

Hunterstown - Doubs - Goose Creek, Black Oak - Woodside - Goose Creek, Stonewall SVC + Cap Banks

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	846
Project title	Hunterstown - Doubs - Goose Creek, Black Oak - Woodside - Goose Creek, Stonewall SVC + Cap Banks
Project description	New Woodside 500/138 kV substation + SVC + Cap Banks, new Black Oak - Woodside - Goose Creek 500 kV line, New Hunterstown-Doubs-Goose Creek 500 kV line, plus various modifications to existing lines and substations Proposal permitting and overhead costs are captured on component 10C2. 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. 10C2 - New 500kV transmission line between new Woodside substation and the Goose Creek substation
2. 21B - New 500kV transmission line between Hunterstown substation and Doubs substation

3. 4CA - New 500kV transmission line from existing Black Oak substation and new Woodside substation
4. 10C1A - New 500kV transmission line from new Woodside substation to Goose Creek substation
5. 21C - Doubs substation expansion with two new 500kV breaker and a half bays
6. 35B - Hunterstown substation single 500kV circuit breaker expansion
7. 04A1 - Black Oak substation 500kV five breaker and new transformer expansion
8. 23s5 - New Woodside Substation - 6 terminal
9. 29A - New 500kV transmission line from BGE Doubs substation to Dominion Goose Creek substation
10. 23sb - Stonewall substation two 138kV breaker expansion
11. 21GA - Goose Creek substation three 500kV breaker expansion
12. 29H - Hatfield to Black Oak 500kV Terminal Equipment Upgrade

Greenfield Transmission Line Component

Component title	10C2 - New 500kV transmission line between new Woodside substation and the Goose Creek substation	
Project description	Proprietary business information.	
Point A	Woodside	
Point B	Goose Creek	
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 25 miles long. The component begins as a continuation of the 500kV - 138kV underbuild from the new Pike substation or new Woodside substation, depending on the solution. The line continues to follow the existing Doubs - Bismark 500kV transmission ROW for about 0.5 miles before turning south. The line maintains a predominately south-southeast direction for about 17 miles, with minor shifts in route direction to reduce impacts to existing structures, residences, and vegetation. The new line shifts east around Leesburg, Virginia, for about 5 miles, before reaching the Dulles Greenway and turning north for about 2 miles and then terminating at the existing Goose Creek substation.

Terrain description

Much of the project is located in the rolling hills and pastures of the Piedmont, where the bedrock consists mostly of gneiss, schist, and granite rocks at a typical depth of between 2 and 10 feet. Soils developed from these rocks and minerals form acid, infertile soils, with sandy loam surfaces. The rolling terrain is interrupted by steep ridges associated with the boundary of the Blue Ridge. Historically, much of the Piedmont region was cleared and farmed intensively, causing extreme erosion over much of the region. Many of the agricultural areas have since reverted to forests.

Right-of-way width by segment

The new right of way will have its own corridor and will have a width of 165 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 18 national wetland inventory (NWI) wetlands and 30 waterbodies, but it appears that most features are small and could be avoided without permitting. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies are 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. This proposed route will require additional consultations with the Waterford Historic District. 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 lattice towers (TTVS-500) in a horizontal conductor configuration. Any proposed deadend structure will either be 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

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	\$84,219,590.00
Component cost (in-service year)	\$73,448,913.00

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 Parris 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	<p>"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 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. 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."</p>
Tower characteristics	<p>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.</p>
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	\$250,611,480.00
Component cost (in-service year)	\$276,628,182.00

Greenfield Transmission Line Component

Component title 4CA - New 500kV transmission line from existing Black Oak substation and new Woodside substation

Project description Proprietary business information.

Point A Black Oak

Point B Woodside

Point C N/A

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 53 miles long. Starting a new dead end structure at the existing Black Oak substation, the line routes east along the south side of the existing Black Oak - Bedington 500kV transmission ROW. The route follows the existing for 8 miles before deviating south from the existing ROW and creating a new ROW for 2.5 miles around Fort Ashbury to minimize structure and residential impacts. The line co-locates with the existing ROW east of Fort Ashbury and follows the southern side of the existing ROW for about 4.5 miles before turning south at the intersection of Black Oak - Bedington 500kV transmission line and Hampshire - Ridgeley 138kV transmission line. The line follows the existing Hampshire - Ridgeley transmission ROW for almost 17 miles before turning east at the existing Hampshire substation. The line then follows the existing Hampshire - Gore 138kV transmission ROW for about 4.5 miles until the Hampshire - Gore 138kV transmission line begins to co-locate with the Doubs - Bismark 500kV transmission line. The new line then follows the existing Doubs - Bismark 500kV transmission ROW on the northern side for almost 2.5 miles to Gore substation. Starting at Gore substation, the line utilizes the existing Gore - Stonewall 138kV transmission ROW for about 15 miles to the new Woodside substation. The line utilizes the existing 138kV transmission ROW by rebuilding the Gore - Stonewall 138kV circuit under the new Black Oak - Woodside 500kV circuit.

Terrain description

The project is located in the geological region known as the Ridge and Valley Province due to extensive river valleys between long ridges characterized by low hills with steep slopes with oak-hickory forest. Wide lowlands and rolling uplands with sandy or silty loam predominate the area.

Right-of-way width by segment

The new right of way will be an expansion of an existing transmission line corridor for approximately 70% of the route length, with a width of 125 ft (40%) and a width of 165 ft (30%). For approximately 30% of the route length, the existing transmission line ROW will be utilized and will require no additional ROW.

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	<p>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 4 national wetland inventory (NWI) wetlands and 64 waterbodies, but it appears that most features are small and could be avoided without permitting. Crossing of the branches of the Potomac River and North River will require additional agency consultations. 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. One historic structure, the Capon Chapel, was identified within 1,000' of the transmission line and will require further consideration. 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 and the rusty patched bumble bee, 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. 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.</p>
Tower characteristics	<p>The majority, approximately 75%, of the proposed structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal conductor configuration. Approximately 25% of the structures will be single circuit 500kV lattice towers with 138kV underbuild (TTVS-500-138) in a horizontal conductor configuration. The 138kV line to be underbuilt is an existing line. Any proposed deadend structure will either be lattice tower or a 3-pole, one phase per pole structure type. See proposed structure drawing set included in attachment 10.</p>
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	\$146,919,990.00
Component cost (in-service year)	\$162,172,179.00

Greenfield Transmission Line Component

Component title	10C1A - New 500kV transmission line from new Woodside substation to Goose Creek substation
Project description	Proprietary business information.
Point A	Woodside
Point B	Goose Creek
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 22 miles long. Starting at a new dead end structure at the new Woodside substation, the line routes east along the existing Stonewall - Feagan's Mill 138kV transmission line ROW for 11 miles with the entire Stonewall - Feagan's Mill 138kV transmission line rebuilt under the new greenfield transmission line. The new line routes around the existing Feagan's Mill substation and then resumes using the existing 138kV transmission ROW between Feagan's Mill and Millville, for about 2 miles where the 138kV transmission ROW separates from the existing Bismark - Doubs 500kV transmission ROW. The line routes adjacent to the existing 500kV transmission ROW for almost 4 miles before resumes using the existing Millville - Lovettsville 138kV transmission line. The line uses the Millville - Lovettsville 138kV transmission line ROW for approximately 4 miles to the east before deviating from the existing 138kV transmission ROW to create a new ROW. It is advantageous to rebuild the existing 138kV transmission circuits underneath the new 500kV transmission line to minimize viewshed impacts, reduce ROW acquisition costs, reduce residential and infrastructure impacts, and reduce tree clearing requirements, especially for the furthest east section where the new line crosses the Appalachian Trail. This line component ends east of the Appalachian Trail, where line component 10c2 begins to continue the route to Goose Creek substation.

Terrain description

Much of the project is located in the rolling hills and pastures of the Piedmont, where the bedrock consists mostly of gneiss, schist, and granite rocks at a typical depth of between 2 and 10 feet. Soils developed from these rocks and minerals form acid, infertile soils, with sandy loam surfaces. The rolling terrain is interrupted by steep ridges associated with the boundary of the Blue Ridge. Historically, much of the Piedmont region was cleared and farmed intensively, causing extreme erosion over much of the region. Many of the agricultural areas have since reverted to forests.

Right-of-way width by segment

The new right of way will be an expansion of an existing transmission line corridor for approximately 80% of the route length, where a 30 ft additional width will be required beyond the existing, assumed, ROW edge. For approximately 20% of the route length, the right of way will have its own corridor with a width of 115 ft (10%) and 165 ft (5%)

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) wetlands and 18 waterbodies, but it appears that most features are small and could be avoided without permitting. The crossing of the Shenandoah River around Millville Dam will require additional agency consultations. The crossing of the Appalachian Trail will also require additional agency coordination and permitting with the National Parks Service. 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, 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. 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 80%, of the proposed structures will be single circuit 500kV lattice towers with 138kV (TTVS-500-138) in a horizontal conductor configuration. The 138kV line to be underbuilt is an existing line. Approximately 20% of the structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal conductor configuration. Any proposed deadend structure will either be 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	\$58,453,430.00
Component cost (in-service year)	\$64,521,650.00

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

Substation Upgrade Component

Component title	35B - Hunterstown substation single 500kV circuit breaker expansion
Project description	Proprietary business information.
Substation name	Hunterstown
Substation zone	METED
Substation upgrade scope	Termination work for Hunterstown to Doubs Line. Add one 500kV circuit breaker and two MODs at Hunterstown.

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 Company 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

\$1,400,000.00

Component cost (in-service year)

\$1,545,338.00

Substation Upgrade Component

Component title

04A1 - Black Oak substation 500kV five breaker and new transformer expansion

Project description

Proprietary business information.

Substation name

Black Oak

Substation zone

Allegheny Power

Substation upgrade scope

Expand the existing Black Oak 500 kV yard by adding two new 500 kV bays. Re-use the existing bay that ties the West and East by installing two circuit breakers as shown in the one line diagram. Re-terminate Black Oak Bedington 500 kV line in that bay position (second bay from the top). Terminate the new Black Oak-Gore 500 kV line in the third bay position from the top Re-terminate the SVC in the fourth bay position from the top Total 5 new 500 kV circuit breakers and 10 MODs need to be installed for above work Add a second 500-138 kV transformer to the West Bus (provide same rating as the existing current transformer) Upgrade the protection scheme to remove non-redundancy (single point of failure).

Transformer Information

	Name	Capacity (MVA)		
Transformer	Transformer 1	760		
	High Side	Low Side	Tertiary	
Voltage (kV)	500	138	N/A	
New equipment description	AC Substation: Add two (2) new 500 kV breakers to existing bay in breaker and a half (BAAH) bus. Add one (1) new 500 - 138 kV transformer bank and one (1) 500 kV breaker.			
Substation assumptions	The use of a spare bay appears to be available. Open area west of the control house is 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	\$14,000,000.00
Component cost (in-service year)	\$15,453,380.00

Greenfield Substation Component

Component title	23s5 - New Woodside Substation - 6 terminal
Project description	Proprietary business information.
Substation name	Woodside
Substation description	New 3 bays breaker and a half 500kV switchyard . Interconnect Bismark-Doubs, new Black Oak Stonewall and Stonewall-Goose Creek 500 kV lines at the new Stonewall switchyard. Add two 150 MVAR Cap banks and -300 to +500 MVAR STATCOM and two new 500/138kV transformers
Nominal voltage	AC
Nominal voltage	500/138

Transformer Information

	Name	Capacity (MVA)		
Transformer	Transformer 1	485/619		
	High Side	Low Side	Tertiary	
Voltage (kV)	500	138	N/A	
	Name	Capacity (MVA)		
Transformer	Transformer 2	485/619		
	High Side	Low Side	Tertiary	

Voltage (kV)	500	138	N/A
Major equipment description	AC Air Insulated Substation (AIS): New proposed 500 - 138 kV Substation. New Breaker and a Half (BAAH) 500kV Switchyard with three (3) bays, five (5) line terminals, twelve (12) 500kV, 5000A, 63kAIC Breakers, two (2) 500 kV, 150 MVAR shunt capacitor banks, one (1) -300 to +500 MVAR Static VAR Compensator (SVC), two (2) 500 KV - 138 kV transformer banks, two (2) 138kV, 5000A, 80kAIC breakers.		
	Normal ratings	Emergency ratings	
Summer (MVA)	485.000000	619.000000	
Winter (MVA)	569.000000	654.000000	
Environmental assessment	<p>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 including listed bats, 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.</p>		

Outreach plan	<p>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.</p>
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	\$125,298,600.00
Component cost (in-service year)	\$138,306,210.00

Greenfield Transmission Line Component

Component title	29A - New 500kV transmission line from BGE Doubs substation to Dominion Goose Creek substation	
Project description	Proprietary business information.	
Point A	Doubs	
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

Route is approximate 19 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 3 miles until reaching the existing Goose Creek substation where it will transition to overhead and then terminate into the bus expansion. The line is planned to HDD under the Harry Byrd Hwy, to avoid major traffic impacts.

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. Some industrial facilities are located to the south of the project area. Slopes are gentle, approximately 4%. The project terminates on the north side of the Potomac River in Montgomery, Maryland where the topography is generally rolling. Elevations range from a low of near sea level along the Potomac River to about 875 feet.

Right-of-way width by segment

The new right of way will be an expansion of an existing transmission line corridor for approximately 60% of the route length and will be 165 ft wide. The route will have its own right of way corridor for approximately 20% of its length with a width of 150 ft in select congested areas. Approximately 20% 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.

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	<p>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 Potomac River will require additional agency consultations. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies in Virginia and Maryland are expected. Additional coordination for this route will include working with the Potomac Heritage National Scenic Trail, and the Chesapeake and Ohio National Historical Park. 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.</p>
Tower characteristics	<p>The proposed structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal configuration. Any proposed deadend structure will either be a steel lattice tower or 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.</p>
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	\$186,834,200.00
Component cost (in-service year)	\$206,229,998.00

Substation Upgrade Component

Component title	23sb - Stonewall substation two 138kV breaker expansion
Project description	Proprietary business information.
Substation name	Stonewall
Substation zone	Allegheny Power
Substation upgrade scope	Add two new 138 kV breakers to existing ring and four new MODs to terminate new greenfield transformers.

Transformer Information

None	
New equipment description	AC Substation: Add two (2) new 138 kV breakers to existing ring.
Substation assumptions	Open area in the existing substation is 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.
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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

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
Substation upgrade scope	Create a line termination position for new 500 kV line from Doubs to Goose Creek & Stonewall to Goose Creek by adding 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	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	\$7,000,000.00
Component cost (in-service year)	\$7,726,690.00

Transmission Line Upgrade Component

Component title	29H - Hatfield to Black Oak 500kV Terminal Equipment Upgrade
Project description	Proprietary business information.
Impacted transmission line	Hatfield to Black Oak 500kV
Point A	Hatfield
Point B	Black Oak
Point C	N/A
Terrain description	Upgrade is within existing ROW

Existing Line Physical Characteristics

Operating voltage	500
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Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	Utilize existing towers to extent practicable.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	3526.000000	3792.000000
Winter (MVA)	3928.000000	4140.000000
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings	
Shield wire size and type	Utilize existing shield wire to extent practicable	
Rebuild line length	61.2 miles	
Rebuild portion description	Proposing to upgrade limiting elements to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
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	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary Company 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. 10C2 - New 500kV transmission line between new Woodside substation and the Goose Creek substation - NEETMA
2. 21B - New 500kV transmission line between Hunterstown substation and Doubs substation - NEETMA
3. 4CA - New 500kV transmission line from existing Black Oak substation and new Woodside substation - NEETMA
4. 10C1A - New 500kV transmission line from new Woodside substation to Goose Creek substation - NEETMA
5. 23s5 - New Woodside Substation - 6 terminal - NEETMA
6. 29A - New 500kV transmission line from BGE Doubs substation to Dominion Goose Creek substation - 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