Barnhart Substation, Bartholow Substation, Barnhart - Bartholow - Goose Creek solution

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	728
Project title	Barnhart Substation, Bartholow Substation, Barnhart - Bartholow - Goose Creek solution
Project description	New Bartholow 500 kV Switchyard, New Barnhart500 kV Switchyard, New 500 kV line from Barnhart -Bartholow - Goose Creek, plus various modifications to existing lines and substations. All of the permitting costs and overhead costs for this proposal are captured in component 38A. 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. 10A - Goose Creek 500kV single breaker expansion
2. 38A - New 500kV transmission line from new Barnhart substation to new Bartholow substation
3. 38B - New 500kV transmission line from new Bartholow substation to Goose Creek substation
4. 29d - New Barnhart Substation - 3 terminal

5. 38C - New Bartholow Substation - 4 terminal

Substation Upgrade Component

Component title	10A - Goose Creek 500kV single breaker expansion
Project description	Proprietary Business Information
Substation name	Goose Creek
Substation zone	Dominion
Substation upgrade scope	Expand existing 500kV Goose Creek ring bus by adding one 500kV breaker and two MODs.

Transformer Information

None

New equipment description	AC Substation: Add one (1) new 500 kV breaker to existing ring.
Substation assumptions	Area south of substation fence is available.
Real-estate description	Expected expansion of fenceline is within utility owned property.
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

Greenfield Transmission Line Component

Component title	38A - New 500kV transmission line from new Barnhart substation to new Bartholow substation
Project description	Proprietary Business Information
Point A	Barnhart
Point B	Bartholow
Point C	N/A

	Normal ratings	Emergency ratings
Summer (MVA)	4295.000000	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	The route is approximately 37 miles long. Starting at a dead-end structure at the new Barnhart substation, the line routes west - southwest for about 8 miles before turning south about 3 miles northeast of Taneytown and routing south - southwest for about 10 miles. The route turns south about 1 mile west of Union Bridge and goes south for about 14 miles until just north of Interstate 70. The route then heads east for about 2 miles before reaching the existing Brighton - Conastone 500kV transmission ROW. The route follows the existing Brighton - Conastone 500kV transmission ROW for about 2 miles and across Interstate 70 before terminating at the new Bartholow substation. The route aims to remain as straight as possible with minor route adjustments to minimize residential impacts.

Terrain description	The project is located in Maryland’s Frederick and Carroll Counties east of the Monocacy River. 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.
Right-of-way width by segment	The new right of way will have its own corridor for approximately 95% of the route length. The right of way will be an expansion of an existing transmission line corridor for approximately 5% of the route length. The right of way width will be 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 9 national wetland inventory (NWI) wetlands and 33 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. 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 bog turtle, and eastern rail, 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 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. 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	$95,022,550.00
Component cost (in-service year)	$93,934,532.00

Greenfield Transmission Line Component

Component title	38B - New 500kV transmission line from new Bartholow substation to Goose Creek substation
Project description	Proprietary Business Information
Point A	Bartholow
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 31 miles long. Starting at a new dead-end structure at the new Bartholow substation, the route follows the existing Doubs - Brighton 500kV transmission ROW west - southwest for almost 8 miles, expanding the existing ROW. Minor adjustments may be needed for reducing impacts to buildings and residences. The route turns south where Bennet Creek intersects with the existing Doubs - Brighton 500kV transmission ROW and then routes on the eastern side of Sugarloaf Mountain for about 12 miles before then co-locating with the existing Doubs - Goose Creek 500KV transmission ROW. The route follows the existing transmission ROW on the eastern side, expanding the existing ROW, for the remainder approximate 9 miles of the route, with slight deviation at the Leesburg Water Treament Plant to avoid impact to operations at the facility. The route also utilizes underground due to spatial constraints from the developed area south of the Potomac River before terminating at the Goose Creek substation.
Terrain description	The Project is located in the valley south of the Potomac River in Loudon County, traversing north through Montgomery and Frederick Counties in Maryland. A former agricultural region, Loudon County 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 Frederick, Maryland where the topography is generally rolling. Elevations range from a low of near sea level along the Potomac River to about 875 feet. 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.
Right-of-way width by segment	The new right of way will have its own corridor for approximately 45% of the route length. The right of way will be an expansion of an existing transmission line corridor for approximately 40% of the route length. Approximately 15% of the route will be underground. Approximately 75% of the route will have a 165 ft wide right of way, and approximately 10% will have a right of way 150 ft wide. Approximately 15% 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	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) wetlands and 38 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. Additional coordination will be required for the crossing of the Potomac River, including with the Chesapeake and Ohio National Historical Park. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. The Sugarloaf Mountain Historic Landmark is adjacent to the proposed route and will require further consultations. 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 bumblebee, and aquatic species. There is potential for Yellow Lance critical habitat to be identified along the proposed route and will require further consultation with the US Fish and Wildlife Service. 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 500kV lattice towers (TTVS-500) in a horizontal configuration. Any proposed dead-end 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.
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	$200,995,900.00
Component cost (in-service year)	$221,861,865.00

Greenfield Substation Component

Component title	29d - New Barnhart Substation - 3 terminal
Project description	Proprietary Business Information
Substation name	Barnhart
Substation description	AC Air Insulated Substation (AIS): New proposed 500 kV Substation. New ring bus switchyard, three (3) line terminals, three (3) 500kV, 5000A, 63kAIC Breakers
Nominal voltage	AC
Nominal voltage	500

Transformer Information

None

Major equipment description	AC Air Insulated Substation (AIS): New proposed 500 kV Substation. New ring bus switchyard, three (3) line terminals, three (3) 500kV, 5000A, 63kAIC Breakers

	Normal ratings	**Emergency ratings**
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000

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, eastern black rail and bog turtle, 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	$13,604,500.00
Component cost (in-service year)	$15,016,822.00

Greenfield Substation Component

Component title	38C - New Bartholow Substation - 4 terminal
Project description	Proprietary Business Information
Substation name	Bartholow
Substation description	AC Air Insulated Substation (AIS): New proposed 500 kV Substation. New Breaker and a Half (BAAH) switchyard, three (3) bays, seven (7) line terminations, twelve (12) 500kV, 5000A, 63kAIC Breakers, two (2) shunt 150 MVAR capacitor banks, one (1) -300 to +500 MVAR Static VAR Compensator (SVC)
Nominal voltage	AC
Nominal voltage	500

Transformer Information

None

Major equipment description	AC Air Insulated Substation (AIS): New proposed 500 kV Substation. New Breaker and a Half (BAAH) switchyard, three (3) bays, seven (7) line terminals, twelve (12) 500kV, 5000A, 63kAIC Breakers, two (2) shunt 150 MVAR capacitor banks, one (1) -300 to +500 MVAR Static VAR Compensator (SVC)

	Normal ratings	**Emergency ratings**
Summer (MVA)	0.000000	0.000000
Winter (MVA)	0.000000	0.000000

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, 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	$74,333,000.00
Component cost (in-service year)	$82,049,724.00

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. 38A - New 500kV transmission line from new Barnhart substation to new Bartholow substation - NEETMA

2. 38B - New 500kV transmission line from new Bartholow substation to Goose Creek substation - NEETMA

3. 29d - New Barnhart Substation - 3 terminal - NEETMA

4. 38C - New Bartholow Substation - 4 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