Dominion
Virginia Power

FirstEnergy

DETAILED CONSTRUCTABILITY REPORT

PUBLIC VERSION

Gordonsville, Oneals Road (Pratts), Sperryville 230 kV

for:

2014 Open Window 2

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A. Executive Summary

A.1. Name and address of proposing entity

Dominion Virginia Power

701 East Cary Street

Richmond, Virginia 23139

FirstEnergy Corporation (FirstEnergy)

76 South Main Street

Akron, Ohio 44308

A.2. General description of proposed project

This proposal is a joint submittal by Dominion Virginia Power and FirstEnergy in response to the 2014 PJM RTEP Reliability Open Window 2. This proposal has two project portions as identified below that will separately resolve two areas of violations identified in Section A.3, but together provide significant future benefits to both Dominion and FirstEnergy service areas. Both Dominion Virginia Power and FirstEnergy requests Designated Entity status for these elements as described below. The elements include:

Proposal elements 1 through 5 resolve the PJM RTEP Reliability Open Window 2 posted violations on the Dominion Virginia Power transmission system listed in section A.3 below.

1. **Remington – Oneals Road (Pratts) 230 kV line:** Construct a new 230 kV transmission line from Dominion's existing Remington substation to FirstEnergy's upgraded Oneals Road (Pratts) 230 kV switching station. Included in this work will be an uprate of one existing 115 kV line segment between Mountain Run and Mitchell for the length of right-of-way it shares with new structures for the new 230 kV line. This work segment is the responsibility of Dominion.
2. **Gordonsville – Oneals Road (Pratts) 230 kV line:** Convert the existing FirstEnergy radial Gordonsville to Pratts 115 kV line to 230 kV and terminate in the new Oneals Road (Pratts) 230 kV switching station creating a new Gordonsville to Oneals Road (Pratts) 230 kV line. This work segment is the responsibility of FirstEnergy.
3. **Oneals Road (Pratts) substation:** Upgrade/expand the existing Pratts substation and install a 230 kV ring bus with a 230/115 kV transformer to connect to the existing Rappahannock Electric Cooperative (REC) Pratts distribution station. This work segment is the responsibility of FirstEnergy.
4. **Remington substation:** Upgrade the 230 kV bus to a ring configuration. This work segment is the responsibility of Dominion.
5. **Gordonsville substation:** Upgrade the 230 kV bus to a breaker-and-a-half configuration. This work segment is the responsibility of Dominion.

Proposal elements 6 and 7 below mitigate the Operational issues on the FirstEnergy transmission system listed in the Table in section A.3 below.

6. **Oneals Road (Pratts) – Sperryville 230 kV line:** Construct a new 230 kV transmission line from FirstEnergy's upgraded Oneals Road (Pratts) 230 kV switching station to FirstEnergy's upgraded Sperryville 138 kV station. This work segment is the responsibility of FirstEnergy.
7. **Sperryville substation:** Upgrade/expand the existing Sperryville substation and install a 138 kV ring bus with a 230/138 kV transformer. This work segment is the responsibility of FirstEnergy.

[redacted]

[redacted]

A.3. Reliability problem(s) proposed to resolve

The proposed solution provides a long-term solution to the violations reported in the RTEP Proposal Window 2 Results provided during the RFP process.

Violations resolved by proposal elements 1 through 5 in section A.2

The proposed project will address the N-1-1 Thermal Overloads associated with the loss of both lines 2088 & 2054, the loss of both lines 6 & 2077, the loss of line 2077 and the Remington 230/115 kV transformer, and the following associated flow gates:

1.1, 2.1, 1.2, 2.2, 1.5, 1.6, 2.6, and 1.7

This project also addresses the N-1-1 AC Voltage Drop and N-1-1 Low Voltage Magnitude issues associated with the loss of both lines 2088 & 2054, the loss of both lines 2088 & 2135, and the following associated flow gates:

N2-VD49 through N2-VD86

N2-VM3 through N2-VM38

Furthermore, this project addresses the case non-convergent N-2 contingencies involving the loss of both lines 255 & 2135 and the following associated flow gates:

N2-NC1 through N2-NC3 and N2-NC6

This project also addresses the Dominion Criteria Thermal flow gate DOM-4 involving the outage of line 2135 within the 2018_RTEP_MTX_05222013_DVPAnalysis Stress No Front Royal.sav case. Project work at Dominion's Gordonsville substation will address this contingency and will be complete by June 2018.

Operational Issues mitigated by proposal elements 6 and 7 in section A.2

The operational issues listed in the following tables will also be mitigated by this solution.

[redacted]

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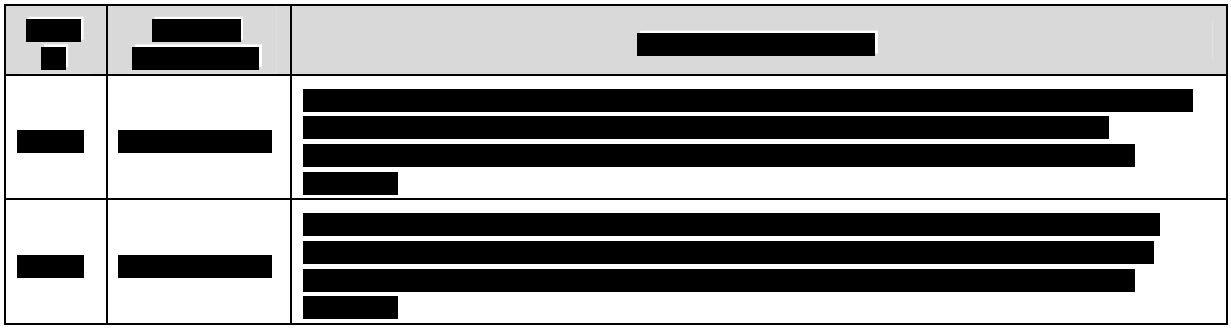


A.4. Total proposed project cost

Entity	Estimated Cost
Proposal Elements 1 thru 5	
Dominion	$99.7 million
FirstEnergy	$49.6 million
Sub Total	**$149.3 million**
Proposal Elements 6 and 7	
FirstEnergy	$51.9 million
Sub Total	**$51.9 million**
Total Proposal Cost:	**$201.2 million**

A.5. Overall schedule duration

The expected schedule duration is 54 months from receipt of approval from PJM.

A.6. Designated Entity

A.6.a. Status/pre-qualification

Dominion has received Pre-Qualification status from PJM under ID 13-03a indicating satisfaction of the pre-qualification requirements for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement ("PJM OZ") in section 1.5.8(a). Consequently, Dominion is eligible as a Designated Entity to construct, own and operate facilities within PJM's footprint. The information as posted on PJM's website reflects the Company's current qualifications.

FirstEnergy has received Pre-Qualification status from PJM under ID 13-10 indicating satisfaction of the pre-qualification requirements for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement ("PJM OZ") in section 1.5.8(a). Consequently, FirstEnergy is eligible as a Designated Entity to construct, own and operate facilities within PJM's footprint. The information as posted on PJM's website reflects the Company's current qualifications.

A.6.b. Statement of intent

For this proposal, Dominion Virginia Power and FirstEnergy seek to be the designated entities to construct, own, operate, maintain and finance the proposed project sections as described in section A.2 above.

B. Company Evaluation Information

B.1. Technical and engineering qualifications

Dominion

Dominion is one of the nation's largest producers and transporters of energy, with a portfolio of approximately 27,500 megawatts of generation, 11,000 miles of natural gas transmission, gathering and storage pipeline and 6,400 miles of electric transmission lines. Dominion operates one of the nation's largest natural gas storage systems with 947 billion cubic feet of storage capacity and serves retail energy customers in 15 states.

Dominion's existing electric transmission facilities are all within the PJM footprint. Dominion has an Electric Transmission staff of over 800 engineers, technicians, operators, and other construction and support personnel dedicated to develop, construct, maintain, and operate these facilities. Dominion has over 80 years' experience in developing, constructing, maintaining and operating transmission facilities, including the most recent nine years as a PJM member.

Dominion has a fully-staffed Substation Engineering team inclusive of Physical Design, System Protection Design, Communications support, Site Plan Development; and Transmission Line Engineering inclusive of overhead and underground design, Civil Engineering support and Geotechnical support. Dominion is fully-staffed for engineering support activities inclusive of siting/routing transmission lines, site development for substations as well as all real estate-related activities.

FirstEnergy

FirstEnergy is a regional energy provider headquartered in Akron, Ohio. Its subsidiaries and affiliates are involved in the generation, transmission, distribution and sale of electricity, as well as energy management and other energy-related services. FirstEnergy is a publicly traded corporation. JCP&L, Met-Ed and Penelec are wholly-owned direct subsidiaries of FirstEnergy. Mon Power, Potomac Edison and West Penn Power are wholly-owned direct subsidiaries of Allegheny Energy, Inc., which is a wholly-owned direct subsidiary of FirstEnergy. ATSI and TrAILCo are wholly-owned direct subsidiaries of FirstEnergy Transmission, LLC, which is a wholly-owned subsidiary of Allegheny Energy, Inc.

FirstEnergy submitted its prequalification documentation on June 27, 2013 and was subsequently granted pre-qualified status by PJM and given ID number 13-10. Further, in compliance with the PJM Operating Agreement Schedule 6, Subsection 1.5.8(a)(3), on September 29, 2014, FirstEnergy submitted the appropriate updates to Section F of its initial prequalification information. As such, FirstEnergy hereby states that the pre-qualification information provided to PJM, as updated, reflects FirstEnergy's current qualifications for eligibility as a Designated Entity as defined in the Operating Agreement Subsection 1.5.8(a).

FirstEnergy hereby submits by reference as to the specific section in its original pre-qualification documentation (dated June 27, 2013 and subsequently accepted by PJM) as evidence of the following:

- FirstEnergy's technical and engineering qualifications (Section B)
- FirstEnergy's experience in:
    - developing, operating and maintaining transmission facilities (Section C);
    - adherence to standardized construction, maintenance and operating practices (Section E), and including the ability for emergency response and system restoration (Section H);
    - working in the geographic region in which the proposed project is located (Section D);
    - ability to acquire rights of way within the proposed projects geographic region (Section I)
- FirstEnergy has adequate financial resources available to construct, operate and maintain the proposed project.

- FirstEnergy has demonstrated its managerial ability to contain costs and adhere to construction schedules for numerous transmission projects that have been constructed by its 10 utilities and 2 transmission companies.
- FirstEnergy will not be offering any construction cost caps or commitments for the proposed project.
- FirstEnergy is amply qualified to construct, operate, and maintain the proposed project (Section C).

B.2. Experience

B.2.a. Types of facilities proposed

The facilities being proposed for this joint proposal are within both FirstEnergy and Dominion's existing transmission zones in PJM. The types of facilities in this proposal are those both companies have extensive experience developing, operating and maintaining on a daily basis.

B.2.b. Standardized construction, maintenance, and operating practices

Both FirstEnergy and Dominion also have fully developed standardized construction, maintenance, and operating practices.

All work and design meets and adheres to the PJM Transmission and Substation Design Technical Requirements and PJM Manual 7 - PJM Protection standards.

As mentioned above, this Greenfield/upgrade proposal will become part of the existing transmission footprint of FirstEnergy and Dominion. These new facilities will utilize the same standard construction, maintenance, and operating practices for their respective utilities.

For more information on either Company, please refer to the pre-qualification documents posted on PJM's website.

B.2.c. Working in the geographical region

This Greenfield/upgrade project is within the geographical region of both FirstEnergy and Dominion's existing transmission system. For FirstEnergy, this will become part of the PJM Western region; for Dominion, the facilities will be part of the PJM Southern. All new facilities will be supported by existing resources of both companies.

B.2.d. Rights of way in geographical region of project

Both FirstEnergy and Dominion have extensive experience in acquiring rights-of-way for this proposal as this proposal is part of both companies' existing transmission footprint with PJM.

B.3. Financing plan

Refer to the filed pre-qualification documents of FirstEnergy and Dominion posted on PJM's website for information regarding the financing plan.

B.4. Cost containment and adherence to construction schedules

Neither FirstEnergy nor Dominion will be offering any construction cost caps or commitments to construction schedules for the proposed project.

B.5. Commitments

Neither FirstEnergy nor Dominion will be offering any commitments to the proposed project.

B.6. Unique qualifications

Refer to the filed pre-qualification documents of FirstEnergy and Dominion posted on PJM's website for information regarding the unique qualifications of each company.

B.7. Assumptions in developing proposal

The assumptions made in developing the proposal are mentioned in the various project components outlined herein.

C. Proposed Project Constructability Information

C.1. Component Scope

C.1.a. Greenfield Transmission Line Element Detail – Remington-Oneals Road 230 kV line

This work segment is the responsibility of Dominion.

See *Attachment 1 Single Line for Oneals Road Area Upgrades* for an overview.

C.1.a.1. Terminal points

The proposed 230 kV line to be constructed by Dominion will terminate in the existing Remington station owned by Dominion and the upgraded/expanded Oneals Road (Pratts) station owned by FirstEnergy.

Sections of existing Dominion line numbers 2, 11, and 70 will be rebuilt in conjunction with the new 230 kV line along the 24.2 mile section of existing 115 kV right-of-way between Remington and Rapidan.

C.1.a.2. Routing

The proposed length of the new Remington to Oneals Road (Pratts) 230 kV line is 37.5 miles. Of this length, 24.2 miles will be routed along existing Dominion 115 kV right-of-way with the remaining 13.3 miles along new right-of-way.

C.1.a.3. Geography and terrain

The terrain is gentle rolling pastures and farmland with crossings at several major state highways and rivers.

C.1.a.4. Right-of-way width by segment

The proposed length of the new Remington to Oneals Road (Pratts) 230 kV line is 37.5 miles. Of this length, 24.2 miles will be routed along existing Dominion 115 kV right-of-way with the remaining 13.3 miles along new right-of-way.

Right-of-way Summary Table

Classification	Length	Width
New right-of-way to be acquired	13.3 miles	120’
Expansion of existing right-of-way		
Proposed use of existing right-of-way	24.2 miles	120’

Segment: Remington to Rapidan

Length: 24.2 miles

Width: 120’

Classification: Existing right-of-way

Description:

This 24.2-mile section is comprised of existing 120’ wide right-of-way. Sections of existing Dominion line numbers 2, 11, and 70 will be rebuilt in conjunction with the new 230 kV line. This will create an uprate of the Mountain Run to Mitchell section of Line Number 2. No additional right-of-way is anticipated.

Segment: Rapidan to Oneals Road (Pratts)

Length: 13.3 miles

Width: 120'

Classification: New right-of-way to be acquired

Description:

It is anticipated that the new 13.3 mile line section between Rapidan and ONeals Road (Pratts) will be constructed in a 120' wide right-of-way.

C.1.a.5. Electrical characteristics

Required Electrical Characteristics Table

For the New 230 kV line between Remington and Oneals Rd (Pratts):

Nominal voltage rating	230 kV
AC or DC	AC
Line MVA normal rating	1047 MVA
Line MVA emergency rating	1047 MVA

For the rebuilt section of 115 kV Line Number 2 between Mountain Run and Mitchell:

Nominal voltage rating	115 kV
AC or DC	AC
Line MVA normal rating	352 MVA
Line MVA emergency rating	352 MVA

C.1.a.6. Physical characteristics

Required Physical Characteristics Table

Line and shield conductor type and size	Line conductor: 2-636 ACSR Shield conductor: .621 Alumoweld w/fiber optic cable
Overhead or underground/submarine	Overhead
Single or double circuit towers	Double Circuit Poles between Remington and Rapidan. Single Circuit Poles between Rapidan and Oneals Road.

C.1.a.7. Geographic map

See *Attachment 2 Preliminary Routes Remington Pratts Gordonsville 230 kV Transmission Line Project*. The line will extend from existing Remington substation for 24.2 miles along existing Dominion corridor to Rapidan. From Rapidan, the line will extend on new right-of-way for 13.3 miles as indicated by "Route 1" (green line) to Oneals Road (Pratts) substation.

C.1.b. Upgrade Transmission Line Element Detail – Gordonsville – Oneals Road (Pratts) 230 kV line

This work segment is the responsibility of FirstEnergy.

C.1.b.1. Terminal points

The proposed 230 kV line to be upgraded/rebuilt by FirstEnergy will terminate in the existing Gordonsville station owned by Dominion and the upgraded/expanded Oneals Road (Pratts) station owned by FirstEnergy.

C.1.b.2. Routing

See *Attachment 3 Routing Study Area between Gordonsville Substation and Oneals Road (Pratts) Substation*. FirstEnergy is in the process of determining proposed routes.

C.1.b.3. Geography and terrain

The study corridor for the new Gordonsville-Oneals Road (Pratts) 230 kV transmission line is located within the eastern foothills of the Shenandoah Mountain Range in an area known as the Virginia Piedmont, which is part of the larger Appalachian Highlands. The surface relief of the study area is characterized by relatively low, rolling hills with heights above sea level between 400 feet along the Rapidan River to elevations exceeding 800 feet along the perimeter of Cowherd Mountain. The soils are generally clay-like and moderately fertile with a high density of agricultural (dairying and general farming) and low density residential, with a moderate amount of forestry and conservation/recreation uses. Numerous named and un-named streams and waterways crisscross the area with interconnected drainage basins – all of which ultimately drain to and are part of the greater Chesapeake Bay watershed. This region also supports a diversity of archeological and historical resources along with several designated conservation easements.

C.1.b.4. Right-of-way width by segment

FirstEnergy intends to upgrade/rebuild the existing 17 mile, single-circuit, wood pole H-frame Gordonsville-Pratts 115 kV line to a present single-circuit, future double-circuit, 2-wood pole 230 kV line from Gordonsville Substation to the upgraded/expanded Oneals Road (Pratts) Substation. The new 230 kV line will re-use the existing 100' wide right-of-way.

Right-of-way Summary Table

Classification	Length	Width
New right-of-way to be acquired	N/A	N/A
Expansion of existing right-of-way	N/A	N/A
Proposed use of existing right-of-way	17 miles	100'

Segment: Gordonsville Substation to upgraded Oneals Road (Pratts) Substation

Length: 17 Miles

Width: 100 feet

Classification: Proposed use of existing right-of-way

Description:

It is anticipated that a new approx. 17 mile line in existing 100' wide right-of-way will be constructed from Gordonsville Substation to the proposed Oneals Road (Pratts) Substation.

C.1.b.5. Electrical characteristics

Required Electrical Characteristics Table

Nominal voltage rating	230 kV
AC or DC	AC
Line MVA normal rating	[redacted]
Line MVA emergency rating	[redacted]

C.1.b.6. Physical characteristics

Required Physical Characteristics Table

Line and shield conductor type and size	[redacted]
Overhead or underground/submarine	Overhead
Single or double circuit towers	[redacted]

C.1.b.7. Geographic map

See *Attachment 3 Routing Study Area between Gordonsville Substation and Oneals Road (Pratts) Substation*.

C.1.b.8. Optional supporting information

See *Attachment 4 Typical Structure Gordonsville-Oneals* for a typical single-circuit, future double-circuit, 2-pole wood structure anticipated for the Gordonsville Substation to Oneals Road (Pratts) Substation 230 kV line.

C.1.c. Upgraded/expanded Substation/ Switchyard Facility Element Detail – Oneals Road (Pratts) 230 kV

This work segment is the responsibility of FirstEnergy.

C.1.c.1. General description of the proposed location(s)

The proposed site for the Oneals Road *(Pratts)* Substation is located approximately 2.25 miles south of the town of Madison, VA; on the eastern side of Route 29; and east of the intersection of Fairground Road (687) with Orange Road (230). [redacted]

C.1.c.2. One-line diagram and general arrangement drawing

See *Attachment 1 Single Line for Oneals Road Area Upgrades*

See *Attachment 6 Oneals Road Plan View*

C.1.c.3. Electrical design

The Oneals Road (Pratts) Substation will have a 230/115 kV, [redacted] autotransformer installed as part of the upgrade/expansion.

C.1.c.4. Relay communications plan

[redacted]

C.1.c.5. Geographic map

See *Attachment 5 Parcel Overview for Oneals Substation* (dated 11/14/2014).

C.1.d. Upgrade Substation/ Switchyard Facility Element Detail – Remington

This work segment is the responsibility of Dominion.

C.1.d.1. General description of the proposed location(s)

The proposed solution includes work within the existing Remington 230/115 kV station that is located in the vicinity of:

Latitude: 38° 32' 22.94"

Longitude: 77° 46' 37.76"

Work will be completely within the existing station and no additional property will be needed.

This work will include:

230 kV 4-breaker ring bus arranged in a breaker-and-a-half configuration to facilitate potential future expansion with minimal incremental cost.

Transformer high side breaker.

C.1.d.2. One-line diagram and general arrangement drawing

See *Attachment 7 Remington Construction One Line Diagram*

See *Attachment 8 General Arrangement Plan Remington Substation*

C.1.d.3. Electrical design

No transformers or reactive devices will be installed.

C.1.d.4. Relay communications plan

Line protection over fiber-optic cable will be implemented consistent with Dominion practice.

C.1.d.5. Geographic map

See *Attachment 2 Preliminary Routes Remington Pratts Gordonsville 230 kV Transmission Line Project*

C.1.e. Upgrade Substation/ Switchyard Facility Element Detail – Gordonsville 230 kV

This work segment is the responsibility of Dominion.

C.1.e.1. General description of the proposed location(s)

The proposed solution includes work within the existing Gordonsville 230/115 kV station that is located in the vicinity of:

Latitude: 38° 7' 35.62"

Longitude: 78° 13' 17.78"

Work will be completely within the existing station and no additional property will be needed.

This work will include:

230 kV 5-breaker ring bus arranged in a breaker-and-a-half configuration to facilitate potential future expansion with minimal incremental cost.

C.1.e.2. One-line diagram and general arrangement drawing

See *Attachment 9 Gordonsville Construction One Line Diagram*

See *Attachment 10 General Arrangement Plan Gordonsville Substation*

C.1.e.3. Electrical design

No transformers or reactive devices will be installed.

C.1.e.4. Relay communications plan

Line protection over fiber-optic cable will be implemented consistent with Dominion practice.

C.1.e.5. Geographic map

See *Attachment 2 Preliminary Routes Remington Pratts Gordonsville 230 kV Transmission Line Project*.

C.1.f. Greenfield Transmission Line Element Detail – Oneals Road-Sperryville 230 kV line

This work segment is the responsibility of FirstEnergy.

C.1.f.1. Terminal points

The proposed 230 kV line to be constructed by FirstEnergy will terminate in the existing Sperryville station owned by FirstEnergy and the upgraded/expanded Oneals Road (Pratts) station owned by FirstEnergy.

C.1.f.2. Routing

See *Attachment 11 Oneals Sperrysville Location Map* for the routing study area between Sperryville Substation and Oneals Road (Pratts) Substation. FirstEnergy is in the process of determining proposed routes.

C.1.f.3. Geography and terrain

The study corridor for the new Sperryville-Oneals Road (Pratts) 230 kV transmission line is located within the eastern foothills of the Shenandoah Mountain Range in an area known as the Virginia Piedmont, which is part of the larger Appalachian Highlands. The surface relief of the study area is characterized by relatively low, rolling hills with heights above sea level between 400 feet along the Robinson River to elevations exceeding 1,200 feet along the ridgeline of Mitchell's Mountain. The geology of this region is complex with numerous rock formations of different materials and ages intermingled. The soils are generally clay-like and moderately fertile with a diversity of existing land uses including agricultural (orchards, dairying, and general farming), low density residential, and a wide variety of forestry and conservation/recreation uses. Numerous named and un-named streams and waterways crisscross the area with interconnected drainage basins – all of which ultimately drain to and are part of the greater Chesapeake Bay watershed. This region also supports a diversity of archeological and historical resources along with numerous conservation easements.

C.1.f.4. Right-of-way width by segment

FirstEnergy has not yet defined the preferred route. It is anticipated that the preferred route will be approximately 23 miles in length in new right-of-way. It is further anticipated that the new right-of-way will be approximately 120' in width. These dimensions may vary depending on final engineering details after the route is determined.

Right-of-way Summary Table

Classification	Length	Width
New right-of-way to be acquired	23 Miles	120'
Expansion of existing right-of-way	N/A	N/A
Proposed use of existing right-of-way	N/A	N/A

Segment: Sperryville Substation to upgraded/expanded Oneals Road (Pratts) Substation

Length: 23 Miles

Width: 120 feet

Classification: New right-of-way to be acquired

Description:

It is anticipated that a new approx. 23 mile line in new 120' wide right-of-way will be constructed from Sperryville Substation to the upgraded/expanded Oneals Road (Pratts) Substation.

C.1.f.5. Electrical characteristics

Required Electrical Characteristics Table

Nominal voltage rating	230 kV
AC or DC	AC
Line MVA normal rating	[redacted]
Line MVA emergency rating	[redacted]

C.1.f.6. Physical characteristics

Required Physical Characteristics Table

Line and shield conductor type and size	[redacted]
Overhead or underground/submarine	Overhead
Single or double circuit towers	[redacted]

C.1.f.7. Geographic map

See *Attachment 11 Oneals Sperrysville Location Map*

C.1.f.8. Optional supporting information

See *Attachment 12 Typical Structure Sperryville to Oneals Road* for the typical single-circuit, wood H-frame structure anticipated for the Sperryville Substation to Oneals Road (Pratts) Substation 230 kV line.

C.1.g. Upgrade Substation/ Switchyard Facility Element Detail – Sperryville

This work segment is the responsibility of FirstEnergy.

C.1.g.1. General description of the proposed location(s)

The proposed site for the upgraded/expanded Sperryville Substation [redacted] The site is shown on *Attachment 13 Parcel Overview for Sperryville* (dated 9/22/2014)

C.1.g.2. One-line diagram and general arrangement drawing

See *Attachment 1 Single Line for Oneals Road Area Upgrades*

C.1.g.3. Electrical design

The Sperryville Substation will have a 230/138 kV, [redacted] autotransformer installed as part of the upgrade/expansion.

C.1.g.4. Relay communications plan

Install a standard 230 kV line panel using fiber-optic communications on the Oneals Road (Pratts) line.

C.1.g.5. Geographic map

See *Attachment 13 Parcel Overview for Sperryville.*

C.1.h. Environmental, Permitting and Land Acquisition

C.1.h.1. Environmental impacts

Remington to Oneals Road (Pratts): Dominion has identified the following environmental constraints using GIS and other information available electronically for the 230 kV transmission line between Remington and Oneals Road (Pratts) (24.2 mile rebuild; 13.3 mile greenfield):

- **Wetlands:** A review of the National Wetland Inventory indicated that the project would cross approximately 23.6 acres of wetlands. While approximately 19.6 acres of wetlands are along the portion of the route that will be constructed within existing right-of-way (ROW), about 4.0 acres of wetlands are along the greenfield portion of the route.
- **Endangered Species:** A review of the Information, Planning, and Conservation System website of the U.S. Fish and Wildlife Service indicated that there are four (4) endangered species within the vicinity of the project area:
  - Dwarf Wedge Mussel (Endangered) - Occurrences are within the Rappahannock River System and any increased sedimentation could cause adverse effects to this species. If there are no construction activities that will impact waterbodies where the species is present and Best Management Practices (BMPs) are implemented, there are no concerns for mussels.
  - James Spinymussel (Endangered) - Occurrences are in the James River Drainage and any increased sedimentation could cause adverse effects to this species. If there are no construction activities that will impact waterbodies where the species is present and Best Management Practices (BMPs) are implemented, there are no concerns for mussels.
  - Northern long-eared bat (Proposed Endangered) - This species is currently proposed for listing as endangered under the Endangered Species Act and a final ruling on the listing decision is expected to occur in April 2015. Habitat is broad ranging including trees in upland and riparian areas.
  - Bald Eagle – The Bald Eagle is no longer listed under the Endangered Species Act (ESA). However, this species is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.
- **Land Clearing:** Approximately 71.1 acres of forested area will need to be cleared for the construction of the project. This clearing will only occur along the 13.3 mile greenfield portion of the route. No clearing of the 24.2 mile existing portion of the route will be necessary, since this represents an existing, cleared ROW.
- **Topography:** The project area consists of gently rolling topography and has 6 stream crossings and over 40 road crossings.
- **Land disturbance:** Work will be required and soil and erosion controls will be put in place to prevent migrations of sediment off-site. Stormwater management will be addressed.
- **Conservation Lands:** The proposed project will cross approximately 3.8 miles of conservation easements. These easements consist of Virginia Department of Outdoors Foundation and Virginia Department of Historic Resource easements. All of the easement crossings are along the portion of the route that will be constructed within existing ROW. The new greenfield route makes effort to avoid these easements.

- **National Register of Historic Places (NRHP):** The local landscape is rich in history and there are fifteen (15) National Register-Eligible and -Listed Properties, Battlefields, Historic Landscapes within 1.5 miles of the project. Necessary steps will be taken to comply with VDHR's *"Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia"* (January 2008) which considers possible impacts to certain historical sites within 1.5 miles of a Transmission line that may have some visibility of the line. Appropriate study and measures will be evaluated to protect all historic resources to the greatest extent feasible. The 13.3 mile greenfield portion of the route does not cross any properties that are listed in or eligible for listing in the National Register of Historic Places.

Oneals Road (Pratts) Substation Site: FirstEnergy has identified the following environmental constraints using GIS and other information available electronically for the preferred Oneals Road (Pratts) Substation Site:

- **Wetlands:** A review of the National Wetland Inventory (NWI) did not indicate the presence of any wetlands or streams on the proposed site. A site investigation of this proposed substation location confirmed this conclusion.
- **Endangered Species:** Preliminary review of United States Fish and Wildlife Service (USFWS) database indicated several listed RTE species in the vicinity of this proposed substation, but the site does not support potentially suitable habitat for any of these species and no adverse impact is anticipated.
- **Land clearing:** The parcel is mostly cleared and no trees are anticipated to be impacted to construct the substation.
- **Topography:** The site is gently sloping according to United States Geological Survey topographical maps, and only minor re-grading will be necessary to construction this substation.
- **Land disturbance:** Work will be required and soil and erosion controls will be put in place to prevent migrations of sediment off site. Storm water management will be addressed through either open ponds or infiltration methods.
- **Conservation lands:** The parcel is outside of all conservations lands and public use lands.
- **National Register of Historic Places (NRHP):** Several NRHP sites are located approximately 2 miles from the parcel, and the construction of this substation should have no effect on these resources.

Other work segments. Environmental constraints for the Gordonsville, Oneals Road (Pratts) and Sperryville 230 kV Transmission Lines are under review. Preferred routes for the 230 kV transmission line routes have not been selected. As a result, FirstEnergy cannot numerate impacts to the environmental constraints listed above. Route selection will evaluate impacts to the above constraints, among other considerations. It is assumed that impacts to wetlands, endangered species, conservation lands, forested areas and NRHP will be avoided or minimized to the extent possible.

C.1.h.2. Right-of-way and land acquisition

Dominion will not need to acquire any additional right-of-way (approx.120' in width) for the 24.2 miles of existing right-of-way from Remington substation to the point

where the new right-of-way is needed. Dominion will then acquire necessary easements (approx. 120' in width) for the 13.3 miles of new right-of-way to a proposed Oneals Substation.

FirstEnergy will acquire new easements (approx. 120' width) for the right-of-way needed for the new 230 kV line from Sperryville Substation to the upgraded/expanded Oneals Road (Pratts) Substation. FirstEnergy will utilize the existing 100' wide right-of-way for the rebuild 230 kV line from Gordonsville Substation to the upgraded/expanded Oneals Road (Pratts) Substation.

C.1.h.3. Permitting plan and approach

FirstEnergy's permitting plan and approach is combined with their discussion of public opposition in Section c.1.h.4 below.

Dominion is providing the following list of agencies and associated permits and approvals needed prior to the construction of the 230 kV electrical transmission line between Remington and Oneals Road (Pratts).

Federal Authorizations & Consultations

- U.S. Army Corps of Engineers
  - Section 404 Permit- Authorization under Section 404 of the Clean Water Act (will likely qualify for Nationwide Permit)
  - Section 10 Permit- Authorization under Section 10 of the Rivers and Harbors Act (would be included in Nationwide Permit)
- U.S. Fish and Wildlife Service
  - Consultation with Corps under Section 7 of the Endangered Species Act for issuance of Section 404/10 permits
  - Migratory Bird Treaty Act- potential relocation/removal permit required if active next is located on existing structure and needs to be removed
  - Bald and Golden Eagle Protection Act- potential Eagle Nest Take Permit required if active next is located on existing structure and needs to be removed
- Advisory Council on Historic Preservation (not likely to be involved)
  - Section 106 National Historic Preservation Act
- U.S. Federal Aviation Administration
  - Form 7460 – Notice of Proposed Construction

State Authorizations & Consultations

- Commonwealth of Virginia State Corporation Commission (SCC)
  - Certificate of Public Convenience and Necessity (CPCN)
- Commonwealth of Virginia Historic Preservation Office- Virginia Department of Historic Resources
  - Consultation with Corps under Section 106 of the National Historic Preservation Act for issuance of Section 404/10 authorizations
  - Consultation under SCC process
- Virginia Department of Environmental Quality
  - Virginia Water Protection Permit not likely to be required if project is authorized under Corps Nationwide Permit

- General Permit for Discharges of Stormwater from Construction Activities
- Coordinates state agency review under SCC process

- Virginia Marine Resources Commission
  - Permit for Subaqueous Lands Encroachment
- Virginia Department of Transportation
  - Land Use Permit
- Virginia Department of Game and Inland Fisheries
  - Consultation with the Corps under Section 7 of the Endangered Species Act for issuance of Section 404/10 permits
  - Consultation under SCC process
- Virginia Department of Conservation and Recreation
  - Consultation under SCC process

Private Authorizations

- Norfolk Southern Railway/Amtrak
  - Right of Entry and Facility Encroachment Permits

C.1.h.4. Discussion of potential public opposition

There is a potential for public opposition to occur in response to any project that proposes to install new or modify existing electric infrastructure. FirstEnergy and Dominion plan to implement the following tasks to educate officials and the public on the need and benefits of the project. Through these communications efforts, the companies seek to minimize misunderstanding and the potential for significant public opposition to the project which could result in delays to the project schedule.

a. FirstEnergy and Dominion are developing a joint comprehensive communications plan to advise and gather input from the local communities on the project.

b. As Dominion and the Rappahannock Electric Cooperative both have distribution facilities within the Project's footprint, FirstEnergy and Dominion have included Rappahannock's representatives in the development of FirstEnergy's and Dominion's communication plan.

c. FirstEnergy has initiated a site selection study to identify and evaluate potential sites for its substation to be installed next to or near the existing Pratts Substation. This study will evaluate both the substation sites and the nearby associated transmission line construction in an effort to identify and rank the sites that have the best potential for minimizing the overall impacts of the project. This will be followed by efforts starting with the most favorable site, to acquire property rights via negotiations.

d. FirstEnergy has started to develop a route selection study for its new transmission line running between the Sperryville Substation and a substation located adjacent to Pratts substation. This study will identify routes that minimize the overall impacts of the project to the extent practical. Potential routes under consideration in addition to new corridors, will include existing corridors (highways, railways, gas lines) and electric infrastructure including existing sub transmission corridors.

e. As part of rebuilding the existing Gordonsville-Pratts 115 kV transmission line for 230 kV operation, the existing corridor will be carefully studied to determine if part or all of the corridor is significantly constrained for the

proposed construction, appropriate alternative alignments will be identified and studied.

f. As project details become refined, local officials will be advised of the project. In addition to providing information on the project, this effort will seek to develop a dialog for future discussions that can resolve concerns about the project before they become points if opposition.

g. FirstEnergy and Dominion will host public information meetings on the project to both present project information and to solicit input from the community on the project. Additionally, the companies will use a toll free phone line and web based sites to also provide project details and provide an avenue to ask questions and provide comments.

C.2. Project Component Cost Estimates

C.2.a. Cost Estimate Table – Remington – Oneals Road (Pratts) 230 kV line

This work segment is the responsibility of Dominion.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.b. Cost Estimate Table – Gordonsville – Oneals Road (Pratts) 230 kV line

This work segment is the responsibility of FirstEnergy.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.c. Cost Estimate Table – Oneals Road (Pratts) substation

This work segment is the responsibility of FirstEnergy.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.d. Cost Estimate Table – Remington substation

This work segment is the responsibility of Dominion.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.e. Cost Estimate Table – Gordonsville substation

This work segment is the responsibility of Dominion.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.f. Cost Estimate Table – Oneals Road (Pratts) – Sperryville 230 kV line

This work segment is the responsibility of FirstEnergy.

Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.2.g. Cost Estimate Table – Sperryville substation

This work segment is the responsibility of FirstEnergy.

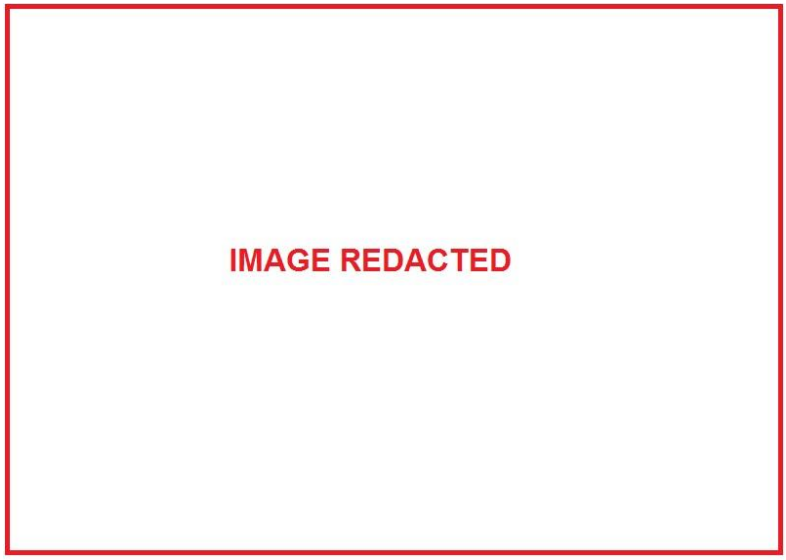
Detail (required)	Estimated Cost
Engineering and design costs	[redacted]
Material and equipment costs	[redacted]
Construction and commissioning costs	[redacted]
Right-of-way and land procurement costs	[redacted]
Permitting costs	[redacted]
Construction management costs	[redacted]
Contingency	[redacted]
Other cost adders such as corporate overhead	[redacted]
TOTAL:	[redacted]

C.3. Schedule

The schedule estimates below include consideration of preliminary work already completed and in progress.

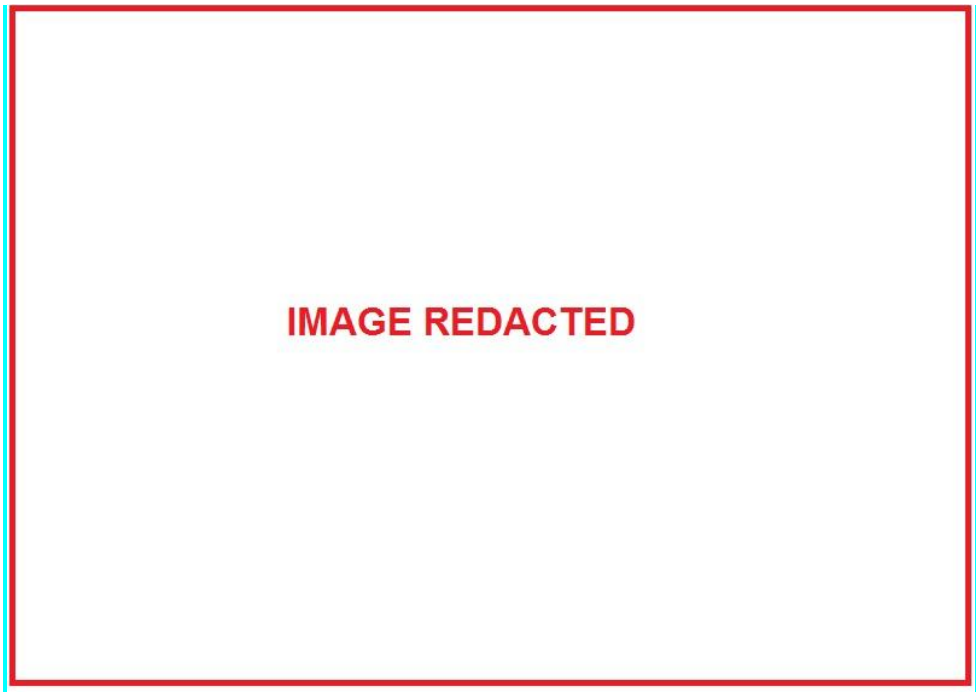
C.3.a. Schedule for Remington – Oneals Road (Pratts) 230 kV line

This work segment is the responsibility of Dominion. In the table below, note that Dominion route selection activities, which began in December 2013, are now complete (not reflected in Gantt chart). For details see *Attachment 14 Remington to Oneals Road Gantt Chart*.



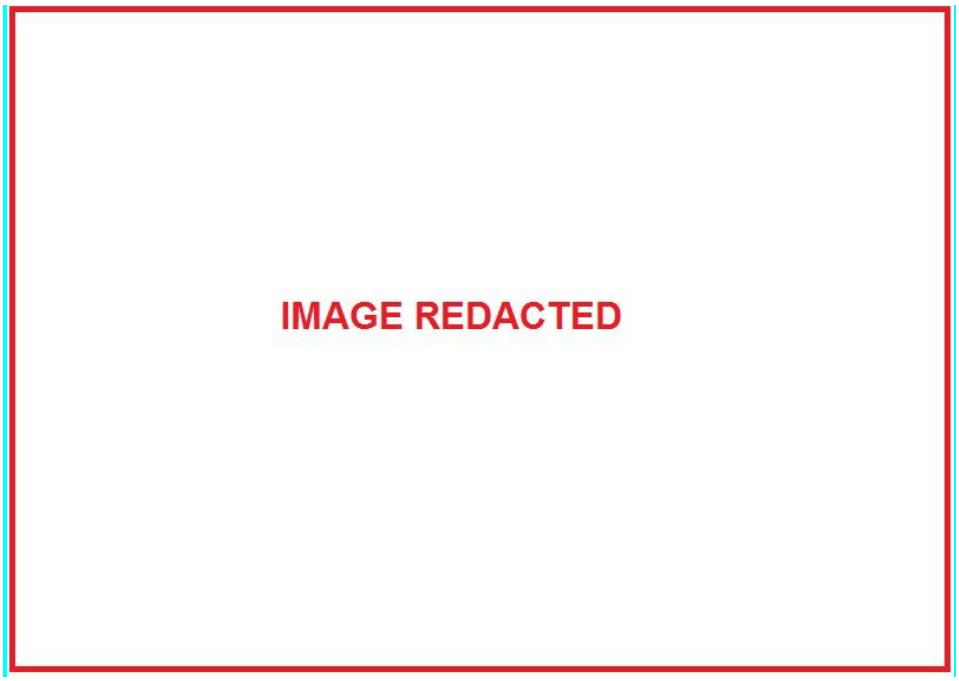
C.3.b. Schedule for Gordonsville – Oneals Road (Pratts) 230 kV line

This work segment is the responsibility of FirstEnergy. For details see *Attachment 15 Gordonsville-Oneals Line 1 Gantt Chart*.



C.3.c. Schedule for Oneals Road (Pratts) substation

This work segment is the responsibility of FirstEnergy. For details see *Attachment 16 Oneals Road SS Gantt Chart*.



C.3.d. Schedule for Remington substation

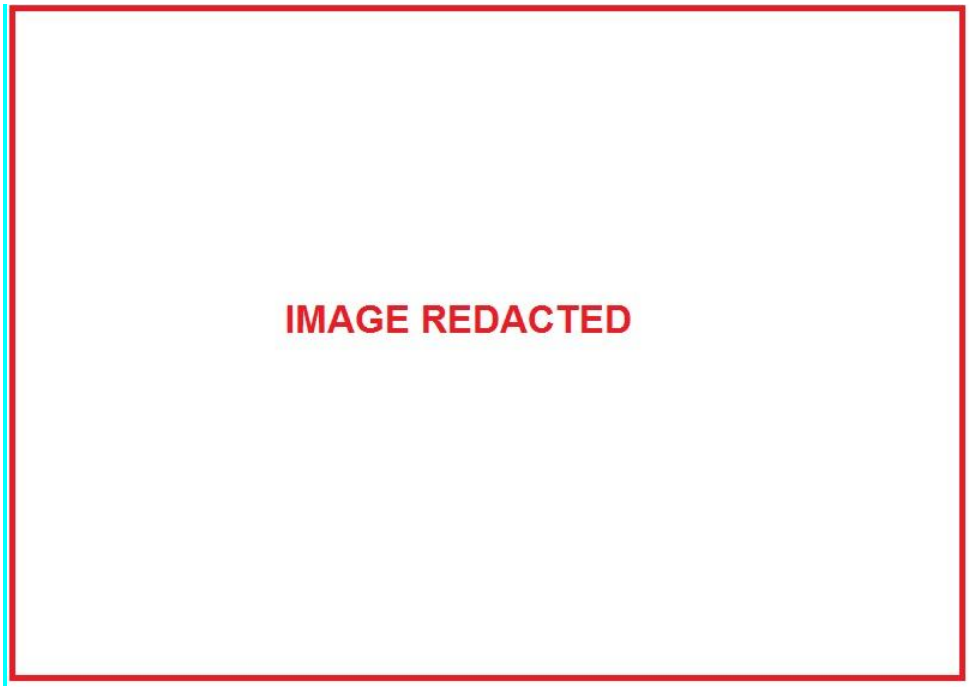
This work segment is the responsibility of Dominion. It is of shorter duration than Dominion's Remington – Oneals Road (Pratts) 230 kV line work and is embedded within the Section C.3.a comprehensive schedule and Gantt Chart.

C.3.e. Schedule for Gordonsville substation

This work segment is the responsibility of Dominion. It is of shorter duration than Dominion's Remington – Oneals Road (Pratts) 230 kV line work and is embedded within the Section C.3.a comprehensive schedule and Gantt Chart. Project work at Dominion's Gordonsville substation will be complete by June 2018.

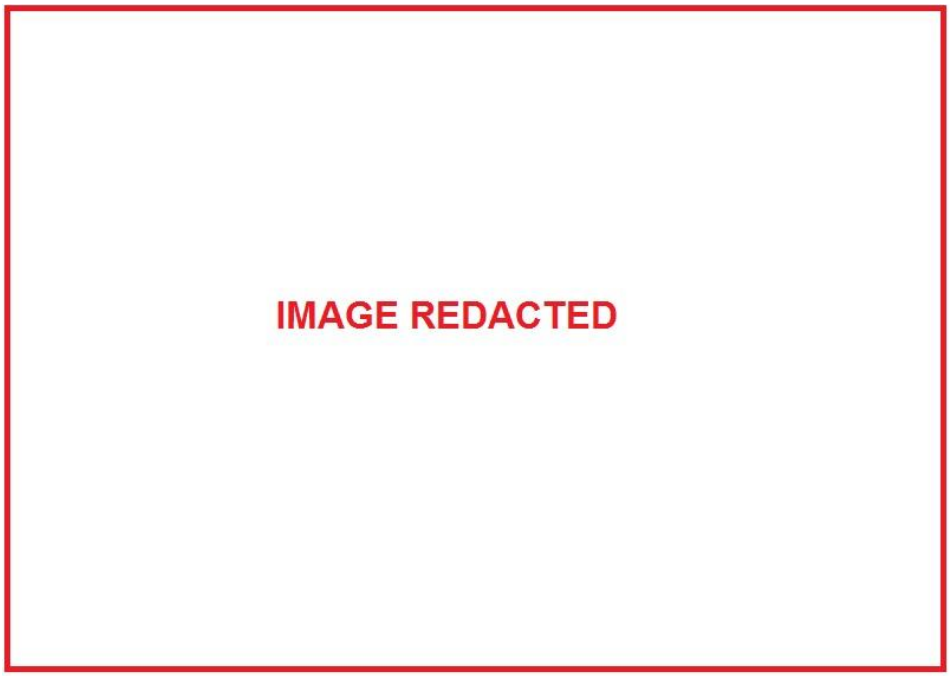
C.3.f. Schedule for Oneals Road – Sperryville 230 kV line

This work segment is the responsibility of FirstEnergy. For details see *Attachment 17 Oneals-Sperryville Line Gantt Chart*.



C.3.g. Schedule for Sperryville substation

This work segment is the responsibility of FirstEnergy. For details see *Attachment 18 Sperryville SS Gantt Chart*.



C.4. On-going Transmission Facility Items

C.4.a. Operational Plan

C.4.a.1. Plan for operating the new Transmission Facilities

The FirstEnergy-owned facilities of the proposed Project will be operated from FirstEnergy's FE South control center.

The Dominion-owned facilities of the proposed Project will be operated as other existing facilities.

C.4.a.2. Required telemetry

Facilities of the proposed Project will have telemetry consistent with each utility's respective practices.

C.4.b. Maintenance Plan

Facilities of the proposed Project will be maintained consistent with each utility's respective practices.

C.5. Assumptions

There are no other assumptions than those mentioned above.

Attachments Redacted