Hunterstown - Doubs - Audobon - Goose Creek

General Information

Proposing entity name	Proprietary business information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	Proprietary business information
PJM Proposal ID	419
Project title	Hunterstown - Doubs - Audobon - Goose Creek
Project description	New Hunterstown - Doubs - Audobon - Goose Creek 500 kV line, New BAudobon 500/230 kV substation, New Beaumeade - Paragon/Nimbus DCT 230 kV, plus various modifications to existing lines and substations Proposal permitting and overhead costs are captured on component 21B. See attachment 1 for flowgate information.
Email	Proprietary business information
Project in-service date	06/2027
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	

Project Components

1. 21B - New 500kV transmission line between Hunterstown substation and Doubs substation
2. 21C - Doubs substation expansion with two new 500kV breaker and a half bays
3. 21D - New 500kV transmission line between existing Doubs substation and new Audobon substation
4. 21ee1 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Nimbus substation

5. 21ee2 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Paragon Park substation

6. 21eeDCT - New 230kV DCT transmission line from Dominion Beaumeade substation to Dominion Paragon Park and Nimbus substations (SCT into each existing substation)

7. 23MA - New 500kV transmission line from new Audobon substation to existing Goose Creek substation

8. 21A - Hunterstown 500kV single breaker expansion

9. 21E - New Audobon Substation - 2 terminal

10. 21EE - Beaumeade substation breaker and a half bay expansion

11. 21ee3 - Nimbus new 230kV termination

12. 21ee4 - Paragon Park new 230kV termination

13. 21GA - Goose Creek substation three 500kV breaker expansion

Greenfield Transmission Line Component

Component title	21B - New 500kV transmission line between Hunterstown substation and Doubs substation
Project description	Proprietary business information
Point A	Hunterstown
Point B	Doubs
Point C	

	Normal ratings	**Emergency ratings**
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5066.000000	5196.000000
Conductor size and type	3x 1780 kcmil Chukar ACSR	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	

General route description	Route is approximately 57 miles long. Starting a new dead end structure at the Hunterstown substation, the new line routes south west for about 0.25 miles before shifting south-southeast for about 7 miles before turning south-southwest and then crossing the Maryland/Pennsylvania border after about 4 miles. The new line continues south-southwest for about 17 miles beyond the state boundary until about 2-miles northeast of Walkersville, Maryland, where it shifts east to navigate around the populated and developed area surrounding Federick, Maryland, including remaining more than 20,000 ft from the Federick airport, aligned with FAA guidance. The new line routes around Federick for about 15 miles until co-locating with the Doubs - Birghton 500kV transmission line near Ijamsville, maryland. The line follows the existing transmission ROW on the north side for the remainder of the route, to Doubs substation, for about 13 miles.
Terrain description	The project is located in Maryland's Frederick and Carroll Counties east of the Monocacy River, and Adams County, Pennsylvania. The Frederick Valley, through which the Monocacy flows, is nestled between the Catoctin Mountains to the west, and the lower Parrs Ridge to the east. The river valley's topography includes little steep terrain, but some steep gradients do exist adjacent to the river. These land elevations and the degree of slope have influenced land use in the watershed. The region's relatively flat topography has made it easily accessible for development and agriculture in some areas next to the river and its tributaries. York County lies within the Appalachian Highlands, a region characterized by a rounded/forested landscape with an elevation of 6,000 feet or less on average and rolling hills and valleys, generally with gentle to moderately steep slopes.
Right-of-way width by segment	Corridor Type: The new right of way will have its own corridor for approximately 75% of the route length. For approximately 25% of the route length, the right of way will be an expansion of an existing transmission line corridor. Approximately 85% of the route will have a ROW width of 165 ft. Approximately 15% of the route will require a ROW width of 75 ft.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.

Environmental impacts	"Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 17 national wetland inventory (NWI) wetlands and 58 waterbodies, but it appears that most features are small and could be avoided without permitting. The crossing of the Moncacy River will require additional agency consultations. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, rusty patched bumble bee, fishes, and bog turtle, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptorsr. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. Routing through the Appalachian Mountains will require additional control measures and monitoring. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed."
Tower characteristics	The majority, approximately 65%, of the proposed structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal conductor configuration. Approximately 35% of the structures will be single circuit 500kV steel monopoles (TVS-500) in a delta conductor configuration. Any proposed deadend structure will either be a lattice tower or a 3-pole, one phase per pole structure type. See proposed structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information

Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$267,498,980.00
Component cost (in-service year)	$276,628,182.00

Substation Upgrade Component

Component title	21C - Doubs substation expansion with two new 500kV breaker and a half bays
Project description	Proprietary business information
Substation name	Doubs
Substation zone	Allegheny Power
Substation upgrade scope	Add two new 500kV breaker and a half bays by adding a total of 4 breakers. Terminate the two new 500kV greenfield transmission lines into the new bays created. Recommend relocating the existing Doubs - Goose Creek 500kV line and Doubs - Brighton per the provided one-line diagram to avoid transmission line crossings of the new 500kV transmission lines with the existing transmission lines.

Transformer Information

None

New equipment description	AC substation: Add two (2) new breaker and a half (BAAH) bays and four (4) new 500kV breakers.
Substation assumptions	The use of a spare bay appears to be available. Area west of substation fence is available.
Real-estate description	Expected expansion of fenceline is within utility owned property.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information

Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$14,000,000.00
Component cost (in-service year)	$15,453,380.00

Greenfield Transmission Line Component

Component title	21D - New 500kV transmission line between existing Doubs substation and new Audobon substation
Project description	Proprietary business information
Point A	Doubs
Point B	Audobon
Point C	N/A

	Normal ratings	**Emergency ratings**
Summer (MVA)	2680.000000	3400.000000
Winter (MVA)	2680.000000	3400.000000

Conductor size and type	OH: 3x 1780 kcmil Chukar ACSR UG: 3x 6000 kcmil Cables per Phase
Nominal voltage	AC
Nominal voltage	500

Line construction type	Overhead, Underground
General route description	Route is approximately 25 miles long. Starting a new dead end structure at the Doubs substation, the line follows the existing Doubs - Pleasant View 500kV transmission line ROW for about 6 miles. The line deviates from the existing ROW for about 4 miles to avoid conflict with existing structures including the Dickerson Power Plant, before again co-locating with the existing transmission ROW about 2 miles south of Dickerson Power Plant. The line co-locates with the existing transmission ROW for about 5 miles until the Potomac River, where it transitions underground to reduce viewshed impacts at the river crossing, which is planned to be a horizontal directional drill (HDD) crossing on the east side of the Leesburg Water Treatment Plant. The line again co-locates with the existing transmission ROW and remains underground for about 2 miles. The line is planned to HDD under the Harry Byrd Hwy, to avoid major traffic impacts, before transitioning back overhead. The line routes southeast adjacent the Harry Byrd Hwy ROW for about 4.5 miles, with a slight deviation to avoid Belmont Slave Cemetery. The line then turns south along the Loudoun County Pkwy for about 2 miles before turning west at Gloucester Pkwy and terminating at the new Audobon substation.
Terrain description	The Project originates north of the Potomac River in Montgomery and Frederick counties, Maryland and is characterized by gentle slopes in the Piedmont Plateau as the project follows the contours of the Potomac River. The project terminates in Loudon County, Virginia, in the valley south of the Potomac River. A former agricultural region, the area is now densely developed with commercial buildings and planned residential communities within commuting distance to Washington, D.C.
Right-of-way width by segment	The new right of way will have its own corridor for approximately 45% of the route length, will be 150 ft wide, with select congested areas where the ROW width was reduced to 55 ft. For approximately 45% of the route length, the right of way will be an expansion of an existing transmission line corridor with a width of 165 ft. Approximately 10% of the route will be underground in narrower and congested areas where overhead construction was considered not feasible. Where underground transmission line segments are not sited by permits issued by the Authority Having Jurisdiction, a 25 ft wide right of way would be required for construction. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.

Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 15 national wetland inventory (NWI) forested wetlands and 26 waterbodies, but it appears that most features are small and could be avoided without permitting. The crossing of the Potomac River will require additional agency consultations and is proposed to be bored underneath to minimize impacts to bed and bank. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, the rusty patched bumble bee, and clam species, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.
Tower characteristics	The majority of the proposed structures, approximately 60%, will be single circuit 500kV lattice towers (TTVS-500) in a horizontal configuration. Approximately 40% of the structures will be single circuit 500kV steel monopoles (TVVS-500) in a vertical configuration. Any proposed deadend structure will either be a lattice tower or a 3-pole, one phase per pole structure type. The portion of the route proposed to be underground will utilize duct bank construction with 3-cables per phase and splicing vaults at regular intervals. See structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information

Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$171,697,750.00
Component cost (in-service year)	$189,522,190.00

Greenfield Transmission Line Component

Component title	21ee1 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Nimbus substation
Project description	Proprietary business information
Point A	Beaumeade
Point B	Nimbus
Point C	N/A

	Normal ratings	**Emergency ratings**
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000

Conductor size and type	3x 1780 kcmil Chukar ACSR
Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead

General route description	Route is approximately 1.3 miles long. This component is a continuation of component 21eeDCT, which is a double circuit 230kV from Beaumeade with circuits connecting to Nimbus and Paragon Park. The line starts at the north corner of the intersection of Loudoun County Pkwy and the Washington and Old Dominion Bike Trail transitioning from double circuit tower to single circuit tower, crossing over the bike trail and continuing to follow the Loudoun County Pkwy on the north and west side. The line follows the Loudoun County Pkwy for almost one mile before turning west at Waxpool Rd. The line follows Waxpool Rd on the north side of the ROW for less than a half mile before crossing Waxpool Rd and terminating at Nimbus substation.
Terrain description	The project is located in the valley south of the Potomac River in Loudon County. A former agricultural region, the area is now densely developed with commercial buildings and planned residential communities within commuting distance to Washington, D.C. Slopes are gentle, approximately 2%.
Right-of-way width by segment	The new right of way will have its own corridor and will have a width of 40 ft. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.
Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses no national wetland inventory (NWI) wetlands and 3 waterbodies. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. Five recorded sites have previously been impacted in close proximity. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.

Tower characteristics	The proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$6,834,660.00
Component cost (in-service year)	$7,544,186.00

Greenfield Transmission Line Component

Component title	21ee2 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Paragon Park substation
Project description	Proprietary business information
Point A	Beaumeade
Point B	Paragon Park
Point C	N/A

	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	3x 1780 kcmil Chukar ACSR	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	Route is approximately 0.5 miles long. This component is a continuation of component 21eeDCT, which is a double circuit 230kV from Beaumeade with circuits connecting to Nimbus and Paragon Park. The line starts at the north corner of the intersection of Loudoun County Pkwy and the Washington and Old Dominion Bike Trail transitioning from double circuit tower to single circuit tower, crossing over the Loudoun County Pkwy and continuing to follow the bike trail on the north side. The line follows the bike trail for less than a half mile before terminating at the Paragon Park substation.	
Terrain description	The project is located in Loudon County, Virginia, co-located along a linear park, once a former railroad that has been converted to a bike trail. Gentle slopes averaging 2.5%.	
Right-of-way width by segment	The new right of way will have its own corridor and will have a width of 40 ft. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.	

Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 2 national wetland inventory (NWI) wetlands and 1 waterbody. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. Five recorded sites have previously been impacted in close proximity. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.
Tower characteristics	The proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process
Component Cost Details - In Current Year $	
Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information

Contingency	Proprietary business information
Total component cost	$3,731,000.00
Component cost (in-service year)	$4,118,326.00

Greenfield Transmission Line Component

Component title	21eeDCT - New 230kV DCT transmission line from Dominion Beaumeade substation to Dominion Paragon Park and Nimbus substations (SCT into each existing substation)
Project description	Proprietary business information
Point A	Beaumeade
Point B	Paragon Park
Point C	Nimbus

	Normal ratings	**Emergency ratings**
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000

Conductor size and type	3x 1780 kcmil Chukar ACSR
Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	Route is approximately 0.6 miles long. This component is the double circuit component first half of the new circuits from Beaumeade to Nimbus and Beaumeade to Paragon Park. A double circuit is utilized here due to ROW constraints and both circuits are able to be sited on a single tower. Starting a new dead end structure at the Beaumeade substation, the line routes east along the south side of Interconnection Plaza ROW. The line follows Interconnection Plaza until turning south at Loudoun County Pkwy. The double circuit follows Loudoun County Pkwy for about 0.3 miles before splitting off into two separate single circuit tower routes at the north corner of intersection of Loudoun Conty Pkwy and Washington and Old Dominion Bike Trail, one going to Paragon Park substation and one going to Nimbus substation.

Terrain description	The project is located in Loudon County, Virginia, collocated along Interconnection Plaza and Loudon County Pkwy, crossing one intermittent stream. Gentle slopes, approximately 2%.
Right-of-way width by segment	The new right of way will have its own corridor and will have a width of 45 ft. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.
Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses no national wetland inventory (NWI) wetlands and 1 waterbody. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.
Tower characteristics	The proposed structures will be double circuit 230kV steel monopoles (TVVS-DC230) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary business information

Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$4,060,000.00
Component cost (in-service year)	$4,481,480.00

Greenfield Transmission Line Component

Component title	23MA - New 500kV transmission line from new Audobon substation to existing Goose Creek substation
Project description	Proprietary business information
Point A	Audobon
Point B	Goose Creek
Point C	N/A

	Normal ratings	**Emergency ratings**
Summer (MVA)	2680.000000	3400.000000
Winter (MVA)	2680.000000	3400.000000

Conductor size and type	OH: 3x 1780 kcmil Chukar ACSR; UG: 3x 6000 kcmil Cables per Phase
Nominal voltage	AC
Nominal voltage	500

Line construction type	Overhead, Underground
General route description	The route is approximately 6.3 miles long. Starting at the new Audobon substation the line routes underground due to heavily developed area constraining overhead construction of the new 500kV line. The line routes underground west along the Gloucester Pkwy ROW, turns southwest at Smith Switch Rd, and then shifts north east at the Washington and Old Dominion Trail. The route remains underground along the Washington and Old Dominion Trail until it reaches the Belmont Ridge Rd where the route shifts north-northeast to follow the Belmont Ridge Rd ROW for about 0.5 miles to Gloucester Pkwy. At the intersection of Belmont Ridge Rd and Gloucester Pkwy, the line shifts to overhead construction and routes northwest to Cochran Mill Rd. The line then follows Cochran Mill Rd ROW for about 0.5 miles until terminating at the Goose Creek substation.
Terrain description	The project is located in Loudon County, Virginia, and is mostly co-located along a linear park, once a former railroad converted to a bike trail. The route crosses three wetlands and nine streams. Gentle slopes, approximately 2%.
Right-of-way width by segment	The new right of way will have its own corridor for approximately 25% of the route length and will be 55 ft wide. Approximately 75% of the route will be underground and sited along an existing bike path. Where underground transmission line segments are not sited by permits issued by the Authority Having Jurisdiction, a 25 ft wide right of way would be required for construction. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz) with identified major crossings.
Civil infrastructure/major waterway facility crossing plan	See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.

Environmental impacts	Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 1 national wetland inventory (NWI) palustrine wetland and one forested wetlands and 9 waterbodies, but it appears that most features are small and could be avoided without or with manageable permitting. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, the rusty patched bumble bee, and clam species, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.
Tower characteristics	The proposed structures will be single circuit 500kV steel monopoles (TVVS-500) in a vertical delta configuration. Any proposed deadend structure will either be a 3-pole, one phase per pole configuration. The portion of the route proposed to be underground will utilize duct bank construction with 3-cables per phase and splicing vaults at regular intervals. See structure drawing set included in attachment 10.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information

Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$579,810.00
Component cost (in-service year)	$.00

Substation Upgrade Component

Component title	21A - Hunterstown 500kV single breaker expansion
Project description	Proprietary business information
Substation name	Hunterstown
Substation zone	METED
Substation upgrade scope	Create a new 500 kV line termination position by adding a new 500 kV circuit breaker and two MODs in the second bay from the top. Terminate the new greenfield 500 kV line in this position.

Transformer Information

None

New equipment description	AC Substation: Add one (1) new 500 kV breaker to existing bay in breaker and a half (BAAH) bus.
Substation assumptions	The use of a position within a bay appears to be available.
Real-estate description	No expansion of substation fence anticipated.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information

Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$2,800,000.00
Component cost (in-service year)	$3,090,676.00

Greenfield Substation Component

Component title	21E - New Audobon Substation - 2 terminal
Project description	Proprietary business information
Substation name	Audobon
Substation description	New 2-terminal, 500kV ring bus configuration substation with two 500/230kV transformers substation on ~14 acre property just north of the existing Beaumeade substation. Terminate the new Doubs - Goose Creek 500kV and new Goose Creek - Audobon substation. Connect to existing Beaumeade substation with 230kV transmission line.
Nominal voltage	AC
Nominal voltage	500/230

Transformer Information

	Name	**Capacity (MVA)**
Transformer	Transformer 1	1559/1940

	High Side	**Low Side**	**Tertiary**
Voltage (kV)	500	230	N/A

	Name	Capacity (MVA)
Transformer	Transformer 2	1559/1940

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	N/A

Major equipment description

AC AirInsulated Substation (AIS): New proposed 500 - 230 kV Substation. New 500 kV ring bus switchyard, four (4) line terminals, six (6) 500kV, 5000A, 63kAIC breakers, two (2) 500 kV - 230 kV transformer banks and two (2) 230 kV, 5000A , 80kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	1559.000000	1940.000000
Winter (MVA)	1785.000000	2168.000000

Environmental assessment

Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses no national wetland inventory (NWI) wetlands or waterbodies. Fatal flaws have not been identified for proposed site. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified with potential to occur in the area including listed bats, Rusty patch bumblebee and listed mussels, but no critical habitat was identified in the area of the substation site. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.

Outreach plan	The Company is committed to working with all interested stakeholders through a robust public outreach program to address/respond to community concerns and inform the public about the project to the greatest extent practicable. The Company believes a well-designed public outreach program can have numerous benefits, including fostering a cooperative relationship with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the Company's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas that have the least amount of cultural, environmental, and social impacts on the community. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the Company will involve the community in providing appropriate and practical mitigation measures. The Company will commence its public outreach activities following project award.
Land acquisition plan	See Attachment 9 for Land Acquisition Plan.
Construction responsibility	Proprietary business information
Benefits/Comments	Resolves reliability and market efficiency issues identified per PJM's. process. Substation is a switchyard with no voltage transformation.

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information

Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$57,246,000.00
Component cost (in-service year)	$63,188,873.00

Substation Upgrade Component

Component title	21EE - Beaumeade substation breaker and a half bay expansion
Project description	Proprietary business information
Substation name	Beaumeade
Substation zone	Dominion
Substation upgrade scope	Add three new breaker and a half (BAAH) bays and eight new 230 kV breakers.

Transformer Information

None

New equipment description	AC Substation: Add three (3) new breaker and a half (BAAH) bays and eight (8) new 230 kV breakers.
Substation assumptions	Area northeast of existing substation is available.
Real-estate description	Expected expansion of fenceline is within utility owned property.
Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information

Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$10,500,000.00
Component cost (in-service year)	$11,590,035.00

Substation Upgrade Component

Component title	21ee3 - Nimbus new 230kV termination
Project description	Proprietary business information
Substation name	Nimbus
Substation zone	Dominion
Substation upgrade scope	Terminate the new Beaumeade to Nimbus 230kV line at available position at Nimbus

Transformer Information

None

New equipment description	AC Substation: Future substation that has not been built. Terminate one (1) new 230 kV line into substation.
Substation assumptions	Substation has not been built yet. Assumed that substation can accommodate new line termination as needed.
Real-estate description	No expansion of substation fence anticipated.
Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$1,400,000.00
Component cost (in-service year)	$1,545,338.00

Substation Upgrade Component

Component title	21ee4 - Paragon Park new 230kV termination
Project description	Proprietary business information
Substation name	Paragon Park
Substation zone	Dominion
Substation upgrade scope	Terminate the new Beaumeade to Paragon Park 230kV line at the Paragon Park substation

Transformer Information

None

New equipment description	Terminate the new Beaumeade to Paragon Park line at the Paragon Park substation
Substation assumptions	The use of a spare position within existing ring bus appears to be available.
Real-estate description	No expansion of substation fence anticipated.

Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information

Component Cost Details - In Current Year $

Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$1,400,000.00
Component cost (in-service year)	$1,545,338.00

Substation Upgrade Component

Component title	21GA - Goose Creek substation three 500kV breaker expansion
Project description	Proprietary business information
Substation name	Goose Creek
Substation zone	Dominion (VEPC)
Substation upgrade scope	Create a line termination position for new 500 kV line from Doubs to Goose Creek & Stonewall to Goose Creek by addting three new 500 kV CBs and MODs.

Transformer Information

None

New equipment description	AC Substation: Add three (3) new 500 kV breaker to existing ring.
Substation assumptions	Area south of the existing substation is available.
Real-estate description	Expected expansion of fenceline is within utility owned property.
Construction responsibility	Proprietary business information
Benefits/Comments	Proprietary business information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary business information
Permitting / routing / siting	Proprietary business information
ROW / land acquisition	Proprietary business information
Materials & equipment	Proprietary business information
Construction & commissioning	Proprietary business information
Construction management	Proprietary business information
Overheads & miscellaneous costs	Proprietary business information
Contingency	Proprietary business information
Total component cost	$7,000,000.00
Component cost (in-service year)	$7,726,690.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary business information

Financial Information

Capital spend start date	09/2023
Construction start date	07/2025
Project Duration (In Months)	45

Cost Containment Commitment

Cost cap (in current year)	Proprietary business information
Cost cap (in-service year)	Proprietary business information

Components covered by cost containment

1. 21B - New 500kV transmission line between Hunterstown substation and Doubs substation - NEETMA
2. 21D - New 500kV transmission line between existing Doubs substation and new Audobon substation - NEETMA
3. 21ee1 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Nimbus substation - NEETMA
4. 21ee2 - New 230kV transmission line from Dominion Beaumeade substation to Dominion Paragon Park substation - NEETMA
5. 21eeDCT - New 230kV DCT transmission line from Dominion Beaumeade substation to Dominion Paragon Park and Nimbus substations (SCT into each existing substation) - NEETMA
6. 23MA - New 500kV transmission line from new Audobon substation to existing Goose Creek substation - NEETMA
7. 21E - New Audobon Substation - 2 terminal - NEETMA

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	Yes
ROW / land acquisition	Yes

Materials & equipment	Yes
Construction & commissioning	Yes
Construction management	Yes
Overheads & miscellaneous costs	Yes
Taxes	Yes
AFUDC	No
Escalation	No
Additional Information	Proprietary business information
Is the proposer offering a binding cap on ROE?	Yes
Would this ROE cap apply to the determination of AFUDC?	Yes
Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?	No
Is the proposer offering a Debt to Equity Ratio cap?	Proprietary business information
Additional cost containment measures not covered above	Proprietary business information

Additional Comments

None