B continues southeast paralleling existing ROW or parcel boundaries to the extent possible before turning sharply east after crossing Route 676. Alternative Route B continues east and crosses Willis Gap Road and other local roadways. This route primarily crosses forest or cleared

farmland avoiding pockets of residential development. Alternative Route B continues to the southeast crossing through the community of Ararat and then continues east and begins heading northeast toward the proposed Claudville substation. Alternative Route B travels east over Simmons Mountain, following the same path as Alternative Route A, before entering the west side of the Proposed Claudville Substation.

3.8.1.3 Alternative Route C

Following the southern route, Alternative Route C exits the existing Willis Gap Substation to the east, similar to Alternative Routes A and B, and then turns south after crossing Route 677. Alternative Route C follows the same path as Alternative B until it crosses Route 676. After crossing, Alternative Route C continues in a more southeastern trajectory. This route is the southernmost route and travels southeast crossing Willis Gap Road and other county roadways. Alternative Route C predominantly crosses large agricultural or forested parcels with few pockets of residential development. Alternative Route C continues traveling southeast and then turns due east after crossing Ararat Highway. Alternative Route C continues traveling east and turns slightly northeast toward the proposed Claudville Substation. Like Alternative Routes A and B, Alternative Route C travels to the east crossing over Simmons Mountain and enters the Proposed Claudville Substation from the west.

3.8.2 Claudville – Mayo River Alternative Routes

3.8.2.1 Alternative Route D

Alternative Route D is the northernmost route for the Claudville – Mayo River section. It exits the proposed Claudville Substation to the north and turns east traveling in a northeastern trajectory crossing Willard, Pikes, and Carter Mountains. Alternative Route D continues in an eastern path until crossing Route 8 where it then turns northeast crossing Wayside Road before entering the Proposed Mayo River Substation from the south. Alternative Route D primarily crosses larger forested or agricultural parcels with limited residential development.

3.8.2.2 Alternative Route E

Alternative Route E exits the proposed Claudville Substation directly to the east and travels in an east, southeast direction. Alternative Route E continues traveling southeast and crosses Claudville Highway and Dry Pond Highway. After crossing Dry Pond Highway, Alternative Route E turns east, generally paralleling the City of Danville's existing Pinnacles – Hydro 69-kV Transmission Line heading east until crossing Route 8. It then turns north and travels in a northeast direction until crossing Wayside Road. After this crossing, Alternative Route E turns slightly northwest before connecting with Alternative Route D and enters the proposed Mayo River Substation from the south.

3.8.2.3 Alternative Route F

Alternative Route F was developed in attempts to minimize impacts to future development along Alternative Route E and follows a similar path. This route exits the proposed Claudville Substation directly to the east and travels in an east, southeast direction. Alternative Route F continues traveling southeast and crosses Claudville Highway and Dry Pond Highway, following the same path as Alternative Route E. After crossing Dry Pond Highway, Alternative Route F turns east generally paralleling the City of Danville's existing Pinnacles – Hydro 69-kV Transmission Line heading east until crossing Route 8. After the Route 8 crossing, Alternative Route F turns north and then due east diverting from Alternative Route E. Alternative Route F travels west of Alternative Route E, traversing in a northeast direction until after crossing Wayside Road where the route turns northwest before connecting with Alternative Route D and entering the proposed Mayo River Substation from the south.

4.0 ALTERNATIVE ROUTE COMPARISON

The Alternative Routes comparison provides a quantitative and qualitative analysis of potential impacts to local communities, the environment, and cultural resources as well as engineering and constructability concerns. The Alternative Routes between Willis Gap and Claudville and Claudville to Mayo River were reviewed in detail and compared using a combination of data collected in the field, GIS sources, stakeholder input, supporting documents, and the Siting Team's collective knowledge and experience.

4.1 Willis Gap to Claudville

4.1.1 Natural Environment

The natural environment includes water, soil, sensitive species, and wildlife habitat. Potential impacts are based on publicly available maps and data as well as coordination with federal, state, and local agencies. The Siting Study goal is to avoid or minimize impacts on the natural environment during construction, operation, and maintenance of the facilities to the extent practicable. A comparison of the natural environment considerations for the Alternative Routes is presented at the end of this section in **Table 2**.

4.1.1.1 Geological, Soil, and Water

Resource Characteristics

Between the existing Willis Gap Substation and proposed Claudville Substation, the Study Area is characterized by rolling and mountainous terrain with agricultural, forested, and residential land uses. Multiple streams and the Ararat and Dan Rivers are within the Study Area.

Alternative Route Comparison

Alternative Routes A, B, and C cross a similar number of streams and rivers; however, Alternative Route B crosses five more streams than the two other Alternative Routes. All three Alternative Routes cross the Dan River (near Claudville), which is designated as a "Threatened and Endangered Species Water" by the VDWR. The Dan River is also a designated Virginia Scenic River by the VDCR. All three of the Alternative Routes also cross the Ararat River. All three Alternative Routes cross similar wetlands and riparian buffers acreage and are comparable. None of the routes cross karst topography, and all cross similar numbers of steep slopes. Alternative Route C crosses half the amount of pasture/rangeland acreage compared to Alternative Routes A and B. Alternative Route A crosses the most cropland and prime and unique farmland acreage; however, all three Alternative Routes show similar farmland of statewide importance acreage within their respective ROWs.

4.1.1.2 Wildlife Habitat and Sensitive Species

Resource Characteristics

The habitat between the existing Willis Gap Substation and the proposed Claudville Substation includes a mix of mountainous and rolling hill terrain, forested areas, agricultural fields, and residential environments. Virginia's special status wildlife and plant species that are designated as threatened, endangered, or candidate species are protected at the federal level by the Endangered Species Act (16 U.S.C. 1531 et seq. [1973]) and/or at the state level for protection of threatened and endangered species of fish and wildlife (4VAC15-20-130) through the VDWR. The USFWS Information for Planning and Consultation ("IPaC") planning tool was used to determine whether any threatened or endangered wildlife plants or species have potential to occur in the Study Area. IPaC results are identified in **Table 1**.

Table 1. Threatened and Endangered Species

Species Name	Status	Note
Indiana Bat *(Myotis sodalist)*	Endangered	The study area does not overlap any critical habitat.
Northern Long-eared Bat *(Myotis septentrionalis)*	Endangered	No critical habitat designated for this species.
Gray Bat (*Myotis grisescens*)	Endangered	No critical habitat designated for this species.
Roanoke Logperch *(Percina rex)*	Endangered	No critical habitat designated for this species.

Table 1. Threatened and Endangered Species		
Species Name	**Status**	**Note**
Monarch Butterfly *(Danaus plexippus)*	Candidate	No critical habitat designated for this species.
Small-anthered Bittercress *(Cardamine micranthera)*	Endangered	No critical habitat designated for this species.

Alternative Route Comparison

Separate IPaC reports run for all three Alternative Routes indicate that all the Alternative Routes for Willis Gap to Claudville contain the same three threatened or endangered species: Indiana Bat (endangered), Northern Long-eared Bat (endangered), and Small-anthered Bittercress (endangered). No critical habitats for these species have been designated.

All three Alternative Routes for Willis Gap to Claudville contain nine birds of conservation concern. Between the Willis Gap and Claudville substations, Alternative Route C requires 131 acres of tree clearing which is 10 to 20 acres more than Alternative Routes A and B, respectively, which are located in more populated, developed and open-field areas. It is likely that Alternative Route C would require more forest clearing for ROW and access roads; however, Alternative Route C is further from existing development than Alternative Routes A and B.

Table 2. Natural Environment Evaluation Criteria				
Alternative Route	**Unit**	**A**	**B**	**C**
General				
Length	miles	11.6	12.4	12.5
Water Resources				
Total streams crossed	count	26	30	25
High/Exceptional/Special Protection streams crossed	count	1	1	1
Riparian buffers crossed	acres	1.9	1.9	1.5
Forested wetlands in the ROW (NWI)	acres	0.1	0.1	0.1
PEM/PSS (Palustrine Emergent/Palustrine Shrub Scrub) wetlands in the ROW (NWI)	acres	0.4	0	0
Waterbody (lakes, rivers, etc.) crossings	count	2	2	2
FEMA-designated floodplain crossed by ROW	acres	1.8	3.5	3.2
Geological and Soil Resources				
Prime and unique farmland soil in the ROW[1]	acres	17.0	11.4	11.4
Farmland of statewide importance in the ROW[2]	acres	85.3	84.5	81.3
Karst topography in the ROW	acres	0	0	0
Known caves or mines in the ROW	count	0	0	0
Wildlife and Habitat				
Tree clearing required in the ROW (digitized based on aerial photography)	acres	107.0	120.3	131.2
Length of clearing parallel to existing linear infrastructure	miles	0	0.3	0.3

Note: FEMA = Federal Emergency Management Agency
[1]Prime farmland is land with the best combination of physical and chemical characteristics for producing crops.
[2]Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance.

4.1.2 Human Environment

The human use of the land and activities at a given location include uses such as agricultural, forestry, residential, industrial, mining, commercial, institutional, scenic assets, and recreational uses. A Siting Study goal is to avoid or minimize conflicts with existing and proposed land uses that are not compatible with the Project. A comparison of the human environment considerations for the Alternative Routes is presented at the end of this section in **Table 3.**

4.1.2.1 Existing and Proposed Developed Land Use

Resource Characteristics

Existing and proposed land uses for the Project Study Area are mostly agricultural with scattered residential and commercial development. Residential and commercial development is built up along major roadways such as Willis Gap Road and Ararat Highway. The community of Ararat is located in the center of the Willis Gap – Claudville portion of the Project.

The Siting Team considers future land use plans during route development to try to avoid or minimize potential impacts to proposed developed areas. In addition to meeting with local officials, Siting Team members reviewed each county's comprehensive plans, and no land use conflicts or development areas were identified.

Alternative Route Comparison

None of the Alternative Route designated ROWs include residences or single-family dwellings. There are more residences or single-family dwellings within 100, 250, and 500 feet of centerline for Alternative Route A than Alternative Routes B and C due to its proximity to major roadways and development along the Blue Ridge Mountain foothills. Both Alternative Routes A and B cross more parcels with more landowners in the ROW than Alternative Route C. Alternative Route B contains two outbuildings within the ROW while Alternative Routes A and C contain one. Alternative Routes A and B have one designated place of worship within 1,000 feet of centerline; Alternative Route C has none. Similarly, Alternative Route A contains two cemeteries within 250 feet of centerline while Alternative Routes B and C have none. No known schools, hospitals, parks, recreation areas, or scenic byways are crossed by any of the Alternative Routes. Overall, Alternative Routes A and B are in closer proximity to existing residential development and communities than Alternative Route C.

4.1.2.2 Agricultural and Forestry Resources

Resource Characteristics

The Willis Gap to Claudville portion of the Project is characterized by a mix of both open and forested agricultural lands. The area includes farmland of statewide importance and prime and unique farmland soil. Where Alternative Routes traverse forest lands, tree clearing to build new ROW will be required.

Alternative Comparison

All three Alternative Routes pass through a mix of agricultural and forested areas within the Project Area. Alternative Routes A and B have twice as much acreage of pasture/rangeland within the ROW compared to Alternative Route C. Alternative Route A ROW has approximately one acre of cropland and tree farms/orchards, and Alternative Routes B and C have none. Alternative Route A contains more prime and unique farmland soil in the ROW, approximately 17 acres, compared to Alternative Routes B and C which contain approximately 11 acres. Similarly, Alternative Route A contains more acres of farmland of statewide importance in the ROW than Alternative Routes B and C; however, all Alternative Routes contain similar acreage and are comparable. None of the Alternative Routes cross known agricultural easements.

4.1.2.3 Recreation and Conservation Lands

Resource Characteristics

Research was conducted to identify any areas that include federal/state forests, parks, designated wilderness areas, and trails and local recreation. Existing recreation area features include local hiking trails, such as the Dan River Trail and the Blue Ridge Parkway, a major federal recreational source. No other local parks, designated wilderness areas, or state/federal parks are crossed by the Alternative Routes.

Alternative Route Comparison

None of the Alternative Routes cross known federal or state lands, conservation easements, parks, recreation areas, or local public lands. Any impacts to recreation or conservation lands for all the Alternative Routes are expected to be minimal.

4.1.2.4 Scenic Resources

Resource Characteristics

Aesthetics are defined as a mix of landscape visual character, the context in which the landscape is viewed (view/user groups), and the scenic integrity of the landscape. This Siting Study reviewed the potential visibility and visual impact of the Alternative Routes through landscape character assessment, field inspections, and viewshed analysis.

Visual character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (*i.e.*, lakes, streams, and wetlands). Multiple elements influence visual character, such as natural systems, human interactions, and land use. In natural settings the visual character attributes are natural elements such as forested mountains or scenic rivers and lakes, whereas rural or pastoral/agricultural settings may include manmade elements such as fences, walls, barns, and outbuildings, and occasional residences. In a more developed setting, the visual character may include commercial or industrial buildings, manicured lawns, pavement, and other infrastructure.

Greenfield transmission routes are those that require entirely new ROW for the transmission line and associated structures. Adding more visible lines and structures introduces new visual impacts to surrounding residential and commercial land uses as well as the overall character of the community.

Alternative Route Comparison

All Alternative Routes between the Willis Gap Substation and Claudville Substation are greenfield routes and will require new ROW and introduce new visual impacts to the surrounding area. Some routes are closer to residential and commercial development than others, and this may result in a greater visual impact to surrounding land uses. Alternative Route A is 11.6 miles, the shortest route, and requires the least number of ROW acreage; however, its ROW crosses the greatest number of parcels and landowners. Alternative Route A also crosses mostly open land with high visibility to surrounding residences and land uses. Finally, Alternative Route A is located further north and closer to the Blue Ridge Mountains foothills, which is a predominant feature in the visual character of the surrounding area.

Alternative Route B is 12.4 miles and longer than Alternative Route A but has fewer parcels and landowners within the ROW. Alternative Route B crosses through tracts of open land similar to Alternative Route A; however, it appears to cross more forest areas that may reduce some of the visual impact based on desktop reviews and field reconnaissance. Alternative Route B also appears to be further away from residential viewsheds where it crosses open tracts of land. While Alternative Route B crosses more forested tracts, it travels closer to the center of the Ararat community and near major roadways, such as Ararat Highway, which may increase potential visual impacts. Alternative Route B will introduce visual impacts; however, they are expected to be less impactful than Alternative Route A based on desktop reviews and field reconnaissance.

Alternative Route C is the least visually impactful to surrounding areas even though it is the longest route at 12.5 miles (see Visual Simulations, Exhibit 37 of the Company's Application). It passes through mostly forest lands further away from developed land uses, especially residential,

and the Ararat community. Alternative Route C also has the fewest number of parcels and landowners within the ROW. Passing through densely vegetated areas helps mitigate visual impacts by sheltering transmission lines and structures.

4.1.2.5 Environmental Justice

Resource Characteristics

Alternative Route Comparison

It is the Company's long-standing practice in its route development processes to avoid or reasonably minimize impacts to the human environment, which includes EJ communities (any low-income community or community of color) and fence line communities within the meaning of the Virginia Environmental Justice Act (§ 2.2-234 *et seq.* of the Code of Virginia), or the "Act." "***Environmental justice*** *means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy*" (VA Code § 2.2-234).

The Siting Team reviewed the United States Environmental Protection Agency's EJSCREEN (2023) tool and data from the American Community Survey from the United States Census Bureau. The EJSCREEN and Census Block Group ("CBG") data (the smallest geographic unit for which United States Census Bureau demographic data is available) was used to review the Project. Per the available EJSCREEN and American Community Survey data, there are six CBGs located within 1.0 mile of the centerline of Alternative Routes A, B, and C, four of which are crossed by the line routes for the Project. The results of the dataset are provided in Attachment E and the CBGs identified within 1.0 mile of the Project are depicted in Attachment B, Map 6. Of the six CBGs located within 1.0 mile of the Willis Gap to Claudville Alternative line routes, five meet or exceed the threshold of at least one "EJ community" as defined by the Act, namely low-income communities. Of these CBGs, four are crossed by the line route for the Project. All four are low-income communities as defined by the Virginia Environmental Act.

The Company obtained meaningful involvement from all potentially affected groups through various methods to gain public input across the entire Project Area. Meaningful involvement included: gathering landowner input on the Alternative Routes at the open house, refining and rerouting the Alternatives while considering landowner preferences, and meeting with individual landowners throughout the siting process and other efforts outlined in Section 3.6. All alternative routes cross EJ communities along most of their length (see Attachment B, Map 6), and no one route would bear disproportionate impacts to such communities more than another. The

Company will continue to engage all affected landowners, including Environmental Justice Communities as defined in the Act throughout the duration of the Project.

Table 3. Human Environment Evaluation Criteria				
Alternative Route	**Unit**	**A**	**B**	**C**
General				
Length	miles	11.6	12.4	12.5
Number of parcels[1] crossed	count	87	85	72
Landowners within ROW	count	80	72	64
Municipalities, Counties, and Townships Crossed				
Residential				
Barns, outbuildings, sheds, garages, and silos in the ROW (excludes abandoned features)	count	1	2	1
Residences/single-family dwellings within ROW	count	0	0	0
Residences/single-family dwellings within 100 feet of centerline	count	3	4	3
Residences/single-family dwellings within 250 feet of centerline	count	16	15	11
Residences/single-family dwellings within 500 feet of centerline	count	43	37	31
Multi-family dwellings[2] within ROW	count	0	0	0
Commercial/Industrial				
Businesses/commercial buildings within 250 feet of the centerline	count	1	1	0
Businesses/commercial buildings within 500 feet of the centerline	count	43	37	31
Agricultural				
Pasture/rangeland crossed in ROW (based on NLCD data)	acres	22.6	23.1	11.4
Cropland crossed in ROW (based on NLCD data)	acres	1.6	0	0
Tree farms/orchards crossed in ROW	acres	1	0	0
Agricultural easements crossed in ROW	acres	0	0	0
Community/Recreational Facilities				
Schools within 1,000 feet of centerline	count	0	0	0
Designated places of worship within 1,000 feet of centerline	count	1	1	0
Cemeteries within 250 feet of centerline	count	2	0	0
Hospitals and assisted living facilities within 250 feet of centerline	count	0	0	0
Parks and recreation areas crossed by the ROW	count	0	0	0

Table 3. Human Environment Evaluation Criteria				
Alternative Route	**Unit**	**A**	**B**	**C**
Scenic byways crossed	count	0	0	0
Protected Land				
Federal/state land crossed by ROW	acres	0	0	0
Conservation easements crossed by the ROW	acres	0	0	0
Local public lands crossed by ROW	acres	0	0	0

Note: NLCD = National Land Cover Database

[1]Number of parcels crossed refers to the number of individual plots of owned land recorded by each County. Number of landowners within the ROW represents the number of individual landowners who each may own one or more parcels.

[2]Multi-family dwellings include townhomes, condominiums, apartment complexes, and duplexes.

4.1.3 Constructability

Constructability is the ability to efficiently and cost effectively engineer, acquire ROW, construct, operate, and maintain the proposed transmission line. Major factors include safety, steep topography, condensed ROWs, heavy angles, access, ability to parallel or use existing ROWs, features, proximity to major highways, etc. A comparison of the constructability considerations for the Alternative Routes is presented at the end of this section in **Table 4.**

4.1.3.1 Engineering

Potential engineering and construction challenges are important to consider when siting a transmission line. Heavy angles, steep topography, nearby communication towers, antennas, and airfields along with narrow ROW alignments are all elements that could require extensive or non-standard engineering and lead to increases in impacts and overall cost.

Proximity to existing roadway, transmission, and gas pipeline infrastructure can also pose potential engineering and construction challenges. As with paralleling existing infrastructure, crossing over transmission lines, distribution lines, and pipelines may require specialized construction techniques and scheduled outages on the existing lines. Appalachian Power Company attempted to minimize engineering challenges during route development.

Alternative Comparison

The Willis Gap to Claudville area is characterized by gentle rolling hills and, in some locations, steep mountainous terrain. Alternative Route A ROW has the highest percentage of total length crossing steep slopes; however, all Alternative Routes are comparable with similar percentages. Alternative Routes B and C have the highest number of heavy angles; however, all Alternative Routes are comparable with similar numbers. All Alternative Routes cross five state highways, and Alternative Route A crosses the most local roads and streets while Alternative Route C crosses the least. None of the Alternative Routes cross existing transmission lines or oil and gas pipelines. There are no communication towers within 1,000 feet of centerline for any of the Alternative Routes and no oil and gas wells within 250 feet from the ROW's edge.

4.1.3.2 Topographic and Geotechnical

Alternative Comparison

All of the routes cross relatively similar terrain characterized by gentle rolling hills and intermittent steep terrain. There are no major topographic or geotechnical concerns for any of the three Alternative Routes.

4.1.3.3 Access Roads

Access roads for the Willis Gap to Claudville portion of the Project will be new since it is a greenfield route where no existing access roads can be used. Potential impacts associated with access roads include possible disturbance to human and natural environments. Preliminary access roads were not designed as part of the siting process.

Alternative Routes Comparison

Potential impacts from new access roads for all of the Alternative Routes will be comparable since all three Alternative Routes are greenfield and will require new access road construction.

4.1.3.4 Right-of-Way

Appalachian Power Company attempted to minimize route length, number of parcels crossed, and ROW acquisition where feasible. Where possible and practical, the Company considered using existing transmission ROW, paralleling existing electric lines, or paralleling other infrastructure (i.e., roadways, railways, or gas lines). There are no major siting opportunities to use existing ROW since Component 1 is greenfield. To assist with future ROW acquisition, ROW agents contacted landowners throughout the siting process and began obtaining permission to survey to better evaluate the Alternative Routes and understand potential constraints.

Alternative Comparison

All three Alternative Routes anticipate a 100-foot ROW, and since all three are greenfield, the need to acquire new ROW is comparable.

Table 4. Constructability Evaluation Criteria				
Alternative Route	**Unit**	**A**	**B**	**C**
General				
Length	miles	11.6	12.4	12.5
Transportation Resources				
Interstate highways crossed	count	0	0	0
US highways crossed	count	0	0	0
State highways crossed	count	5	5	5
Local roads and streets crossed	count	13	10	8
Railroads crossed	count	0	0	0
Airports within one mile of centerline	count	0	0	0
Utility Resources				
Oil and gas pipelines crossed	count	0	0	0
Oil and gas wells within 250 feet from ROW edge	count	0	0	0
Communication towers within 1,000 feet of centerline	count	0	0	0
Existing 69 kV Transmission Lines Crossed	count	0	0	0
Existing 138 kV Transmission Lines Crossed	count	0	0	0
Engineering and Geotechnical Considerations				
Steep slopes crossed by ROW (>20%), percent of total length	miles	0.4	0.3	0.3
Heavy angles, greater than 30 degrees	count	6	7	7
Rights-of-Way Rebuild/Parallel				
Existing 69 kV transmission lines paralleled	miles	0	0	0
Existing 138 kV transmission lines paralleled	miles	0	0.3	0.3
Existing distribution lines paralleled or underbuilt	miles	0	0	0
Oil and Gas Pipeline paralleled	miles	0	0	0
Interstate highways, US highways, state highways, and local roads	miles	0	0	0
Railroad paralleled	miles	0	0	0

4.2 Claudville to Mayo River

4.2.1 Natural Environment

The natural environment includes water, soil, sensitive species, and wildlife habitat. Potential impacts are based on publicly available maps and data as well as coordination with federal, state, and local agencies. A Siting Study goal is to avoid or minimize impacts on the natural environment to the extent practicable during construction, operation, and maintenance of the transmission facilities. A comparison of the natural environment considerations for the Alternative Routes is presented at the end of this section in **Table 6**.

4.2.1.1 Geological, Soil, and Water

Resource Characteristics

Between the proposed Claudville Substation and proposed Mayo River Substation, the Study Area is characterized by rolling and mountainous terrain with agricultural, forested, and residential land uses. The Study Area intersects numerous streams as well as the Ararat River and Dan River, but no high/exceptional/special protection streams.

Alternative Route Comparison

Alternative Routes E and F cross 24 streams whereas Alternative Route D crosses 19. All of the Alternative Routes cross the Peters-Creek Dan River, Little Dan River, and Upper South Mayo River. None of these are designated as threatened and endangered species waters by the VDWR. None of the Alternative Routes cross special protection streams. Alternative Routes E and F have the most waterbody and riparian buffer crossings and PEM/PSS wetlands in the ROW; however, all Alternative Routes are comparable with similar numbers of crossings and acreage. Alternative Routes E and F ROWs have the most FEMA-designated floodplain, roughly 6.0 acres, while Alternative Route D has about three acres. All three Alternative Routes cross a similar percentage of steep slopes.

4.2.1.2 Wildlife Habitat and Sensitive Species

Resource Characteristics

Habitat between the proposed Claudville Substation and proposed Mayo River Substation includes a mix of mountainous and rolling hill terrain, forest areas, agricultural fields, and residential environments. Virginia's special status wildlife and plant species designated as threatened, endangered, or candidate species are protected at the federal level by the

Endangered Species Act [16 U.S.C. 1531 et seq. (1973)] and/or at the state level for the protection of threatened and endangered species of fish and wildlife (4VAC15-20-130) through the VDWR. The USFWS IPaC planning tool was used to determine whether any threatened or endangered wildlife plants or species have potential to occur within the Study Area. IPaC results are identified in **Table 5**.

Table 5. Threatened and Endangered Species

Species Name	Status	Note
Indiana Bat (*Myotis sodalist*)	Endangered	The study area does not overlap any critical habitat.
Northern Long-eared Bat *(Myotis septentrionalis)*	Endangered	No critical habitat designated for this species.
Gray Bat (*Myotis grisescens*)	Endangered	No critical habitat designated for this species.
Roanoke Logperch *(Percina rex)*	Endangered	No critical habitat designated for this species.
Monarch Butterfly *(Danaus plexippus)*	Candidate	No critical habitat designated for this species.
Small-anthered Bittercress *(Cardamine micranthera)*	Endangered	No critical habitat designated for this species.

Alternative Route Comparison

Separate IPaC reports were run for all three Alternative Routes, and results indicate that all the Alternative Routes for Claudville to Mayo River contain the same two threatened or endangered species: Northern Long-eared Bat (endangered) and Small-anthered Bittercress (endangered). No critical habitats have been designated for these species. Alternative Route D contains five birds of conservation concern and Alternative Routes E and F contain six. Between the proposed Claudville and Mayo River substations, Alternative Route E requires the most tree clearing, approximately 105 acres total, which is about 10 acres more than Alternative Route F but similar to Alternative Route D.

Table 6. Natural Environment Evaluation Criteria				
Alternative Route	**Unit**	**D**	**E**	**F**
General				
Length	miles	10.4	12	11.6
Water Resources				
Total streams crossed	count	19	24	24
High/Exceptional/Special Protection streams crossed	count	0	0	0
Riparian buffers crossed	acres	1.3	1.9	1.8
Forested wetlands in the ROW (NWI)	acres	0.2	0	0
PEM/PSS wetlands in the ROW (NWI)	acres	0	0.1	0.1
Waterbody (lakes, rivers, etc.) crossings	feet	0	2	2
FEMA-designated floodplain crossed by ROW	acres	2.9	6.0	6.1
Geological and Soil Resources				
Prime and unique farmland soil in the ROW[1]	acres	11.4	13.5	13.2
Farmland of statewide importance in the ROW[2]	acres	49.3	82.7	75.2
Wildlife and Habitat				
Tree clearing required in the ROW (digitized based on aerial photography)	acres	101	105.2	93.9
Length of clearing parallel to existing linear infrastructure	miles	0	6.0	5.3

[1]Prime farmland is land with the best combination of physical and chemical characteristics for producing crops.
[2]Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance.

4.2.2 Human Environment

The human use of the land and activities at a given location include uses such as agricultural, forestry, residential, industrial, mining, commercial, institutional, scenic assets, and recreational uses. A Siting Study goal is to avoid or minimize conflicts with existing and proposed land uses that are not compatible with the Project. A comparison of human environment considerations for the Alternative Routes is presented at the end of this section in **Table 7.**

4.2.2.1 Existing and Proposed Developed Land Use

Resource Characteristics

Existing and proposed land uses for the area are mostly agricultural with scattered residential and commercial development primarily built up along major roadways such as Dry Pond Highway and Route 8. The Town of Stuart is located northeast of the proposed Mayo River Substation.

The Siting Team considered future land use plans during the route development process to try to avoid or minimize potential impacts to proposed developed areas. In addition to meeting with local jurisdictions, members of the Siting Team reviewed each county's comprehensive plans, and no land use conflicts or development areas were identified per discussions with the counties and comprehensive plan reviews.

Alternative Route Comparison

Alternative Route D contains the fewest landowners within its ROW, and Alternative Routes E and F contain the most landowners within the respective ROWs. Similarly, Alternative Route D crosses the fewest parcels, and Alternative Routes E and F cross the most parcels. Alternative Route E does not contain any outbuildings or residences within the ROW. Alternative Route D contains one outbuilding and no residences in its ROW while Alternative Route F contains two outbuildings and one residence in its ROW. Alternative Route D has less than half the number of residences within 250 and 500 feet of centerline compared to Alternative Routes E and F, which parallel the existing Pinnacles – Hydro 69-kV Transmission Line through more developed areas. None of the Alternative Routes contain schools within 1,000 feet of centerline, hospitals within 250 feet of centerline, or parks and recreation areas crossed by the ROW. Alternative Route D is the only route that contains a designated place of worship within 1,000 feet of centerline. All three Alternative Routes contain three cemeteries within 250 feet of centerline and cross one scenic byway.

4.2.2.2 Agricultural and Forestry Resources

Resource Characteristics

The Claudville to Mayo River portion of Component 1 is characterized by a mix of both open and forested agricultural land. The area includes farmland of statewide importance and prime and unique farmland soil. Where Alternative Routes cross forested lands, tree clearing will be required to build new ROW. There are no known federal or state forest lands in the Claudville to Mayo River area.

Alternative Comparison

All the Alternative Routes between the proposed Claudville and Mayo River substations are greenfield routes that require new ROW. Alternative Route E is the longest route and will require approximately 105 acres of tree clearing in the ROW. Alternative Routes D and F are shorter and will require less tree clearing in the ROW, approximately 101 and 93 acres, respectively. Alternative Route D passes through mostly forest land compared to Alternative Routes E and F, which pass through a mix of agricultural and forest land. Alternative Route D crosses the least pasture and rangeland acreage in the ROW while Alternative Route F crosses the most. Similarly, Alternative Route D crosses the least prime and unique farmland soil and farmland of statewide importance acreage in the ROW while Alternative Routes E and F cross the most. Portions of Alternative Routes E and F parallel the existing City of Danville's Pinnacles – Hydro 69-kV Transmission Line and will utilize existing ROW where feasible to reduce tree clearing. None of the Alternative Route ROWs cross through any protected easements.

4.2.2.3 Recreation and Conservation Lands

Resource Characteristics

Research was conducted to identify whether any of the Alternative Routes include federal/state forests, parks, designated wilderness, trails, and local recreation areas. The Blue Ridge Parkway, a major federal recreational source, is located north of the Component 1 Alternative Routes. Alternative Routes do not intersect any other local parks, designated wilderness areas, or state/federal parks between the proposed Claudville and Mayo River substations.

Alternative Route Comparison

The Alternative Route ROWs do not cross any known federal or state lands, conservation easements, parks, recreation areas, or local public lands.

4.2.2.4 Scenic Resources

Resource Characteristics

Aesthetics are defined as "a mix of landscape visual character, the context in which the landscape is viewed (view/user groups), and the scenic integrity of the landscape." This Siting Study reviewed the potential visibility and visual impact of the Alternative Routes through landscape character assessment, field inspections, and viewshed analysis.

Visual character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (i.e., lakes, streams, and wetlands). Multiple elements influence visual character, such as natural systems, human interactions, and land use. In natural settings, the visual character attributes are natural elements such as forested mountains or scenic rivers and lakes, whereas rural or pastoral/agricultural settings may include manmade elements such as fences, walls, barns and outbuildings, and occasional residences. In a more developed setting, the visual character may include commercial or industrial buildings, manicured lawns, pavement, and other infrastructure.

Greenfield transmission routes are those that require entirely new ROW for the transmission line and associated structures. Having more visible lines and structures introduces new visual impacts to surrounding residential and commercial land uses as well as the overall character of the community. All of the Alternative Routes will be greenfield routes that will introduce new visual impacts; however, some of these routes are closer to developed land uses than others.

Alternative Route Comparison

Alternative Route D crosses a mountainous area with highpoints visible from surrounding communities. It also crosses through more forested, undeveloped land and has the fewest landowners nearby compared to Alternative Routes E and F. Alternative Routes E and F generally cross more developed land and will be closer to more residences; however, because they parallel portions of the existing Pinnacles – Hydro 69-kV Transmission Line, they will remain cohesive with the surrounding existing visual character of the area (Attachment D, Photo 4). Additionally, by paralleling an existing line, Alternative E avoids introducing new transmission line and ROW visual impacts into a mountainous, unfragmented area with highpoints visible from surrounding communities. See Visual Simulations, Exhibit 37 of the Company's Application.

4.2.2.5 Environmental Justice

Resource Characteristics

Alternative Route Comparison

It is the Company's long-standing practice in its route development processes to avoid or reasonably minimize impacts to the human environment, which includes environmental justice ("EJ") communities (any low-income community or community of color) and fence line communities within the meaning of the Virginia Environmental Justice Act (§ 2.2-234 e*t seq.* of the Code of Virginia), or the "Act." *"Environmental justice means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy"* (VA Code § 2.2-234).

The Siting Team reviewed the United States Environmental Protection Agency's EJSCREEN (2023) tool and data from the American Community Survey from the United States Census Bureau. The EJSCREEN and CBG data (the smallest geographic unit for which United States Census Bureau demographic data is available) was used to review the Project. Per the available EJSCREEN and American Community Survey data, there are seven CBGs located within 1.0 mile of the centerline of Alternative Routes D, E, and F, four of which are crossed by the three alternative line routes for the Claudville to Mayo River portion of the Project. The results of the dataset are provided in Attachment E and the CBGs identified within 1.0 mile of the Project are depicted in Attachment B, Map 6. Of the seven CBGs located within 1.0 mile of the Alternative line routes, five meet or exceed the threshold of at least one "EJ community" as defined by the Act, namely low-income communities. Of the five CBGs that meet or exceed the threshold of at least one "EJ community", three are crossed by the Alternative Routes E and F and two are crossed by Alternative Route D. The CBGs are low-income communities as defined by the Virginia Environmental Act.

The Company obtained meaningful involvement from all potentially affected-groups through various methods to gain public input across the entire Project Area. Meaningful involvement included: gathering landowner input on the Alternative Routes at the open house, refining and rerouting the Alternatives while considering landowner input, and meeting with individual landowners throughout the siting process and other efforts outlined in Section 3.6. All Alternative Routes cross similar EJ communities (see Attachment B, Map 6); however, Alternative D is located in an undeveloped mountainous area with less people and therefore crosses one less CBG group as compared to Alternative Routes E and F which cross one additional CBG group that exceeds the threshold of an "EJ Community" as defined by the Act. Alternative Routes E and F, however,

parallel an existing transmission per public preference and federal and state guidelines. The Company will continue to engage all affected landowners, including EJ Communities as defined in the Act throughout the duration of the Project.

Table 7. Human Environment Evaluation Criteria				
Alternative Route	**Unit**	**D**	**E**	**F**
General				
Length	miles	10.4	12	11.6
Number of parcels[1] crossed	count	63	70	74
Landowners within ROW	count	54	64	68
Residential				
Barns, outbuildings, sheds, garages and silos in the ROW (excludes abandoned features)	count	1	0	2
Residences/single-family dwellings within ROW	count	0	0	1
Residences/single-family dwellings within 100 feet of centerline	count	1	1	2
Residences/single-family dwellings within 250 feet of centerline	count	7	17	15
Residences/single-family dwellings within 500 feet of centerline	count	18	43	43
Multi-family dwellings[2] within ROW	count	0	0	0
Commercial/Industrial				
Businesses/commercial buildings[3] within the ROW	count	0	0	0
Agricultural				
Pasture/rangeland crossed in ROW (based on NLCD data)	acres	19.6	32.2	34.4
Cropland crossed in ROW (based on NLCD data)	acres	1.2	0	0
Tree farms/orchards crossed in ROW	acres	0	0	0
Community/Recreational Facilities				
Schools within 1,000 feet of centerline	count	0	0	0
Designated places of worship within 1,000 feet of centerline	count	1	0	0
Cemeteries within 250 feet of centerline	count	3	3	3
Hospitals and assisted living facilities within 250 feet of centerline	count	0	0	0
Parks and recreation areas crossed by the ROW	count	0	0	0
Scenic byways crossed	count	1	1	1

[1]Number of parcels crossed refers to the number of individual plots of owned land recorded by each County. Number of landowners within the ROW represents the number of individual landowners who each may own one or more parcels.
[2]Multi-family dwellings include townhome, condominium, and apartment complexes, and duplexes.
[3]Commercial development includes retail, service, office, restaurants, and lodging establishments.

4.2.3 Constructability

Constructability is the ability to efficiently and cost effectively engineer, acquire ROW, construct, operate, and maintain the proposed transmission line. Major factors include safety, steep topography, condensed ROWs, heavy angles, access, ability to parallel or use existing ROWs, features, proximity to major highways, etc. A comparison of the constructability considerations for the Alternative Routes is presented at the end of this section in **Table 8.**

4.2.3.1 Engineering

Potential engineering and construction challenges are important to consider when siting a transmission line. Heavy angles, steep topography, nearby communication towers, antennas, and airfields along with narrow ROW alignments are all elements that could require extensive or non-standard engineering and lead to increases in impacts and overall cost.

Proximity to existing roadway, transmission, and gas pipeline infrastructure can also pose potential engineering and construction challenges. As with paralleling existing infrastructure, crossing over transmission lines, distribution lines, and pipelines may require specialized construction techniques and scheduled outages on the existing lines. Appalachian Power Company attempted to minimize engineering challenges during route development.

Alternative Comparison

The Claudville to Mayo River area is generally characterized by gentle rolling hills to the south and steep mountainous terrain to the north. Alternative Route D has the highest percentage of total length where steep slopes are crossed by the ROW; however, all Alternative Routes are comparable with similar numbers. Alternative Routes D and E have the most heavy angles, and Alternative Route F has the least. Alternative Route D crosses the most local roads and streets; however, all the Alternative Routes are comparable with similar crossings. Alternative Routes E and F cross the most state highways compared to Alternative Route D, which crosses the least. All the Alternative Routes cross one existing 69-kV transmission line. None of the Alternative Routes cross oil or gas lines in the area. There are no communication towers within 1,000 feet of centerline for any of the Alternative Routes, and no oil and gas wells are within 250 feet from the edge of the ROW.

4.2.3.2 Topographic and Geotechnical

Alternative Comparison

Alternative Route D crosses steep mountainous terrain (Willard, Pikes, and Carter Mountains) and topography whereas Alternatives E and F cross a more rolling topography.

4.2.3.3 Access Roads

Access roads for the Willis Gap to Claudville portion of the Project will be new since it is a greenfield route and no existing access roads can be used. Potential impacts associated with access roads include possible disturbance to the human and natural environments.

Alternative Routes Comparison

Alternative D is located in the mountainous forested area and would require more access roads and forest clearing during construction when compared to Alternatives E and F, which are located in more rolling hills, adjacent to existing roads, and an existing transmission line.

4.2.3.4 Right-of-Way

Appalachian Power Company attempted to minimize route length, number of parcels crossed, and ROW acquisition where feasible. Where possible and practical, the Company considered using existing transmission ROW, paralleling existing electric lines, or paralleling other infrastructure (i.e., roadways, railways, or gas lines). There are no major siting opportunities to use existing ROW since Component 1 is greenfield. To assist with future ROW acquisition, ROW agents contacted landowners throughout the siting process and began obtaining permission to survey to better evaluate the Alternative Routes, understand potential constraints, answer landowner questions, and make logical adjustments.

Alternative Comparison

All three Alternative Routes anticipate a 100-foot ROW. However, Alternative Routes E and F parallel existing transmission line ROW, which typically helps new ROW acquisition.

Table 8. Constructability Evaluation Criteria				
Alternative Route	**Unit**	**D**	**E**	**F**
General				
Length	miles	10.4	12	11.6
Transportation Resources				
Interstate highways crossed	count	0	0	0
US highways crossed	count	0	0	0
State highways crossed	count	1	5	5
Local roads and streets crossed	count	11	10	10
Railroads crossed	count	0	0	0
Airports within one mile of centerline	count	0	0	0
Utility Resources				
Oil and gas pipelines crossed	count	0	0	0
Oil and gas wells within 250 feet from edge of ROW	count	0	0	0
Communication towers within 1,000 feet of centerline	count	0	0	0
Existing 69 kV Transmission Lines Crossed	count	1	1	1
Existing 138 kV Transmission Lines Crossed	count	0	0	0
Engineering and Geotechnical Considerations				
Steep slopes crossed by ROW (>20%), percent of total length	miles	0.03	0.01	0.02
Heavy angles, greater than 30 degrees	count	5	6	3
Rights-of-Way Rebuild/Parallel				
Existing 69 kV transmission lines paralleled	miles	0	6.4	5.4
Existing 138 kV transmission lines paralleled	miles	0	0	0
Existing distribution lines paralleled or underbuilt	miles	0	0	0
Oil and Gas Pipeline paralleled	miles	0	0	0
Interstate highways, US highways, State highways, and local roads	miles	0	0	0
Railroad paralleled	miles	0	0	0

5.0 IDENTIFICATION OF THE PROPOSED ROUTE

The route development study for Component 1's proposed Mayo River – Willis Gap 138-kV Transmission Line was organized into two parts (i) Willis Gap to Claudville and (ii) Claudville to Mayo River. Extensive stakeholder input and data gathering, route development, and comparative analysis process was completed. As a result, Alternative Route C (Willis Gap to Claudville portion) and Alternative Route E (Claudville to Mayo River portion) were identified by the Siting Team as the **Proposed Route** which is 24.5 miles in total length (see Attachment B, Map 7, and see the Company's Application, GIS Constraints Map, Exhibit 7). The rationale for selecting the Proposed Route is derived from accumulation of siting decisions made throughout the process, Siting Team knowledge and experience, public and regulatory agencies' comments, and the comparative analysis of potential impacts. The following summarizes the Proposed Route selection.

5.1 Willis Gap to Claudville

To identify the Proposed Route for the Willis Gap to Claudville portion, the Siting Team first delineated a Study Area and collected constraint data (Map 1). Next, three routing concepts for the Willis Gap to Claudville portion were developed. These three routing concepts were carried forward and developed into a Study Segment Network comprised of 16 Study Segments (Map 3), which were presented at the public open houses. The Siting Team met with numerous landowners at their request, and at key areas the Company ROW agents made further landowner contacts as necessary. Using stakeholder input and analysis, the Study Segment Network was refined into three alternative routes including a northern, central, and southern route (Map 4). The Siting Team reviewed and analyzed the three Alternative Routes based on input and resource constraints in the Study Area (Map 5) and arrived at Alternative Route C as the Proposed Route between the existing Willis Gap and proposed Claudville substations (Map 7).

The Proposed Route (12.5 miles in length) for Willis Gap to Claudville is the longest route and requires the most tree clearing (approximately 10 to 20 acres more than Alternative Routes A and B, respectively); however, it minimizes overall impact to the surrounding community and takes landowner feedback into consideration to the extent practical. The Proposed Route (the most southern route) is located in a forested, rural area with rolling hills. It has the fewest nearby residences and is the least visible. Alternative Routes A and B are located in an area that is mostly cleared with open fields closer to residences and communities. Additionally, public stakeholder input strongly favored the Proposed Route since it was located away from the residential and

more visually open areas and best minimizes existing and future land use conflicts. For these reasons, the Proposed Route for Willis Gap to Claudville was selected as the most suitable route.

5.2 Claudville to Mayo River

To identify the Proposed Route for the Claudville to Mayo River portion, the Siting Team first delineated a Study Area and collected constraint data (Map 1). Next, three routing concepts were developed for the Claudville to Mayo River portion. These three routing concepts were carried forward and developed into a Study Segment Network comprised of 33 Study Segments (Map 3), which were presented at public open houses. The Siting Team met with numerous landowners at their request and at key areas, the Company ROW agents made further contacts as necessary. Using stakeholder input and analysis and site visit evaluations, the Study Segment Network was refined into three alternative routes including a northern and southern route (Map 4). The Siting Team reviewed and analyzed the three 138-kV Alternative Routes based on resource constraints in the Study Area (Map 5) and arrived at Alternative Route E as the Proposed Route between the proposed Claudville to Mayo River substations (Map 7).

The Proposed Route (12.0 miles in length) for Claudville to Mayo River is the longest compared to Alternative Routes D (10.4 miles) and F (11.6 miles); however, it parallels an existing transmission line which was heavily favored by the public and follows federal and state guidelines to use or parallel existing ROWs. This existing City of Danville's Pinnacles – Hydro 69-kV Transmission Line generally follows the Dry Pond Highway corridor from west to east and is similar in size and character to the proposed 138-kV transmission line. Scattered residences have been built near the existing highway corridor and the existing transmission line. While the Proposed Route is closer to residential development and crosses more landowners than Alternative Route D, it minimizes new visual impacts by being cohesive with the existing visual character of the existing transmission line. See Exhibit 37, Visual Simulations within the Company's Application, for more detailed visuals depicting the Proposed Route paralleling the existing City of Danville line. Additionally, Alternative D traverses a mountainous and unfragmented forested area which would require longer access roads with associated visual and environmental impacts. The Proposed Route considers landowner feedback to the extent practical and was preferred by landowners. For these reasons, the Proposed Route for Claudville to Mayo River was selected as the most suitable route.

The Company made extraordinary efforts working with the affected landowners and making reasonable route adjustments. Once the Siting Team identified the initial Proposed Route, mailings were sent out, the Project website updated, and the Company ROW agents started to contact the potentially affected landowners to make them aware of the final route, collect

additional feedback, make reasonable adjustments, and secure permission to survey for future field studies. As of March 16, 2023, the vast majority of the affected landowners have been contacted. Collectively, the Siting Team believes the Mayo River to Willis Gap 24.5-mile Proposed Route (1) has been well vetted with affected landowners; (2) is most consistent with federal and state siting guidelines; (3) reasonably minimizes adverse impacts on area land uses and the visual, natural and cultural environment; (4) minimizes special design requirements and unreasonable costs; and (5) can be constructed and operated in a safe, timely, and reliable manner.

Attachment A: Outreach Fact Sheet

STUART AREA IMPROVEMENTS PROJECT

STUART - WILLIS GAP TRANSMISSION LINE

APPALACHIAN POWER
An AEP Company
BOUNDLESS ENERGY

Appalachian Power representatives plan to upgrade the local electric transmission grid in Virginia. The Stuart Area Improvements Project provides a new electrical source for the region and increases reliability for customers. The project involves constructing several components in the next few years. The Stuart - Willis Gap component involves building approximately 22 miles of 138-kilovolt (kV) transmission line and two new substations in Patrick and Carroll counties.

WHAT

The Stuart - Willis Gap Transmission Line component involves:

- Building approximately 22 miles of transmission line*
- Building two new substations
- Retiring the Stuart Substation

*Company representatives are evaluating route options for the new transmission line. Input from the community helps determine the location of the proposed line route.

WHY

Project benefits include:

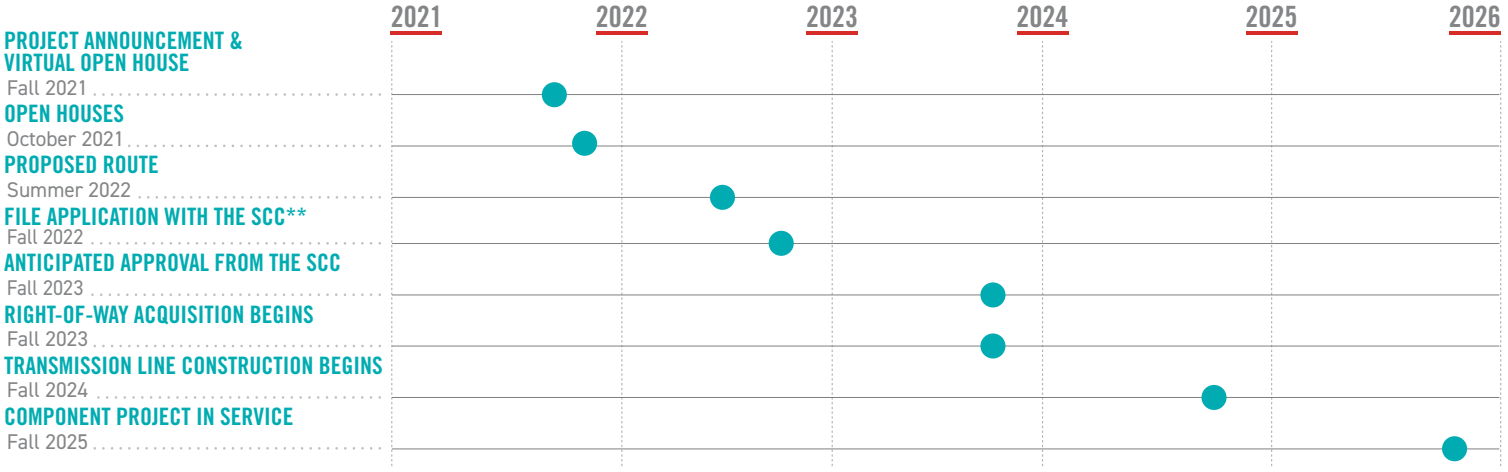
- Upgrading the local, aging 69-kV and 138-kV electrical infrastructure with an updated 138-kV transmission system provides reliable electric service.
- Installing the additional 138-kV electrical source from Stuart to the Willis Gap area ensures adequate power delivery to the area to support today's electrical load. Additionally, in the event the existing line experiences an extended outage, the new line can continue to serve customers.
- Building the proposed substation centrally located in Claudville between Stuart and Willis Gap shortens the local distribution power line lengths between substations and reduces service interruptions.
- These combined improvements provide a more reliable transmission system and increase reliability for area customers.

WHERE

Potential route options, or study segments, for the new transmission line begin at the existing Willis Gap Substation located off Orchard View Drive just inside Carroll County.

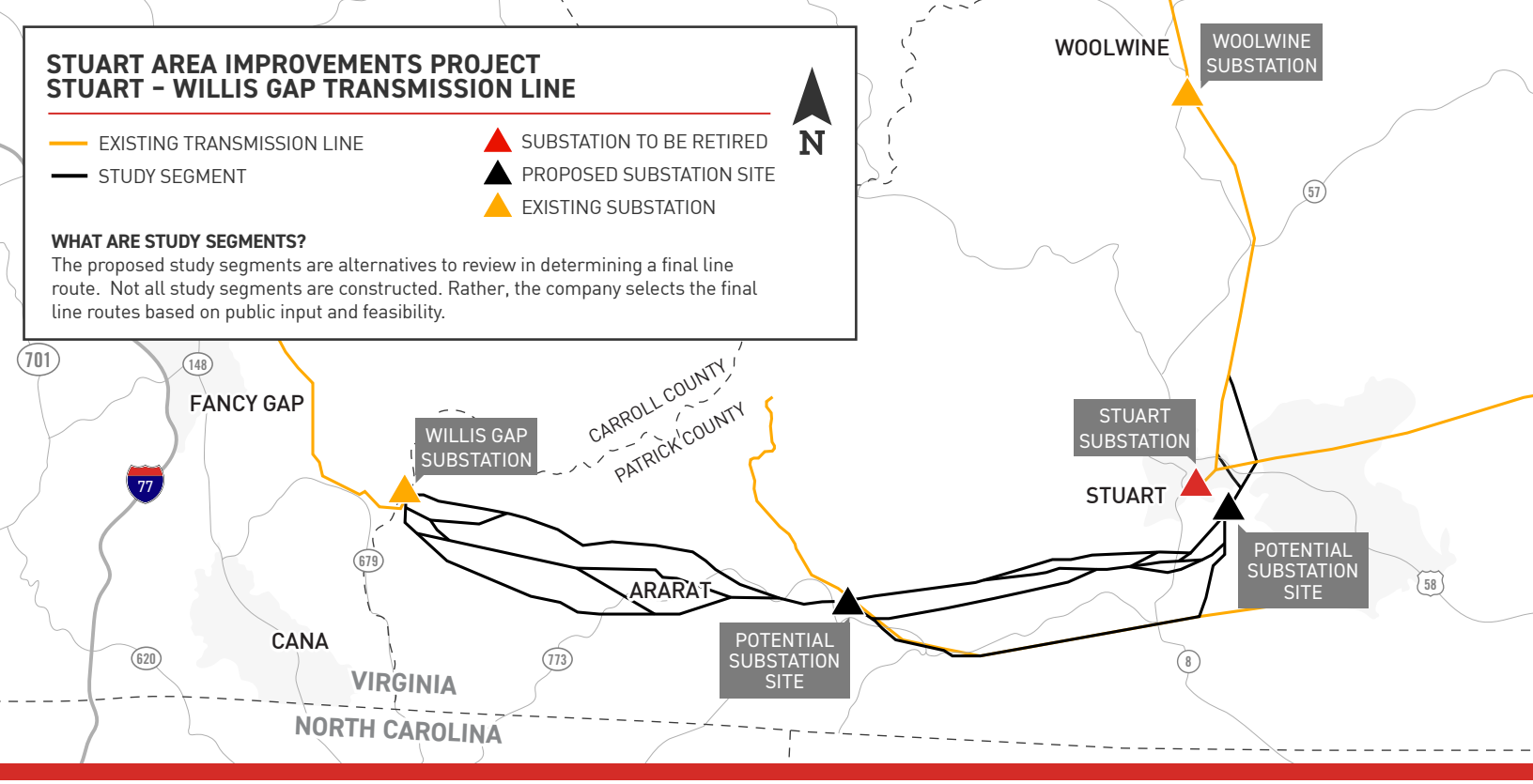
Route options continue east for approximately 12 miles towards the proposed substation, located off Cox Ridge Road in Patrick County near the community of Claudville. The route options then travel east for approximately 10 miles and end at a proposed substation site located off Commerce Drive near the town of Stuart.

PROJECT SCHEDULE*



*Timeline subject to change.

**Virginia State Corporation Commission

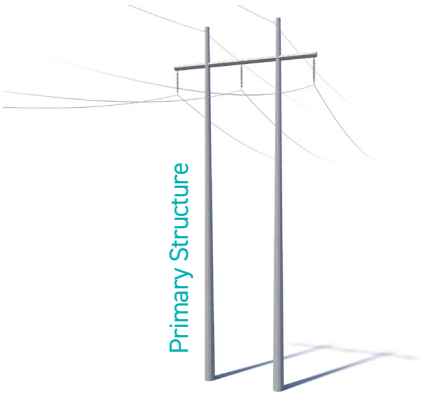


TYPICAL STRUCTURES

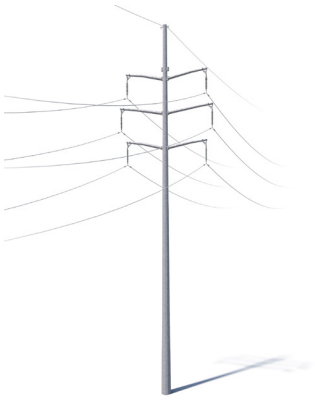
Plans call for the new line to be built using mostly H-frame structures; however, crews plan to use steel, double circuit single-pole structures north of the proposed substation site in Stuart. At select points, lattice towers and three-pole structures with guy wires may be installed to meet engineering needs.

Typical Structure Height: 80 to 100 feet

*Exact structure, height and right-of-way requirements may vary



Single Circuit H-Frame

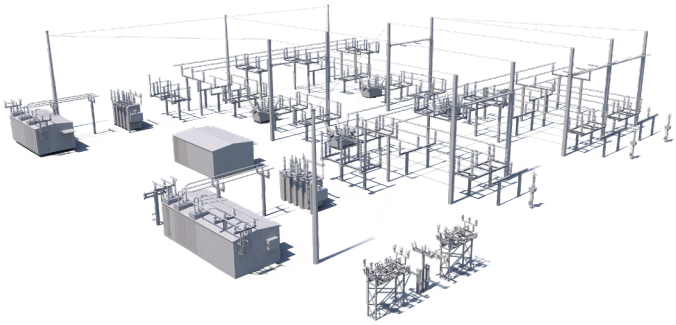


Double Circuit Single-Pole

TYPICAL SUBSTATION

Substations serve as electrical intersections directing the flow of electricity and either decrease or increase voltage levels for transport. Substations transform 69-kV and 138-kV electricity into lower distribution level voltages such as 34.5-kV, 12-kV, or 7.2-kV.

*Substation shown is a general depiction of the proposed facility that will be built for this project. It does not represent final design.



APPALACHIAN POWER VALUES YOUR INPUT ABOUT THIS PROJECT. PLEASE SEND COMMENTS AND QUESTIONS TO:

CORTNEY MUSTARD
Project Outreach Specialist
833-760-0604
Apco_Outreach@aep.com
www.AppalachianPower.com/Stuart

APPALACHIAN POWER
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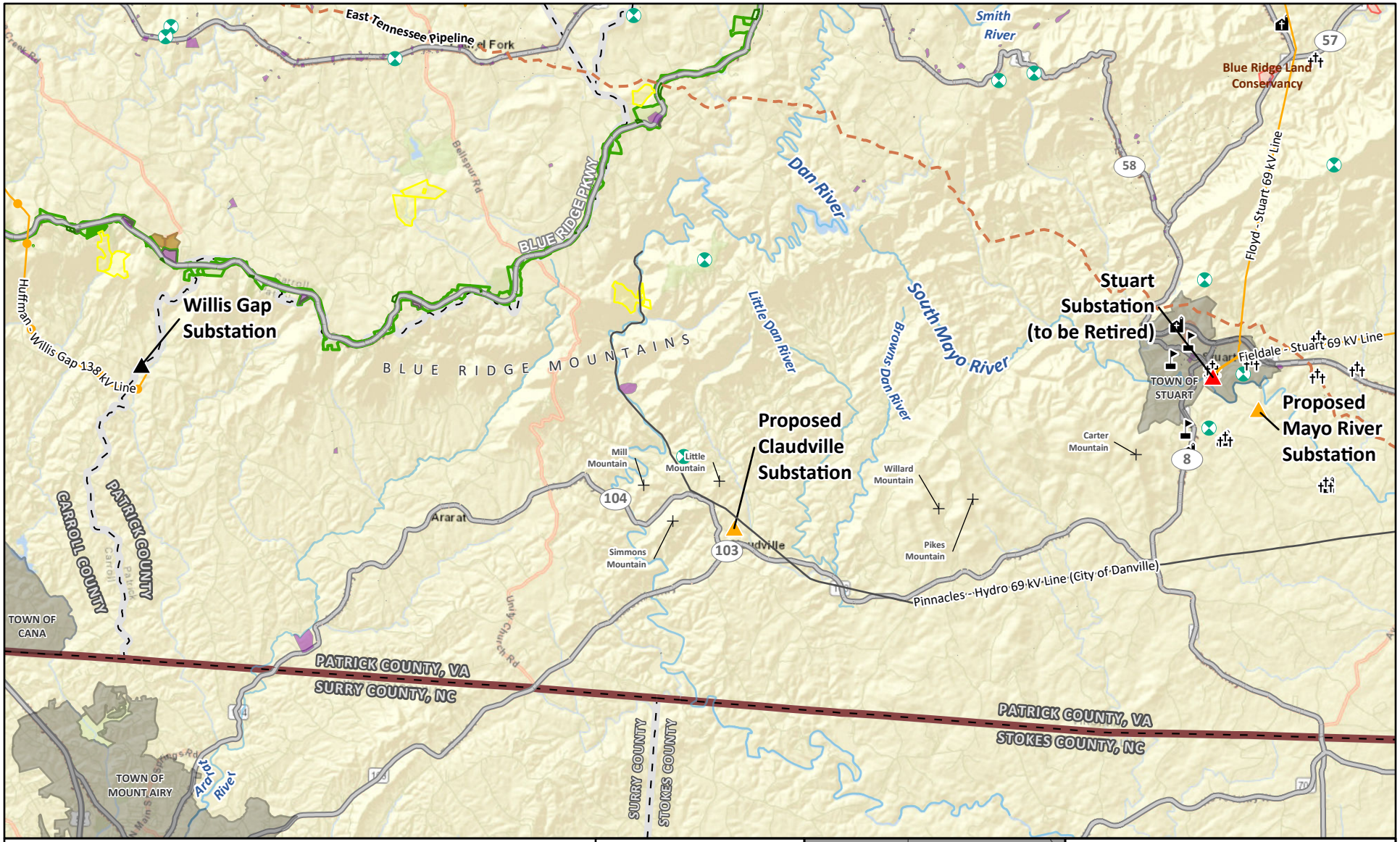
BOUNDLESS ENERGY

10/05/2021

Attachment B: Route Development Maps



Carroll & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 1
Study Area

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Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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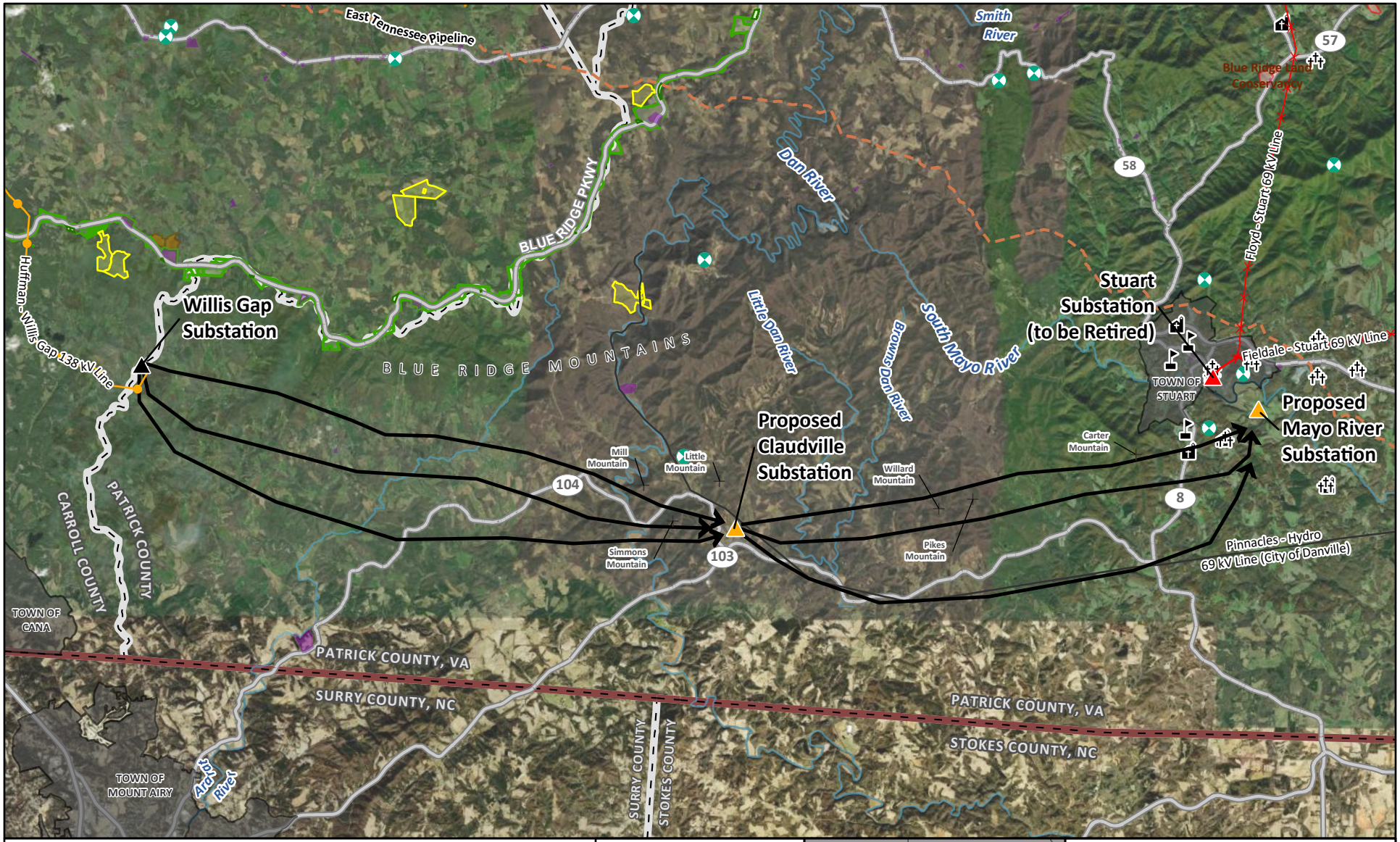
Miles



Routing Concepts
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (115 kV - 230 kV)
City of Danville's Pinnacles - Hydro 69-kV Transmission Line
Existing Transmission Line to be Retired
Cemetery
Place of Worship
School
Cell Tower (FCC)
Highway
River (NHD)
Natural Gas Pipeline
County Boundary
State Boundary
Architectural Resource (VDHR)
Federal Easement
Private Easement
State Easement
VOF Easement
Private Conservation Land
Blue Ridge Parkway
Town Boundary

Carroll & Patrick Counties, Virginia

Author: elundy
Project: 158529

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FIPS 4502 Feet
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Map 2
Routing Concepts

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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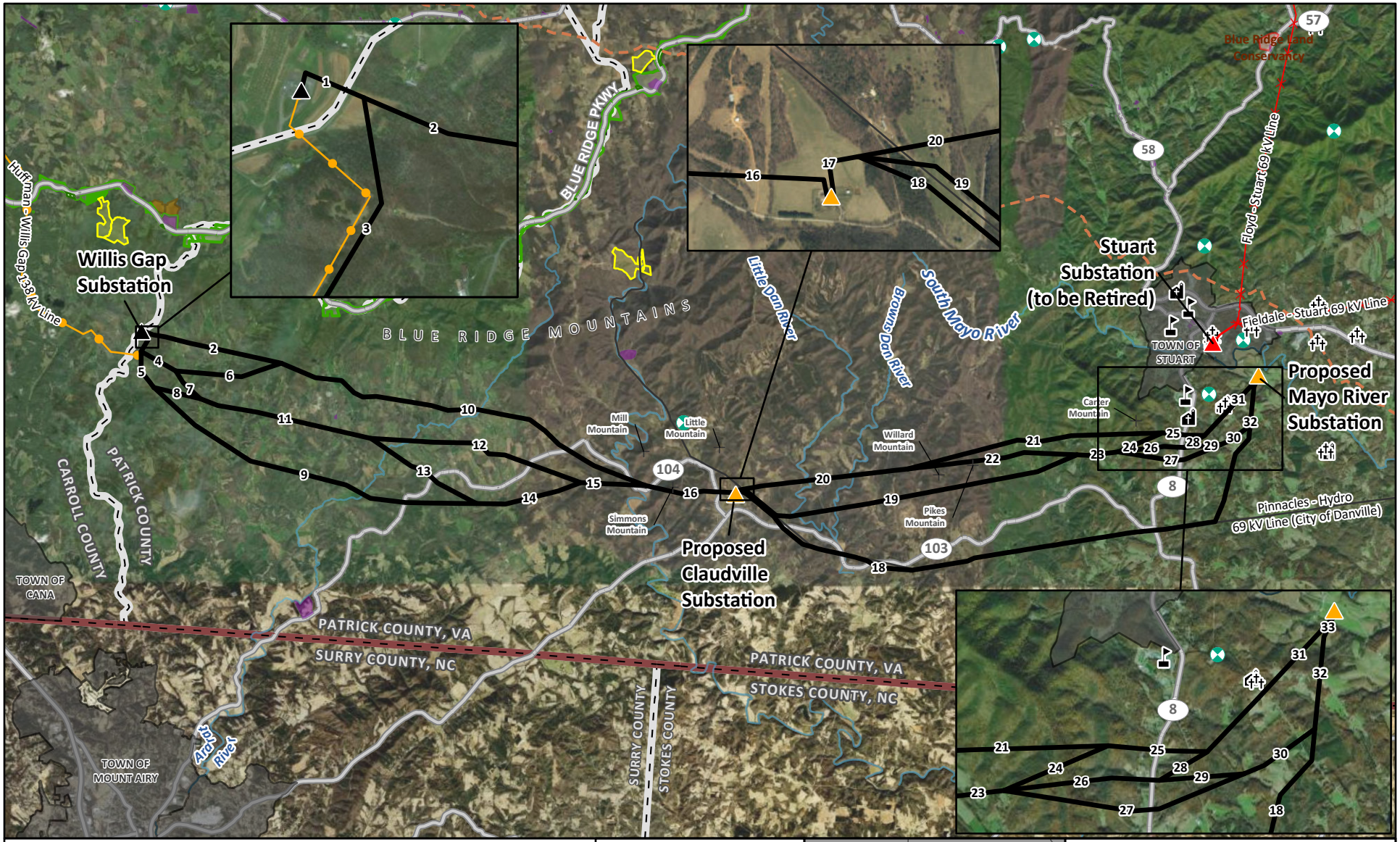

Open House Study Segments
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (115 kV - 230 kV)
City of Danville's Pinnacles - Hydro 69-kV Transmission Line
Existing Transmission Line to be Retired

Cemetery
Place of Worship
School
Cell Tower (FCC)
Highway
River (NHD)
Natural Gas Pipeline
County Boundary

State Boundary
Architectural Resource (VDHR)
Federal Easement
Private Easement
VOF Easement
Private Conservation Land
Blue Ridge Parkway
Town Boundary

Carroll & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 3
Open House Study Segments

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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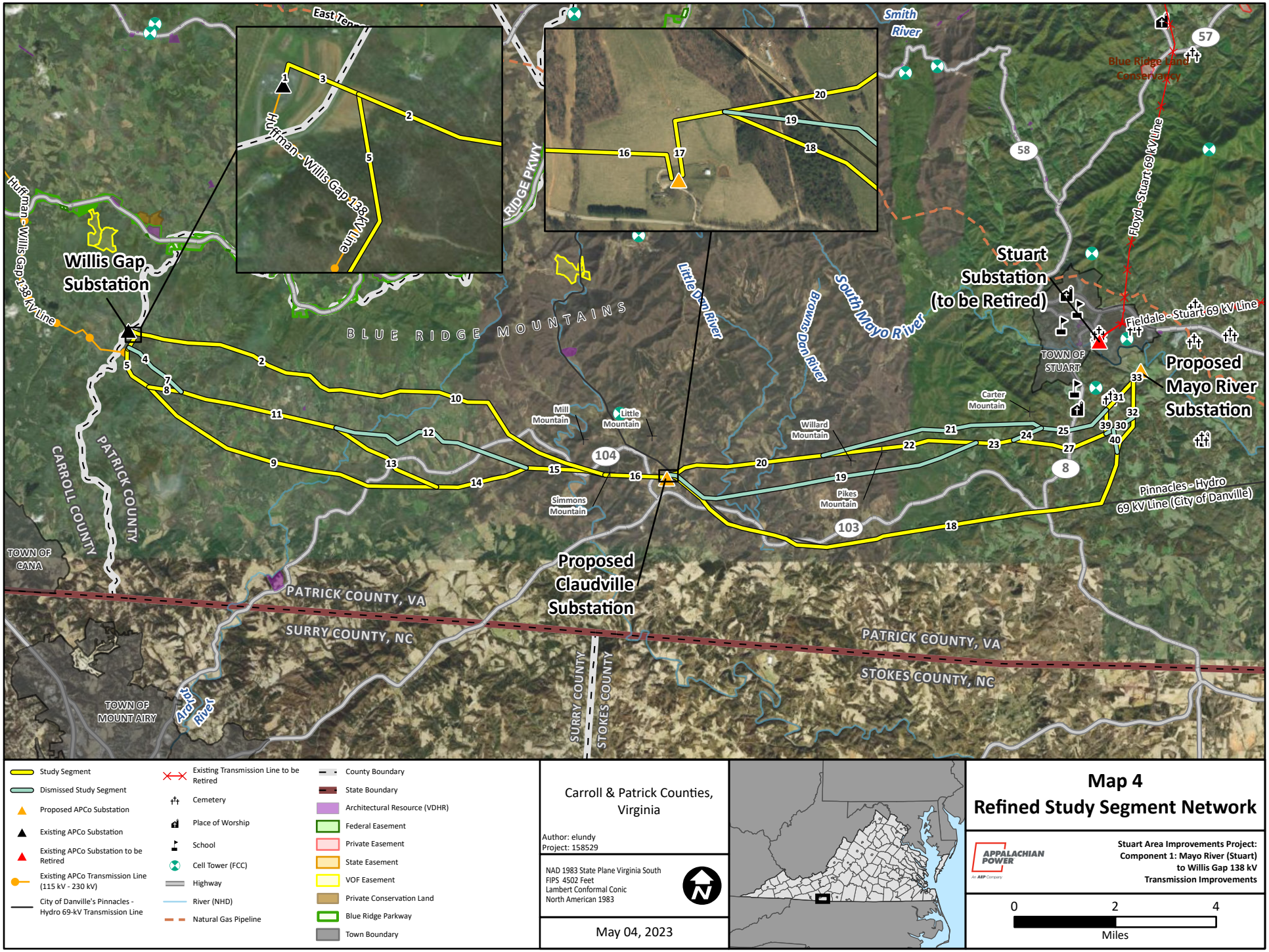

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Project: 158529

NAD 1983 State Plane Virginia South
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Map 4
Refined Study Segment Network

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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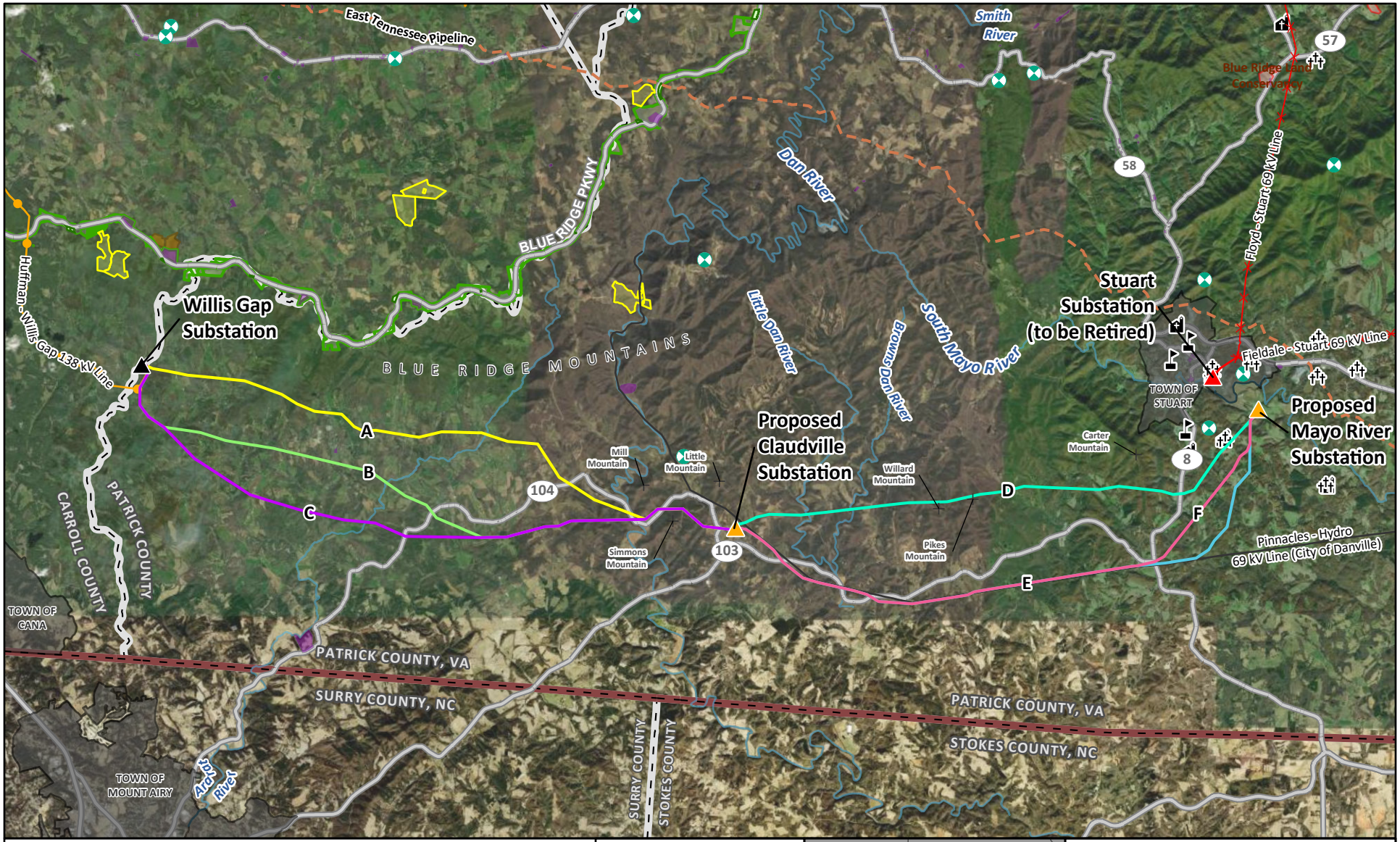

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Project: 158529

NAD 1983 State Plane Virginia South
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Map 5
Alternative Routes

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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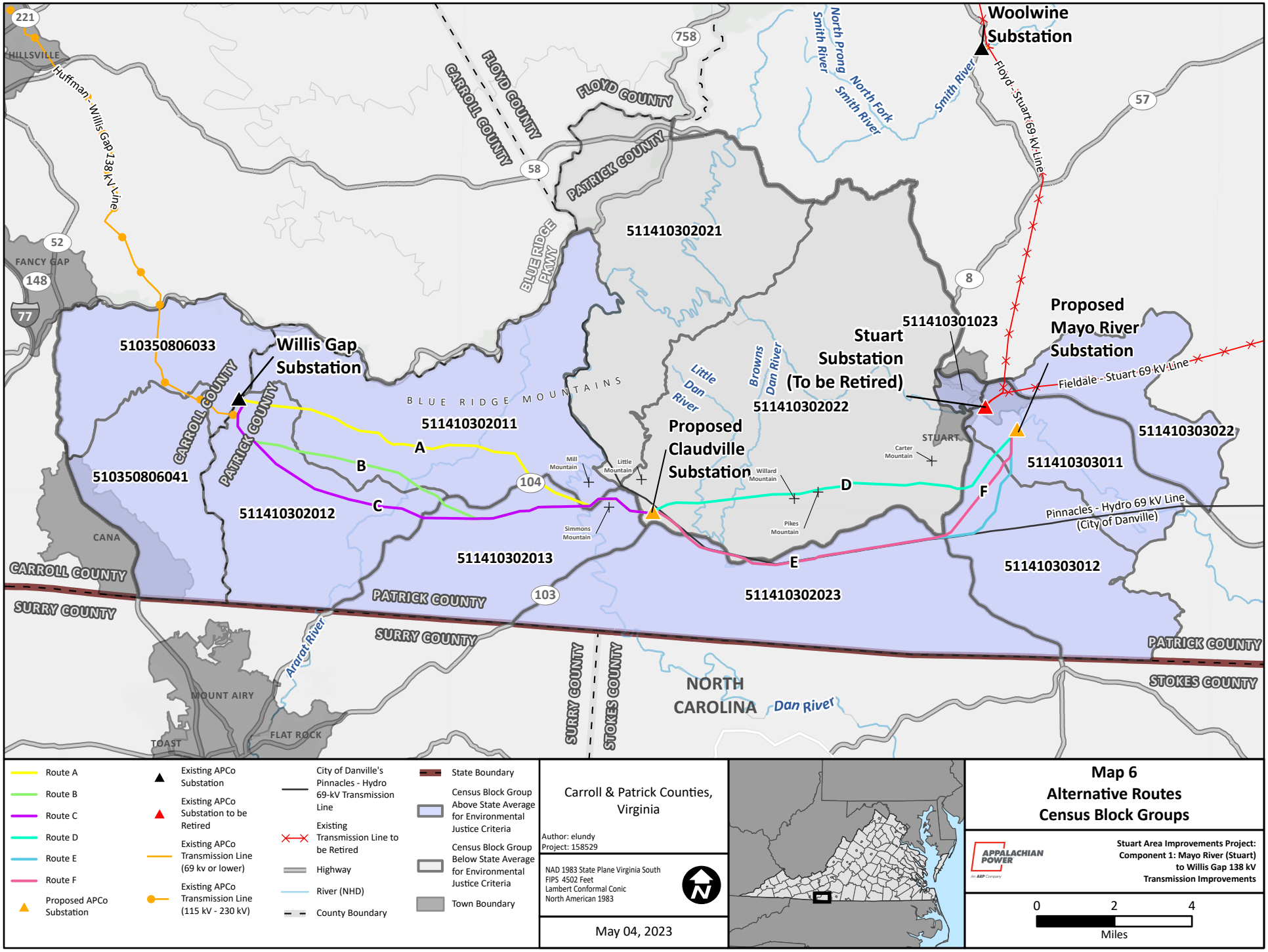

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Author: elundy
Project: 158529

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Lambert Conformal Conic
North American 1983

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Map 6
Alternative Routes
Census Block Groups

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

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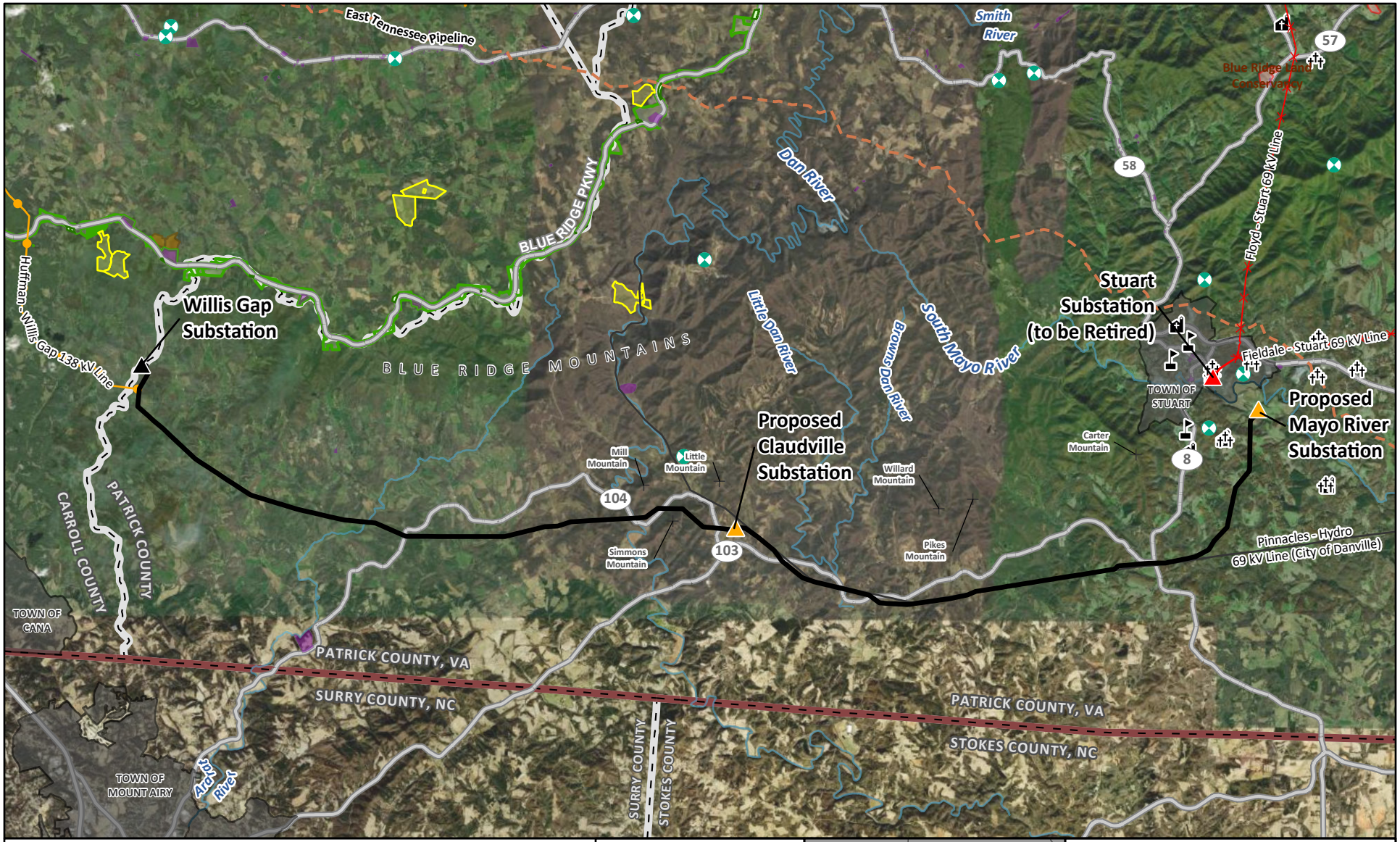

Component 1 Proposed Route
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (115 kV - 230 kV)
City of Danville's Pinnacles - Hydro 69-kV Transmission Line
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VOF Easement
Private Conservation Land
Blue Ridge Parkway
Town Boundary

Carroll & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 7
Component 1 Proposed Route

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 1: Mayo River (Stuart) to Willis Gap 138 kV Transmission Improvements

0 2 4
Miles

Attachment C: GIS Data Sources

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Land Use		
Number of parcels crossed by the ROW	Component 1 – Patrick County Parcel Data (September 2022), Carroll County Parcel Data (September 2022)	Count of the number of parcels crossed by the ROW
Number of residences within 50, 100, 250, and 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019 and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of residences within the ROW and within 50, 100, 250, and 500 feet of potential routes
Number of commercial buildings within 50, 250, and 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019), and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of commercial buildings within the ROW and within 50, 250, and 500 feet of potential routes
Land use acreage and distance crossed by the ROW and acreage within 50 feet of the route centerline	National Land Cover Database ([NLCD] (2022)	The National Land Cover Database (NLCD 2022) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed	National Conservation Easement Database ([NCED] 2020)	Private conservation easements crossed by the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Acres of agricultural district land crossed	NLCD (2019)	Protected land that is devoted exclusively to agricultural production or devoted to and qualified for compensation under a federal land retirement or conservation program that is at least 10 acres in size, or produces an average yearly gross income of at least $2,500 during a 3-year period
Number of archeological resources within the ROW and 250 feet of centerline	VDHR's VCRIS (2022)	Previously identified archeological resources listed or eligible on the NRHP acquired through VDHR's VCRIS (2022)
Number of historic architectural resources within the ROW, within 1.0 mile	VDHR's VCRIS (2022)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP acquired through VDHR's VCRIS (2022)
Institutional uses (schools, places of worship, hospitals, assisted living) within 1,000 feet of the route centerline. Cemeteries within 250 of centerline.	USGS's GNIS 2022	This dataset includes the locations of places of worship, hospitals, parks, and schools. Features within 1,000 feet of potential routes were field verified. Cemetery locations within 250 of the route centerlines.
Airfield and heliports within 1.0 mile of the route centerline	USGS's GNIS 2022 and the Federal Aviation Administration (FAA) database 2020	Distance from airfields and heliports

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Natural Environment		
Forest clearing within the ROW	Digitized based on Virginia Geographic Information Network VGIN (2019) and Google Earth (2017;2019); NLCD Tree Canopy Cover (2016)	Acres of forest within the ROW
Number of National Hydrography Dataset (NHD) stream and waterbody crossings within the ROW	USGS 2022	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells
Acres of National Wetland Inventory (NWI) wetland crossings within the ROW	USFWS 2022	The NWI produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats
Acres of 100-year floodplain crossing within the ROW	Federal Emergency Management Agency (FEMA) (2008)	Acres of 100-year floodplain within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2022); VA-DCR, Natural Heritage Conservation Lands Database (2021)	Miles of federal, state, and local lands crossed by the ROW
Threatened, endangered, rare or sensitive species occurrence within the Project vicinity	USFWS Critical Habitat Report (2022)	Known occurrences; locations of potential habitat based on land use

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Percent of hydric soils within the ROW	United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) Database (2021)	Percent of soil associations crossed by the ROW characterized as hydric, predominantly hydric, partially hydric and non-hydric
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (2021)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Technical		
Route length	Measured in GIS	Length of route in miles
Number and severity of angled structures	Developed in GIS	Anticipated number of angled structures less than 3 degrees, 3 to 45 degrees and more than 45 degrees based on preliminary design
Number of road crossings	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Count of federal, state, and local roadway crossings
Number of pipeline crossings	S&P Global Platts NGL Refined Product Pipelines (2021)	Number of known pipelines crossed by the transmission ROW
Number of transmission line crossings	AEP TGIS Database (2022)	Number of high voltage (100 kV or greater) transmission lines crossed by the ROW
Distance of steep slopes crossed	Derived from seamless Digital Elevation Models (DEMs) obtained from the United States Geological Survey (2022)	Miles of slope greater than 20 percent crossed by the routes

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Length of transmission line parallel	AEP TGIS Database (2022)	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	S&P Global Platts NGL Refined Product Pipelines (2021)	Miles of the route parallel to existing pipelines
Length of road parallel	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Miles of the route parallel to existing roadways

Attachment D: Study Area Photographs



Photo 1. Rolling Terrain in Carroll County



Photo 2. Agricultural Land in Patrick County



Photo 3. Recreational Development in Patrick County



Photo 4. City of Danville's Pinnacles – Hydro 69-kV Transmission Line

Attachment E: Environmental Justice Communities

Attachment E. Environmental Justice Communities										
CBG within one mile of centerline	Crossed by Centerline (Yes/No)	Component	Crossing Route	Population	% people of color	% low income[1]	% linguistic isolation	% less than high school	% under age 5	% over age 64
Virginia[2]				8509358	39%	24%	3%	10%	6%	15%
510350806033	**Yes**	**Component 1**	**A, B, C**	**798**	**29%**	**51%**	**22%**	**28%**	**4%**	**9%**
511410302011	**Yes**	**Component 1**	**A, B, C**	**827**	**9%**	**34%**	**0%**	**28%**	**5%**	**29%**
511410302012	**Yes**	**Component 1**	**A, B, C**	**1248**	**4%**	**26%**	**2%**	**26%**	**3%**	**17%**
511410302013	**Yes**	**Component 1**	**A, B, C**	**741**	**15%**	**34%**	**0%**	**41%**	**0%**	**20%**
511410302022	**Yes**	**Component 1**	**D, E**	**983**	**0%**	**17%**	**0%**	**10%**	**5%**	**22%**
511410302023	**Yes**	**Component 1**	**E, F**	**1260**	**2%**	**39%**	**0%**	**27%**	**5%**	**35%**
511410303011	**Yes**	**Component 1**	**D, E, F**	**1166**	**14%**	**27%**	**0%**	**18%**	**0%**	**41%**
511410303012	**Yes**	**Component 1**	**D, E, F**	**1407**	**3%**	**44%**	**0%**	**12%**	**5%**	**20%**
510350806041	No	Component 1	-	1747	5%	35%	0%	24%	3%	20%
511410301023	No	Component 1	-	874	18%	45%	2%	19%	8%	26%
511410302021	No	Component 1	-	391	0%	22%	0%	20%	0%	46%
511410303022	No	Component 1	-	1550	16%	28%	1%	4%	9%	32%

[1] Per the Virginia Environmental Justice Act, "Low-income community" means any census block group in which 30 percent or more of the population is composed of people with low income, and used in the comparative analysis.

[2] Virginia Population (U.S.Census Bureau April 1, 2020)

Note:

Bold text indicates populations, as defined in Virginia Environmental Justice Act, which exceed the state average, and are crossed by the Proposed Route.

Gray shaded cells indicate reference populations.

Green shaded cells indicate identified minority populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Yellow shaded cells indicate identified low-income populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Orange shaded cells indicate identified other demographic populations as defined in EJSCREEN, which exceed the state average, but not defined in Virginia Environmental Justice Act.

Attachment F: Agency Correspondence

SEE VOLUME 3 FOR ATTACHMENT F - AGENCY CORRESPONDENCE

Siting Study

Stuart Area 138-kV Transmission Improvements Project: Component 2: Mayo River (Stuart) to Floyd Transmission Improvements
SCC Case No. PUR-2023-00024

Prepared for:

APPALACHIAN POWER
An AEP Company

Prepared by:

POWER Engineers, Inc.
6641 W. Broad Street, Suite 405
Richmond, Virginia 23230

POWER ENGINEERS

May 2023

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ATTACHMENTS

Attachment A: Outreach Fact Sheet

Attachment B: Route Development Maps

- Map 1. Study Area
- Map 2. Mayo River Focus Area
- Map 3. Open House Study Segments
- Map 4. Alternative Route A
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- Map 6. Alternative Route B and Rebuild Route Census Block Groups
- Map 7. Component 2 Proposed Route

Attachment C: GIS Data Sources

Attachment D: Data Collection Summary

Attachment E: Study Area Photographs

Attachment F: Environmental Justice Communities

Attachment G: Agency Correspondence

Key Terminology

Alternative Routes	Assemblage of Study Segments that form routes for analysis and comparison.
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process.
Endpoints	The project starting and ending point(s) ("Project Endpoints"), which may include substations, switch stations, tap points, or other locations defined by the Company's planners and engineers.
Environmental Justice	The fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy (VA Code § 2.2-234).
Focus Area	Locations along the existing route where rebuilding may not be feasible due to the presence of constraints and diversions are necessary.
Greenfield	New transmission line route or substation site constructed in an area or along a route where no previous substation or transmission line route existed.
Land Use	Describes the human use of the land and activities at a given location such as agricultural, residential, industrial, mining, commercial, and recreational uses. It differs from land cover which only describes the physical characteristics (summarized from EPA.gov).
Opportunity Feature(s)	Areas or existing linear features along which the transmission line may have less disruption to area land uses and the natural and cultural environment.
Project	The proposed transmission facilities studied in the siting report.
Proposed Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Proposed Route (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a safe, timely, and reliable manner.
Routing Concepts	Initial routes for the project that adhere to a series of general siting and technical guidelines.
Segment Endpoint	The intersection of two or more Study Segments.
Siting Team	A multidisciplinary team of experts in transmission line routing, environmental impact assessment, impact mitigation, engineering, and construction management

Study Area	The territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental impacts and Project costs.
Study Segments	Study Segments are partial alignments that when combined form a complete route.

ABBREVIATIONS AND ACRONYMS

AEP	American Electric Power (parent company for Appalachian Power)
Appalachian Power or Company	Appalachian Power Company
CBG	Census Block Group
Component 2	Mayo River (Stuart) to Floyd Transmission Improvements
CPCN	Certificate of Public Convenience and Necessity
EJ	Environmental Justice
GIS	Geographic Information System
IPaC	Information for Planning and Consultation
kV	kilovolt
LiDAR	Light Detection and Ranging
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
ROW	Right-of-way
SCC	State Corporation Commission
Stuart Project or Project	Stuart Area 138-kV Transmission Improvements Project
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VDCR	Virginia Department of Conservation and Recreation

VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VOF	Virginia Outdoors Foundation

1.0 PROJECT DESCRIPTION

The Stuart Area 138-kV Transmission Improvements Project ("Stuart Project" or "Project") is Appalachian Power Company's ("Appalachian Power's" or "Company's") proposed project to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades equipment voltage from 69-kilovolt ("kV") to 138-kV, improves the local distribution system, and addresses aging infrastructure. The Project will ensure adequate power delivery to the area to support today's electrical load and provide continued support during extended outages.

The Mayo River (Stuart) to Floyd Transmission Improvements ("Component" or "Component 2") is the second component of the three included in the Project (Attachment A – Outreach Fact Sheet). Component 2 will rebuild approximately 22 miles of the existing Floyd – Stuart 69-kV Transmission Line to 138-kV between the proposed Mayo River 138-kV Substation and existing Woolwine and Floyd substations in Patrick (approximately 17 miles) and Floyd (approximately 5.0 miles) counties (see Exhibit 3, Project Overview Map in the Company's SCC application). The transmission line rebuild will upgrade the voltage of deteriorating equipment originally constructed in the 1950s. In addition, the Company's existing Woolwine Substation will be upgraded and the Floyd Substation will be expanded. The proposed Mayo River 138-kV Substation will replace the existing Stuart 69-kV Substation, which is to be retired. Component 2 will be constructed mostly within or near existing right-of-way ("ROW") with some deviations from the centerline or some greenfield portions to optimize design or avoid constraints.

Transmission line structure type may vary along the line route depending on topography, design, and Component needs. The existing transmission structures are primarily single-circuit wooden H-frame structures and the Company plans to replace them primarily with dulled galvanized steel single-circuit H-frame (see Figure 1). For certain portions, double-circuit monopole structures are planned (see Figure 2, Comparable Double-Circuit Structure). Structures on the single-circuit portion will be approximately 80 feet high, on average, and structures on the double-circuit portions will average approximately 100 feet high. Proposed structures for the rebuilt line will on average be approximately 35 feet taller than existing structures (see below Figure 1, Visual Simulation. Comparable Existing and Proposed Single-Circuit Structure and Typical Structures in Attachment A - Outreach Fact Sheet).



Figure 1. Comparable Existing and Proposed Single-Circuit H-Frame Structure (consisting of three conductors)
Existing Wood H-frame (top) and Proposed Steel H-frame (bottom), which is the primary proposed structure to be used

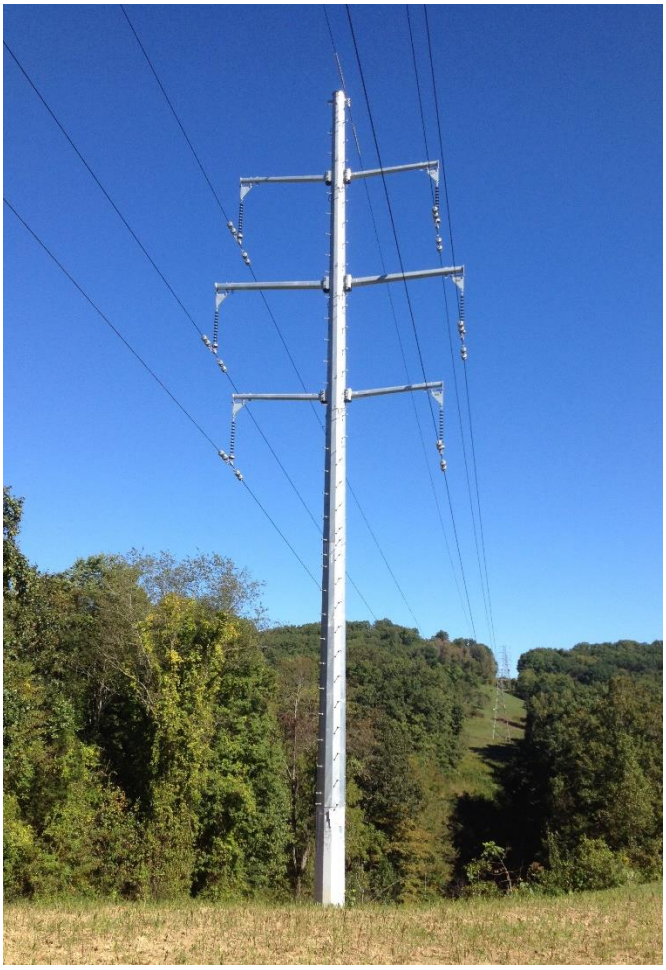


Figure 2. Comparable Steel Double-Circuit Monopole Structure (consisting of six conductors)

A Certificate of Public Convenience and Necessity ("CPCN") from the Virginia State Corporation Commission ("SCC") is required for the Project. The Company will seek approval from the SCC to rebuild the transmission line within a 600-foot-wide filing corridor (approximately 300 feet on either side of the route centerline). The filing corridor allows for design flexibility in determining the final centerline and ROW width which will be based on ground surveys, environmental studies, additional landowner input, and final engineering.

If approved, the Company will complete preliminary engineering and work with affected landowners to update existing easements, as necessary, and provide fair compensation for any new or supplemental easements. The Company then will finalize proposed structure locations and ROW width within the SCC-approved filing corridor working with appropriate local, state, and federal agencies during the permitting and construction phases. The proposed in-service date for the Project is December 2029.

This Siting Study describes the transmission line route development process and rationale for the proposed route selection.

2.0 ROUTE DEVELOPMENT OVERVIEW AND DUE DILIGENCE

The goal of the route development process is to identify a proposed route that (1) is most consistent with the siting guidelines (e.g., use existing ROW to extent possible); (2) reasonably minimizes adverse impacts on the natural and human environments; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner.

AEP's electrical planners started the route development process by defining the **Project Endpoints**, which include the Company-owned Floyd – Stuart 69-kV Transmission Line between the existing Stuart Substation and the existing Woolwine and Floyd substations (Attachment A, Outreach Fact Sheet). Additionally, see Exhibit 8 Component 2 GIS Constraints Map in the Company's SCC Application.

The existing Stuart 69-kV Substation, located in the Town of Stuart, is constrained by existing development, topography, and a major sewer line (see Exhibit 25, Existing Stuart Substation within the Company's SCC Application). Additionally, bringing the new 138-kV transmission line from Willis Gap into the town and rebuilding the two existing 69-kV transmission lines from Woolwine and Fieldale would have engineering challenges and high land use and environmental impacts. Adjacent parcels were reviewed but dismissed due to size constraints. Therefore, a new endpoint and substation site, the proposed Mayo River 138-kV Substation, was identified after reviewing numerous potential sites in the area. The proposed Mayo River site, located on Commerce Drive just southeast outside of the Town of Stuart, is generally flat and rural, has plenty of space and a buffer, and is adjacent to the existing distribution circuits. Additionally, the three 138-kV transmission line circuits can connect to the substation at this location without significant impacts.

Next, AEP planners determined the existing Floyd – Stuart 69-kV Transmission Line is not outage constrained and can be rebuilt within the existing ROW to the extent practicable.

The Project was initiated in 2018 with a Siting Team meeting that included Appalachian Power employees and external consultants with diverse expertise including transmission line and substation siting, distribution planning, impact assessment for natural and human environments, impact mitigation, engineering, construction management, project management, and public relations. The Siting Team initially met with county officials throughout 2020 and 2021.

The Stuart Project was announced to the public in October 2021, and Component 2 was announced with a public open house and news release in February 2022. The Siting Team determined a proposed route in August 2022.

2.1 Review of Existing ROW and The Study Area

The Siting Team considered using existing ROW during Component 2 initial route development to minimize new impacts on the natural and human environments. This approach is consistent with Sections 56-46.1 and 56-259 of the Code of Virginia, which suggest that existing ROWs should be given priority when adding new transmission facilities and which promote using existing ROW for new transmission facilities. After reviewing the existing ROW, the Siting Team determined that Component 2 can follow the existing centerline for most of its length and that the existing ROW is feasible for a rebuild.

The **Study Area** for the proposed rebuild was then defined to include a 1,000-foot buffer (500 feet on either side) of the existing Floyd – Stuart 69-V Transmission Line and one **Focus Area** (Section 3.0) identified along the existing route where rebuilding may not be feasible and alternative route analysis is necessary (Attachment B, Map 1). The Study Area is characterized by forested, agricultural, recreational, residential, and commercial land uses (Attachment E, Photos 1-4). Component 2 is bound by the Company's Floyd Substation to the north, and the Town of Stuart to the south. Terrain in the Study Area is rolling hills with some steeper topography around Bull Mountain and the Blue Ridge Mountains. The Study Area is crossed by US Highways 221 (Floyd Highway North) and 58 (Jeb Stuart Highway) and 57 (Fairystone Park Highway), and State Route 8 (Woolwine Highway), and the Blue Ridge Parkway. Between the proposed Mayo River Substation site to the existing Woolwine Substation, forest and timber lands with scattered residential development along roadways are predominant. Between the Woolwine and Floyd Substations where the rebuild will occur, the land is characterized by rolling hills, forest, and residential development and the existing Floyd – Stuart 69-kV Transmission Line crosses the South Mayo River and the Blue Ridge Parkway.

2.2 Data Collection and Geographic Information Systems

The Siting Team used Geographic Information Systems ("GIS") data obtained through publicly available agency databases and aerial photography during the siting process[1]. This data allowed review of the existing ROW and potential impacts to existing and proposed land uses, natural resources, cultural resources, transportation facilities, and existing utility and linear features. A

[1] Primary aerial imagery sources used in route identification, analysis, and selection for the Project include: Esri (2020), Google (Imagery dates vary by location), and Light Detection and Ranging (LiDAR) (flown in June 2020).

table of data sources is provided in Attachment C – GIS Data Sources and Attachment D – Data Collection Summary.

2.3 Federal, State, and Local Government Coordination

Twenty-two local, state, and federal agencies were contacted in November 2021, requesting input for the route planning process. Nine responses have been received to date. Copies of letters, contact list, and correspondence are included in Attachment G – Agency Correspondence.

The Siting Team coordinated with local government agencies/officials to aid the route review process. Specifically, virtual and in-person meetings were held with officials from Patrick and Floyd Counties throughout the siting process. The purpose of meeting with officials was to introduce the Project, review Component(s) located within their jurisdictions, and obtain information to aid in the route review process. The Siting Team reviewed municipalities' future land uses and comprehensive plan goals to evaluate potential constraints and opportunities within local planning documents. Overall, local officials supported the Project, and no future development plans were identified as potential impacts. Specifically, no "important," "prime," or "unique" farmlands or forest lands were noted as potential Project impacts, as stated in Virginia State Code Section 3.2-205.

2.4 Constraints and Opportunities

A majority of Component 2 will be rebuilt on the centerline of the existing ROW; however, some deviations from the existing centerline are necessary to optimize design or avoid constraints. Major constraints include scattered residential areas near the towns of Stuart and Floyd, the Floyd historic district, Virginia Outdoors Foundation ("VOF") conservation easements, local recreational sites and parks, and the South Mayo River. Other constraints include several residential and commercial developments along major roadways and highways that cross the Study Area.

The main siting opportunity for Component 2 is the existing ROW corridor where the Siting Team considered rebuilding on the centerline to the extent practicable (**Rebuild Segments**). Deviations from the existing centerline in a few areas are necessary to optimize design or avoid constraints where possible (**Reroute Segments**).

3.0 STUDY SEGMENTS

Study Segments (Attachment B - Map 3) include the Rebuild and Reroute Segments and are developed to meet the Project's functional requirements (engineering and construction) and, at the same time, minimize environmental and socioeconomic impacts.

3.1 Mayo River Focus Area

One **Focus Area,** where rebuilding on the existing centerline may not be feasible, was identified north of the proposed Mayo River Substation (Attachment B, Map 2). A **Reroute Segment** was developed here to avoid residential and commercial development along Route 58 near the Town of Stuart ("Mayo River Focus Area") in and around the existing ROW.

The existing Floyd – Stuart 69-kV Transmission Line crosses through a residential community and the Patrick County Hospital property. The hospital is closed; however, it is currently under redevelopment and scheduled to reopen in 2023. Therefore, the Siting Team developed an eastern Reroute Segment in the Mayo River Focus Area that largely passes through undeveloped forested areas and avoids the hospital and residential area (Attachment B, Map 2). Though this Reroute Segment requires new ROW, desktop analysis indicated the segment was feasible, and it was presented to the open house for public review and input. A 1.5 mile Reroute Segment was also developed to connect the proposed Mayo River Substation to the existing 69-kV line ROW near the hospital and residential area described above.

3.2 Rebuild Route Review

Rebuild Segments are all those that will be rebuilt on centerline**.** Combined they are the **Rebuild Route**. A majority of Component 2 can be rebuilt on existing centerline within the existing ROW with minor deviations to minimize potential impacts to the human environment or to optimize design.

In assessing the suitability of the Rebuild Route by using the existing Floyd – Stuart 69-kV Transmission Line ROW, the Company undertook these actions:

- Company planners determined that an extended outage to rebuild the existing transmission line within the existing ROW is feasible.

- The Siting Team undertook desktop and field examinations and concluded that rebuilding the existing Floyd – Stuart 69-kV Transmission Line largely in or parallel to the existing ROW is reasonable and the best route where feasible.

- Company ROW agents reviewed the existing ROW easements and determined that they generally permit line rebuilds and upgrades.
- The Siting Team undertook field reconnaissance of the existing ROW to identify any existing development in or near the ROW.
- Building within the existing ROW or paralleling the existing ROW minimizes impacts on the human, visual, and natural environments as compared to new routes that would generate more impacts resulting from developing new ROW and associated access roads.
- Meetings with local officials were conducted, a Project website and virtual open house were established, and two in person open houses were hosted.

The siting team concluded a vast majority of the Project can be rebuilt within or near the existing ROW (see Study Segment, Existing ROW, Attachment B, Map 3) and additional reroute development in new ROW was not necessary or reasonable.

4.0 PUBLIC INVOLVEMENT

Component 2 was announced publicly on February 9, 2022, with a news release and a virtual open house was posted online (**https://www.aeptransmission.com/virginia/Stuart-Floyd/**) where the Study Segments were presented (Attachment B, Map 3). The virtual open house provided information related to engineering and design of the structures, why the Project is needed, ROW development, and construction description. Through the virtual open house, landowners and the public were encouraged to submit comments to the Siting Team and identify property locations using an address search tool. Two in-person public open houses were held, one in the community of Floyd on February 23, and a second in the community of Stuart on February 24, 2022. A total of 22 landowners attended the public open houses.

Aerial maps showing existing infrastructure and Study Segments were also provided on the Project website and made available to download.[2] Participants at the in-person and the virtual open houses were encouraged to identify the location of their homes, places of business, properties of concern, or other sensitive resources on maps and submit comments to the Siting Team. Comments received were digitized and entered into a GIS database.

[2] Maps were scale of 1 inch = 200 feet.

The Project website includes updates and news releases, an interactive overview map, fact sheet (see Attachment A – Outreach Fact Sheet), schedule information, photographs of representative structures, and questions and comment options on the contact page.

Landowners within a 1,000-foot corridor (500 feet on either side of a route centerline) of Study Segments were notified of the February 2022 open houses. Landowner addresses were obtained from Patrick and Floyd counties' parcel databases, and notifications were made through:

1. A news release announcing the Project and virtual open house dated February 9, 2022, distributed by the Company.

2. Two separate Project mailings sent to 213 landowner addresses on February 9 and 11, 2022, that included a letter, postcard, Component fact sheet (see Attachment A – Outreach Fact Sheet), comment card with prepaid postage return envelope, and Project and Component information trifold pamphlet.

3. An automated telephone voicemail message informing 96 landowners about the open houses made on February 15, 2022.

A total of 35 comments were received from the public for Component 2: 27 comments received through phone calls, US mail, or the Project website and eight comment cards received at the open houses. All comments were entered into the Project's public comment database. Comment topics generally related to how the rebuild will differ from the existing line, whether it will affect landowners' property in the vicinity, the Mayo River Focus Area, and potential impacts from access and construction.

The public, stakeholders, and landowners did not express major concerns since most of the Project will be rebuilt within or near to existing ROW. The Siting Team coordinated with stakeholders and landowners to discuss where rebuilding on the existing centerline may not be feasible due to the presence of constraints, such as the Mayo River Focus Area. The Company will continue to coordinate with landowners and stakeholders throughout the Project duration.

5.0 ALTERNATIVE ROUTE COMPARISON

A majority of Component 2 is the Rebuild Route, where abandoning existing ROW for a new greenfield route is neither practical nor necessary. In the Mayo River Focus Area, however, a reroute segment deviates from existing ROW and is considered an eastern alternative to minimize potential impacts to residences and the surrounding community.

Alternative Route A exits the proposed Mayo River Substation as a double-circuit line to the north and travels for approximately 0.4 mile where one single-circuit line turns northwest for one mile to the Patrick County Hospital and connects to the existing Floyd – Stuart 69-kV ROW, continues in the existing ROW for 2.0 miles and connects to the Rebuild Route. The other single-circuit line continues northeast for 0.8 mile before turning east and connecting to the beginning point of Component 3. Alternative Route B is the eastern greenfield route that also exits the proposed Mayo River Substation as a double-circuit line, which travels to the northeast for about 1.0 mile spanning Jeb Stuart Highway. One line and circuit connects to Component 3 and the other single-circuit and line turns northwest continuing for approximately 2.5 miles where it meets the existing Floyd - Stuart 69-kV ROW and connects to the Rebuild Route. The Rebuild Route begins where Alternative Routes A and B merge and continues north utilizing existing ROW for approximately 7.5 miles before entering the existing Woolwine Substation. The Rebuild Route exits the Woolwine Substation and continues north utilizing existing ROW for approximately 11 miles terminating at the existing Floyd Substation.

A comparison of the Alternative Routes A and B within the Mayo River Focus Area and a review of the Rebuild Route is presented below.

5.1 Natural Environment

The natural environment includes water, soil, sensitive species, and wildlife habitat. Potential impacts are based on publicly available maps and data and coordination with federal, state and local agencies.

Agencies contacted in November 2021 were requested to provide input for the route planning process as part of data collection. Responses were received from the Virginia Department of Conservation and Recreation (“VDCR”), the Virginia Department of Health (“VDH”) Office of Drinking Water, Virginia Department of Forestry (“VDOF”), and VOF.

The VDCR noted in its December 17, 2021 letter that the Thomas Grove Flats, Dodd Creek – Rakes Mill Pond, Slusher Bog, and Robertson Bog Conservation Sites are all located within the Component 2 Study Area, and each has a very high significant biodiversity ranking (B2). Two highly categorized ecological core areas with significant integrity as determined by the VDCR, the Rich Creek Conservation Site and the Oldfield Creek Seep Conservation Site, were identified within the Study Area. They also noted multiple “General” C5 core areas, the lowest category regarding ecological integrity, are in the Component Study Area as indicated by VDCR’s Virginia Natural Heritage Data Explorer.

The Component crosses a total of 94 National Hydrography Dataset ("NHD") features and 7.3 acres of National Wetland Inventory ("NWI") features at or near existing crossings[3]. The VDOF noted that the Component 2 Study Area contains over 4,000 acres of trees considered having very high or outstanding conservation value in its January 7, 2022 communication. The VDH wrote on December 13, 2021, acknowledging receipt of the Company's letter and stated no Project comments or concerns were noted. Responses received from the VDCR, VDOF, VOF, and VDH are included in Attachment G – Agency Correspondence.

No responses were received from the Virginia Marine Resources Commission, Virginia Department of Environment Quality's Office of Wetland and Stream Protections, or United States Army Corps of Engineers ("USACE"). Coordination and review with the Virginia Department of Environment Quality, USACE, and Virginia Marine Resources Commission will be conducted during environmental studies for the Project.

Alternative Route A in the Mayo River Focus Area utilizes portions of existing ROW and mitigates impacts to surrounding trees while Alternative Route B does not utilize existing ROW at all. As a result, Alternative Route A requires approximately 19 acres of tree clearing, while Alternative Route B requires approximately 33 acres (approximately 14 acres more than Alternative A) based on a 100-foot-wide ROW (See Table 1. Alternative Route Evaluation Criteria).

The United States Fish and Wildlife Service ("USFWS") Information for Planning and Consultation ("IPaC") project planning tool was used to determine whether any threatened or endangered wildlife or plant species may occur in the Component Study Area. Six USFWS-listed species were identified to potentially occur within the Study Area of Component 2: the Indiana bat (endangered), Northern long-eared bat (endangered), Roanoke Logperch (endangered), James Spinymussel (endangered), Mitchell's Satyr Butterfly (endangered), and Small-anthered Bittercress (endangered). In addition, the Monarch Butterfly is shown as a candidate species and the Tricolored bat is shown as a proposed endangered species. The separate IPaCs for both Alternative Routes A and B identified three endangered species: the Northern Long-eared Bat, Roanoke Logperch, and Small-anthered Bittercress. No critical habitats were identified for either of the Alternative Routes.

Component 2 does not intersect any of VDCR's predictive models identifying potential habitat for natural heritage resources, nor any special natural areas based on input received from VDCR. The South Mayo River is a designated scenic river, and both Alternative Routes A and B cross the river

[3] A desktop review of Component 2 wetland and streams is described further in the Desktop Wetland and Stream Delineation Report, located in the Volume 3 of the Company's CPCN Application.

upon exiting the proposed Mayo River Substation. Alternative Route B crosses the river once, and Alternative Route A crosses the river three times. Alternative Routes A and B cross the same riparian buffer acreage and Alternative Route B has one fewer stream crossing than Alternative Route A[4]; however, Alternative Route B parallels Rich Creek for 0.6 mile. The Company plans to maintain a 50-foot buffer between the ROW and Rich Creek to mitigate any potential impacts. While both Alternative Routes introduce new waterway crossings, Component 2 is expected to span these with minimal impact.

The Rebuild Route requires approximately 56 acres of tree clearing; however, approximately 22,000 feet (4.0 miles) of clearing parallels existing linear infrastructure. The VOF stated in its January 20, 2022 response that they hold easements on three properties intersected by the Rebuild Route: one near the Buffalo Creek crossing; one east of Woolwine Elementary School; and one at the Barberry Road southeast crossing. The Rebuild Route crosses all three VOF easements at their existing locations, and minimal impacts are anticipated. The Rebuild Route crosses 40 streams, one waterbody and two high/exception/special protection streams; however, the Rebuild Route will cross at existing locations.

5.2 Human Environment

The human environment includes land use and activities at a given location including recreational, agricultural, forestry, residential, industrial, commercial, and institutional uses, and scenic assets. The Virginia Department of Transportation's ("VDOT") January 3, 2022 letter did not indicate any major concerns for Component 2. The Virginia Department of Aviation's December 7, 2021 letter indicated that no part of Component 2 is located within 20,000 linear feet of a public use airport. VDOT and Virginia Department of Aviation's responses are included in the agency correspondence in Attachment G. The United States Department of Agriculture's National Resources Conservation Service did not respond to the Company's request for comment on agricultural lands related to the Project.

Background research to identify all previously recorded cultural and potential cultural resource locations for the Component Study Area was conducted by reviewing historic documents, agency and public input, and various archives, including the Virginia Department of Historic Resources ("VDHR") database. With a majority of the Component using existing ROW, impacts to any National Historic Landmarks, National Register of Historic Places-listed ("NRHP") or -eligible historic resources are either not anticipated at all or will be minimal because of intervening vegetation and development that largely limits visibility of the Component. Where the existing

[4] Overall, Alternative Route A crosses five streams and Alternative Route B crosses four streams.

transmission line is visible from many historic properties, structures will remain visible but only be slightly taller resulting in nominal increased visibility of the new structures. The extent of these cultural resources is further detailed in the VDHR Pre-Application Analysis in support of the CPCN Application (included in Volume 3 of the Company's CPCN Application).

Alternative Routes A and B both traverse mostly forested and agricultural land before merging into the Rebuild Route. Alternative Route A crosses approximately 23 acres of farmland of statewide importance in the ROW, whereas Alternative Route B crosses approximately 16 acres. Alternative Route A intersects more parcels (and landowners) and is 0.7 mile longer than Alternative Route B (see Table 1). Similarly, there are fewer residences, single-family dwellings, businesses, and commercial buildings within 100, 250, and 500 feet of centerline on Alternative Route B as compared to Alternative Route A. There is one cemetery within 250 feet of centerline on Alternative Route A and none on Alternative Route B. There is one designated place of worship within 1,000 feet of centerline for Alternative Route B and none for A. Neither Alternative Route passes through a park or recreational area. Both Alternative Routes cross US Highway 58, Jeb Stuart Highway; however, Alternative Route A crosses more local streets and roads than Alternative Route B. In addition, Alternative Route A crosses the Patrick County Hospital property which is under redevelopment and is scheduled to reopen in 2023. This development will require considerable coordination between the Project team and hospital administration during permitting and construction. The hospital development team indicated in an August 2022 meeting that future plans include constructing a helipad as well as other repairs and improvements to the hospital grounds and facilities.

The Rebuild Route crosses approximately 12 acres of prime and unique farmland and approximately 121 acres of farmland of statewide importance in the ROW. There are 124 parcels and 92 unique landowners within the ROW; however, since a majority of the Rebuild Route utilizes existing ROW, impacts are expected to be minimal. There are eight outbuildings and one residence within the Rebuild Route ROW. Existing easements pre-date many of these encroachments, and the Project Team will work closely with landowners during final engineering design to minimize impacts where feasible. Landowners did not express concerns during the open house or indicate future development along the Rebuild Route that would be impacted. The Rebuild Route 2 crosses the Fairystone Loop and the Sweet Mountain Laurel Loop, designated wildlife viewing driving routes that are part of the Virginia Bird and Wildlife Trail system. The proposed crossings are located within the existing ROW to minimize recreational and visual impacts. The Rebuild Route crosses four US highways, two state highways, and the Blue Ridge Parkway, a scenic byway, near the border of Floyd and Patrick counties. The Rebuild Route

will cross the Blue Ridge Parkway at its existing location, and any nearby structures will be rebuilt at or near existing locations thus minimizing any potential impacts.

5.3 Environmental Justice

It is the Company's long-standing practice in its route development processes to avoid or reasonably minimize impacts to the human environment, which includes environmental justice ("EJ") communities and fence line communities within the meaning of the Virginia Environmental Justice Act (§ 2.2-234 *et seq.* of the Code of Virginia), or the "Act." "***Environmental justice*** *means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy*" (VA Code § 2.2-234).

The Siting Team reviewed the United States Environmental Protection Agency's EJSCREEN (2023) tool and data from the American Community Survey from the United States Census Bureau. The EJSCREEN and Census Block Group ("CBG") data (the smallest geographic unit for which United States Census Bureau demographic data is available) was used to review the Project. Per the available EJSCREEN and American Community Survey data, there are 12 CBGs located within 1.0 mile of the existing Mayo River (Stuart) to Floyd ("Component 2") 69-kV Transmission Lines, eight of which are crossed by the line route for the Project. The results of the dataset are provided in Attachment F and the CBGs identified within 1.0 mile of the Project are depicted in Attachment B, Map 6. Of the 12 CBGs located within 1.0 mile of the line route, 10 meet or exceed the threshold of at least one "EJ community" as defined by the Act, namely low-income communities. Of these CBGs, seven are crossed by the line route for the Project.

The Project is not anticipated to have a disproportionately high or adverse impact on EJ communities as defined in the Act. The Project will generally rebuild the existing transmission line within or near the existing transmission line ROW. Relocating the Project from its current location would result in additional ROW impacts by crossing other similar EJ communities and was not considered a feasible alternative for the Project. As discussed in Section 4.0, Appalachian Power mailed notifications to 213 landowners who were within 1000 feet of a Study Segment (500 feet on either side) announcing the Project and inviting the public to provide feedback at virtual and in-person open houses, via the website, or by telephone. All landowner input received was reviewed by the Siting Team and, where feasible, Study Segments were adjusted to minimize impacts. The Company will continue to engage all affected landowners, including EJ communities as defined in the Act, throughout the duration of the Project.

5.4 Visual

Aesthetics are defined as a mix of landscape visual character, the context within which the landscape is viewed (view/user groups), and the scenic integrity of the landscape. Existing Floyd – Stuart 69-kV Transmission Line structures average 52 feet in height, and the proposed Component 2 transmission line structures average 80 feet in height for single-circuit structures and 100 feet for double-circuit structures. While taller structures may introduce new visual impacts, they provide the ability to reduce the overall number of structures for Component 2. Preliminary engineering review indicates the number of structures in or near existing ROW can be reduced by approximately 25 percent from the current transmission line. Additionally, the proposed structures are steel H-frames, which are comparable in character to the existing wood H-frames (see Figure 1).

Alternative Route A requires new ROW for approximately 1.0 mile until it crosses Jeb Stuart Highway; after the Jeb Stuart Highway crossing, Alternative Route A utilizes existing ROW, which minimizes new visual impacts to the community because the Alternative Route will be similar to the area's existing visual character. Alternative Route B is a greenfield route and, therefore, will introduce new structures in that area. Since Alternative Route B is situated among rolling hills and vegetation and away from surrounding residences, visibility will be limited. Alternative Routes A and B both introduce new crossings of Jeb Stuart Highway, which will change the visual at this location. Alternative Route A would likely require additional lighting and marker balls if the nearby hospital constructs a helipad, per Federal Aviation Administration requirements. This may increase Alternative Route A visibility near the hospital and Jeb Stuart Highway.

The Rebuild Route crosses the Blue Ridge Parkway, a National Parkway managed by the National Park Service, and it will cross at the same location with structures set back from the Parkway. The current transmission line crossing from one viewpoint looking at the cross section of the existing transmission line is illustrated in Attachment E, Photo 5. The Company will work with Blue Ridge Parkway and the National Park Service on a clearing plan for this area; however, measurable visual impacts to the Blue Ridge Parkway are not anticipated.

The existing Floyd – Stuart line crosses a mix of rural, forest and developed land areas. The entire Rebuild Route utilizes or is adjacent to existing ROW which minimizes any new visual impacts of Component 2. Replacing infrastructure where it already exists avoids new visual impacts to the surrounding community and landscape. Additionally, a majority of the Rebuild Route crosses through undeveloped forest and mountain terrain where a vegetative cover minimizes visual impacts. Taller, double-circuit structures averaging 100 feet in height will be used for certain portions of the Rebuild Route. Character along the Rebuild Route near the existing Floyd

Substation where double-circuit structures will be used is illustrated in Attachment E, Photo 6. Commercial and industrial land uses are currently near the Floyd Substation, and visual impacts there are expected to be minimal (Attachment E, Photo 7).

5.5 Constructability

Potential engineering and construction challenges are important to consider when siting a transmission line. Heavy angles, steep topography, nearby communication towers, antennas, airfields, and narrow ROW alignments are all elements that could require extensive or non-standard engineering leading to more impacts and costs. Component 2 uses existing ROW, which minimizes construction challenges since existing access roads can be used, minimal disturbance to areas not crossed previously by the ROW will be realized, and few crossings of new roads or other linear infrastructure is required. The Siting Team attempted to reduce engineering challenges during route development by using existing ROW as much as possible.

Alternative Route B requires new ROW for approximately three miles. Alternative Route B crosses an East Tennessee gas line at a new location north of the Jeb Stuart Highway crossing. In the same area, a new crossing of the existing Fieldale – Stuart 69-kV Transmission Line is required; however, as part of the larger Stuart Project this line will eventually be retired. Alternative Route A requires new ROW for approximately one mile then utilizes existing ROW for approximately 2.0 miles before merging into the Rebuild Route. Alternative Route A also introduces a new crossing of the Fieldale – Stuart line but crosses the East Tennessee gas line at an existing location. Alternative Route A crosses steep slopes over 47 percent of its length while Alternative Route B crosses 53 percent over its length. Alternative Route A has two heavy angles compared to Alternative Route B which has only one.

Alternative Route A will be constructed adjacent to the hospital and its future medevac helipad. At a minimum, mitigations would likely be necessary such as additional clearing, grading, FAA structure lighting, and aerial marker balls.

For the Rebuild Route, constructability concerns are minimized by using the existing ROW and rebuilding on centerline to the extent practical. The Rebuild Route does not cross any gas or other pipelines, only has two heavy angles, and only crosses approximately 13 percent steep slopes. A comparison of Alternative Route evaluation criteria and potential impacts is shown in **Table 1**.

TABLE 1. ALTERNATIVE ROUTE EVALUATION CRITERIA				
Alternative Route	**Unit**	**Alternative Route A**	**Alternative Route B**	**Rebuild Route**
General				
Length	miles	4.2	3.5	18.5
Human Environment				
Barns, outbuildings, sheds, etc. in ROW[1]	count[1]	0	0	8
Residences/single-family dwellings within ROW	count	0	0	1
Residences/single-family dwellings within 100 feet of centerline	count	1	0	11
Residences/single-family dwellings within 250 feet of centerline	count	3	0	30
Residences/single-family dwellings within 500 feet of centerline	count	14	1	59
Number of parcels crossed	count	25	15	124
Unique landowners within ROW	count	19	12	92
Places of Worship within 1,000 feet	count	0	1	3
Cemeteries within 250 feet	count	1	0	7
Water Resources				
Total streams crossed	count	5	4	40
High/Exceptional/Special Protection streams crossed	count	1	0	2
Riparian buffers crossed	count	4	4	22
Waterbody crossings	count	0	0	1
Constructability				
Existing 69 kV transmission lines paralleled	miles	0	0	0
US highways crossed	count	1	1	4
Existing 69 kV transmission lines crossed	count	1	1	0
Steep slopes (>20%) crossed by ROW, percent of total length	percent	47	53	45
Heavy angles, greater than 30%	count	2	1	4
Oil and gas pipelines crossed	count	1	1	0
Geological and Soil Resources				
Prime and unique farmland soil in the ROW[2]	acres[2]	5	6	12
Farmland of statewide importance in the ROW[3]	acres[3]	23	16	121

TABLE 1. ALTERNATIVE ROUTE EVALUATION CRITERIA				
Alternative Route	**Unit**	**Alternative Route A**	**Alternative Route B**	**Rebuild Route**
Wildlife and Habitat				
Tree clearing required in ROW (digitized based on aerial photography)	acres	19	33	56
Threatened and Endangered Species in ROW	count	0	0	2
Protected Land				
Federal/state land crossed by ROW	count	0	0	1
Conservation easements crossed by ROW	count	0	0	3

Notes:
[1]Values assume a 100-foot-wide ROW.
[2]Prime farmland is land with the best combination of physical and chemical characteristics for producing crops.
[3]Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance.

6.0 THE PROPOSED ROUTE

Alternative Route B and the Rebuild Route were identified as the **Component 2 Proposed Route** (22.0 miles in total length) following an extensive data gathering, route development, stakeholder input, and comparative analysis process (Attachment B, Map 7). A summary of rationale for selecting the Component 2 Proposed Route as the route that minimizes impacts follows. This rationale is derived from accumulated siting decisions made throughout the process, Siting Team knowledge and experience, public and regulatory agency comments, and the comparative analysis of potential impacts presented in Section 5.0.

A stepwise process was undertaken by the Siting Team to compare options for rebuilding the existing transmission line. First, a Study Area was defined, and constraint and opportunities data was collected (Map 1). The existing ROW was reviewed, and a focus area with a reroute segment was developed due to existing land use constraints near the existing ROW (Maps 2 and 3). The Reroute Segments and the Rebuild Route were presented at in-person and virtual public open houses. Using stakeholder input, site visit evaluations, and comparative analysis, the Siting Team reviewed and analyzed two alternative routes (Alternative Route A and Alternative Route B) in the Mayo River Focus Area and the Rebuild Route (Maps 4 and 5). The Siting Team selected Alternative Route B and the Rebuild Route as the Component 2 Proposed Route (Map 7) additionally see the GIS Constraints Map, Exhibit 8 of the Company's SCC Application.

The Rebuild Route was selected because minimal new ROW is required thereby minimizing impacts to the natural and human environment. It also minimizes potential constructability issues by reducing required new access roads and tree clearing and minimizing impacts to landowners along the Component's centerline. Alternative Route B was selected for the following reasons:

- Avoids land use and engineering conflicts with the Patrick County Hospital proposed Medevac/Helipad.
- Avoids additional visual impacts from FAA marker balls and lighting near the hospital.
- Avoids two crossings over US Route 58 (visual, permitting, and engineering benefits).
- Avoids multiple crossings of the scenic South Mayo River.
- Avoids proximity to residences.
- Reduces constructability challenges.

Component 2 will be rebuilt on centerline of the existing ROW except for a greenfield portion exiting the proposed Mayo River Substation and other minor deviations from centerline to optimize design or avoid constraints. The Proposed Route is 22.0 miles in length of which approximately 3.5 miles is greenfield construction and the remainder is in or near the existing ROW (**Table 2**). After the Proposed Route was selected, additional engineering adjustment and analysis was completed, and the Siting Team further minimized potential impacts to landowners along the Component 2 Proposed Route through minor route shifts. Engineering adjustments were made so the Component 2 Proposed Route only has one residence within the proposed ROW. Accordingly, and subject to completion of final engineering and ROW negotiations with affected landowners, the Company will work with landowners to remove or relocate the dwelling as needed.

The Proposed Route begins at the proposed Mayo River Substation off Commerce Drive and requires new ROW for approximately 3.5 miles through Patrick County. The Proposed Route exits the proposed Mayo River Substation as a double-circuit line to the north and heads northeast for approximately 1.0 mile. One circuit and line diverges east at the existing Fieldale – Stuart 69-kV line.[5] The other single-circuit and line portion continues to the northwest toward the existing Floyd – Stuart 69-kV line ROW for approximately 2.5 miles before connecting back to the Rebuild Route and existing Floyd – Stuart 69-kV ROW.

After rejoining the existing ROW, the Component 2 Proposed Route continues for approximately 3.44 miles and deviates to the east after crossing Fairystone Park Highway. The Proposed Route diverts from centerline at this location north of Fairystone Park Highway to minimize impacts to surrounding residences with one residence on the edge of the ROW that the Company expects to avoid, pending final engineering and ROW negotiations. The Proposed Route shifts east again after crossing State Road 775 to minimize potential impacts to a pond crossed by the current ROW. After approximately 0.83 mile, the Proposed Route returns to centerline and continues along the existing ROW for approximately three miles before turning west and entering the existing Woolwine Substation. There is one dwelling in the proposed ROW, off Crestview Road, that could not be avoided due to other residences surrounding the existing ROW. The Company will continue to collaborate with landowners to remove or relocate dwellings as needed and minimize impacts where feasible.

[5] The separate Project Component 3 will continue east within the ROW of the existing Fieldale – Stuart 69-kV line that will be rebuilt.

The Proposed Route then exits the existing Woolwine Substation to the east and turns north following existing centerline for approximately 10.5 miles before diverging to the west, south of crossing US-221 North Highway. The Proposed Route then meets up with the existing Claytor-Fieldale 138-kV Transmission Line ROW after the US-221 North Highway crossing and begins as a double-circuit line. It continues to follow the existing 138-kV ROW for approximately 0.5 mile into the Floyd Substation.

Collectively, the Siting Team believes the Component 2 Proposed Route: (1) is most consistent with the siting guidelines by using existing ROW to the extent practical; (2) reasonably minimizes adverse impacts on area land uses and the natural and human environment by using existing ROW with logical diversions; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner. Proposed Route evaluation data and details are included in **Table 2**.

TABLE 2. PROPOSED ROUTE EVALUATION DATA		
Criteria	**Unit**	**Quantity**
Total length	miles	22.0
Length Rebuilt within Existing ROW	miles	16.24
Length Built within New ROW	miles	5.62
Natural Environment		
Streams crossed (NHD)	count	44
Wetlands in ROW (NWI)	count	50
High/Exceptional/Special Protection Streams Crossed	count	2
Approximate tree clearing required in ROW (digitized based on aerial photography)	acres	89
Prime and unique farmland soil in ROW (based on SSURGO data)[6]	acres	18
Farmland of statewide importance in ROW (SSURGO)[7]	acres	137
Conservation easements crossed by ROW	count	3
Human Environment[8]		
Barns, outbuildings, shed, garages, and silos in ROW	count	8
Residences/single-family dwellings within ROW[9]	count	1
Residences/single-family dwellings within 100 feet of centerline	count	7
Multi-family dwellings within ROW	count	0
Businesses/commercial buildings within ROW	count	0
Schools within 1,000 feet of the centerline	count	1
Designated places of worship within 1,000 feet of centerline	count	4
Cemeteries within 250 feet of centerline	count	7
Parcels crossed	count	139
Unique Landowners within ROW	count	104
Cultural Resources		
NRHP-listed sites within one mile of centerline	count	4
NRHP-eligible sites within one mile of centerline	count	3
Historic districts within one mile of centerline	count	2
Listed archaeological sites within ROW	count	3

[6] Prime farmland is land with the best combination of physical and chemical characteristics for producing crops (based on USDA-NRCS SSURGO data).

[7] Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance (based on USDA-NRCS SSURGO data).

[8] Building footprints were obtained from a combination of sources including LiDAR imagery, Microsoft Building Footprints, and field reviews, as available.

[9] One residence encroaches on the existing ROW. Accordingly, and subject to completion of final engineering and ROW negotiations with the affected landowner, the Company will work with them to remove or relocate the residence as needed.

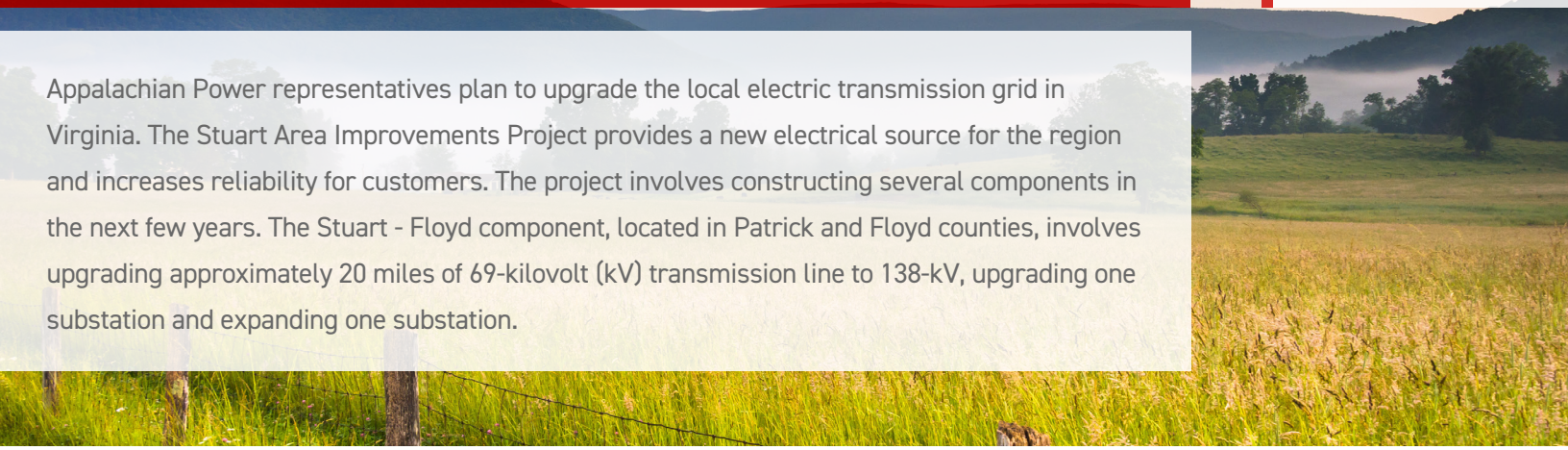
TABLE 2. PROPOSED ROUTE EVALUATION DATA		
Transportation Resources		
Interstates crossed	count	0
US highways crossed	count	5
State highways crossed	count	6
Local roads and streets crossed	count	22
Railroads crossed	count	0
Utility Resources		
Oil and gas pipelines crossed	count	1
Communication towers within 1,000 feet of centerline	count	1
Existing 69-kV Transmission Lines crossed	count	0
Existing 138-kV Transmission Lines crossed	count	1
Heavy line angles, greater than 30 degrees	count	5

Attachment A: Outreach Fact Sheet

STUART AREA IMPROVEMENTS PROJECT

STUART - FLOYD TRANSMISSION LINE REBUILD PROJECT

APPALACHIAN POWER
An AEP Company
BOUNDLESS ENERGY



Appalachian Power representatives plan to upgrade the local electric transmission grid in Virginia. The Stuart Area Improvements Project provides a new electrical source for the region and increases reliability for customers. The project involves constructing several components in the next few years. The Stuart - Floyd component, located in Patrick and Floyd counties, involves upgrading approximately 20 miles of 69-kilovolt (kV) transmission line to 138-kV, upgrading one substation and expanding one substation.

WHAT

The Stuart-Floyd Transmission Line Rebuild Component involves:

- Upgrading approximately 20 miles of 69-kV transmission line to 138-kV in or near the existing right of way, which may include new or updated property easements
- Upgrading the Woolwine Substation
- Expanding the Floyd Substation
- Retiring the Stuart Substation and building a new substation in Stuart (as part of Stuart - Willis Gap Transmission Line Component)

This project requires approval by the Virginia State Corporation Commission (SCC).

WHY

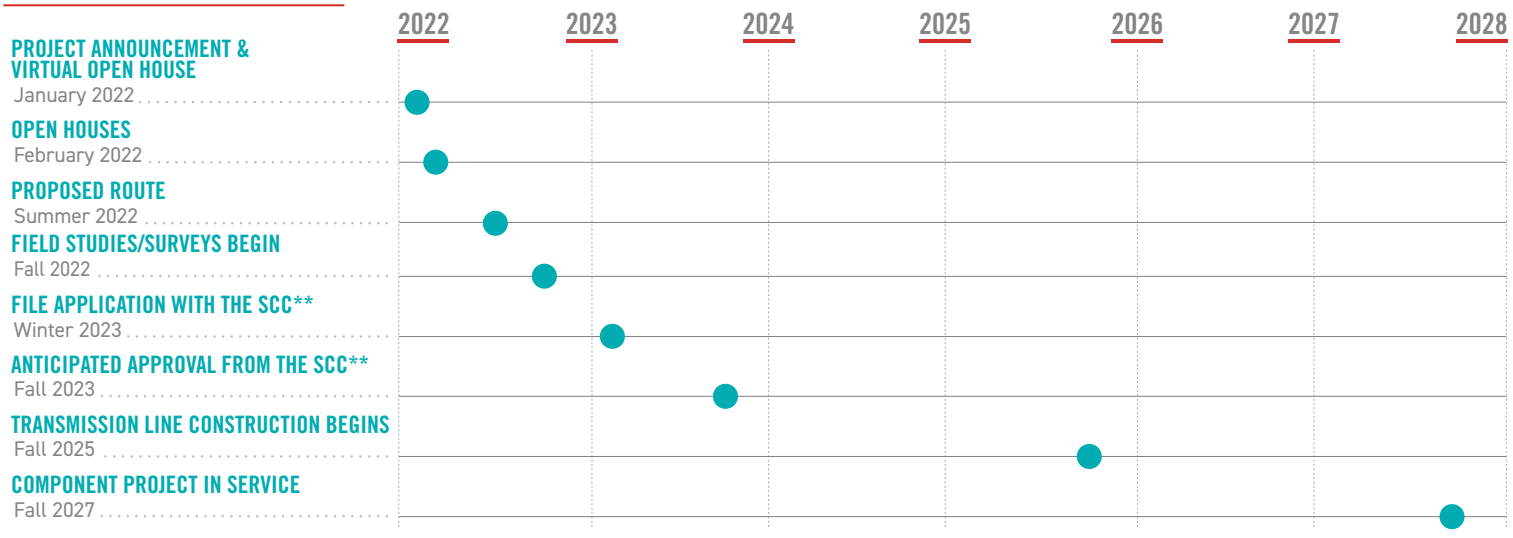
Project benefits include:

- Mondernizing the aging 69-kV electrical infrastructure to a more reliable, higher capacity 138-kV transmission system
- Increasing electrical capacity at the Woolwine and Floyd substations to improve service for area customers and support future economic development at the Floyd Regional Commerce Center
- Establishing a second source of power and connecting the local 138-kV electrical system to the new substations and transmission lines proposed in the Claudeville, Stuart and Willis Gap communities (Stuart - Willis Gap Transmission Line Component)
- Providing a more robust and reliable electric transmission system to support local communities

WHERE

The project begins at the Floyd Substation located off Route 615 near the town of Floyd and travels south approximately 10 miles to the Woolwine Substation located off Woolwine Highway in Woolwine. The project continues south approximately 10 miles and connects to the potential substation off Commerce Drive just outside the town of Stuart.

PROJECT SCHEDULE*



*Timeline subject to change.

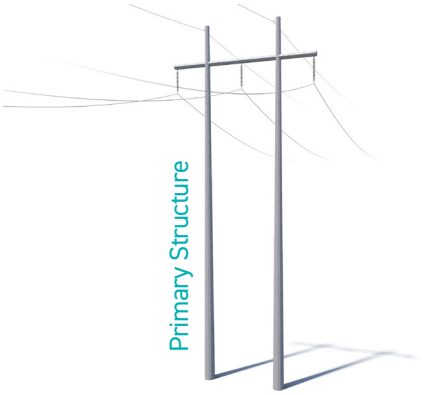
**Virginia State Corporation Commission

TYPICAL STRUCTURES

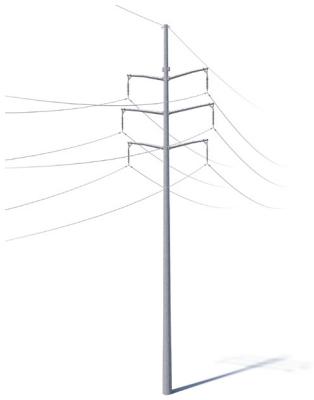
Crews plan to rebuild most of the line using steel, H-frame structures; however, crews plan to use steel, double circuit single-pole structures between Highway 221 and the Floyd Substation. At select locations, crews may use steel single pole structures, lattice towers and three-pole structures with guy wires to meet engineering needs.

Typical Structure Height: 80-100 feet*
Right-of-Way Width: Approximately 100 feet*

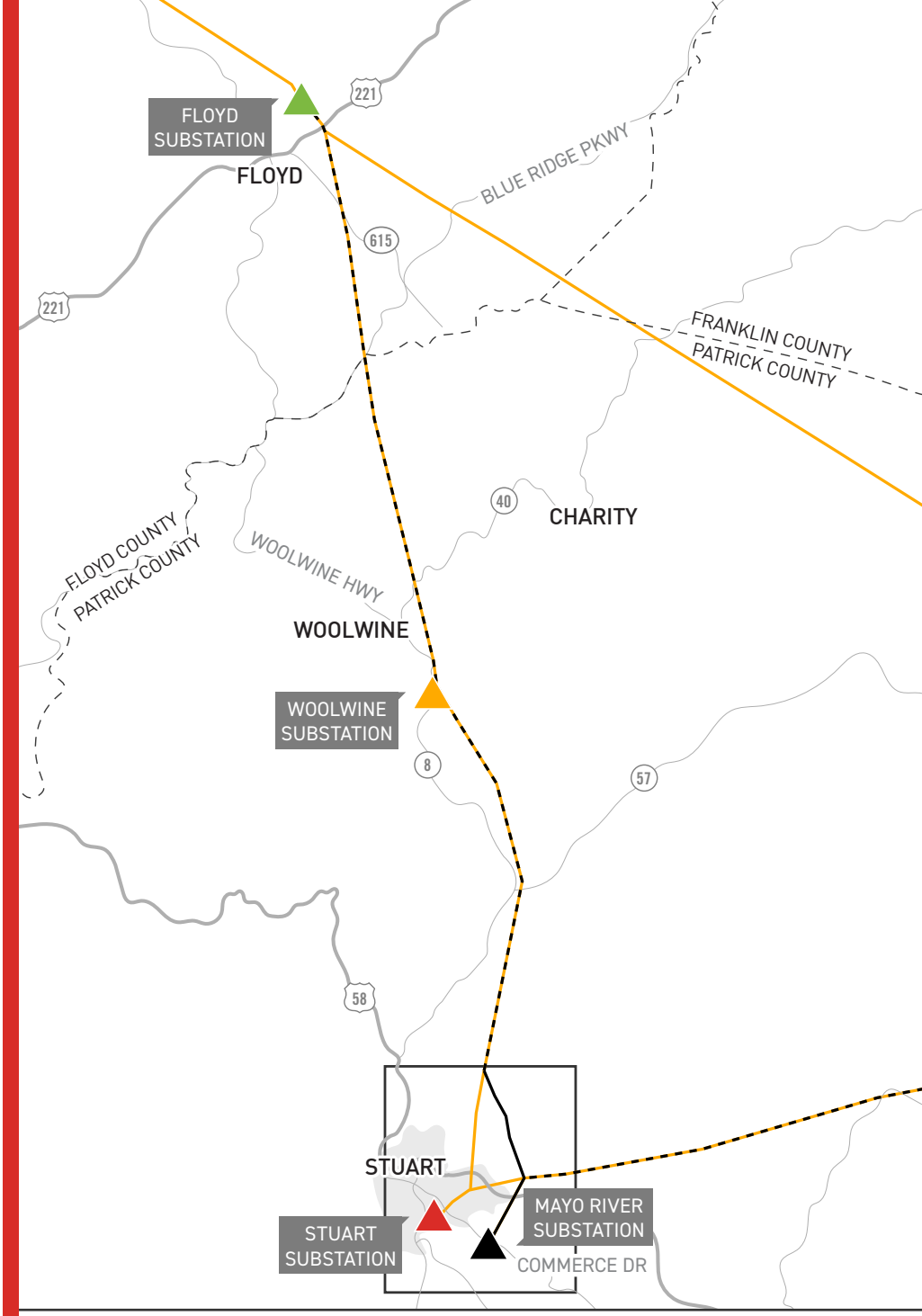
*Exact structure, height and right-of-way requirements may vary



Single Circuit H-Frame



Double Circuit Single-Pole



STUART AREA IMPROVEMENTS PROJECT:
STUART - FLOYD TRANSMISSION LINE REBUILD PROJECT

- EXISTING TRANSMISSION LINE
- TRANSMISSION LINE TO BE REBUILT
- PROPOSED TRANSMISSION LINE
- PREVIOUSLY ANNOUNCED IN THE STUART-WILLIS GAP TRANSMISSION LINE COMPONENT
- EXISTING SUBSTATION
- PROPOSED SUBSTATION
- SUBSTATION TO BE RETIRED
- SUBSTATION TO BE EXPANDED

N

APPALACHIAN POWER VALUES YOUR INPUT ABOUT THIS PROJECT. PLEASE SEND COMMENTS AND QUESTIONS TO:

CORTNEY MUSTARD
Project Outreach Specialist Sr.
833-760-0604
Apco_Outreach@aep.com
www.AppalachianPower.com/Stuart

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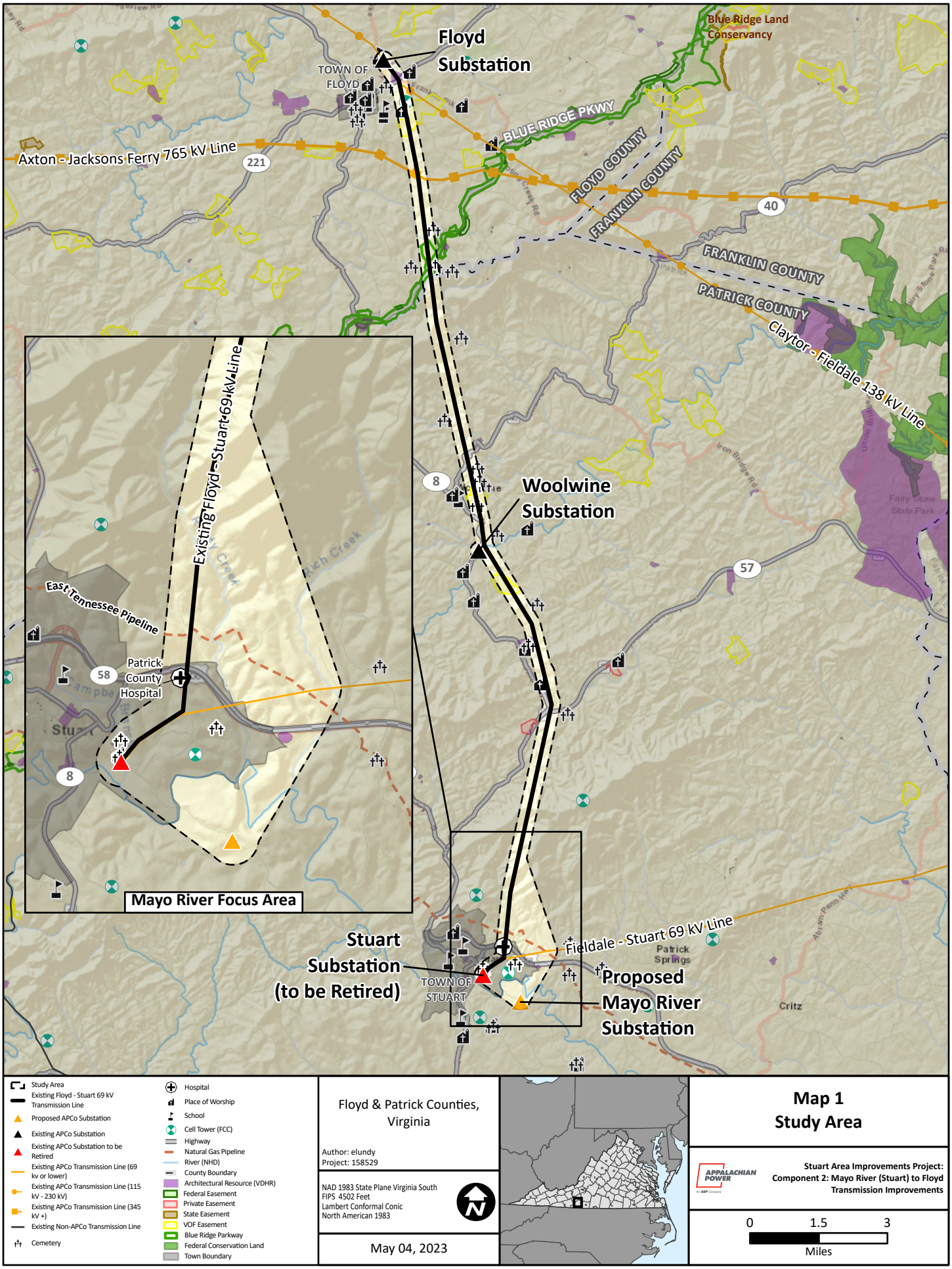
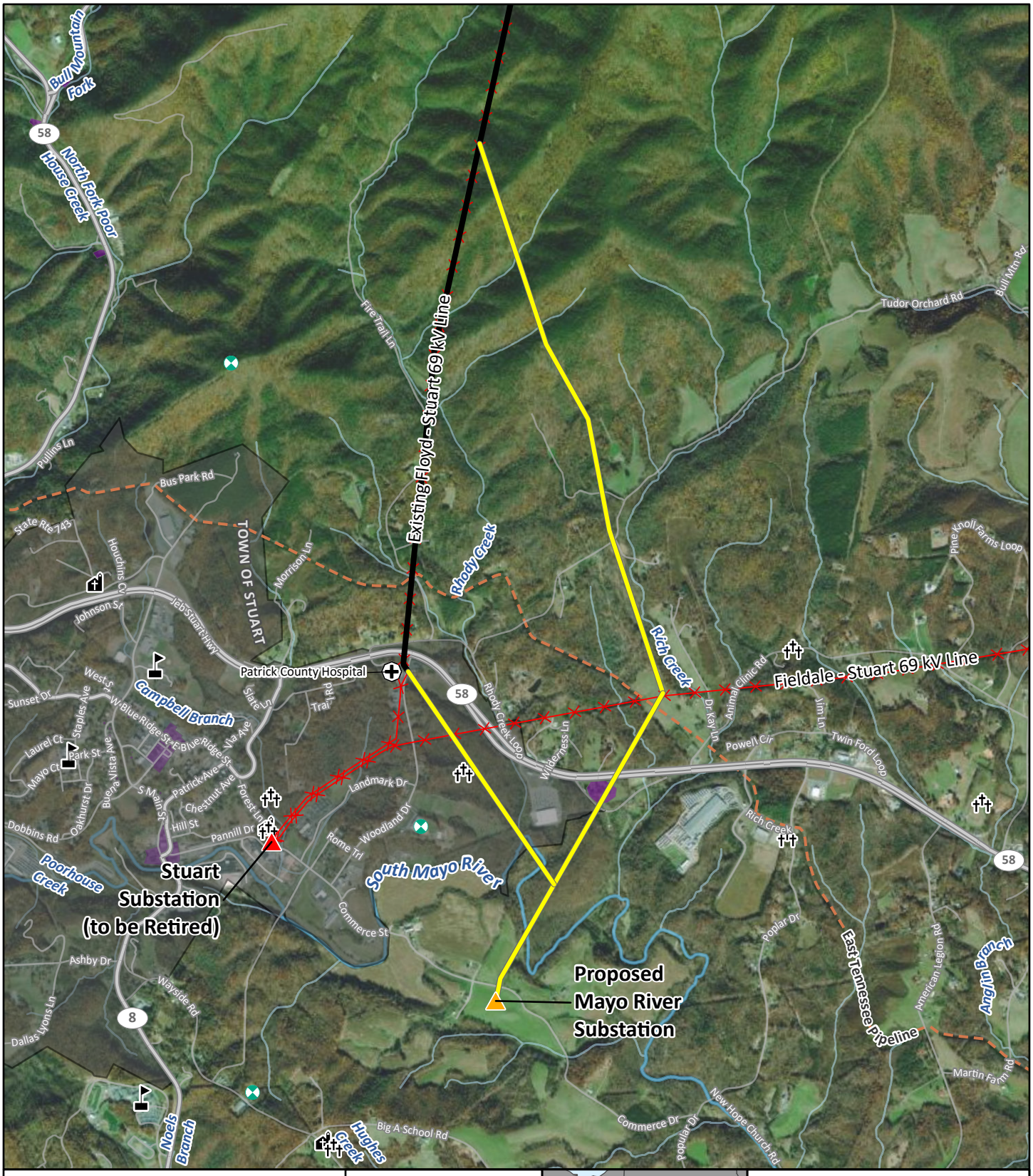
09/07/2022

Attachment B: Route Development Maps


Floyd Substation
TOWN OF FLOYD
Blue Ridge Land Conservancy
BLUE RIDGE PKWY
Axton - Jacksons Ferry 765 kV Line
221
FLOYD COUNTY
FRANKLIN COUNTY
40
FRANKLIN COUNTY
PATRICK COUNTY
Claytor - Fieldale 138 kV Line
Fairy Stone State Park
Woolwine Substation
8
57
Existing Floyd - Stuart 69 kV Line
East Tennessee Pipeline
Patrick County Hospital
58
8
Mayo River Focus Area
Stuart Substation (to be Retired)
TOWN OF STUART
Fieldale - Stuart 69 kV Line
Patrick Springs
Proposed Mayo River Substation
Critz
Study Area
Existing Floyd - Stuart 69 kV Transmission Line
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Cemetery
Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Natural Gas Pipeline
River (NHD)
County Boundary
Architectural Resource (VDHR)
Federal Easement
Private Easement
State Easement
VOF Easement
Blue Ridge Parkway
Federal Conservation Land
Town Boundary
Floyd & Patrick Counties, Virginia
Author: elundy
Project: 158529
NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983
May 04, 2023
Map 1
Study Area
APPALACHIAN POWER
Stuart Area Improvements Project: Component 2: Mayo River (Stuart) to Floyd Transmission Improvements
0
1.5
3
Miles



Study Segment (New ROW)
Study Segment (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation to be Retired
Existing Transmission Line to be Retired
Cemetery
Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Road
Natural Gas Pipeline
River (NHD)
Stream (NHD)
Architectural Resource (VDHR)
Town Boundary

Patrick County, Virginia

Author: elundy
Project: 158529

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North American 1983

May 04, 2023

Map 2
Mayo River Focus Area

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd Transmission Improvements

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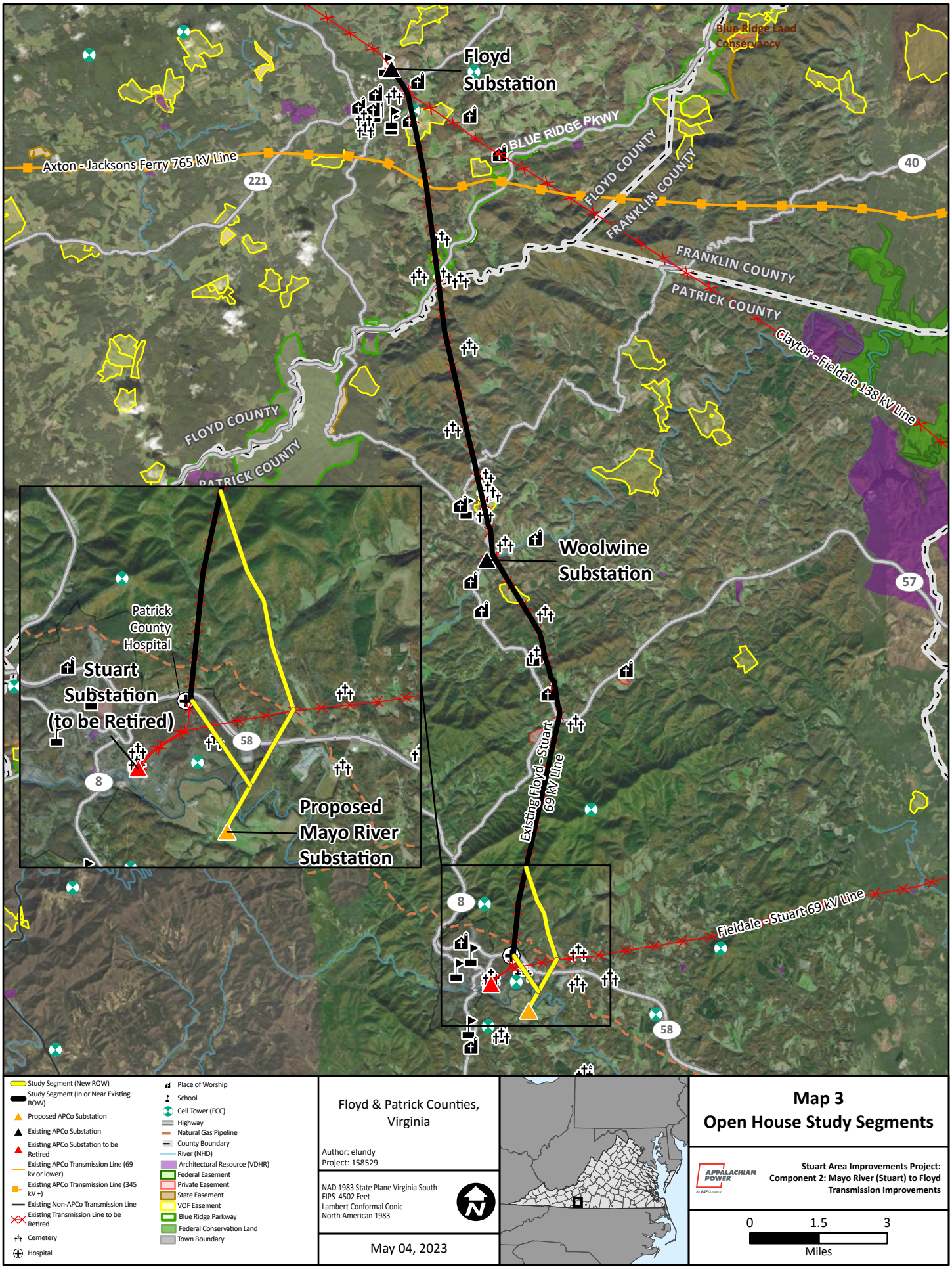
Floyd Substation
Blue Ridge Land Conservancy
BLUE RIDGE PKWY
Axton - Jacksons Ferry 765 kV Line
221
40
FLOYD COUNTY
FRANKLIN COUNTY
FRANKLIN COUNTY
PATRICK COUNTY
Claytor - Fieldale 138 kV Line
FLOYD COUNTY
PATRICK COUNTY
Woolwine Substation
57
Patrick County Hospital
Stuart Substation (to be Retired)
58
8
Proposed Mayo River Substation
Existing Floyd - Stuart 69 kV Line
8
Fieldale - Stuart 69 kV Line
58
Study Segment (New ROW)
Study Segment (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Cemetery
Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Natural Gas Pipeline
County Boundary
River (NHD)
Architectural Resource (VDHR)
Federal Easement
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State Easement
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Blue Ridge Parkway
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Floyd & Patrick Counties, Virginia
Author: elundy
Project: 158529
NAD 1983 State Plane Virginia South
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Lambert Conformal Conic
North American 1983
May 04, 2023
Map 3
Open House Study Segments
APPALACHIAN POWER
Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd Transmission Improvements
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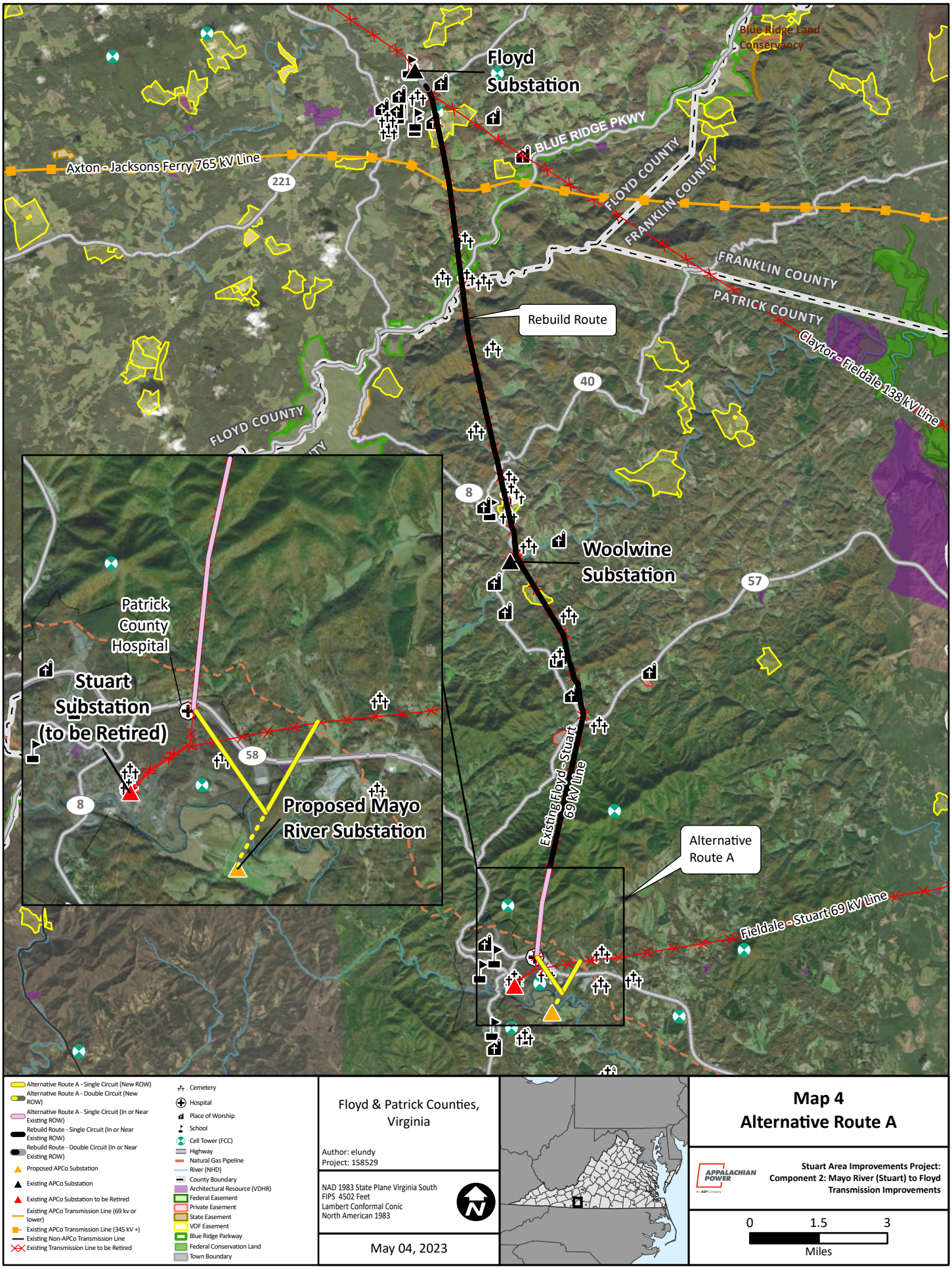
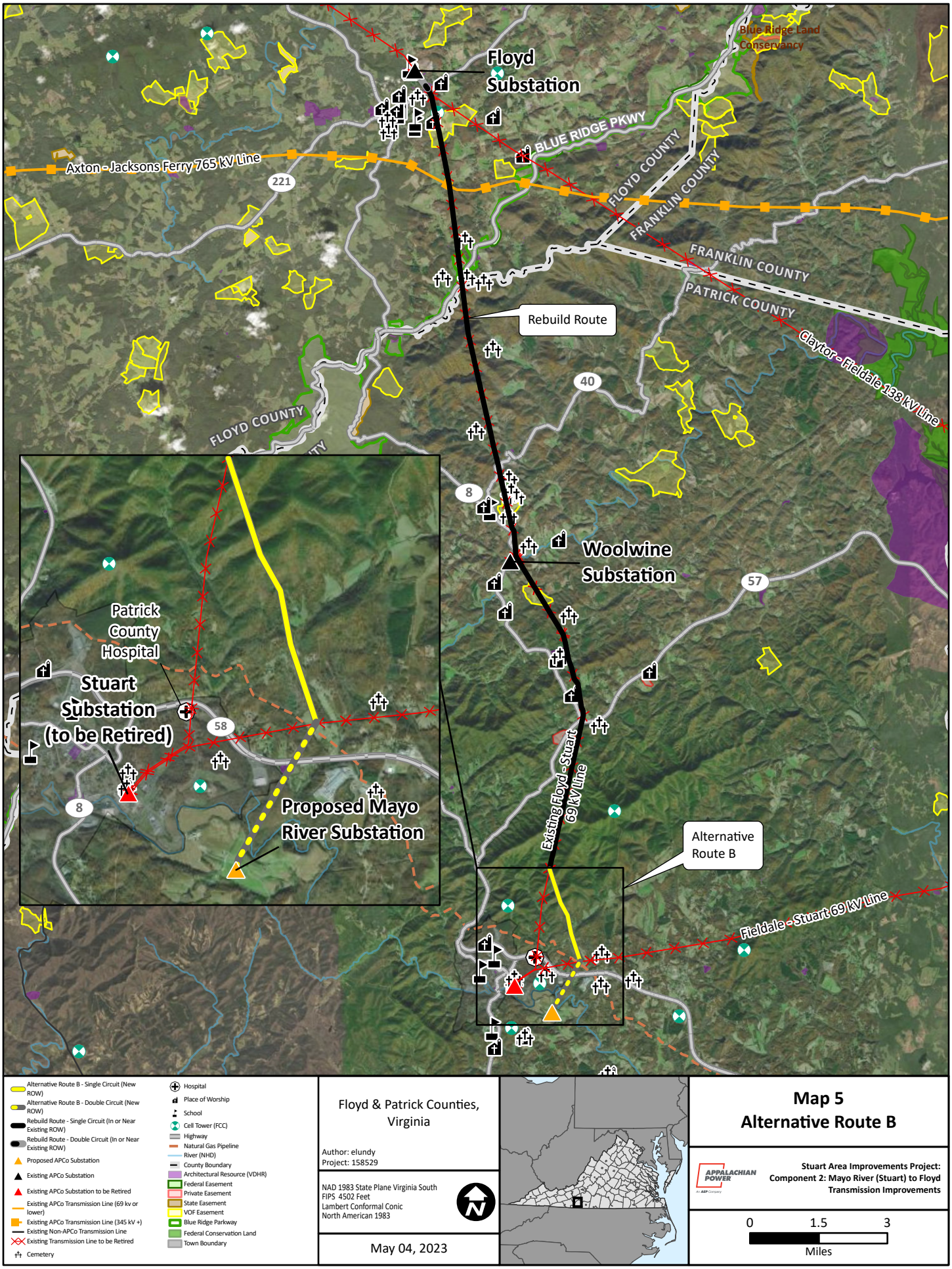

Floyd Substation
Blue Ridge Land Conservancy
BLUE RIDGE PKWY
Axton - Jacksons Ferry 765 kV Line
221
FLOYD COUNTY
FRANKLIN COUNTY
FRANKLIN COUNTY
PATRICK COUNTY
Rebuild Route
Claytor - Fieldale 138 kV Line
40
FLOYD COUNTY
8
Woolwine Substation
57
Patrick County Hospital
Stuart Substation (to be Retired)
58
8
Proposed Mayo River Substation
Existing Floyd - Stuart 69 kV Line
Alternative Route A
Fieldale - Stuart 69 kV Line
Alternative Route A - Single Circuit (New ROW)
Alternative Route A - Double Circuit (New ROW)
Alternative Route A - Single Circuit (In or Near Existing ROW)
Rebuild Route - Single Circuit (In or Near Existing ROW)
Rebuild Route - Double Circuit (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Cemetery
Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Natural Gas Pipeline
River (NHD)
County Boundary
Architectural Resource (VDHR)
Federal Easement
Private Easement
State Easement
VOF Easement
Blue Ridge Parkway
Federal Conservation Land
Town Boundary
Floyd & Patrick Counties, Virginia
Author: elundy
Project: 158529
NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983
May 04, 2023
Map 4
Alternative Route A
APPALACHIAN POWER
Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd
Transmission Improvements
0
1.5
3
Miles



Alternative Route B - Single Circuit (New ROW)
Alternative Route B - Double Circuit (New ROW)
Rebuild Route - Single Circuit (In or Near Existing ROW)
Rebuild Route - Double Circuit (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Cemetery

Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Natural Gas Pipeline
River (NHD)
County Boundary
Architectural Resource (VDHR)
Federal Easement
Private Easement
State Easement
VOF Easement
Blue Ridge Parkway
Federal Conservation Land
Town Boundary

Floyd & Patrick Counties, Virginia

Author: elundy
Project: 158529

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Map 5
Alternative Route B

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Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd Transmission Improvements

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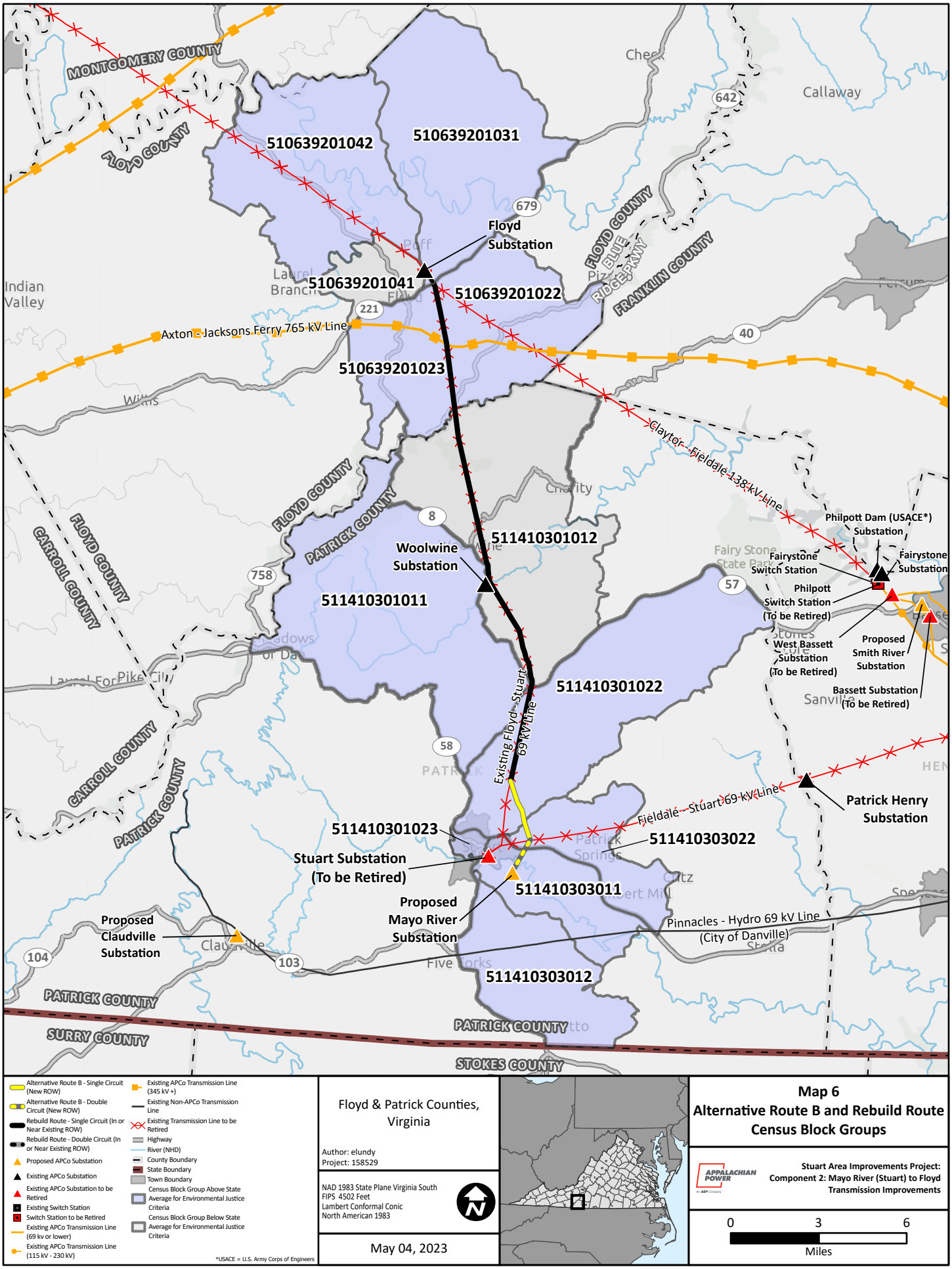
Miles



Alternative Route B - Single Circuit (New ROW)
Alternative Route B - Double Circuit (New ROW)
Rebuild Route - Single Circuit (In or Near Existing ROW)
Rebuild Route - Double Circuit (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Highway
River (NHD)
County Boundary
State Boundary
Town Boundary
Census Block Group Above State Average for Environmental Justice Criteria
Census Block Group Below State Average for Environmental Justice Criteria

*USACE = U.S. Army Corps of Engineers

Floyd & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 6
Alternative Route B and Rebuild Route Census Block Groups

APPALACHIAN POWER

Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd Transmission Improvements

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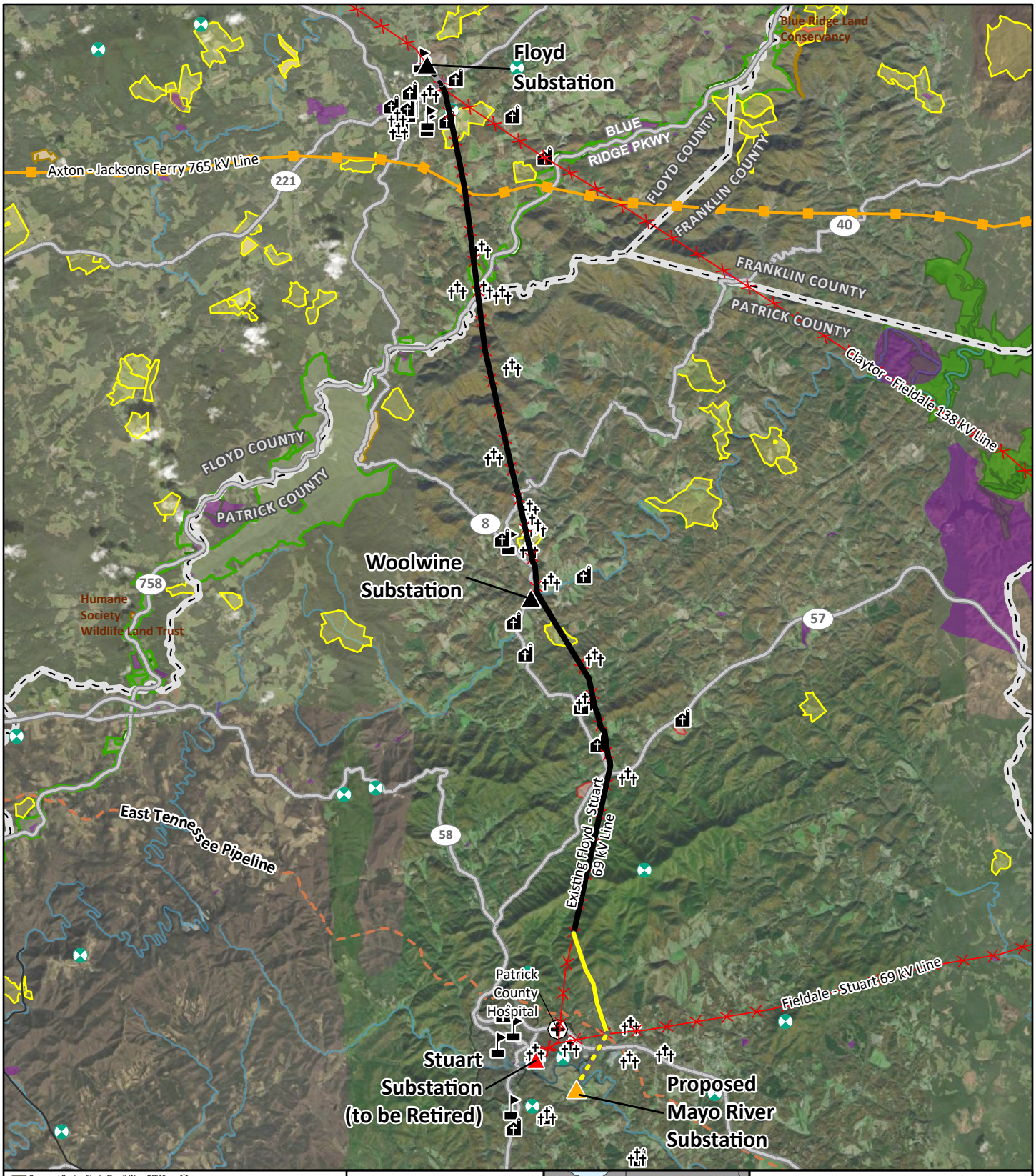
Miles



Proposed Route - Single Circuit (New ROW)
Proposed Route - Double Circuit (New ROW)
Proposed Route - Single Circuit (In or Near Existing ROW)
Proposed Route - Double Circuit (In or Near Existing ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Cemetery

Hospital
Place of Worship
School
Cell Tower (FCC)
Highway
Natural Gas Pipeline
County Boundary
River (NHD)
Architectural Resource (VDHR)
Federal Easement
Private Easement
State Easement
VOF Easement
Blue Ridge Parkway
Federal Conservation Land
Town Boundary

Floyd & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 7
Component 2 Proposed Route

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 2: Mayo River (Stuart) to Floyd Transmission Improvements

0 1.5 3
Miles

Attachment C: GIS Data Sources

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Land Use		
Number of parcels crossed by the ROW	Component 2 – Patrick County Parcel Data (2022), Floyd County Parcel Data (2022)	Count of the number of parcels crossed by the ROW
Number of residences within 50, 100, 250, and 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019 and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of residences within the ROW and within 50, 100, 250, and 500 feet of potential routes
Number of commercial buildings within 50, 250, and 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019), and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of commercial buildings within the ROW and within 50, 250, and 500 feet of potential routes
Land use acreage and distance crossed by the ROW and acreage within 50 feet of the route centerline	National Land Cover Database [NLCD] (2022)	The National Land Cover Database (NLCD 2022) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed	National Conservation Easement Database (NCED) National Conservation Easement Database (NCED) (2020)	Private conservation easements crossed by the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies
Acres of agricultural district land crossed	National Land Cover Database [NLCD] (2019)	Protected land that is devoted exclusively to agricultural production or devoted to and qualified for compensation under a federal land retirement or conservation program that is at least 10 acres in size, or produces an average yearly gross income of at least $2,500 during a 3-year period
Number of archeological resources within the ROW and 250 feet of centerline	VDHR's VCRIS (2022)	Previously identified archeological resources listed or eligible on the National Register of Historic Places (NRHP) acquired through VDHR's VCRIS (2022)

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Number of historic architectural resources within the ROW, within 1.0 mile	VDHR's VCRIS (2022)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP acquired through VDHR's VCRIS (2022)
Institutional uses (i.e., schools, places of worship, hospitals, assisted living) within 1000 feet of the route centerline. Cemeteries with 250 of centerline	United States Geological Survey's (USGS's) (GNIS) 2022	This dataset includes the locations of churches, hospitals, parks, and schools. Features within 1,000 feet of potential routes were field verified. Cemetery locations within 250 of the route centerlines.
Airfield and heliports within 1 mile of the route centerline	USGS's (GNIS) 2022 and the Federal Aviation Administration (FAA) database 2020	Distance from airfields and heliports
Natural Environment		
Forest clearing within the ROW	Digitized based on Virginia Geographic Information Network VGIN (2019) and Google Earth (2017; 2019); NLCD Tree Canopy Cover (2016)	Acres of forest within the ROW
Number of National Hydrography Dataset (NHD) stream and waterbody crossings within the ROW	USGS 2022	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells
Acres of National Wetland Inventory (NWI) wetland crossings within the ROW	United States Fish and Wildlife Service (USFWS) 2022	The NWI produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats
Acres of 100-year floodplain crossings within the ROW	United States Federal Emergency and Management Agency (FEMA) (2008)	Acres of 100-year floodplain within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2022); VA-DCR, Natural Heritage Conservation Lands Database (2021)	Miles of federal, state and local lands crossed by the ROW
Threatened, endangered, rare or sensitive species occurrence within the Project vicinity	USFWS Critical Habitat Report (2022)	Known occurrences; locations of potential habitat based on land use

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Percent of hydric soils within the ROW	United States Department of Agriculture (USDA-NRCS), Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Database (2021)	Percent of soil associations crossed by the ROW characterized as hydric, predominantly hydric, partially hydric and non-hydric
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (2021)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Technical		
Route length	Measured in GIS	Length of route in miles
Number and severity of angled structures	Developed in GIS	Anticipated number of angled structures less than 3 degrees, 3 to 45 degrees and more than 45 degrees based on preliminary design
Number of road crossings	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Count of federal, state and local roadway crossings
Number of pipeline crossings	S&P Global Platts NGL Refined Product Pipelines (2021)	Number of known pipelines crossed by the transmission line ROW
Number of transmission line crossings	AEP TGIS Database (2022)	Number of high voltage (100 kV or greater) transmission lines crossed by the ROW
Distance of steep slopes crossed	Derived from seamless Digital Elevation Models (DEMs) obtained from the United States Geological Survey (2022)	Miles of slope greater than 20% crossed by the routes
Length of transmission line parallel	AEP TGIS Database (2022)	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	S&P Global Platts NGL Refined Product Pipelines (2021)	Miles of the route parallel to existing pipelines
Length of road parallel	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Miles of the route parallel to existing roadways

Attachment D: Data Collection Summary

Data Source	Description
GIS Data	See typical GIS data sources in Attachment C.
Field Inspections	Siting Team members conducted field inspections throughout the Study Area and along the proposed Study Segments throughout 2019, 2021, and 2022.
Federal Agencies	• United States Fish and Wildlife Service's (USFWS), Virginia Ecological Services Office utilizing the Information, Planning and Consultation (IPAC) System [April 2023]
State Agencies	• Virginia Department of Historic Resources' Virginia Cultural Resources Information System database review [2022] • Virginia Department of Environmental Quality databases [2022] • Virginia Department of Wildlife Resources online databases for sensitive species and habitats [2022] • Virginia Department of Conservation and Recreation Natural Heritage Program [2022]
Local Agencies/Officials	• Patrick County Officials – virtual presentation to officials by Siting personnel. [June 2021, September 2021]. • Patrick County Officials – in-person meeting [August 2022] • Floyd County Officials – virtual presentation to officials by Siting personnel [November 2021]
Other Stakeholders	• Patrick County Hospital – in-person meeting [August 2022]
Open House(s)	• A news release was distributed to the public on February 9, 2022 • Two separate Project mailings were sent to 213 landowner addresses on February 9 and 11, 2022. The outreach mailings included a letter, postcard, component fact sheet, comment card with a prepaid postage return envelope, and trifold letter of Project and Component information. • An automated telephone notification from the Company was made on February 15, 2022, to notify landowners about the open houses. A total of 96 landowners were reached through the voicemail message on February 15, 2022. • Appalachian Power hosted a public open house on February 23 and 24, 2022 from 5 p.m. to 7 p.m. at Floyd Elementary School (531 Oak Hill Dr. SW) and Stuart Rotary Field (420 Woodland Drive, Memorial Building) • 22 landowners attended the public open house.
Individual Landowners	• No landowner requested on-site visits by the Siting Team. The Siting Team followed up with individual landowners via phone or email as needed. ROW team members met with landowners later during the siting process.
Website and Mailed-In Comments	Received approximately 35 public comments. AEP representatives reviewed the comments and contacted authors to address concerns or discuss the Project further.

Attachment E: Study Area Photographs



Photo 1. Rolling terrain in Floyd County



Photo 2. Agricultural land in the Town of Stuart



Photo 3. Residential development in Patrick County



Photo 4. Rolling terrain in Patrick County



Photo 5. Existing Blue Ridge Parkway Crossing (views of the existing transmission line are blocked by existing vegetation which will be preserved to extent possible with the proposed rebuild)



Photo 6. Existing ROW Exiting Floyd Substation



Photo 7. Commercial Development Surrounding Floyd Substation

Attachment F: Environmental Justice Communities

Attachment F. Environmental Justice Communities										
CBG within one mile of centerline	Crossed by Centerline (Yes/No)	Component	Crossing Route	Population	% people of color	% low income[1]	% linguistic isolation	% less than high school	% under age 5	% over age 64
Virginia[2]				8509358	39%	24%	3%	10%	6%	15%
510639201022	**Yes**	**Component 2**	**Proposed Route**	**1178**	**17%**	**33%**	**0%**	**12%**	**8%**	**22%**
510639201023	**Yes**	**Component 2**	**Proposed Route**	**969**	**15%**	**27%**	**0%**	**8%**	**3%**	**23%**
510639201031	**Yes**	**Component 2**	**Proposed Route**	**1632**	**14%**	**36%**	**0%**	**8%**	**3%**	**18%**
511410301011	**Yes**	**Component 2**	**Proposed Route**	**1093**	**17%**	**35%**	**0%**	**22%**	**8%**	**39%**
511410301012	**Yes**	**Component 2**	**Proposed Route**	**1516**	**9%**	**20%**	**0%**	**7%**	**4%**	**27%**
511410301022	**Yes**	**Component 2**	**Proposed Route**	**401**	**24%**	**25%**	**0%**	**19%**	**0%**	15%
511410303011	**Yes**	**Component 2**	**Proposed Route**	**1166**	**14%**	**27%**	**0%**	**18%**	**0%**	**41%**
511410303022	**Yes**	**Component 2**	**Proposed Route**	**1550**	**16%**	**28%**	**1%**	**4%**	**9%**	**32%**
510639201041	No	Component 2	-	817	4%	5%	0%	2%	4%	18%
510639201042	No	Component 2	-	1817	3%	55%	0%	10%	13%	18%
511410301023	No	Component 2	-	874	18%	45%	2%	19%	8%	26%
511410303012	No	Component 2	-	1407	3%	44%	0%	12%	5%	20%

[1] Per the Virginia Environmental Justice Act, "Low-income community" means any census block group in which 30 percent or more of the population is composed of people with low income, and used in the comparative analysis.

[2] Virginia Population (U.S.Census Bureau April 1, 2020)

Note:

Bold text indicates populations, as defined in Virginia Environmental Justice Act, which exceed the state average, and are crossed by the Proposed Route.

Gray shaded cells indicate reference populations.

Green shaded cells indicate identified minority populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Yellow shaded cells indicate identified low-income populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Orange shaded cells indicate identified other demographic populations as defined in EJSCREEN, which exceed the state average, but not defined in Virginia Environmental Justice Act.

Attachment G: Agency Correspondence

SEE VOLUME 3 FOR ATTACHMENT G - AGENCY CORRESPONDENCE

Siting Study

Stuart Area 138-kV Transmission Improvements Project: Component 3: Mayo River (Stuart) to Bassett Area Transmission Improvements
SCC Case No. PUR-2023-00024

Prepared for:

APPALACHIAN POWER
An AEP Company

Prepared by:

POWER Engineers, Inc.
6641 W. Broad Street, Suite 405
Richmond, Virginia 23230

POWER ENGINEERS

May 2023

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ATTACHMENTS

Attachment A: Outreach Fact Sheet

Attachment B: Route Development Maps

- Map 1. Study Area
- Map 2. Circle Drive Focus Area
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- Map 5. Open House Study Segments
- Map 6. Refined Study Segments
- Map 7. Refined Study Segments Census Block Groups
- Map 8. Component 3 Proposed Route

Attachment C: GIS Data Sources

Attachment D: Data Collection Summary

Attachment E: Study Area Photographs

Attachment F: Environmental Justice Communities

Attachment G: Agency Correspondence

Key Terminology

Alternative Routes	Assemblage of Study Segments that form routes for analysis and comparison.
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process.
Endpoints	The project starting and ending point(s) ("Project Endpoints"), which may include substations, switch stations, tap points, or other locations defined by the Company's planners and engineers.
Environmental Justice	The fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy (VA Code § 2.2-234).
Focus Area	Locations along the existing route where rebuilding may not be feasible due to the presence of constraints and diversions are necessary.
Greenfield	New transmission line route or substation site constructed in an area or along a route where no previous substation or transmission line route existed.
Land Use	Describes the human use of the land and activities at a given location such as agricultural, residential, industrial, mining, commercial, and recreational uses. It differs from land cover which only describes the physical characteristics (summarized from EPA.gov).
Opportunity Feature(s)	Areas or existing linear features along which the transmission line may have less disruption to area land uses and the natural and cultural environment.
Project	The proposed transmission facilities studied in the siting report.
Proposed Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Proposed Route: (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a safe, timely, and reliable manner.
Routing Concepts	Initial routes for the project that adhere to a series of general siting and technical guidelines.
Segment Endpoint	The intersection of two or more Study Segments.
Siting Team	A multidisciplinary team of experts in transmission line routing, environmental impact assessment, impact mitigation, engineering, and construction management.

Study Area	The territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental impacts and Project costs.
Study Segments	Study Segments are partial alignments that when combined form a complete route.

ABBREVIATIONS AND ACRONYMS

Application	The Company's application for approval to the State Corporation Commission
AEP	American Electric Power (parent company for Appalachian Power)
Appalachian Power	Appalachian Power Company
CBG	Census Block Group
Component 3	Mayo River (Stuart) to Bassett Area Transmission Improvements
CPCN	Certificate of Public Convenience and Necessity
EJ	Environmental Justice
GIS	Geographic Information System
IPaC	Information for Planning and Consultation
kV	kilovolt
LiDAR	Light Detection and Ranging
NHD	National Hydrography Dataset
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
POWER	POWER Engineers, Inc.
ROW	Right-of-way
SCC	State Corporation Commission
Stuart Project	Stuart Area 138-kV Transmission Improvements Project
USACE	United States Army Corps of Engineers

USFWS	United States Fish and Wildlife Service
VDA	Virginia Department of Aviation
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VOF	Virginia Outdoors Foundation

1.0 PROJECT DESCRIPTION

The Stuart Area 138-kV Transmission Improvements Project ("Stuart Project" or "Project") is Appalachian Power Company's ("Appalachian Power" or "Company") proposed project to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades equipment voltage from 69 kilovolts ("kV") to 138 kV, improves the local distribution system, and addresses aging infrastructure. The Project will ensure adequate power delivery to the area to support today's electrical load and provide continued support during an extended outage.

The Stuart Project includes three components, and the Mayo River (Stuart) to Bassett Area Transmission Improvements ("Component" or "Component 3") is the third component of the three included in the Project (Attachment A – Outreach Fact Sheet). Component 3 will rebuild approximately 25.5 miles of existing 69 and 138-kV transmission lines to 138-kV throughout Patrick (approximately 9.5 miles) and Henry (approximately 16 miles) Counties (see Exhibit 3, Project Overview Map in the Company's SCC application) as follows:

- Starting from a structure northeast of the new Mayo River 138-kV Substation,
- to the new Stoneleigh 138-kV Substation,
- to the existing Fieldale 69/138-kV Substation,
- to the new Smith River 138-kV Substation, and
- to existing Structure No. 1365-4 near the existing Philpott 138-kV Switch Station.

The existing transmission lines will be rebuilt to upgrade deteriorating equipment originally constructed throughout the 1930s to the 1960s. In addition, the Company will construct the new Stoneleigh 138-kV Substation to replace the existing Stanleytown 69-kV Substation; construct the new Smith River 138-kV Substation to replace the existing Bassett 69-kV and West Bassett 69/138-kV Substations; convert the existing Patrick Henry 69-kV Substation to 138 kV; and upgrade the existing Fieldale 69/138-kV Substation. Component 3 will be constructed mostly within or near existing right-of-way ("ROW"). Approximately 3.0 miles of transmission line in new ROW will be needed to account for deviations from the existing centerline to optimize design, avoid constraints, or integrate the rebuilt transmission lines to the new substations.

Transmission line structure type along the line route may vary depending on topography, design, and Component needs. The existing transmission structures are primarily single-circuit wood H-frame and monopole structures. However, the Company plans to replace them primarily with

dulled galvanized steel single-circuit H-frames (Figure 1. Comparable Existing and Proposed Single-Circuit H-Frame Structure). Single-circuit monopole structures and double-circuit monopole structures will be also used where applicable. Structures on the single-circuit portions will average approximately 80 feet high, and structures on the double-circuit portions will average approximately 100 feet high (**Figure 1. Comparable Existing and Proposed Single-Circuit Monopole Structure**). Structures proposed for the rebuilt line will be approximately 45 feet taller than existing structures and will be constructed near existing structure locations (see Company witness McMillen's direct testimony for more details in Volume one of the Company's Application).



Figure 1. Comparable Existing and Proposed Single-Circuit H-Frame Structure (consisting of three conductors)

Existing wood single-circuit monopole (top) and proposed steel single-circuit monopole (bottom), which is the primary type of proposed structure to be used.



Figure 2. Comparable Steel Double-Circuit Monopole Structure (consisting of six conductors)

2.0 ROUTE DEVELOPMENT OVERVIEW AND DUE DILIGENCE

The goal of the route development process is to identify a proposed route that: (1) is most consistent with siting guidelines (e.g., use existing ROW to the extent possible); (2) reasonably minimizes adverse impacts on the natural and human environments; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner.

The route development process for the Stuart Project was initiated in 2018 when a Siting Team that included Appalachian Power employees and external consultants with diverse expertise including transmission line and substation siting, distribution planning, impact assessment for natural and human environments, impact mitigation, engineering, construction management,

project management, and public relations was assembled ("**Siting Team**").

The Siting Team initially met with Patrick County local officials in June 2020 and provided updates throughout the siting process during the spring and fall of 2021. The Siting Team also met with Henry County local officials in March 2022 and provided them with updates throughout the siting process. The larger Stuart Area 138-kV Transmission Improvements Project was announced to the public in October 2021, and Component 3 was announced with a public open house meeting and news release on March 17, 2022. During the siting process, the Siting Team collected data, reviewed existing ROW, and selected a proposed route in Summer 2022.

The Stuart Project requires a Certificate of Public Convenience and Necessity ("CPCN") from the Virginia State Corporation Commission ("SCC"). The Company will seek approval from the Virginia SCC to rebuild the transmission line generally within a 600-foot-wide filing corridor (300 feet on either side of the route centerline). The filing corridor allows for design flexibility in determining the final centerline and ROW width, which will be based on ground surveys, environmental studies, additional landowner input, and final engineering.

If approved, the Company will complete preliminary engineering and work with affected landowners to update existing easements, as necessary, and provide fair compensation for any new or supplemental easements. The Company then will finalize proposed structure locations and ROW width within the SCC-approved filing corridor and coordinate with the necessary local, federal, and state agencies during permitting and construction. The proposed in-service date for the Project is December 2029.

This Siting Study describes the transmission line route development process and the rationale for the proposed route selection.

2.1 Review of Existing ROW and the Study Area

The route development process began by defining **Project Endpoints** that include the proposed Company-owned structure northeast of the proposed Mayo River Substation that connects to Project Component 2 at the Mayo River – Woolwine Structure No. 10 and existing Structure No. 1365-4 near the existing Philpott 138-kV Switch Station (**Attachment A, Outreach Fact Sheet**).

The proposed Stoneleigh and Smith River substations and the existing Fieldale Substation are intervening connection points for Component 3. The proposed Stoneleigh Substation is located off Route 57 on an undeveloped parcel, southwest of the existing Stanleytown Substation, which will be retired. The proposed Smith River Substation will replace the existing Bassett and West

Bassett substations and is located off Fairystone Park Highway on an undeveloped parcel south of the Smith River in the Bassett community. More detail on the proposed substation sites selection is in Company witness Bledsoe's direct testimony located in Volume one in the Company's Application.

After identifying the endpoints and intervening substation sites, AEP planners determined the existing Fieldale - Stuart 69-kV, Fieldale - West Bassett No. 2 69-kV, and sections of the Claytor - Fieldale 138-kV transmission lines are not outage constrained and, therefore, can be rebuilt almost completely within or near existing ROWs.

As part of Component 3 initial route development, the Siting Team reviewed use of existing ROWs to generally minimize new impacts on the natural and human environments. Specifically, this approach is consistent with Sections 56-46.1 and 56-259 of the Code of Virginia, which suggests that existing ROWs should be given priority when adding new transmission facilities and which promotes using existing ROW corridors for new transmission facilities as compared to introducing new impacts.

After reviewing existing ROWs, the Siting Team determined that the existing ROW can be used for the rebuild for much of its length.

Since the existing ROW is feasible for a rebuild, the **Study Area** for the proposed rebuild generally includes a 2,000-foot buffer (1,000 feet on either side) of the existing transmission lines and three **Focus Areas** identified along the existing route where rebuilding may not be feasible due to potential constraints (**Attachment B, Map 1**).

2.2 Data Collection and Geographic Information Systems

The Siting Team used Geographic Information System ("GIS") data obtained through publicly available agency databases and aerial photography during the siting process. These data allowed review of the existing ROW and potential impacts to existing and proposed land uses, natural resources, cultural resources, transportation facilities, and existing utility and linear features. The primary sources of aerial imagery used in route identification, analysis, and selection for the Project include: Esri (2020), Google (Imagery dates vary by location), and Light Detection and Ranging ("LiDAR") (flown in June 2020). A table of data sources is provided in **Attachment C – GIS Data Sources** and **Attachment D – Data Collection**.

2.3 Federal, State, and Local Government Coordination

The Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route planning process.

Twenty-two local, state, and federal agencies were contacted in November 2021 requesting input for the route planning process. Nine responses have been received to date. Copies of letters, contact list, and correspondence are included in Attachment G – Agency Correspondence.

The Siting Team coordinated with local government agencies/officials to aid the route review process. Specifically, Siting Team members met virtually with Henry County officials on March 4, 2022. Additionally, since multiple Stuart Project components are in Patrick County, the Siting Team met virtually with members of Patrick County throughout the siting process starting as early as June 2020. The purpose of these meetings was to introduce the Project, review Component(s) located within their jurisdictions and obtain information to aid in the route review process. The Siting Team reviewed municipalities' future land uses and specific comprehensive plan goals to evaluate potential constraints and opportunities within local planning documents. Overall, local officials supported the Project, and no future development plans were identified as potential impacts. Specifically, no "important," "prime," or "unique" farmlands or forest lands were noted as potential Project impacts, as stated in Virginia State Code Section 3.2-205.

2.4 Constraints and Opportunities

A majority of Component 3 will be rebuilt on the centerlines of existing ROWs; however, some deviations from existing centerlines are necessary to optimize the design or avoid constraints. The Study Area is generally characterized as rural with forested, agricultural, recreational, residential, and commercial land uses (**Attachment E, Photos 1-6**).

Component 3 generally is bound by Philpott Lake to the north, the Smith River and Fairystone Parkway to the east, Fieldale to the south, and the Town of Stuart to the west. From the proposed Mayo River Substation to the Patrick Henry Substation, forested and timber lands are the predominant land use with scattered residential development along roadways. Between the Patrick Henry, Fieldale, and Stoneleigh substations, the Study Area is characterized by multiple road crossings, rolling terrain, forested lands, and residential areas near Fieldale and the Smith River. From the proposed Stoneleigh Substation to the proposed Smith River Substation and Philpott Dam area, the Study Area crosses forested, mountainous terrain with residential and industrial development near the historical community of Bassett and the Smith River.

Major constraints include scattered residential clusters close to Component 3 such as near the Town of Fieldale and community of Bassett, including the historical significance and resources surrounding the Bassett community. Other constraints include the Smith River and North Mayo River, a Virginia Outdoors Foundation ("VOF") conservation easement, local recreational sites and parks including Philpott Park and the Philpott Lake Recreation Area, steep terrain, and

residential and commercial development concentrated along major roadways and highways that cross the Study Area.

The main siting opportunities considered for Component 3 are the existing ROW corridors where rebuilding on the existing centerline will be done to the extent practicable (**Rebuild Segments**). However, some deviations from the existing centerline are required to optimize design or avoid constraints where possible (**Reroute Segments**).

3.0 STUDY SEGMENTS

3.1 Circle Drive Focus Area

Focus areas are locations along the existing route where rebuilding may not be feasible due to the presence of constraints and diversions are necessary. The Circle Drive Focus Area considers a reroute segment to avoid residential development that has occurred in and around the existing ROW (Attachment B, Map 2). The existing Fieldale – Stuart 69-kV Transmission Line is also encroached upon by residences near Circle Drive. Therefore, a reroute segment that avoids residential development but requires new ROW by shifting to the south was considered. Desktop analysis indicated the southern Reroute Segment was feasible, and it was brought forward to the open house for public review and input.

3.2 Route 220 Focus Area

The Route 220 Focus Area was identified west of Route 220 and the existing Fieldale Substation and Fieldale community where rebuilding on centerline may not be as favorable as a greenfield option (Attachment B, Map 3). In addition to considering a rebuild on centerline, the Siting Team identified a greenfield reroute segment. The reroute segment travels northeast from the existing ROW and rebuild segment after crossing The Great Road and connects back to a rebuild segment after approximately one mile. This Reroute Segment reduces the number of Route 220 crossings, minimizes the number of highway crossings, reduces the length of double-circuit transmission line needed, and minimizes outage risks. The rebuild concept requires more highway crossings and double-circuit transmission line length. It also requires building to the east and then heading back west, requiring additional line length. Desktop analysis indicated the Reroute Segment was feasible and favorable to rebuilding on existing centerline. Therefore, the Reroute Segment was brought forward to the open house, and the rebuild concept was dismissed early in the siting process.

3.3 Smith River Focus Area

The Smith River Focus Area was identified near the community of Bassett to better evaluate existing siting opportunities (**Attachment B, Map 4**). In the Smith River Focus Area the existing Claytor – Fieldale 138-kV Transmission Line and the existing Fieldale – West Bassett No. 2 69-kV Transmission Line parallel one another and are the primary siting opportunities. Rebuilding on either centerline was deemed feasible, and the Siting Team noted that rebuilding on the 69-kV centerline would minimize outages. Two rebuild segments, the Eastern 69-kV Rebuild Segment and the Western 138-kV Rebuild Segment, were developed. Each follows existing ROW and then connects to the proposed Smith River Substation. Based on desktop analysis, both rebuild segments were deemed feasible, and both were brought forward to the open house for public review and input.

3.4 Rebuild Route Review

All areas that will be rebuilt on centerline are referred to collectively as **Rebuild Segments** and, combined, they represent the **Rebuild Route.** Based on desktop analysis, a majority of Component 3 can be rebuilt on existing centerline within the existing ROW with minor deviations to minimize potential impacts to residences and the surrounding environment or to optimize design.

Using existing ROWs minimizes impacts on the natural and human environments and is consistent federal and state guidelines which suggest that existing ROWs should be given priority when adding new transmission facilities and which promotes using existing ROW for new transmission facilities. Additionally, the public generally prefers reusing existing ROW corridors.

In assessing the suitability of the Rebuild Route, the Company undertook these actions:

- Company planners determined that an extended outage to rebuild the existing transmission line within the existing ROW is feasible.
- The Siting Team undertook desktop and field examinations and concluded that rebuilding the existing transmission lines in or parallel to the existing ROW is reasonable and the best route where feasible.
- Company ROW agents reviewed the existing ROW easements and determined that they generally permit line rebuilds and upgrades.
- The Siting Team undertook field reconnaissance of the existing ROW to identify any existing development in or near the ROW.

- The Project Team initiated public outreach as described in Section 4.0.

4.0 PUBLIC INVOLVEMENT

Component 3 was announced publicly with a news release on March 17, 2022, and a virtual open house was launched (**https://www.aeptransmission.com/virginia/Stuart-Bassett/**) where the Study Segments were presented (Attachment B – Map 5). The virtual open house provided information related to engineering and design of the structures, why the Project is needed, ROW development, and construction description. Through the virtual open house, landowners and the public were encouraged to submit comments to the Siting Team and identify property locations using an address search tool. Two in-person public open houses were held; one in the community of Stuart on March 28, 2022, and a second in the community of Bassett on March 29, 2022. 79 landowners attended the in-person open houses, and a total of 16 comment cards were received at the open houses.

Aerial maps showing existing infrastructure and Study Segments were also provided on the Project website and made available to download.[1] Participants at the in-person and virtual open houses were encouraged to identify the location of their houses, places of business, properties of concern, or other sensitive resources on the mapping and submit comments to the Siting Team. Comments received through the virtual open house were digitized and entered into a GIS database.

The Project website includes updates and news releases, an interactive overview map, fact sheet (see Attachment A – Outreach Fact Sheet), and Component and Stuart Project timeline. In addition to comments submitted at the in-person open house, questions and comments were also welcomed on the website contact page.

Landowners within a 1,000-foot corridor (500 feet on either side of a route centerline) of Study Segments were notified of the March 2022 open houses. Landowner addresses were obtained from Patrick and Henry counties' parcel databases, and notification included:

1. News release distributed by the Company on March 17, 2022, to announce the Project and virtual open house.

2. Two separate Project mailings sent to 782 landowner addresses on March 17 and 21, 2022 that included a letter, postcard, Component 3 fact sheet (see Attachment A – Outreach

[1] Maps were at a scale of 1 inch = 200 feet.

Fact Sheet), comment card with prepaid postage return envelope, and Project and Component trifold pamphlet.

3. An automated DAVOX message went out to 349 landowners on March 22, 2022, to invite participation in the in-person open house.

A total of 31 comments were received via phone calls, U.S. mail, or through the Project website, and 16 comment cards were received at the open house. All comments were entered into the Stuart Project public comment database. Comment topics generally related to how the rebuild will differ from the existing line, whether it will affect landowner property in the vicinity, and potential impacts due to access and construction.

Since Component 3 will use mostly existing ROW, minimal impacts are anticipated. The Siting Team coordinated with stakeholders and landowners where rebuilding on the existing centerline may not be feasible due to the presence of constraints. The Company will continue to coordinate with landowners and stakeholders throughout the Project duration.

Additionally, the Company conducted stakeholder meetings with the Harmony Hall Assisted Living Facility located in Bassett near the proposed Smith River Substation beginning in 2021 and through 2022. These meetings included members from AEP and its associated consultants on the Project. The Company received input from the facility administrator and discussed the substation plan overview including comparable station photos, fencing around the gravel yard, stormwater retention pond locations, and line routes in relation to the substation. As of May 2023, however, the Company was informed that Harmony Hall is closing in perpetuity.

5.0 ROUTE REFINEMENT

After the open houses, the Siting Team reviewed Study Segments again considering landowner input and further engineering and siting analysis. As a result, multiple refinements were made to the Study Segments presented at the public open house.

In the Circle Drive Focus Area, the Siting Team dismissed the southern reroute study segment based on landowner input, new residential visual impacts, and possible new impacts to landowners who were not previously crossed. However, further discussions with landowners and additional engineering analysis showed that a trailer had been removed from the Circle Drive Focus Area recently. After coordinating the landowner where the trailer was removed, the Siting Team was able to refine the rebuild segment to avoid existing residential encroachments (**Attachment B, Map 6**).

In the Smith River Focus Area, landowner input indicated there may be potential impacts to more landowners along the Western 138-kV Rebuild Segment than to those on the Eastern 69-kV Rebuild Segment. This meant that additional ROW would need to be acquired or supplemented along the Western 138-kV Rebuild Segment because of undefined ROW width and easements. Engineering analysis also indicated increased outage risks along the Western 138-kV Rebuild Segment. As a result, the Western 138-kV Rebuild Segment was dismissed, and the Siting Team moved forward with the Eastern 69-kV Rebuild Segment.

Other minor adjustments and shifts were made to the Rebuild Route to account for landowner input and to avoid constraints where feasible (**Attachment B, Map 6**). The Siting Team continued to review and discuss with landowners to determine the Component 3 Proposed Route.

6.0 PROPOSED ROUTE EVALUATION

A majority of Component 3 is the Rebuild Route, where abandoning existing ROW for a new greenfield route is neither practical nor necessary. However, adjustments and shifts were included as necessary to minimize potential impacts to residences and the surrounding community. After the March open house and more landowner engagement and engineering and route analysis, the Siting Team selected a Proposed Route in July of 2022.

The Component 3 Proposed Route is a combination of the Rebuild Route, Reroute Segment in the Route 220 Focus Area, and Eastern 69-kV Rebuild Segment in the Smith River Focus Area. The Proposed Route primarily follows existing ROW (**Attachment B, Map 8**) and is described in the conclusion.

6.1 Natural Environment

The natural environment includes water, soil, sensitive species, and wildlife habitat. Potential impacts are based on publicly available maps and data and coordination with federal, state and local agencies.

Agencies contacted were requested to provide input for the route planning process as part of data collection. Responses were received from the Virginia Department of Conservation and Recreation (“VDCR”), Virginia Department of Health (“VDH”) Office of Drinking Water, Virginia Department of Forestry (“VDOF”), and VOF.

The VDCR noted in its December 17, 2021 letter that the Smith River Slope Conservation Site and Rich Creek Conservation Site are located within the Component 3 Study Area. The Smith River Slope Conservation Site has a biodiversity ranking of B5, which represents sites of general significance, and the Rich Creek Conservation Site has a biodiversity of B3, which represents a

site of high significance. In addition, the Smith River – Jordan Creek Stream Conservation Unit is located downstream from the Study Area and has a biodiversity ranking of B2, which represents a site of very high significance.

Component 3 also crosses the Smith River, designated by VDWR as a "Threatened and Endangered Species Water" for the Roanoke Logperch, a natural heritage resource located within Component 3. Component 3 crosses the North Mayo River, a VDCR-designated scenic river near the Route 626 crossing west of the existing Patrick Henry Substation. The Proposed Route crosses the North Mayo River at its existing crossing in the existing ROW. Component 3 crosses 143 National Hydrography Dataset ("NHD") features and 5.1 acres of National Wetland Inventory ("NWI") features, at or near existing crossings. [2]

The VDH replied on December 13, 2021, acknowledging receipt of the letter and stated that no comments or concerns were noted for the Project or Component 3. The VDOF's January 7, 2022 response noted that the Component 3 Study Area contains approximately 2,400 acres of forest that are considered very high or outstanding conservation value. Responses received from the VDCR, VDOF, VOF, and VDH are included in Attachment G – Agency Correspondence.

No comment letter was received from the Virginia Marine Resources Commission, the VDEQ's Office of Wetland and Stream Protection's, or United States Army Corps of Engineers ("USACE"). Coordination and review with Virginia Department of Environmental Quality ("VDEQ"), USACE, and Virginia Marine Resources Commission will be conducted during Component 3 environmental studies.

The Component 3 Proposed Route primarily utilizes existing ROW thereby mitigating impacts to surrounding tree acreage. The Proposed Route requires 91 acres of tree clearing; however, approximately 1,500 feet of clearing parallels existing linear infrastructure.

The United States Fish and Wildlife Service ("USFWS") Information for Planning and Consultation ("IPaC") project planning tool was used to determine if any threatened or endangered wildlife or plant species have potential to occur within the Study Area. The IPaC for the Proposed Route identified four endangered species: the Northern long-eared bat, Roanoke Logperch, James Spinymussel, and the Small-anthered Bittercress. In addition, the Monarch Butterfly is shown as a candidate species and the Tricolored bat is shown as a proposed endangered species. No critical habitats were identified for the Component.

[2] A desktop review of Component 3 wetland and streams is described further in the Desktop Wetland and Stream Delineation Report, located in the Volume 3 of the Company's CPCN Application.

Component 3 does not intersect any of VDCR's predictive models identifying potential habitat for natural heritage resources and based on VDCR input, Component 3 does not intersect any special natural areas. The Proposed Route crosses the Smith River; 37 streams; and approximately 170 acres of riparian buffers. Most of these hydrological resource crossings are located at their existing crossing locations along existing ROW.

The VOF sent a response on January 20, 2022, stating they hold an easement on one property intersected by the Proposed Route west of Stanleytown and Bassett. The VOF easement is crossed by the Rebuild Route at the existing location, and minimal impacts are anticipated.

The Proposed Route will require new ROW across Blue Ridge Land Conservancy easements on five parcels after exiting the proposed Smith River Substation heading northwest. The Company will coordinate with the Blue Ridge Land Conservancy to secure the necessary easements and mitigate impacts to the extent practicable.

6.2 Human Environment

The human environment includes land use and activities at a given location including agricultural, forestry, residential, industrial, commercial, recreational, and institutional uses and scenic assets. The Virginia Department of Transportation's ("VDOT") January 3, 2022 letter did not indicate any major concerns for Component 3. The Virginia Department of Aviation's ("VDA") December 7, 2021 letter indicated Component 3 is located within 20,000 linear feet of a public use airport (Blue Ridge Airport), and a 7460 Airspace Study submitted to the Federal Aviation Administration for review is required. VDOT and VDA responses are included in **Attachment G**. The United States Department of Agriculture's National Resources Conservation Service did not respond to the Company's request for comment on agricultural lands related to the Project.

Background research to identify all previously recorded cultural and potential cultural resource locations for the Component Study Area was conducted by reviewing historic documents, agency and public input, and various archives including the Virginia Department of Historic Resources ("VDHR") database. With a majority of the Component using existing ROW, impacts to any National Historic Landmarks, National Register of Historic Places-listed ("NRHP") or -eligible historic resources are either not anticipated at all or will be minimal because of intervening vegetation and development that largely limits visibility of the Component. There are 21 resources located within 1.5 miles of Component 3 including one National Historical Landmark, 12 NRHP-listed resources within one mile, six NRHP-eligible resources within 0.5-mile, and two unassessed archaeological sites within the proposed ROW. The extent of these cultural resources

is further detailed in the VDHR Pre-Application Analysis in support of the CPCN Application (Volume 3 of Company's CPCN Application).

The Hordsville Enslaved/Freed African American Cemetery is located north of the proposed Stoneleigh Substation site near Stanleytown. This cemetery is a previously recorded historic resource by the VDHR and was initially surveyed by the POWER cultural team during field reconnaissance. POWER included the Hordsville Cemetery in its report to the VDHR dated February 15, 2022 and is continuing to coordinate with this agency to conduct further surveys on the site. Additionally, POWER and the Company are collecting input concerning the cemetery from local stakeholders including historic societies, places of worship, and others and will continue this coordination. The Company plans to maintain a 25 to 50-foot buffer zone around the cemetery to ensure the Hordsville Cemetery is not disturbed.

The Proposed Route traverses mostly forested terrain with scattered residential development between the Mayo River and Fieldale substations. Between Fieldale and the existing Philpott Switch Station, the Proposed Route traverses more developed areas, with residential, commercial, and industrial development along the Smith River. There is approximately 20 acres of prime and unique farmland within the ROW for the Proposed Route.

The Proposed Route crosses 256 parcels with 210 landowners along its approximately 25.5-mile route. There are seven residences and 25 outbuildings within the Proposed Route 100-foot ROW. However, based on preliminary engineering review, a condensed transmission line design with shorter spans utilizing steel monopoles with braced posts is possible due to the flatter terrain and access. As a result, the ROW can be slightly reduced in width and the seven dwelling number can likely be reduced to two dwellings. A diversion out of the existing ROW into a new ROW was not reasonable due to the existing residential constraints. Accordingly, and subject to completion of final engineering and ROW negotiations with affected landowners, the Company will continue to collaborate with landowners to remove or relocate dwellings as needed. See Company witness McMillen direct testimony in the Company's SCC Application for more discussion.

There are two schools and seven designated places of worship within 1,000 feet of the Proposed Route centerline. An adult assisted-living center, Harmony Hall Assisted Living, is located adjacent to the proposed Smith River Substation. As discussed earlier in Section 4.0, the Siting Team has been coordinating with the facility since 2021 and as of May 2023 it is closing permanently. In an effort to minimize impacts to adjacent residences, a faux brick wall is planned around the substation.

The Proposed Route crosses the Fairy Stone Loop, a designated wildlife viewing driving route that is part of the Virginia Bird and Wildlife Trail system twice at the existing ROW crossings. The Proposed Route also crosses a small portion of the Philpott Lake Recreation Area, which is a USACE-owned property; however, the Proposed Route crosses within the existing ROW at its existing crossing. The Proposed Route also crosses Route 220 and Dillon Forks Road. The Company has been coordinating with the USACE and will continue coordination efforts.

6.3 Environmental Justice

It is the Company's long-standing practice in its route development processes to avoid or reasonably minimize impacts to the human environment, which includes environmental justice ("EJ") communities and fence line communities within the meaning of the Virginia Environmental Justice Act (§ 2.2-234 *et seq.* of the Code of Virginia), or the "Act." "***Environmental justice*** *means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy*" (VA Code § 2.2-234).

The Siting Team reviewed the United States Environmental Protection Agency's EJSCREEN (2023) tool and data from the American Community Survey from the United States Census Bureau. The EJSCREEN and Census Block Group ("CBG") data (the smallest geographic unit for which United States Census Bureau demographic data is available) was used to review the Project. Per the available EJSCREEN and American Community Survey data, there are 23 CBGs located within 1.0 mile of the existing Mayo River (Stuart) to Basset Area ("Component 3") 69-kV Transmission Lines, 12 of which are crossed by the line route for the Project. The results of the dataset are provided in Attachment F and the CBGs identified within 1.0 mile of the Project are depicted in Attachment B, Map 7. Of the 23 CBGs located within 1.0 mile of the line route, all 23 meet or exceed the threshold of at least one "EJ community" as defined by the Act, namely low-income communities (22) and communities of color (1). Of these CBGs, 12 are crossed by the line route for the Project.

The Proposed Route crosses one CBG that exceeds both state averages for percentage of low-income communities and communities of color near Stanleytown. The Proposed Route is not anticipated to disproportionately impact these communities given that the transmission line is being rebuilt in existing ROW, is set back further away from residential areas, and is on the edge of the CBG boundary. As previously mentioned in Section 6.2, the historical Hordsville Enslaved/Freed African American Cemetery is located northwest of the Stoneleigh Substation site and also within a designated EJ community. The Project Team will continue to coordinate

with VDHR and local resources to mitigate impacts to this cemetery and conduct further cultural surveys for it.

The Project is not anticipated to have a disproportionately high or adverse impact on EJ communities as defined in the Act. The Project will generally rebuild the existing transmission line within or near the existing transmission line ROW. Relocating the Project from its current location would result in additional ROW impacts by crossing other similar EJ communities and was not considered a feasible alternative for the Project. As discussed in Section 4.0, Appalachian Power mailed notifications to 782 landowners who were within 1000 feet of a Study Segment (500 feet on either side) announcing the Project and inviting the public to provide feedback at virtual and in-person open houses, via the website, or by telephone. All landowner input received was reviewed by the Siting Team and, where feasible, Study Segments were adjusted to minimize impacts. The Company will continue to engage all affected landowners, including EJ communities as defined in the Act, throughout the duration of the Project.

6.4 Visual

Aesthetics are defined as a mix of landscape visual character, the context in which the landscape is viewed (view/user groups), and the scenic integrity of the landscape. Existing transmission line structures range from 34 – 70 feet in height and the proposed transmission line structures average 80 feet for single-circuit structures or 100 feet in height for double-circuit structures. While taller structures may introduce new visual impacts, they provide the ability to reduce the overall number of structures for Component 3. Preliminary engineering review indicates the number of structures in or near existing ROW can be reduced by approximately 45% from the current transmission lines.

Parts of the Proposed Route are greenfield and, therefore, will introduce new visual impacts to the surrounding area. Approximately 3.0 miles of the Proposed Route will be built outside existing ROW with approximately 22.5 miles within existing ROW. Building within existing ROW and replacing infrastructure where it already exists minimizes visual impacts to the surrounding community and landscape. Also, parts of the Proposed Route traverse undeveloped forested and mountainous terrain where a vegetative cover can minimize visual impacts.

The proposed Smith River Substation is located near the Bassett Historic District. The Company is taking several measures to minimize potential visual impacts from the proposed Smith River Substation that will be located along Fairystone Park Highway near residential and industrial development. The Company is working closely with the VDHR to coordinate mitigation efforts including using aesthetic fencing material and vegetation to minimize visual impacts to the extent

possible. The Company will continue to work closely with the VDHR and surrounding community to minimize potential visual impacts where feasible.

6.5 Constructability

Potential engineering and construction challenges are important to consider when siting a transmission line. Heavy angles, steep topography, nearby communication towers, antennas, and airfields along with narrow ROW alignments are all elements that can require extensive or non-standard engineering and lead to more impacts and higher costs. Using existing ROW for Component 3 minimizes construction challenges by allowing use of existing access roads, minimizing disturbance to areas not previously crossed by the ROW, and minimizing new crossings of roads or other linear infrastructure, including but not limited to, utility lines and railroads. The Siting Team attempted to minimize engineering challenges during route review by predominantly using existing ROW where possible.

The Component 3 Proposed Route requires new ROW for approximately 3.0 miles. The Component 3 Proposed Route crosses one United States highway, six state highways, and 44 local roads, primarily at existing crossing locations. The Proposed Route crosses one railroad near Fieldale Substation but does not cross any mining areas or oil and gas pipelines. Approximately 35% of the Proposed Route crosses steep slopes (<20%), and there are 16 heavy angles along the route. Overall, constructability concerns are minimized by using existing ROW and rebuilding on centerline to the extent practical.

7.0 IDENTIFICATION OF THE PROPOSED ROUTE

After extensive data gathering, route development, and comparative analysis process, the Siting Team identified a combination of the Rebuild Route, Reroute Segment in the Route 220 Focus Area, and the Eastern 69-kV Rebuild Segment in the Smith River Focus Area as the Proposed Route (25.5 miles total length of which about 22.5 miles is located in or near existing ROW) (**Attachment B, Map 8**). Rationale for selecting this Proposed Route is derived from an accumulation of siting decisions made throughout the process, the Siting Team's knowledge and experience, public and regulatory agency comments, and the comparative analysis of potential impacts presented above.

The process for comparing options for rebuilding the existing transmission line included first defining a Study Area, next collecting constraint data (**Map 1**), then reviewing the existing ROW and developing reroutes in the three Focus Areas (**Maps 2, 3, and 4**). Reroute Segments were developed for each Focus Area, and preliminary engineering and siting analysis determined which segments would be feasible to present to the public at an open house.

In the Circle Drive Focus Area, both a Rebuild Segment and Southern Reroute Segment were carried forward. In the Route 220 Focus Area, the Rebuild Segment was dismissed since it was longer in length, had multiple highway crossings, required more double-circuit line, and had additional outage constraints; therefore, only the Reroute Segment was presented to the public. Finally, in the Smith River Focus Area, both the Eastern 69-kV and Western 138-kV Rebuild Segments were determined to be feasible, and both were presented to the public.

Study Segments were shared with landowners at the March 2022 public open house (**Map 5**). Using stakeholder input, site visit evaluations, and comparative analysis, the Siting Team reviewed and dismissed the Southern Reroute Segment in the Circle Drive Focus Area due to the additional visual and land use of a new ROW and the Western 138-kV Rebuild Segment in the Smith River Focus Area was dismissed since it was more outage constrained and had more residential impacts based on landowner input (Map 6).

As a result, Proposed Routes still under consideration were the overall Rebuild Route, the greenfield Reroute Segment in the Route 220 Focus Area, and the Eastern 69-kV Rebuild Segment in the Smith River Focus Area. Therefore, the Component 3 Proposed Route was selected, and more engineering adjustments were made after further discussions with landowners, engineering analysis, and Siting Team review (Map 8). The Proposed Route was announced in August 2022, a vast majority of affected landowners have been contacted, and further refinements made as practical.

The Component 3 Proposed Route was selected for these reasons:

- Minimizes impacts to the visual, human and natural environments by primarily using the existing transmission line ROW for much of its length as recommended by federal and state guidelines and public preferences.
- Reduces required access roads.
- Reduces required tree clearing.
- Further reduces land use impacts with practical refinements from the existing ROW.
- Minimizes new ROW and landowner impacts along the Component's Proposed Route centerline.

The Component 3 Proposed Route connects to the Mayo River – Woolwine Structure No. 10 along Component 2 of the Project and travels east in or near the existing Fieldale – Stuart 69-kV

Transmission Line ROW, crossing multiple local roads and scattered residential developments for approximately 9.5 miles, stopping at an existing structure west of the existing Patrick Henry Substation. The Proposed Route continues again from an existing structure east of the Patrick Henry Substation, crossing multiple local roads and scattered residential developments for approximately 6.5 miles. Once the Proposed Route crosses The Great Road, it turns north and travels northeast diverting from existing ROW for approximately one mile before connecting back to existing ROW. From there, a portion of the Proposed Route (approximately two miles) travels southeast along existing ROW and enters the existing Fieldale Substation from the west. A double circuit portion of the Proposed Route travels along new ROW for approximately 0.5 mile from the connector point northeast toward the proposed Stoneleigh Substation where it enters from the southwest. From the connector point, the Proposed Route travels northwest along the existing Fieldale – West Bassett No. 2 69-kV Transmission Line ROW. The Proposed Route diverts from the existing ROW south of the existing Bassett Substation and turns northwest before turning east to enter the proposed Smith River Substation. From the Smith River Substation, the Proposed Route runs near the existing Fieldale – Bassett No. 2 69-kV Transmission Line ROW and travels northwest past the West Bassett Substation. West of the West Bassett Substation, the Proposed Route follows the existing Claytor – Fieldale 138-kV Transmission Line ROW and for 0.6 mile to the existing Philpott 138-kV Switch Station. The Proposed Route then turns northeast and ends at existing Structure No. 1365-4 northeast of the existing Philpott 138-kV Switch Station, which will be retired. See the Component 3 GIS Constraints Map, Exhibit 9 of the Company's SCC Application for a detailed view of the Proposed Route and its circuitry.

Component 3 is generally a rebuild where abandoning existing ROW for a new greenfield route is neither reasonable nor necessary. Practical route adjustments in new ROW were made to avoid/reduce impacts to residences and the surrounding community or due to today's engineering requirements. The Siting Team believes the Component 3 Proposed Route is: (1) most consistent with federal and state guidelines and public preferences; (2) reasonably minimizes adverse impacts on area land uses and the visual, natural, and cultural environments by using existing ROW; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner. Route evaluation criteria for the Component 3 Proposed Route are shown in **Table 1**.

Table 1. Component 3 Proposed Route Evaluation Criteria

Component 3 Proposed Route Evaluation Criteria	Unit	Proposed Route
General		
Length	miles	25.5
Human Environment		
Barns, outbuildings, sheds, etc. in ROW	count	25
Residences/single-family dwellings within ROW	count	7[3]
Number of parcels crossed	count	256
Unique landowners within ROW	count	210
Places of worship within 1,000 feet	count	7
Cemeteries within 250 feet	count	0
Water Resources		
Total streams crossed	count	37
High/Exceptional/Special Protection streams crossed	count	1
Riparian buffers crossed	count	170
FEMA-designated floodplain crossed by ROW	acres	21.0
Constructability		
Length of line rebuilt within existing ROW	miles	20.8
Length of line built in new ROW	miles	4.5
U.S. highways crossed	count	1
Existing 69-kV transmission lines crossed	count	0
Steep slopes (>20%) crossed by ROW, percent of total length	percent	34%
Geological and Soil Resources		
Prime and unique farmland soil in ROW[1]	acres	20.7
Farmland of statewide importance in ROW[2]	acres	159.5
Wildlife and Habitat		
Tree clearing required in ROW (digitized based on aerial photography)	acres	90.7
Cultural Resources		
NRHP-listed sites within one mile of centerline	count	12
NRHP-eligible sites within one mile of centerline	count	6
Historic districts within one mile of centerline	count	1

Notes:
[1] Prime farmland is land with the best combination of physical and chemical characteristics for producing crops.
[2] Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance.
[3]Based on preliminary engineering design, the seven dwellings in the Proposed ROW can likely be reduced to two. See Company witness McMillen's direct testimony in the Company's SCC Application for more discussion.

Attachment A: Outreach Fact Sheet

STUART AREA IMPROVEMENTS PROJECT

STUART - BASSETT TRANSMISSION LINE PROJECT

APPALACHIAN POWER
An AEP Company
BOUNDLESS ENERGY

Appalachian Power representatives plan to upgrade the local electric transmission grid in Virginia. The Stuart Area Improvements Project provides a new electrical source for the region and increases reliability for customers. The project involves constructing several components in the next few years. The Stuart – Bassett component involves rebuilding approximately 22 miles of 69-kilovolt (kV) transmission line to 138-kV, building approximately 3 miles of new 138-kV transmission line, upgrading two substations and building two new substations.

WHAT

The Stuart-Bassett Transmission Line Component involves:

- Rebuilding approximately 22 miles of 69-kV transmission line to 138-kV in or near the existing right-of-way, which may include new or updated property easements
- Building approximately 3 miles of 138-kV transmission line in new right-of-way
- Upgrading two substations
- Building two new substations
- Retiring four substations

This project requires approval by the Virginia State Corporation Commission (SCC).

WHY

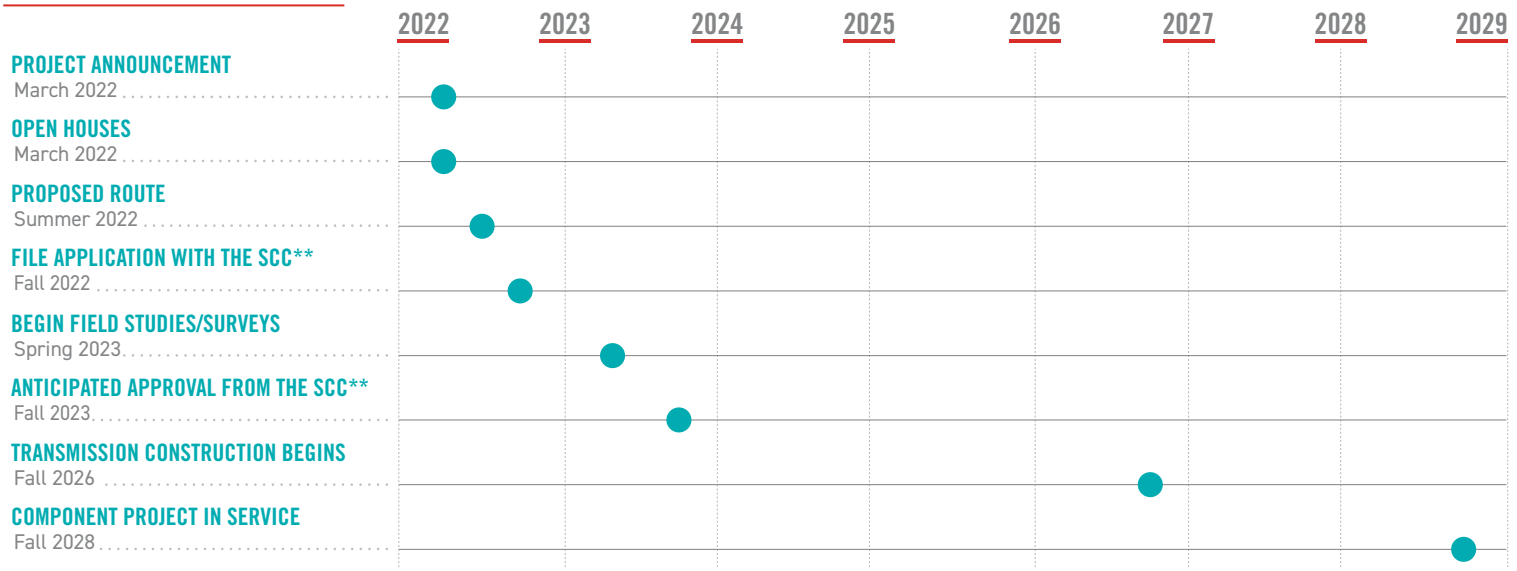
Project benefits include:

- Upgrading the aging 69-kV electrical infrastructure to a more reliable, higher capacity 138-kV transmission system
- Upgrading two substations and building two new substations to provide increased capacity to serve area customers and reduce service interruptions
- Providing a more robust and reliable electric transmission system to support local communities, businesses and future growth

WHERE

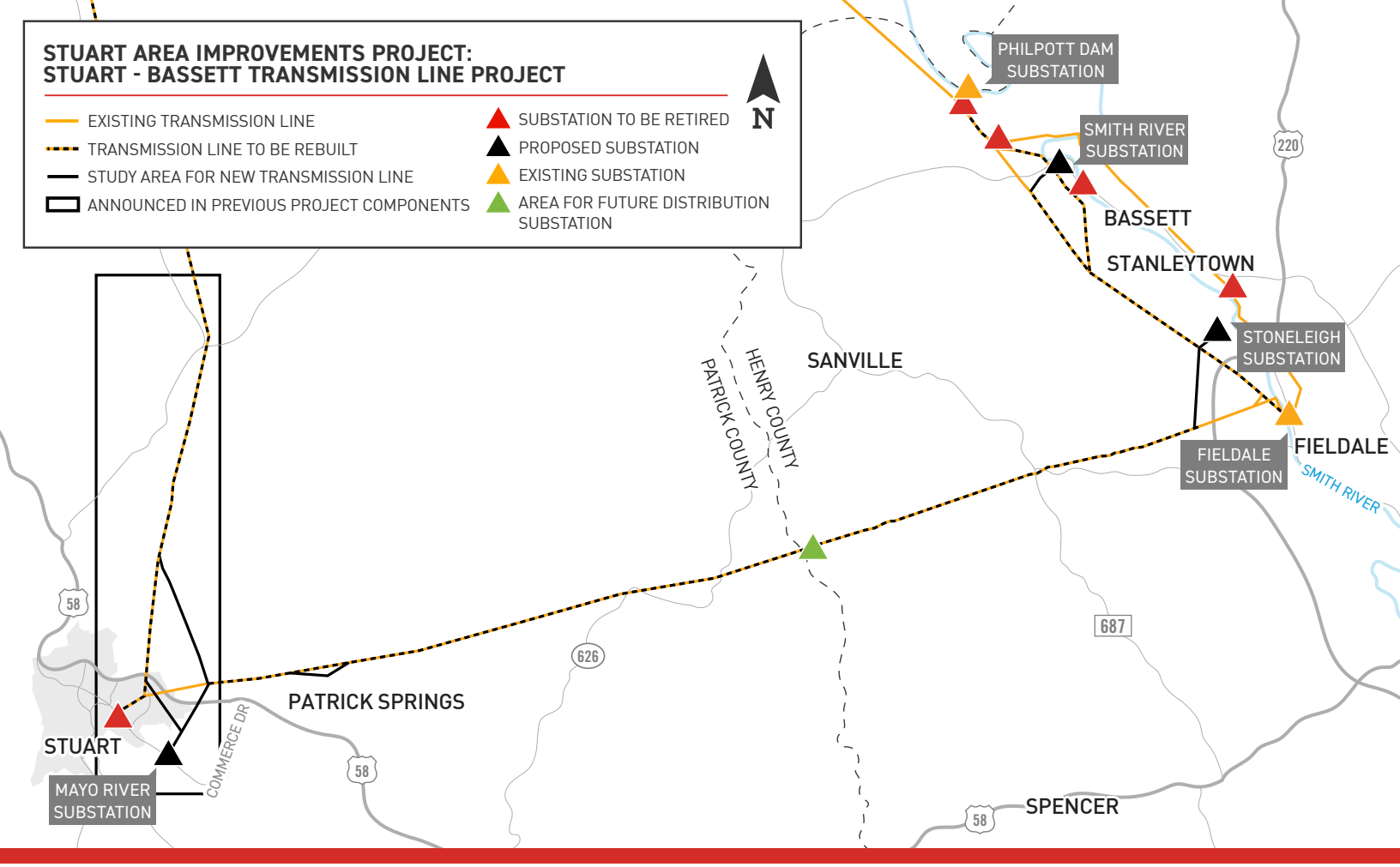
The project begins at the proposed Mayo River Substation off Commerce Drive in Patrick County and travels northeast 10 miles to the proposed Patrick Henry Substation at the Patrick and Henry county line. The project continues 9 miles northeast towards the existing Fieldale and proposed Stoneleigh substations; then, northwest 6 miles to the proposed Smith River and existing Philpott Dam substations.

PROJECT SCHEDULE



*Timeline subject to change

**Virginia State Corporation Commission

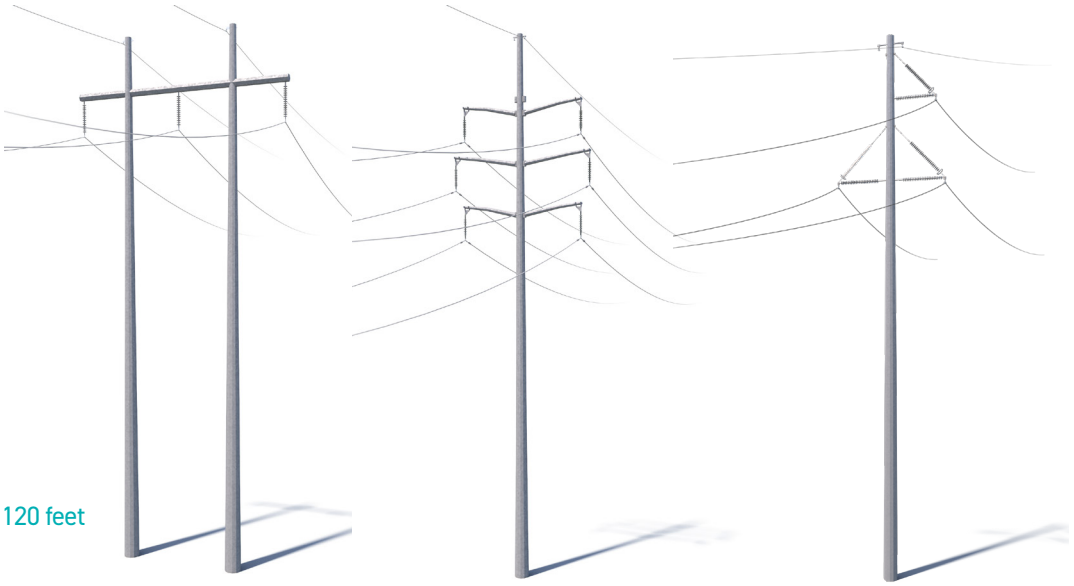


TYPICAL STRUCTURES

Crews plan to rebuild the line using steel H-frame structures and single poles. At select locations, crews may use lattice towers and three-pole steel structures with guy wires to meet engineering needs. Proposed structures will be approximately 20-30 feet taller than the existing structures.

Typical Structure Heights:

- Steel H-Frames Structures: 80 to 100 feet
- Double Circuit Single-Pole Structures: 85 to 120 feet



Single Circuit H-Frame | Double Circuit Single-Pole | Single Circuit Single-Pole

*Exact structure, height and right-of-way requirements may vary

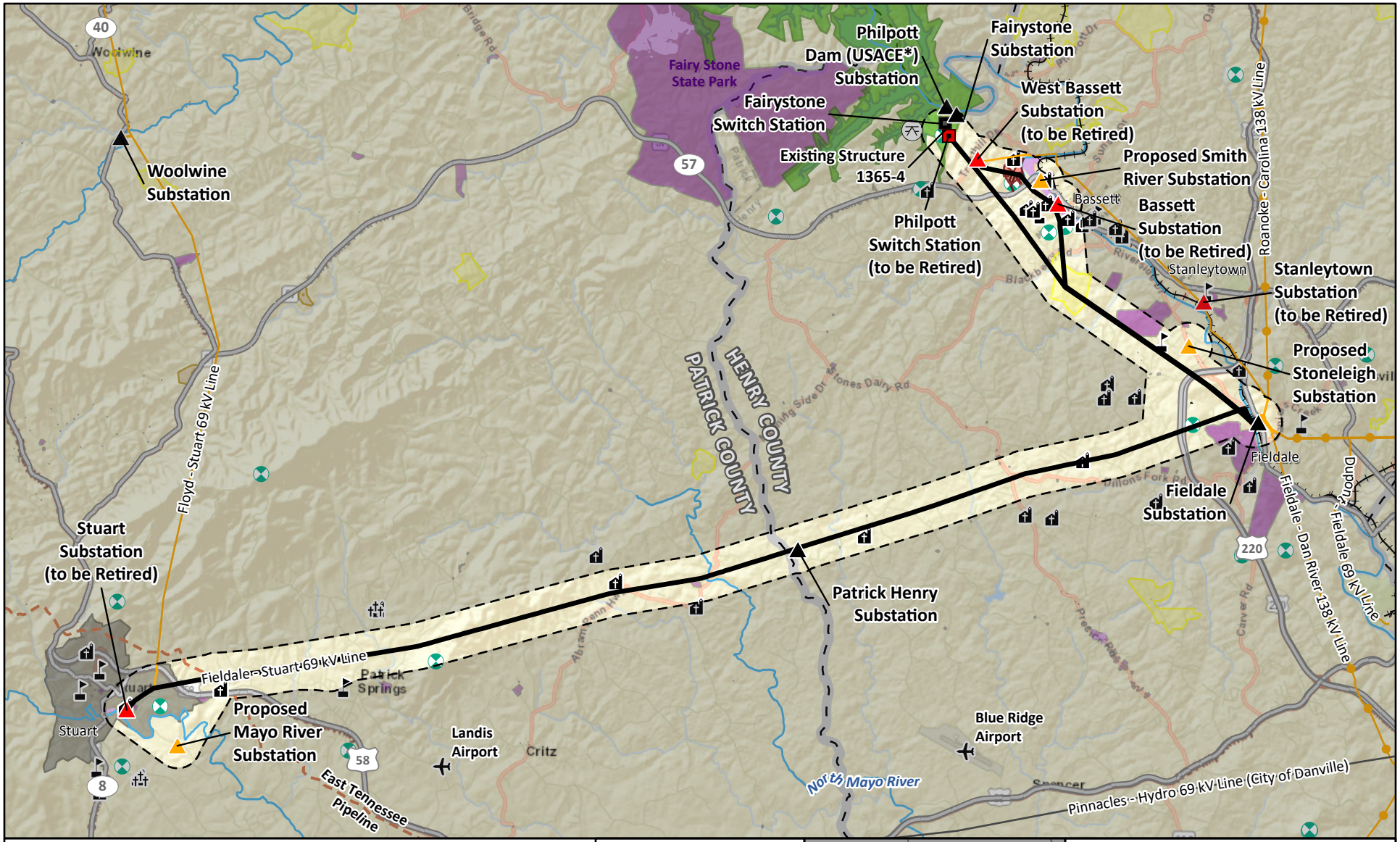
APPALACHIAN POWER VALUES YOUR INPUT ABOUT THIS PROJECT. PLEASE SEND COMMENTS AND QUESTIONS TO:

CORTNEY MUSTARD
Project Outreach Specialist
833-760-0604
Apco_Outreach@aep.com
www.AppalachianPower.com/Stuart

APPALACHIAN POWER
An AEP Company
BOUNDLESS ENERGY

03/04/2022

Attachment B: Route Development Maps



Existing APCo Transmission Line to be Rebuilt
Study Area
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Non-APCo Transmission Line
Airport
Cemetery
Place of Worship
School
Park
Cell Tower (FCC)
Highway
Railroad
Natural Gas Pipeline
Stream (NHD)
County Boundary
Architectural Resource (VADHR)
Historic District (VADHR)
Private Easement
VOF Easement
Federal Conservation Land
Local Conservation Land
Town Boundary

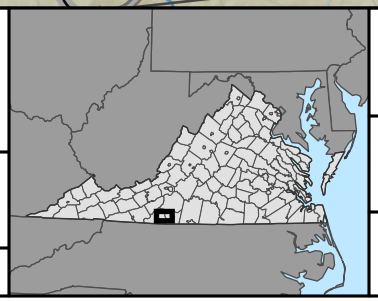
*USACE = U.S. Army Corps of Engineers

Henry & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 15, 2023

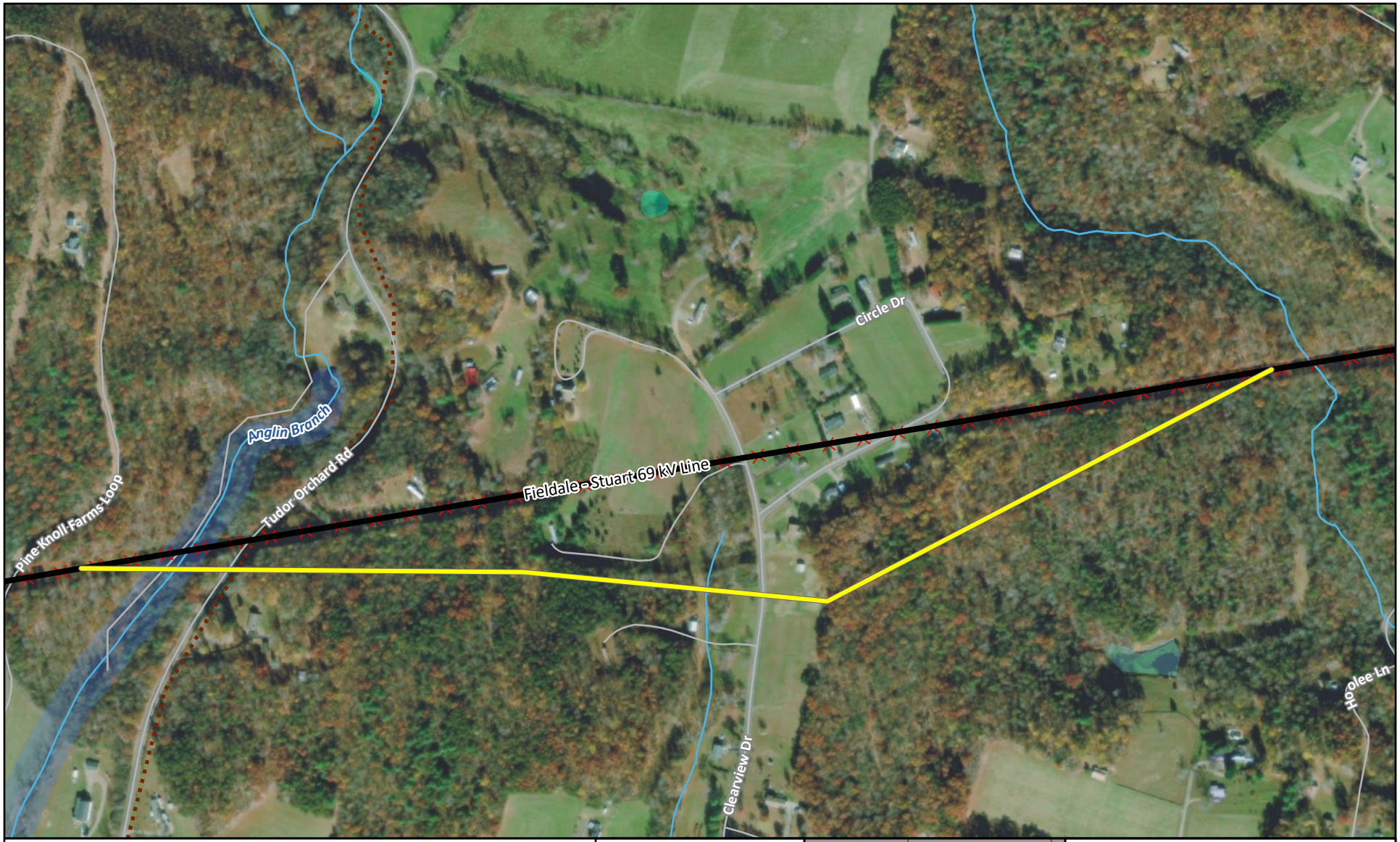


Map 1
Study Area

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project: Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 2 4
Miles



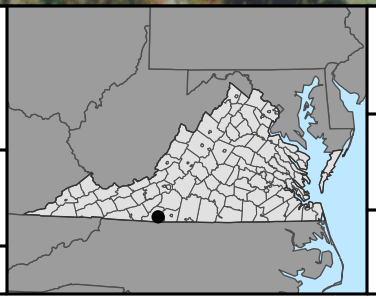
Study Segment (New ROW)
Study Segment (In or Near Existing ROW)
Existing Transmission Line to be Retired
Road
Recreation Trail
Stream (NHD)
Waterbody (NHD)
Wetland (NWI)
Floodplain

Patrick County, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

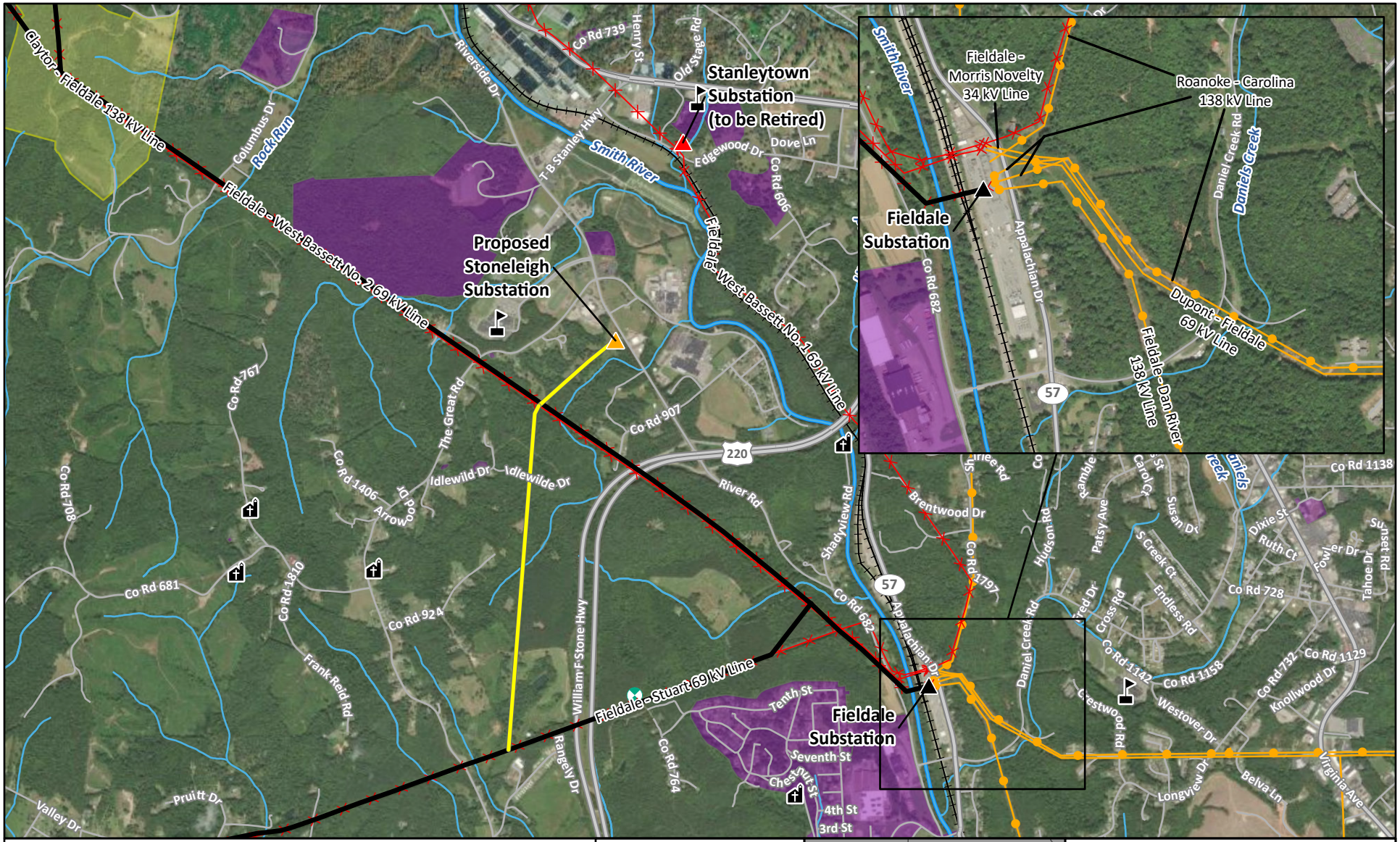


Map 2
Circle Drive Focus Area

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 500 1,000
Feet



Study Segment (In or Near Existing ROW)
Study Segment (New ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Transmission Line to be Retired
Place of Worship
School
Cell Tower (FCC)
Highway
Road
Railroad
River (NHD)
Stream (NHD)
VOF Easement
Architectural Resource (VADHR)

Henry County, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

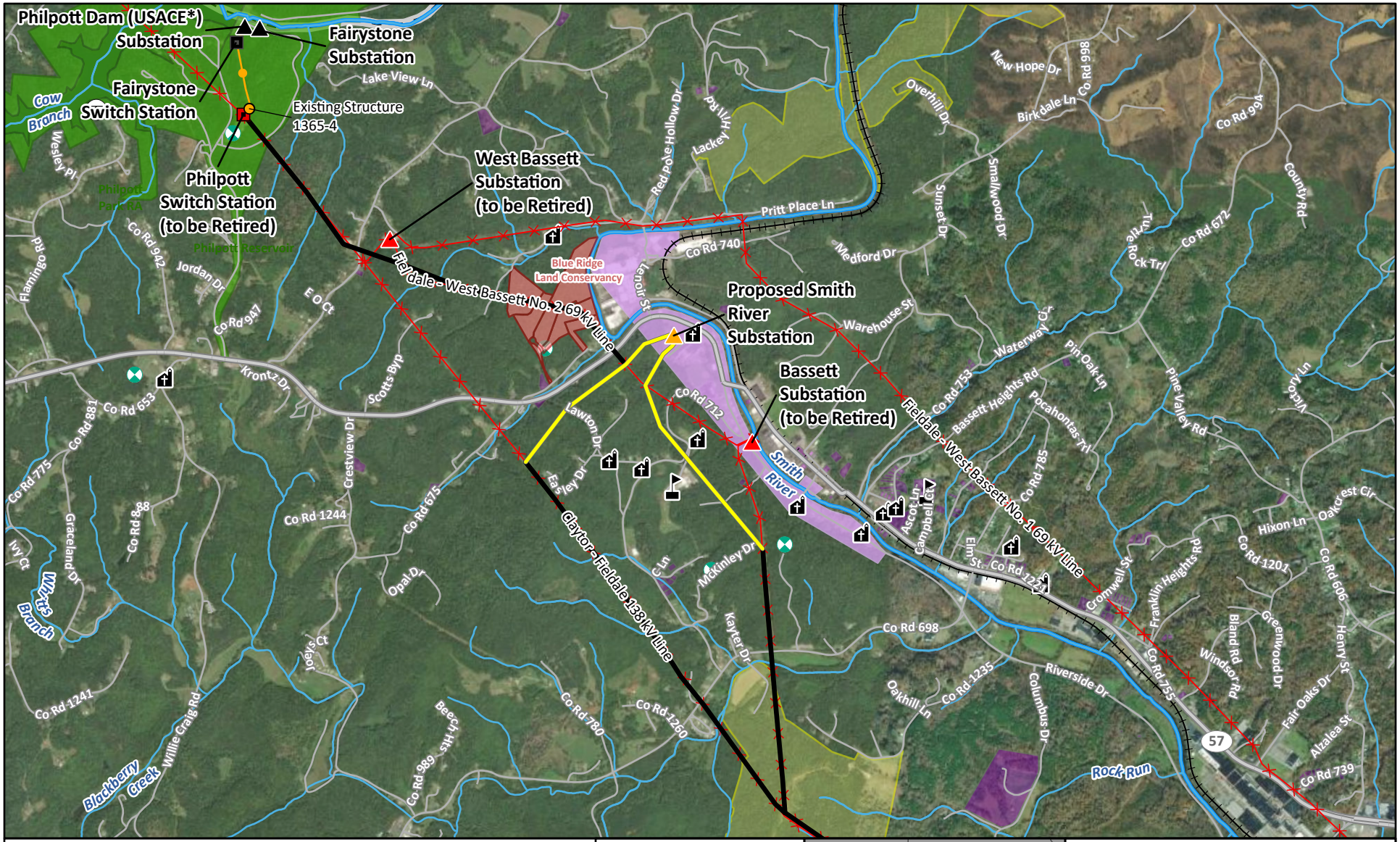
May 04, 2023

Map 3
Route 220 Focus Area

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 0.5 1
Miles



Study Segment (In or Near Existing ROW)
Study Segment (New ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing Structure
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Transmission Line to be Retired
Place of Worship
School
Park
Cell Tower (FCC)
Highway
Road
Railroad
River (NHD)
Stream (NHD)
County Boundary
VOF Easement
Federal Conservation Land
Local Conservation Land
Historic District (VADHR)
Architectural Resource (VADHR)

*USACE = U.S. Army Corps of Engineers

Henry County, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

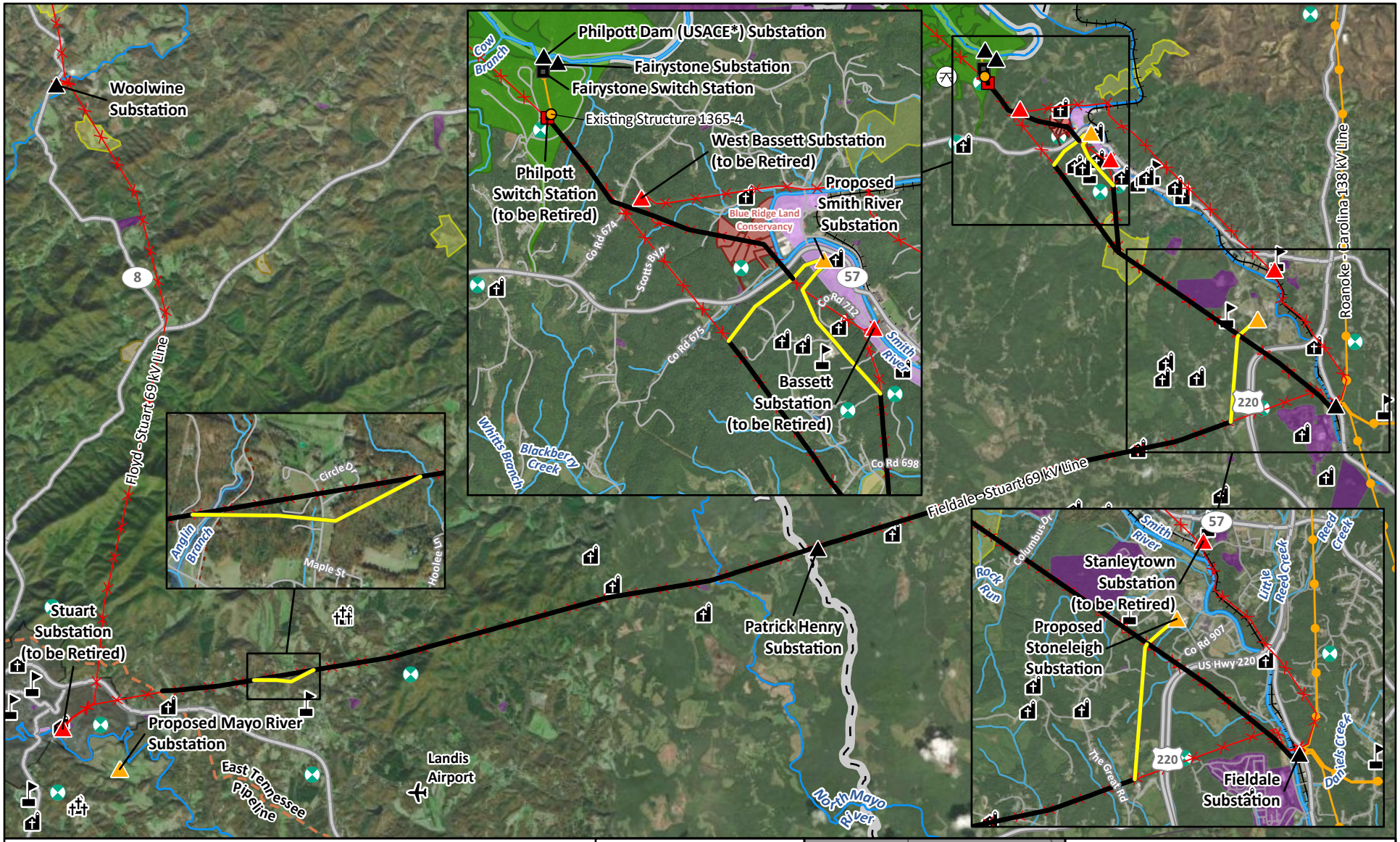
May 04, 2023

Map 4
Smith River Focus Area

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project: Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 0.5 1
Miles



Study Segment (In or Near Existing ROW)
Study Segment (New ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing Structure

Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Non-APCo Transmission Line
Existing Transmission Line to be Retired
Cemetery
Place of Worship

School
Park
Airport
Cell Tower (FCC)
Highway
Railroad
Natural Gas Pipeline
River (NHD)

County Boundary
Private Easement
VOF Easement
Federal Conservation Land
Local Conservation Land
Historic District (VADHR)
Architectural Resource (VADHR)
Town Boundary

*USACE = U.S. Army Corps of Engineers

Henry & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South
FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

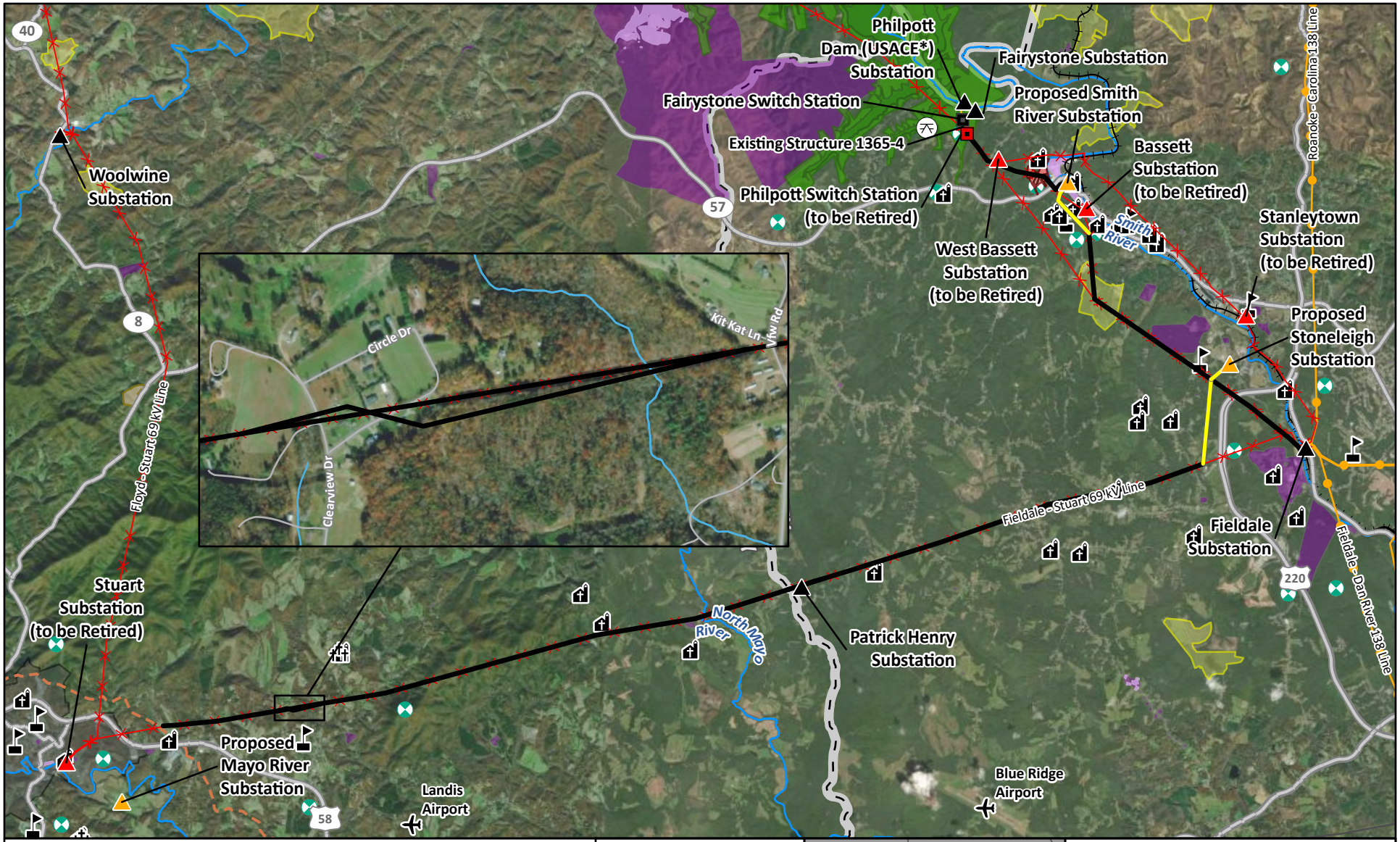
May 04, 2023

Map 5
Open House Study Segments

APPALACHIAN POWER
An AEP Company

Stuart Area Improvements Project:
Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 2 4
Miles



Study Segment (In or Near Existing ROW)
Study Segment (New ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing Transmission Line to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Non-APCo Transmission Line
Cemetery
Place of Worship
School
Park
Airports
Cell Tower (FCC)
Highway
Railroad
Natural Gas Pipeline
River (NHD)
County Boundary
Private Easement
VOF Easement
Federal Conservation Land
Local Conservation Land
Historic District (VADHR)
Architectural Resource (VADHR)
Town Boundary

*USACE = U.S. Army Corps of Engineers

Henry & Patrick Counties, Virginia

Author: elundy
Project: 158529

NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983

May 04, 2023

Map 6
Refined Study Segments

APPALACHIAN POWER
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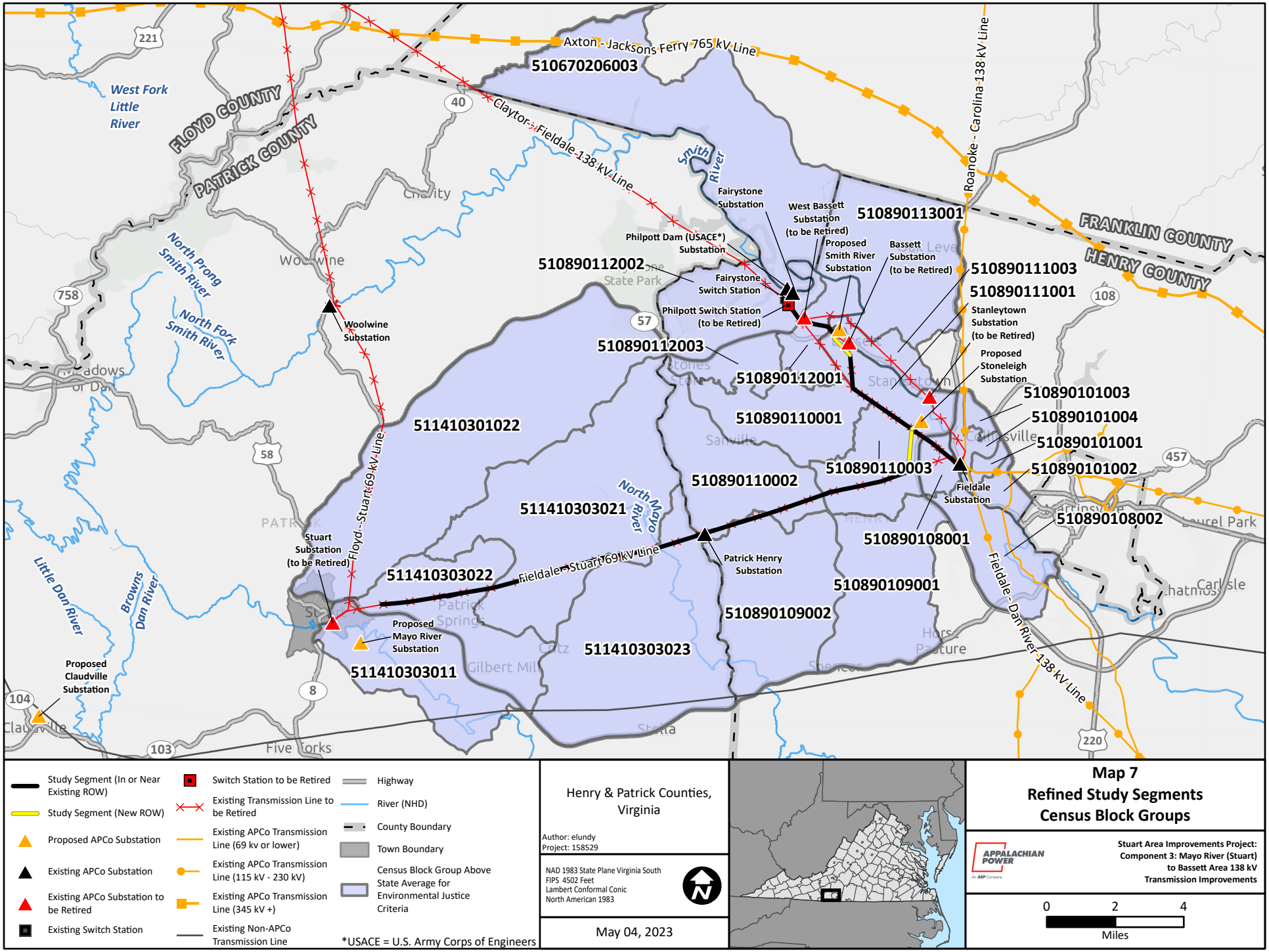
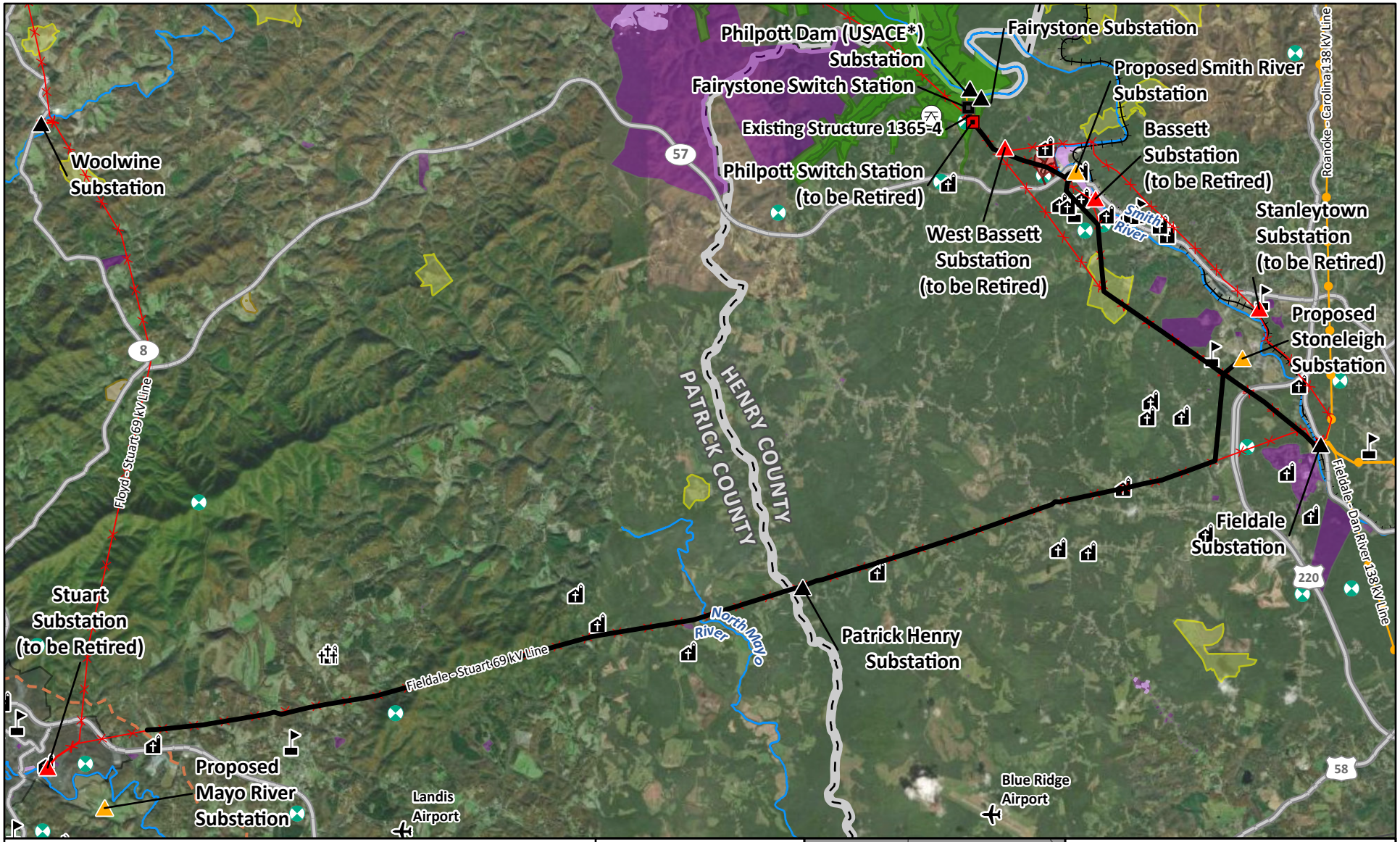
Stuart Area Improvements Project: Component 3: Mayo River (Stuart) to Bassett Area 138 kV Transmission Improvements

0 2 4
Miles


Axton - Jacksons Ferry 765 kV Line
Claytor - Fieldale 138 kV Line
Roanoke - Carolina 138 kV Line
Floyd - Stuart 69 kV Line
Fieldale - Stuart 69 kV Line
Fieldale - Dan River 138 kV Line
FLOYD COUNTY
PATRICK COUNTY
FRANKLIN COUNTY
HENRY COUNTY
West Fork Little River
North Prong Smith River
North Fork Smith River
Smith River
North Mayo River
Little Dan River
Browns Dan River
510670206003
510890113001
510890112002
510890111003
510890111001
510890112003
510890112001
510890110001
511410301022
510890101003
510890101004
510890101001
510890110003
510890101002
510890110002
511410303021
510890108002
510890108001
511410303022
510890109001
510890109002
511410303023
511410303011
Fairystone Substation
West Bassett Substation (to be Retired)
Proposed Smith River Substation
Bassett Substation (to be Retired)
Philpott Dam (USACE*) Substation
Fairystone Switch Station
Philpott Switch Station (to be Retired)
Stanleytown Substation (to be Retired)
Proposed Stoneleigh Substation
Woolwine Substation
Fieldale Substation
Stuart Substation (to be Retired)
Patrick Henry Substation
Proposed Mayo River Substation
Proposed Claudville Substation
Woolwine
Stanleytown
Fieldale
Martinsville
Laurel Park
Carlisle
Five Forks
Gilbert Mill
Patrick Springs
Stella
Claudville
Chatmos
Horsepasture
Study Segment (In or Near Existing ROW)
Study Segment (New ROW)
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing Transmission Line to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing APCo Transmission Line (345 kV +)
Existing Non-APCo Transmission Line
Highway
River (NHD)
County Boundary
Town Boundary
Census Block Group Above State Average for Environmental Justice Criteria
*USACE = U.S. Army Corps of Engineers
Henry & Patrick Counties, Virginia
Author: elundy
Project: 158529
NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983
May 04, 2023
Map 7
Refined Study Segments
Census Block Groups
APPALACHIAN POWER
Stuart Area Improvements Project:
Component 3: Mayo River (Stuart)
to Bassett Area 138 kV
Transmission Improvements
0 2 4
Miles


Philpott Dam (USACE*)
Substation
Fairystone Switch Station
Fairystone Substation
Proposed Smith River
Substation
Existing Structure 1365-4
Bassett
Substation
(to be Retired)
Philpott Switch Station
(to be Retired)
Roanoke - Carolina 138 kV Line
Woolwine
Substation
West Bassett
Substation
(to be Retired)
Smith River
Stanleytown
Substation
(to be Retired)
57
Proposed
Stoneleigh
Substation
8
Floyd - Stuart 69 kV Line
HENRY COUNTY
PATRICK COUNTY
Fieldale
Substation
Fieldale - Dan River 138 kV Line
220
Stuart
Substation
(to be Retired)
North Mayo
River
Patrick Henry
Substation
Fieldale - Stuart 69 kV Line
Proposed
Mayo River
Substation
Landis
Airport
Blue Ridge
Airport
58
Component 3 Proposed Route
Proposed APCo Substation
Existing APCo Substation
Existing APCo Substation to be Retired
Existing Switch Station
Switch Station to be Retired
Existing Transmission Line to be Retired
Existing APCo Transmission Line (69 kv or lower)
Existing APCo Transmission Line (115 kV - 230 kV)
Existing Non-APCo Transmission Line
Cemetery
Place of Worship
School
Park
Airport
Cell Tower (FCC)
Highway
Railroad
Natural Gas Pipeline
County Boundary
River (NHD)
Private Easement
VOF Easement
Local Conservancy
Federal Conservation Land
Historic District (VADHR)
Architectural Resource (VADHR)
Town Boundary
*USACE = U.S. Army Corps of Engineers
Henry & Patrick Counties, Virginia
Author: elundy
Project: 158529
NAD 1983 State Plane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983
May 04, 2023
Map 8
Component 3 Proposed Route
APPALACHIAN POWER
An AEP Company
Stuart Area Improvements Project:
Component 3: Mayo River (Stuart)
to Bassett Area 138 kV
Transmission Improvements
0
2
4
Miles

Attachment C: GIS Data Sources

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Land Use		
Number of parcels crossed by the ROW	Component 3 – Patrick County Parcel Data (2022), Henry County Parcel Data (2022)	Count of the number of parcels crossed by the ROW
Number of residences within 50, 100, 250, & 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019 and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of residences within the ROW and within 50, 100, 250, & 500 feet of potential routes
Number of commercial buildings within 50, 250, & 500 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] Imagery (2019), and Google Earth Imagery (2021) and field verified from points of public access	Count of the number of commercial buildings within the ROW and within 50, 250, & 500 feet of potential routes
Land use acreage and distance crossed by the ROW and acreage within 50 feet of the route centerline	National Land Cover Database [NLCD] (2022)	The National Land Cover Database (NLCD 2022) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed	National Conservation Easement Database (NCED) National Conservation Easement Database (NCED) (2020)	Private conservation easements crossed by the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies
Acres of agricultural district land crossed	National Land Cover Database [NLCD] (2019)	Protected land that is devoted exclusively to agricultural production or devoted to and qualified for compensation under a federal land retirement or conservation program

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
		that is at least 10 acres in size, or produces an average yearly gross income of at least $2,500 during a 3-year period
Number of archeological resources within the ROW and 250 feet of centerline	VDHR's VCRIS (2022)	Previously identified archeological resources listed or eligible on the National Register of Historic Places (NRHP) acquired through VDHR's VCRIS (2022)
Number of historic architectural resources within the ROW, within 1 mile	VDHR's VCRIS (2022)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP acquired through VDHR's VCRIS (2022)
Institutional uses (schools, places of worship, hospitals, assisted living) within 1,000 feet of the route centerline. Cemeteries within 250 feet of centerline.	United States Geological Survey's (GNIS) 2022	This dataset includes the locations of churches, hospitals, parks, and schools. Features within 1000 feet of potential routes were field verified. Cemetery locations within 250 of the route centerlines.
Airfield and heliports within 1 mile of the route centerline	United States Geological Survey's (GNIS) 2022 and the Federal Aviation Administration (FAA) database 2020	Distance from airfields and heliports
Natural Environment		
Forest clearing within the ROW	Digitized based on Virginia Geographic Information Network VGIN (2019) and Google Earth (2017; 2019); NLCD Tree Canopy Cover (2016)	Acres of forest within the ROW
Number of National Hydrography Dataset (NHD)	USGS 2022	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
stream and waterbody crossings within the ROW		surface water features such as lakes, ponds, streams, rivers, springs and wells
Acres of National Wetland Inventory (NWI) wetland crossings within the ROW	United States Fish and Wildlife Service (USFWS) 2022	The NWI produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats
Acres of 100-year floodplain crossing within the ROW	United States Federal Emergency and Management Agency (FEMA) (2008)	Acres of 100-year floodplain within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2022); VA-DCR, Natural Heritage Conservation Lands Database (2021)	Miles of federal, state and local lands crossed by the ROW
Threatened, endangered, rare or sensitive species occurrence within the Project vicinity	United States Fish and Wildlife Service Critical Habitat Report (2022)	Known occurrences; locations of potential habitat based on land use
Percent of hydric soils within the ROW	United States Department of Agriculture (USDA-NRCS), Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Database (2021)	Percent of soil associations crossed by the ROW characterized as hydric, predominantly hydric, partially hydric and non-hydric
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (2021)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Technical		
Route length	Measured in GIS	Length of route in miles

Attachment C. GIS Data Sources		
Siting Criteria	**Source**	**Description**
Number and severity of angled structures	Developed in GIS	Anticipated number of angled structures less than 3 degrees, 3 to 45 degrees and more than 45 degrees based on preliminary design
Number of road crossings	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Count of federal, state and local roadway crossings
Number of pipeline crossings	S&P Global Platts NGL Refined Product Pipelines (2021)	Number of known pipelines crossed by the transmission ROW
Number of transmission line crossings	AEP TGIS Database (2022)	Number of high voltage (100 kV or greater) transmission lines crossed by the ROW
Distance of steep slopes crossed	Derived from seamless Digital Elevation Models (DEMs) obtained from the U.S. Geologic Survey (2022)	Miles of slope greater than 20% crossed by the routes
Length of transmission line parallel	AEP TGIS Database (2022)	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	S&P Global Platts NGL Refined Product Pipelines (2021)	Miles of the route parallel to existing pipelines
Length of road parallel	The Virginia Geographic Information Network (VGIN) - The Road Centerline Program (RCL) (2022)	Miles of the route parallel to existing roadways

Attachment D: Data Collection Summary

Data Source	Description
GIS Data	See typical GIS data sources in Attachment C.
Field Inspections	Siting Team members conducted field inspections throughout the Study Area and along the proposed Study Segments throughout 2019, 2021, and 2022.
Federal Agencies	• United States Fish and Wildlife Service's (USFWS), Virginia Ecological Services Office utilizing the Information, Planning and Consultation (IPaC) System [April 2023]
State Agencies	• Virginia Department of Historic Resources' Virginia Cultural Resources Information System database review [2022] • Virginia Department of Environmental Quality databases [2022] • Virginia Department of Wildlife Resources online databases for sensitive species and habitats [2022] • Virginia Department of Conservation and Recreation Natural Heritage Program [2022]
Local Agencies/Officials	• Henry County Officials – virtual presentation to officials by Siting personnel. [June 2020 and March 2022]. • Patrick County Officials – virtual meeting with officials by Siting personnel. [June 2020]
Open House(s)	• A news release was distributed to the public on March 17, 2022 • Two separate Project mailings were sent to 782 landowner addresses on March 17 and 21, 2022. The outreach mailings included a letter, postcard, component fact sheet, comment card with a prepaid postage return envelope, and trifold letter of Project and Component information. • An automated telephone notification from the Company was made on March 22, 2022, to notify landowners about the open houses. A total of 349 landowners were reached through the voicemail message on March 22, 2022. • Appalachian Power hosted public open houses on March 28 and 29, 2022 from 5 p.m. to 7:30 p.m. at Stuart Rotary Field (420 Woodland Drive, Memorial Building) and Bassett Train Station (3536 Fairystone Park Highway) in Stuart and Bassett. • 79 total landowners attended the public open houses.
Individual Landowners	• No landowner requested on-site visits by the Siting Team. The Siting Team followed up with individual landowners via phone or email as needed. ROW team members met with landowners later during the siting process.
Website and Mailed-In Comments	• Received approximately 31 public comments. AEP representatives reviewed comments and contacted authors to address concerns or discuss the Project further.

Attachment E: Study Area Photographs



Photo 1. Forested Land in Patrick County



Photo 2. Agricultural Land in Patrick County



Photo 3. Residential Development in Patrick County



Photo 4. Recreational Development in Henry County



Photo 5. Agricultural Land in Henry County



Photo 6. Residential Development in Henry County

Attachment F: Environmental Justice Communities

Attachment F. Environmental Justice Communities										
CBG within one mile of centerline	Crossed by Centerline (Yes/No)	Component	Crossing Route	Population	% people of color	% low income[1]	% linguistic isolation	% less than high school	% under age 5	% over age 64
Virginia[2]				8509358	39%	24%	3%	10%	6%	15%
510890101004	**Yes**	**Component 3**	**Proposed Route**	**1818**	**31%**	**55%**	**0%**	**17%**	**6%**	**21%**
510890108001	**Yes**	**Component 3**	**Proposed Route**	**849**	**1%**	**55%**	**0%**	**19%**	**9%**	**14%**
510890109002	**Yes**	**Component 3**	**Proposed Route**	**757**	**16%**	**54%**	**0%**	**27%**	**10%**	**29%**
510890110001	**Yes**	**Component 3**	**Proposed Route**	**1453**	**45%**	**54%**	**0%**	**24%**	**2%**	**25%**
510890110002	**Yes**	**Component 3**	**Proposed Route**	**1822**	**4%**	**50%**	**0%**	**36%**	**9%**	**31%**
510890110003	**Yes**	**Component 3**	**Proposed Route**	**1674**	**35%**	**48%**	**0%**	**18%**	**3%**	**18%**
510890111001	**Yes**	**Component 3**	**Proposed Route**	**872**	**13%**	**42%**	**0%**	**29%**	**15%**	**35%**
510890112001	**Yes**	**Component 3**	**Proposed Route**	**498**	**4%**	**71%**	**0%**	**25%**	**4%**	**32%**
510890112002	**Yes**	**Component 3**	**Proposed Route**	**756**	**8%**	**50%**	**0%**	**14%**	**1%**	**25%**
511410303021	**Yes**	**Component 3**	**Proposed Route**	**1355**	**4%**	**32%**	**0%**	**23%**	**7%**	**13%**
511410303022	**Yes**	**Component 3**	**Proposed Route**	**1550**	**16%**	**28%**	**1%**	**4%**	**9%**	**32%**
511410303023	**Yes**	**Component 3**	**Proposed Route**	**1330**	**24%**	**43%**	**0%**	**13%**	**8%**	**17%**
510670206003	No	Component 3	-	480	0%	26%	0%	25%	8%	46%
510890101001	No	Component 3	-	815	30%	74%	7%	14%	12%	17%
510890101002	No	Component 3	-	366	65%	6%	0%	9%	11%	17%
510890101003	No	Component 3	-	542	19%	68%	0%	32%	4%	30%
510890108002	No	Component 3	-	889	65%	74%	0%	25%	0%	43%
510890109001	No	Component 3	-	1696	29%	44%	0%	27%	5%	24%
510890111003	No	Component 3	-	990	16%	49%	0%	30%	1%	21%
510890112003	No	Component 3	-	1512	10%	54%	0%	32%	8%	37%
510890113001	No	Component 3	-	1357	36%	43%	0%	14%	5%	32%
511410301022	No	Component 3	-	401	24%	25%	0%	19%	0%	15%
511410303011	No	Component 3	-	1166	14%	27%	0%	18%	0%	41%

[1] Per the Virginia Environmental Justice Act, "Low-income community" means any census block group in which 30 percent or more of the population is composed of people with low income, and used in the comparative analysis.

[2] Virginia Population (U.S.Census Bureau April 1, 2020)

Note:

Bold text indicates populations, as defined in Virginia Environmental Justice Act, which exceed the state average, and are crossed by the Proposed Route.

Gray shaded cells indicate reference populations.

Green shaded cells indicate identified minority populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Yellow shaded cells indicate identified low-income populations as defined in Virginia Environmental Justice Act, which exceed the state average.

Orange shaded cells indicate identified other demographic populations as defined in EJSCREEN, which exceed the state average, but not defined in Virginia Environmental Justice Act.

Attachment G: Agency Correspondence

SEE VOLUME 3 FOR ATTACHMENT G - AGENCY CORRESPONDENCE