

Broad Creek - Robinson Run 230/500kV Transmission Project

General Information

Proposing entity name	CONFIDENTIAL
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	CONFIDENTIAL
Company proposal ID	CONFIDENTIAL
PJM Proposal ID	203
Project title	Broad Creek - Robinson Run 230/500kV Transmission Project
Project description	<p>The Broad Creek - Robinson Run Transmission Project includes a new 500/230kV substation, a new 500kV substation, and a new 500kV transmission line. The new Broad Creek 500/230kV substation will include a six (6) position breaker and a half arrangement 230kV yard connected to a three (3) position ringbus configuration 500kV yard via two (2) transformers. The 230kV portion of the substation will interconnect the Graceton - Bagley #1 230kV transmission line and the Graceton - Bagley #2 230kV transmission line. The 500kV portion will connect to the new three (3) position ringbus configuration 500kV Robinson Run Switching Station via a new 500kV transmission line. The 500kV transmission line will be built in the existing corridor that contains the Graceton - Cooper 230kV transmission line and the Conastone - Peach Bottom 500kV transmission line. While in this corridor, the Graceton - Cooper 230kV transmission line will be demolished and replaced with a double circuit 500/230kV transmission line. The 500kV transmission line will terminate at the new Robinson Run Switching Station and the 230kV transmission line will continue on to the Cooper Substation.</p>
Email	CONFIDENTIAL
Project in-service date	05/2028
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	CONFIDENTIAL

Project Components

1. Broad Creek 230/500kV Substation
2. Robinson Run 500kV Switching Station
3. Broad Creek - Robinson Run 230/500kV Transmission Line
4. Graceton - Bagley #1 230kV Interconnection
5. Graceton - Bagley #2 230kV Interconnection
6. Delta Power Plant - Peach Bottom 500kV Interconnection

Greenfield Substation Component

Component title	Broad Creek 230/500kV Substation
Project description	CONFIDENTIAL
Substation name	Broad Creek
Substation description	The Broad Creek Substation will include a six (6) position breaker and a half arrangement configuration 230kV yard that connects to a three (3) position ringbus configuration 500kV yard via two (2) transformers.
Nominal voltage	AC
Nominal voltage	500/230

Transformer Information

	Name	Capacity (MVA)	
Transformer	Broad Creek 500/230kV Transformer #1	640	
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	
	Name	Capacity (MVA)	
Transformer	Broad Creek 500/230kV Transformer #2	640	

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	
Major equipment description	500kV circuit breakers (3) will have a continuous current rating of 5000A, a 3464 MVA rating, and a short circuit current rating of 63kA. 500kV terminal equipment will be rated at 5000A. 230kV circuit breakers (9) will have a continuous current rating of 4000A, a 1593 MVA rating, and a short circuit current rating of 63kA. 230kV terminal equipment will be rated at 4000A. The two (2) 500/230kV transformers will each have a capacity of 1640 MVA.		
	Normal ratings	Emergency ratings	
Summer (MVA)	4330.000000	4330.000000	
Winter (MVA)	4330.000000	4330.000000	
Environmental assessment	The proposed Project was sited to avoid and minimize impacts to wetlands or other areas of environmental concern based on GIS data. It is possible that the Project cannot avoid impacts to a limited number of wetlands and waterways. If so, Proposer expects the Project will be subject to regulation under certain permitting programs, namely Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 401 of the Clean Water Act. Proposer will engage a qualified consultant to conduct a wetlands delineation of the selected site/route in order to establish the extent of proposed impacts and the need for specific permits from the state or U.S. Army Corps of Engineers. In addition to the permits described above, Proposer has identified other permits which may be required for the construction of the Project. Proposer considers these permits to be minor due to the more limited effort to prepare applications and the less intensive permitting processes which follow. These include permits related to airspace clearance, stormwater/erosion and sedimentation control, road crossings, and utility and railroad crossings.		
Outreach plan	Proposer will identify and engage stakeholders, such as community officials and landowners within the Project area, early in the process and maintain an active dialogue throughout. Public meetings may be held to offer a venue for landowners and other interested community members to learn about the Project and for Proposer to learn more about specific landowner and community preferences. Proposer plans to make information available on its website and provide notification of public meetings to landowners within the Project area as required in the siting approval process.		

Land acquisition plan	The Project will be located primarily on new right-of-way to be purchased by Proposer. In addition, Proposer will procure any necessary easements required to access the site. Proposer will assign a Right-of-Way Manager to oversee all real estate related activities for the Project including appraisals, title work, surveying, land acquisition and restoration. A right-of-way agent will contact the property owner(s) in person to explain the Project and, as necessary, secure permission to conduct surveys, archaeological studies, etc. The right-of-way agent will be the primary point of contact to negotiate with the property owner to acquire the substation site and any required easements on a mutually agreeable basis. To the extent that negotiations reach an impasse, Proposer will be able to pursue eminent domain. The right-of-way agents will continue to act as a liaison with the property owners during construction and through the restoration process.
Construction responsibility	CONFIDENTIAL
Benefits/Comments	CONFIDENTIAL
Component Cost Details - In Current Year \$	
Engineering & design	CONFIDENTIAL
Permitting / routing / siting	CONFIDENTIAL
ROW / land acquisition	CONFIDENTIAL
Materials & equipment	CONFIDENTIAL
Construction & commissioning	CONFIDENTIAL
Construction management	CONFIDENTIAL
Overheads & miscellaneous costs	CONFIDENTIAL
Contingency	CONFIDENTIAL
Total component cost	\$57,577,800.00
Component cost (in-service year)	\$69,660,848.00
Greenfield Substation Component	
Component title	Robinson Run 500kV Switching Station
Project description	CONFIDENTIAL

Substation name	Robinson Run Switching Station
Substation description	The 500kV Robinson Run Switching Station will be a three-position ring bus that will interconnect the existing Delta Power Plant to Peach Bottom 500kV transmission line. The third position will connect to the new Broad Creek to Robinson Run 500kV transmission line.
Nominal voltage	AC
Nominal voltage	500

Transformer Information

None

Major equipment description 500kV circuit breakers (3) will have a continuous current rating of 5000A, a 3464 MVA rating, and a short circuit current rating of 63kA. 500kV terminal equipment will be rated at 5000A.

	Normal ratings	Emergency ratings
Summer (MVA)	4330.000000	4330.000000
Winter (MVA)	4330.000000	4330.000000

Environmental assessment The proposed Project was sited to avoid and minimize impacts to wetlands or other areas of environmental concern based on GIS data. It is possible that the Project cannot avoid impacts to a limited number of wetlands and waterways. If so, Proposer expects the Project will be subject to regulation under certain permitting programs, namely Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 401 of the Clean Water Act. Proposer will engage a qualified consultant to conduct a wetlands delineation of the selected site/route in order to establish the extent of proposed impacts and the need for specific permits from the state or U.S. Army Corps of Engineers. In addition to the permits described above, Proposer has identified other permits which may be required for the construction of the Project. Proposer considers these permits to be minor due to the more limited effort to prepare applications and the less intensive permitting processes which follow. These include permits related to airspace clearance, stormwater/erosion and sedimentation control, road crossings, and utility and railroad crossings.

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Construction responsibility	CONFIDENTIAL
Benefits/Comments	CONFIDENTIAL
Component Cost Details - In Current Year \$	
Engineering & design	CONFIDENTIAL
Permitting / routing / siting	CONFIDENTIAL
ROW / land acquisition	CONFIDENTIAL
Materials & equipment	CONFIDENTIAL
Construction & commissioning	CONFIDENTIAL
Construction management	CONFIDENTIAL
Overheads & miscellaneous costs	CONFIDENTIAL
Contingency	CONFIDENTIAL
Total component cost	\$11,810,352.00
Component cost (in-service year)	\$14,288,825.00
Greenfield Transmission Line Component	
Component title	Broad Creek - Robinson Run 230/500kV Transmission Line
Project description	CONFIDENTIAL

Point A	Broad Creek	
Point B	Robinson Run	
Point C	Cooper	
	Normal ratings	Emergency ratings
Summer (MVA)	3280.000000	4100.000000
Winter (MVA)	3280.000000	4100.000000
Conductor size and type	Triple Bundle 1272 kcmil "Bittern" ACSS High Strength	
Nominal voltage	AC	
Nominal voltage	500/230	
Line construction type	Overhead	
General route description	<p>See Routing Map attachment for information on the general project route. Most high-voltage transmission projects will require a state siting approval. To begin the siting approval process, Proposer plans to hold pre-application meetings with the regulatory agency to introduce Proposer and the Project, as well as confirm its understanding of the process. Shortly thereafter, Proposer will simultaneously begin collecting siting data and start its outreach efforts so that public siting input is incorporated at the earliest stages of the Project. Once the Proposer identifies a preferred site/route and at least one viable alternative site/route, Proposer will carry out the environmental and detailed engineering work described in the Site Selection/Routing Analysis section above in order to establish a highly- detailed Project plan to support the siting applications.</p>	
Terrain description	<p>The terrain traversed by the project features an existing ROW. The land around the existing ROW consists of farmland and forested areas.</p>	
Right-of-way width by segment	<p>The project proposes to utilize the existing ROW in the Graceton - Cooper corridor.</p>	
Electrical transmission infrastructure crossings	<p>Electrical infrastructure crossings may be required depending on final line route. This will be coordinated during the detailed design process with the interconnection PTO.</p>	
Civil infrastructure/major waterway facility crossing plan	<p>No civil infrastructure or major waterway crossings.</p>	

Environmental impacts	The proposed Project was sited to avoid and minimize impacts to wetlands or other areas of environmental concern based on GIS data. It is possible that the Project cannot avoid impacts to a limited number of wetlands and waterways. If so, Proposer expects the Project will be subject to regulation under certain permitting programs, namely Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 401 of the Clean Water Act. Proposer will engage a qualified consultant to conduct a wetlands delineation of the selected site/route in order to establish the extent of proposed impacts and the need for specific permits from the state or U.S. Army Corps of Engineers. In addition to the permits described above, Proposer has identified other permits which may be required for the construction of the Project. Proposer considers these permits to be minor due to the more limited effort to prepare applications and the less intensive permitting processes which follow. These include permits related to airspace clearance, stormwater/erosion and sedimentation control, road crossings, and utility and railroad crossings.
Tower characteristics	The preliminary design for the transmission line utilizes tubular steel monopole structures with double circuit conductor in a vertical configuration. Triple bundle 1272 kcmil "Bittern" ACSS high strength conductor will be used for the 500kV circuit. The existing conductor on the Graceton - Cooper 230kV transmission line will be used for the 230kV circuit. Two optical groundwires will be utilized.
Construction responsibility	CONFIDENTIAL
Benefits/Comments	CONFIDENTIAL
Component Cost Details - In Current Year \$	
Engineering & design	CONFIDENTIAL
Permitting / routing / siting	CONFIDENTIAL
ROW / land acquisition	CONFIDENTIAL
Materials & equipment	CONFIDENTIAL
Construction & commissioning	CONFIDENTIAL
Construction management	CONFIDENTIAL
Overheads & miscellaneous costs	CONFIDENTIAL
Contingency	CONFIDENTIAL
Total component cost	\$32,261,855.00

Component cost (in-service year) \$38,981,555.00

Transmission Line Upgrade Component

Component title Graceton - Bagley #1 230kV Interconnection

Project description CONFIDENTIAL

Impacted transmission line Graceton - Bagley

Point A Graceton

Point B Bagley

Point C

Terrain description The terrain description is farmland.

Existing Line Physical Characteristics

Operating voltage 230

Conductor size and type N/A

Hardware plan description N/A

Tower line characteristics N/A

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1331.000000	1594.000000
Winter (MVA)	1795.000000	1851.000000
Conductor size and type	N/A	

Shield wire size and type	N/A
Rebuild line length	<0.25 miles
Rebuild portion description	The existing line will be broken and new deadend towers installed to facilitate looping into the new Broad Creek 500/230kV Substation.
Right of way	The existing right-of-way will be reused to facilitate the transmission interconnection facilities necessary to loop the lines into the new substation.
Construction responsibility	CONFIDENTIAL
Benefits/Comments	CONFIDENTIAL
Component Cost Details - In Current Year \$	
Engineering & design	CONFIDENTIAL
Permitting / routing / siting	CONFIDENTIAL
ROW / land acquisition	CONFIDENTIAL
Materials & equipment	CONFIDENTIAL
Construction & commissioning	CONFIDENTIAL
Construction management	CONFIDENTIAL
Overheads & miscellaneous costs	CONFIDENTIAL
Contingency	CONFIDENTIAL
Total component cost	\$690,000.00
Component cost (in-service year)	\$840,119.00
Transmission Line Upgrade Component	
Component title	Graceton - Bagley #2 230kV Interconnection
Project description	CONFIDENTIAL
Impacted transmission line	Graceton - Bagley

Point A	Graceton	
Point B	Bagley	
Point C		
Terrain description	The terrain description is farmland.	
Existing Line Physical Characteristics		
Operating voltage	230	
Conductor size and type	N/A	
Hardware plan description	N/A	
Tower line characteristics	N/A	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1331.000000	1594.000000
Winter (MVA)	1795.000000	1851.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	<0.25 miles	
Rebuild portion description	The existing line will be broken and new deadend towers installed to facilitate looping into the new Broad Creek 500/230kV Substation.	
Right of way	The existing right-of-way will be reused to facilitate the transmission interconnection facilities necessary to loop the lines into the new substation.	

Construction responsibility CONFIDENTIAL

Benefits/Comments CONFIDENTIAL

Component Cost Details - In Current Year \$

Engineering & design CONFIDENTIAL

Permitting / routing / siting CONFIDENTIAL

ROW / land acquisition CONFIDENTIAL

Materials & equipment CONFIDENTIAL

Construction & commissioning CONFIDENTIAL

Construction management CONFIDENTIAL

Overheads & miscellaneous costs CONFIDENTIAL

Contingency CONFIDENTIAL

Total component cost \$690,000.00

Component cost (in-service year) \$840,119.00

Transmission Line Upgrade Component

Component title Delta Power Plant - Peach Bottom 500kV Interconnection

Project description CONFIDENTIAL

Impacted transmission line Delta Power Plant - Peach Bottom

Point A Delta Power Plant

Point B Peach Bottom

Point C

Terrain description The terrain description is farmland.

Existing Line Physical Characteristics

Operating voltage	500
Conductor size and type	N/A
Hardware plan description	N/A
Tower line characteristics	N/A

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2338.000000	2931.000000
Winter (MVA)	3062.000000	3480.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	<0.25 miles	
Rebuild portion description	The existing line will be broken and new deadend towers installed to facilitate looping into the new 500kV Robinson Run Switching Station.	
Right of way	The existing right-of-way will be reused to facilitate the transmission interconnection facilities necessary to loop the lines into the new substation.	
Construction responsibility	CONFIDENTIAL	
Benefits/Comments	CONFIDENTIAL	
Component Cost Details - In Current Year \$		
Engineering & design	CONFIDENTIAL	
Permitting / routing / siting	CONFIDENTIAL	

ROW / land acquisition	CONFIDENTIAL
Materials & equipment	CONFIDENTIAL
Construction & commissioning	CONFIDENTIAL
Construction management	CONFIDENTIAL
Overheads & miscellaneous costs	CONFIDENTIAL
Contingency	CONFIDENTIAL
Total component cost	\$1,150,000.00
Component cost (in-service year)	\$1,400,199.00

Congestion Drivers

None

Existing Flowgates

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
28-GD-W1	270072	FUR RUN_500	270073	FUR RUN_230	1	500/230	225	Gen Deliv (winter)	Included
28-GD-W2	270072	FUR RUN_500	270073	FUR RUN_230	2	500/230	225	Gen Deliv (winter)	Included
28-GD-S2-W3	270072	FUR RUN_500	270073	FUR RUN_230	1	500/230	225	Gen Deliv (winter)	Included
28-GD-S2-W3	270072	FUR RUN_500	270073	FUR RUN_230	2	500/230	225	Gen Deliv (winter)	Included
28-GD-S2-W9	200066	PCHBTM1N	270072	FUR RUN_500	1	500	230/225	Gen Deliv (winter)	Included
35-GD-S2-W1	200066	PCHBTM1N	270072	FUR RUN_500	1	500/500	230/225	Gen Deliv (winter)	Included
35-GD-W5	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-W6	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-S2-W1	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-S2-W3	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
35-GD-S2-W5	200064	PCHBTM1S	200004	CNASTONE	1	500/500	230/232	Gen Deliv (winter)	Included
28-GD-S2-W1	200073	FUR RUN_230	220963	CONASTON	2	230	232/225	Gen Deliv (winter)	Included

FG #	From Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
28-GD-S2-W107	270073	FUR RUN_230	220963	CONASTON	1	230	232/225	Gen Deliv (winter)	Included
28-GD-W19	270073	FUR RUN_230	220963	CONASTON	1	230	232/225	Gen Deliv (winter)	Included
28-GD-W20	270073	FUR RUN_230	220963	CONASTON	2	230	232/225	Gen Deliv (winter)	Included
28-GD-S2-W32	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W33	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W12	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W22	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W32	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W33	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W4	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W5	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W110	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W111	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W112	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-W16	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W92	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W32	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included
28-GD-S2-W33	200064	PCHBTM1S	200004	CNASTONE	1	500	232/230	Gen Deliv (winter)	Included

New Flowgates

CONFIDENTIAL

Financial Information

Capital spend start date 01/2024

Construction start date 01/2026

Project Duration (In Months) 52

Cost Containment Commitment

Cost cap (in current year) CONFIDENTIAL

Cost cap (in-service year) CONFIDENTIAL

Components covered by cost containment

1. Broad Creek 230/500kV Substation - Proposer
2. Robinson Run 500kV Switching Station - Proposer
3. Broad Creek - Robinson Run 230/500kV Transmission Line - Proposer

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 Yes

Escalation No

Additional Information CONFIDENTIAL

Is the proposer offering a binding cap on ROE? No

Is the proposer offering a Debt to Equity Ratio cap? CONFIDENTIAL

Additional Comments

None