

# Muddy Creek / North Delta - Conastone 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	631
Project title	Muddy Creek / North Delta - Conastone Solution
Project description	New Muddy Creek 230 kV switchyard, New Muddy Creek - Conastone/Graceton 230 kV lines, New North Delta 500/230 kV substation, New North Delta - Conastone 500 kV line, plus various modifications to existing lines and substations Proposal permitting and overhead costs are captured in Component 25B. 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. 24e - North Delta to Cooper 230kV rebuild
2. 24f - North Delta to Graceton 230kV rebuild
3. 25B - New double circuit 230kV transmission line from new Muddy Creek switchyard to the point where PPL's Manor - Graceton 230kV transmission line crosses Peach - Otter Creek 500kV transmission line

4. 26d - Waugh Chapel to Brandon Shores 230kV upgrade
5. 25F - Muddy Run to Peach Bottom 230kV upgrade
6. 25C - New single circuit 230kV transmission line from where PPL's Manor - Graceton 230kV transmission line crosses Peach Bottom - Otter Creek 500kV transmission line to where the Otter Creek - Conastone 230kV transmission line begins
7. 26e - Granite to North West 230kV upgrade
8. 27d - North Peach Bottom to South Peach Bottom 500kV rebuild
9. 25d - Graceton substation single 230kV breaker expansion
10. 25a - New Muddy Creek Substation- 6 terminal
11. 24a - New North Delta Substation- 4 terminal
12. 25b2 - Muddy Creek to Graceton 230kV Brownfield Component
13. 25c2 - Muddy Creek to Conastone 230kV Brownfield Component
14. 25e - Conastone substation 230kV termination

### **Transmission Line Upgrade Component**

Component title	24e - North Delta to Cooper 230kV rebuild
Project description	Proprietary Business Information
Impacted transmission line	Cooper sub to Graceton sub 230kV line
Point A	North Delta
Point B	Cooper
Point C	N/A
Terrain description	Rebuild is within existing ROW
<b>Existing Line Physical Characteristics</b>	
Operating voltage	230
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)

230.000000

230.000000

**Normal ratings**

**Emergency ratings**

Summer (MVA)

1573.000000

1810.000000

Winter (MVA)

1648.000000

1896.000000

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

0.75 miles

Rebuild portion description

Proposing to rebuild the entire line to achieve specific rating.

Right of way

Use of existing ROW to extent practicable.

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	\$1,837,500.00
Component cost (in-service year)	\$2,028,256.00

**Transmission Line Upgrade Component**

Component title	24f - North Delta to Graceton 230kV rebuild
Project description	Proprietary Business Information
Impacted transmission line	Cooper sub to Graceton sub 230kV line
Point A	North Delta
Point B	Graceton
Point C	N/A
Terrain description	Rebuild is within existing ROW

**Existing Line Physical Characteristics**

Operating voltage	230
Conductor size and type	Incumbent / Current Transmission owner specific
Hardware plan description	Utilize existing line hardware to extent possible.
Tower line characteristics	New double circuit structures will be required.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>

Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
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	6.5 miles	
Rebuild portion description	Proposing to rebuild the entire line to achieve specific rating.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	
Contingency	Proprietary Company Information	
Total component cost	\$15,925,000.00	
Component cost (in-service year)	\$17,578,220.00	

**Greenfield Transmission Line Component**

Component title	25B - New double circuit 230kV transmission line from new Muddy Creek switchyard to the point where PPL's Manor - Graceton 230kV transmission line crosses Peach - Otter Creek 500kV transmission line	
Project description	Proprietary Company Information	
Point A	Muddy Creek	
Point B	Graceton	
Point C	N/A	
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1295.000000	1863.000000
Winter (MVA)	1534.000000	1795.000000
Conductor size and type	3x 1590 kcmil Falcon ACSR	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	Route is approximately 6.1 miles long. Starting on the east end at the new Muddy Creek substation and routing toward the west, the double circuit 230kV circuit follows the existing Peach Bottom - Otter Creek ROW on the north side. The double circuit ends at the intersection of Manor - Graceton 230kV transmission line and Peach Bottom - Otter Creek 500kV transmission line. The line component 25B1 then continues from the end of this component south as a single circuit to Graceton substation.	

## Terrain description

The Project is located in York County, which is in the southernmost portion of Pennsylvania, along the state boundary with Maryland. 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. The Appalachian Highlands Region is further broken down into provinces based on different land forms. York County lies almost entirely within the Piedmont Province, except for small areas in the northern portion of the County that are located within the Blue Ridge Province and the Ridge and Valley Province. The Piedmont Upland Section is located in the southern third of the County. The Piedmont Upland is characterized by rolling hills and valleys, generally with gentle to moderately steep slopes. However, steeper slopes with narrow valley bottoms dominate near the Susquehanna River. Many higher ridges are underlain by more resistant bedrock such as quartzite. This Section was formed by fluvial erosion and some peri-glacial wasting and averages about 600-700 feet in elevation. The drainage pattern of the area is considered to be dendritic. Slopes in the range of 0-8% are common throughout York County. The Piedmont Upland of Pennsylvania has a humid continental climate. Weather systems that affect the area generally originate in the central United States and move eastward over the Appalachians. Periodically, moist northward moving weather systems bring moderate and heavy precipitation to the area.

## Right-of-way width by segment

The majority of the new right of way will be an expansion of an existing transmission line corridor, where a 45 ft additional width will be required beyond the existing, assumed, ROW edge.

## 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 6 national wetland inventory (NWI) wetlands and 4 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 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 and the 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. 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-230DC) 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 Company Information

Benefits/Comments Resolves reliability issues identified per PJM's Gen. Deliv. Process

**Component Cost Details - In Current Year \$**

Engineering & design Proprietary Company Information

Permitting / routing / siting Proprietary Company Information

ROW / land acquisition Proprietary Company Information

Materials & equipment Proprietary Company Information

Construction & commissioning Proprietary Company Information

Construction management Proprietary Company Information

Overheads & miscellaneous costs Proprietary Company Information

Contingency Proprietary Company Information

Total component cost \$26,254,980.00

Component cost (in-service year) \$23,930,641.00

**Transmission Line Upgrade Component**

Component title 26d - Waugh Chapel to Brandon Shores 230kV upgrade

Project description Proprietary Company Information

Impacted transmission line Waugh Chapel sub to Brandon Shores sub double circuit 230kV line

Point A Waugh Chapel

Point B Brandon Shores

Point C N/A

Terrain description

Upgrade is within existing ROW.

**Existing Line Physical Characteristics**

Operating voltage

230

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)

230.000000

230.000000

**Normal ratings**

**Emergency ratings**

Summer (MVA)

1573.000000

1810.000000

Winter (MVA)

1648.000000

1896.000000

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

14.4

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 Company Information

Benefits/Comments

Resolves reliability issues identified per PJM's Gen. Deliv. Process

**Component Cost Details - In Current Year \$**

Engineering & design

Proprietary Company Information

Permitting / routing / siting

Proprietary Company Information

ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,519,064.00

**Transmission Line Upgrade Component**

Component title	25F - Muddy Run to Peach Bottom 230kV upgrade
Project description	Proprietary Company Information
Impacted transmission line	Muddy Run sub to Peach Bottom sub 500kV line
Point A	Muddy Run
Point B	Peach Bottom
Point C	N/A
Terrain description	Upgrade is within existing ROW.

**Existing Line Physical Characteristics**

Operating voltage	230
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**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1573.000000	1810.000000
Winter (MVA)	1648.000000	1896.000000
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	4.5	
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 Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	

Contingency	Proprietary Company Information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,519,064.00

### Greenfield Transmission Line Component

Component title	25C - New single circuit 230kV transmission line from where PPL's Manor - Graceton 230kV transmission line crosses Peach Bottom - Otter Creek 500kV transmission line to where the Otter Creek - Conastone 230kV transmission line begins	
Project description	Proprietary Company Information	
Point A	Muddy Creek	
Point B	Conastone	
Point C	N/A	

	Normal ratings	Emergency ratings
Summer (MVA)	1295.000000	1863.000000
Winter (MVA)	1534.000000	1795.000000
Conductor size and type	3x 1590 kcmil Falcon ACSR	
Nominal voltage	AC	
Nominal voltage	230	
Line construction type	Overhead	
General route description	Route is approximately 4.9 miles. Starting at the intersection of the Manor - Graceton 230kV transmission line and Peach Bottom - Otter Creek 500kV transmission line, where component 25B ends and 25B1 begins, the single circuit component 25C routes west following the existing Peach Bottom - Otter Creek ROW on the north side until it reaches the Otter Creek substation. The line component 25C1 then continues from the end of this component south as a single circuit to Conastone substation.	

## Terrain description

The Project is located in York County, which is in the southernmost portion of Pennsylvania, along the state boundary with Maryland. 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. The Appalachian Highlands Region is further broken down into provinces based on different land forms. York County lies almost entirely within the Piedmont Province, except for small areas in the northern portion of the County that are located within the Blue Ridge Province and the Ridge and Valley Province. The Piedmont Upland Section is located in the southern third of the County. The Piedmont Upland is characterized by rolling hills and valleys, generally with gentle to moderately steep slopes. However, steeper slopes with narrow valley bottoms dominate near the Susquehanna River. Many higher ridges are underlain by more resistant bedrock such as quartzite. This Section was formed by fluvial erosion and some peri-glacial wasting and averages about 600-700 feet in elevation. The drainage pattern of the area is considered to be dendritic. Slopes in the range of 0-8% are common throughout York County. The Piedmont Upland of Pennsylvania has a humid continental climate. Weather systems that affect the area generally originate in the central United States and move eastward over the Appalachians. Periodically, moist northward moving weather systems bring moderate and heavy precipitation to the area.

## Right-of-way width by segment

The majority of the new right of way will be an expansion of an existing transmission line corridor, where a 45 ft additional width will be required beyond the existing, assumed, ROW edge.

## 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 6 national wetland inventory (NWI) wetlands and 4 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 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 and the 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. 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 (TVS-230) in a delta conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in Attachment 10.
-----------------------	---

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 Company Information
----------------------	---------------------------------

Permitting / routing / siting	Proprietary Company Information
-------------------------------	---------------------------------

ROW / land acquisition	Proprietary Company Information
------------------------	---------------------------------

Materials & equipment	Proprietary Company Information
-----------------------	---------------------------------

Construction & commissioning	Proprietary Company Information
------------------------------	---------------------------------

Construction management	Proprietary Company Information
-------------------------	---------------------------------

Overheads & miscellaneous costs	Proprietary Company Information
---------------------------------	---------------------------------

Contingency	Proprietary Company Information
-------------	---------------------------------

Total component cost	\$15,935,150.00
----------------------	-----------------

Component cost (in-service year)	\$17,589,424.00
----------------------------------	-----------------

**Transmission Line Upgrade Component**

Component title	26e - Granite to North West 230kV upgrade
-----------------	---

Project description	Proprietary Company Information
---------------------	---------------------------------

Impacted transmission line	Granite sub to North West sub 230kV line
----------------------------	--

Point A	Granite
---------	---------

Point B	North West
---------	------------

Point C	N/A
---------	-----

Terrain description

Upgrade is within existing ROW.

**Existing Line Physical Characteristics**

Operating voltage

230

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)

230.000000

230.000000

**Normal ratings**

**Emergency ratings**

Summer (MVA)

1573.000000

1810.000000

Winter (MVA)

1648.000000

1896.000000

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

8.5 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 Company Information

Benefits/Comments

Resolves reliability issues identified per PJM's Gen. Deliv. Process

**Component Cost Details - In Current Year \$**

Engineering & design

Proprietary Company Information

Permitting / routing / siting

Proprietary Company Information

ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$5,000,000.00
Component cost (in-service year)	\$5,519,064.00

**Transmission Line Upgrade Component**

Component title	27d - North Peach Bottom to South Peach Bottom 500kV rebuild
Project description	Proprietary Company Information
Impacted transmission line	North Peach Bottom to South Peach Bottom 500kV
Point A	North Peach Bottom
Point B	South Peach Bottom
Point C	N/A
Terrain description	Upgrade is within existing ROW

**Existing Line Physical Characteristics**

Operating voltage	500
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**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	500.000000	500.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	4295.000000	4357.000000
Winter (MVA)	5066.000000	5196.000000
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	1.03 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 Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	

Contingency	Proprietary Company Information
Total component cost	\$1,514,100.00
Component cost (in-service year)	\$1,671,283.00

**Substation Upgrade Component**

Component title	25d - Graceton substation single 230kV breaker expansion
Project description	Proprietary Company Information
Substation name	Graceton
Substation zone	BG&E
Substation upgrade scope	Add a new 230kV circuit breaker and one MOD.

**Transformer Information**

None	
New equipment description	AC Substation: Add one (1) new 230 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 Company Information
Permitting / routing / siting	Proprietary Company Information
ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information

Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$1,400,000.00
Component cost (in-service year)	\$1,545,338.00

### Greenfield Substation Component

Component title	25a - New Muddy Creek Substation- 6 terminal
Project description	Proprietary Company Information
Substation name	Muddy Creek
Substation description	AC Air Insulated Substation (AIS): New proposed 230 kV Substation. New Ring Bus switchyard, six (6) line terminals, six (6) 230kV, 5000A, 80 kAIC Breakers
Nominal voltage	AC
Nominal voltage	230

### Transformer Information

None

Major equipment description	AC Air Insulated Substation (AIS): New proposed 230 kV Substation. New Ring Bus switchyard, six (6) line terminals, six (6) 230kV, 5000A, 80kAIC Breakers
-----------------------------	---

	<b>Normal ratings</b>	<b>Emergency ratings</b>
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 but is located near Muddy Creek. 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.

## 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 Company 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 Company Information

Permitting / routing / siting

Proprietary Company Information

ROW / land acquisition

Proprietary Company Information

Materials & equipment

Proprietary Company Information

Construction & commissioning

Proprietary Company Information

Construction management

Proprietary Company Information

Overheads & miscellaneous costs

Proprietary Company Information

Contingency

Proprietary Company Information

Total component cost

\$8,218,000.00

Component cost (in-service year)

\$9,071,134.00

**Greenfield Substation Component**

Component title

24a - New North Delta Substation- 4 terminal

Project description

Proprietary Company Information

Substation name

North Delta

Substation description

AC Air Insulated Substation (AIS): New proposed 500 - 230 kV Substation. New Breaker and a Half (BAAH) 500 kV switchyard with two (2) bays, two (2) line terminals, six (6) 500 kV, 5000A, 63kAIC breakers and two 500 kV - 230 kV transformer banks. New 230kV BAAH Switchyard with two (2) bays, three (3) line terminals, seven (7) 230 kV, 5000A, 80 kAIC breakers

Nominal voltage

AC

Nominal voltage

500/230

## Transformer Information

	<b>Name</b>	<b>Capacity (MVA)</b>	
Transformer	Transformer 1	1559/1940	
	<b>High Side</b>	<b>Low Side</b>	<b>Tertiary</b>
Voltage (kV)	500	230	N/A
	<b>Name</b>	<b>Capacity (MVA)</b>	
Transformer	Transformer 2	1559/1940	
	<b>High Side</b>	<b>Low Side</b>	<b>Tertiary</b>
Voltage (kV)	500	230	N/A
Major equipment description	AC Air Insulated Substation (AIS): New proposed 500 - 230 kV Substation. New Breaker and a Half (BAAH) 500 kV switchyard with two (2) bays, two (2) line terminals, six (6) 500 kV, 5000A, 63kAIC breakers and two 500 kV - 230 kV transformer banks. New 230kV BAAH Switchyard with two (2) bays, three (3) line terminals, seven (7) 230 kV, 5000A, 80 kAIC breakers		
	<b>Normal ratings</b>	<b>Emergency ratings</b>	
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 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 is an actively maintained agricultural field, and no national wetland inventory (NWI) wetlands or waterbodies are crossed. Fatal flaws have not been identified. 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 in the general area, including listed bats. However at this time no tree clearing is required for this location. If suitable habitat for bats, or any other protected species, is identified or regulations change, agency consultation 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 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

The substation is being proposed to be built on a parcel that is already under purchase option.

Construction responsibility

Proprietary Company 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 Company Information

Permitting / routing / siting

Proprietary Company Information

ROW / land acquisition

Proprietary Company Information

Materials & equipment

Proprietary Company Information

Construction & commissioning

Proprietary Company Information

Construction management

Proprietary Company Information

Overheads & miscellaneous costs

Proprietary Company Information

Contingency

Proprietary Company Information

Total component cost

\$62,405,000.00

Component cost (in-service year)

\$68,883,443.00

**Transmission Line Upgrade Component**

Component title

25b2 - Muddy Creek to Graceton 230kV Brownfield Component

Project description

Proprietary Company Information

Impacted transmission line

Manor sub to Graceton sub 230kV line

Point A

Muddy Creek

Point B

Graceton

Point C

N/A

Terrain description

Upgrade is within existing ROW.

**Existing Line Physical Characteristics**

Operating voltage	230
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. There is an open position on the existing transmission towers for a new circuit.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1295.000000	1863.000000
Winter (MVA)	1534.000000	1795.000000
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	9.3	
Rebuild portion description	Proposing to build the new circuit on the existing tower due to there being an available position on the current double circuit towers with only one circuit installed.	
Right of way	Use of existing ROW to extent practicable.	
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 Company Information
Permitting / routing / siting	Proprietary Company Information

ROW / land acquisition	Proprietary Company Information
Materials & equipment	Proprietary Company Information
Construction & commissioning	Proprietary Company Information
Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$13,671,000.00
Component cost (in-service year)	\$15,090,226.00

**Transmission Line Upgrade Component**

Component title	25c2 - Muddy Creek to Conastone 230kV Brownfield Component
Project description	Proprietary Company Information
Impacted transmission line	Otter Creek sub to Conastone sub 230kV
Point A	Muddy Creek
Point B	Conastone
Point C	N/A
Terrain description	Upgrade is within existing ROW

**Existing Line Physical Characteristics**

Operating voltage	230
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. There is open position on the existing transmission towers for a new circuit.

**Proposed Line Characteristics**

	<b>Designed</b>	<b>Operating</b>
Voltage (kV)	230.000000	230.000000
	<b>Normal ratings</b>	<b>Emergency ratings</b>
Summer (MVA)	1295.000000	1863.000000
Winter (MVA)	1534.000000	1795.000000
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	14.7	
Rebuild portion description	Proposing to build the new circuit on the existing tower due to there being an available position on the current double circuit towers with only one circuit installed.	
Right of way	Use of existing ROW to extent practicable.	
Construction responsibility	Proprietary Company Information	
Benefits/Comments	Resolves reliability issues identified per PJM's Gen. Deliv. Process	
<b>Component Cost Details - In Current Year \$</b>		
Engineering & design	Proprietary Company Information	
Permitting / routing / siting	Proprietary Company Information	
ROW / land acquisition	Proprietary Company Information	
Materials & equipment	Proprietary Company Information	
Construction & commissioning	Proprietary Company Information	
Construction management	Proprietary Company Information	
Overheads & miscellaneous costs	Proprietary Company Information	

Contingency Proprietary Company Information

Total component cost \$21,609,000.00

Component cost (in-service year) \$23,852,293.00

### **Substation Upgrade Component**

Component title 25e - Conastone substation 230kV termination

Project description Proprietary Company Information

Substation name Conastone

Substation zone BG&E

Substation upgrade scope Terminate new Muddy Creek to Conastone 230kV transmission line at Conastone

### **Transformer Information**

None

New equipment description AC substation: terminate new 230kV transmission line into spare position in the western most bay.

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 Company Information

Permitting / routing / siting Proprietary Company Information

ROW / land acquisition Proprietary Company Information

Materials & equipment Proprietary Company Information

Construction & commissioning Proprietary Company Information

Construction management	Proprietary Company Information
Overheads & miscellaneous costs	Proprietary Company Information
Contingency	Proprietary Company Information
Total component cost	\$700,000.00
Component cost (in-service year)	\$772,669.00

### **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 Company Information
Cost cap (in-service year)	Proprietary Company Information

### **Components covered by cost containment**

1. 25B - New double circuit 230kV transmission line from new Muddy Creek switchyard to the point where PPL's Manor - Graceton 230kV transmission line crosses Peach - Otter Creek 500kV transmission line - NEETMA
2. 25C - New single circuit 230kV transmission line from where PPL's Manor - Graceton 230kV transmission line crosses Peach Bottom - Otter Creek 500kV transmission line to where the Otter Creek - Conastone 230kV transmission line begins - NEETMA
3. 25a - New Muddy Creek Substation- 6 terminal - NEETMA
4. 24a - New North Delta 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	No
AFUDC	No
Escalation	No
Additional Information	Proprietary Company 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 Company Information

Additional cost containment measures not covered above

Proprietary Company Information

## **Additional Comments**

None