500kV Safety Solutions

General Information

Proposing entity name	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Company proposal ID	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
PJM Proposal ID	983
Project title	500kV Safety Solutions
Project description	This proposal includes the following projects: 1. 99-3082 - Lexington TX1 & TX2 Replacement 2. 99-3149 - North Anna - Ladysmith 2nd 500kV Line 3. 99-3169 - North Anna - Spotsylvania 2nd 500kV Line 4. 99-3177 - Lexington - Dooms 2nd 500kV Line 5. 99-3226 - Line 541 Rebuild Front Royal to Morrisville 6. 99-3227 - Line 535 Vint Hill to Meadow Brook 7. 99-3447 - Heritage 500kV Substation Expansion 8. 99-3405 - Line 573 Rebuild North Anna to Spotsylvania 9. 99-3406 - Line 594 Rebuild Spotsylvania to Morrisville 10. 99-3409 - New 500 kV Line North Anna to Rawlings 11. 99-3410 - Line 576 Rebuild North Anna to Midlothian 12. 99-3420 - Line 594 Spotsylvania to Morrisville 13. 99-3428 - Elmont TX3 Installation 14. 99-2944 - Auburn Farm 500/230kV Substation 15. Line 539 Rebuild - Bristers to Ox 16. New 500kV Line - Aspen to Brambleton
Email	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Project in-service date	06/2029
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Project Components

1. North Anna - Ladysmith 500 kV Line (99-3149)

2. North Anna Substation (99-3149)
3. Ladysmith Substation (99-3149)
4. New 500 kV Line (North Anna - Spotsylvania) (993169)
5. North Anna Equipment Uprate (993169)
6. Spotsylvania Equipment Uprate (993169)
7. Vint Hill to Meadow Brook Uprate (99-3227)
8. Vint Hill Substation Relay Reset (99-3227)
9. Line 573 Rebuild - North Anna to Spotsylvania (99-3405)
10. North Anna Substation Terminal Equipment Uprate (99-3405)
11. Spotsylvania Substation Terminal Equipment Uprate (99-3405)
12. Line 594 Rebuild - Spotsylvania to Morrisville (99-3406)
13. Morrisville Substation Terminal Equipment Uprate (99-3406)
14. Spotsylvania Substation Terminal Equipment Uprate (99-3406)
15. Line 576 Rebuild - North Anna to Midlothian (99-3410)
16. North Anna Terminal Equipment Uprate (993410)
17. Midlothian Substation Terminal Equipment Uprate (99-3410)
18. Line 37 Rebuild - Spotsylvania - Wilderness D.P. (99-3420)
19. New 500 kV Line - Spotsylvania to Morrisville (99-3420)
20. Spotsylvania Substation Terminal Equipment Uprate (99-3420)
21. Vint Hill Substation Relay Reset (99-3420)
22. New 500 kV Line - Lexington to Dooms (99-3177)
23. Dooms Substation Terminal Equipment Upgrade (99-3177)
24. Lexington Substation Terminal Equipment Upgrade (99-3177)
25. Line 541 Rebuild - Front Royal to Morrisville (99-3226)
26. Front Royal Substation Terminal Equipment Upgrade (99-3226)
27. Morrisville Substation Terminal Equipment Upgrade (99-3226)
28. New 500 kV Line - North Anna to Rawlings (99-3409)
29. North Anna Substation Terminal Equipment Upgrade (99-3409)
30. Rawlings Substation Terminal Equipment Upgrade (99-3409)

31. Elmont Substation Transformer Uprate (99-3428)
32. Line 559 Cut-In to Auburn Farm Substation (99-2944)
33. Line 569 Cut-In to Auburn Farm Substation (99-2944)
34. Line 2008 Cut-In to Auburn Farm Substation (99-2944)
35. Line 2173 Cut-In to Auburn Farm Substation (99-2944)
36. Auburn Farm - New Substation (99-2944)
37. Clifton Substation Relay Reset (99-2944)
38. Elklick Substation Upgrade (99-2944)
39. Lincoln Park Substation Upgrade (99-2944)
40. Loudoun Substation Upgrade (99-2944)
41. Morrisville Substation Upgrade (99-2944)
42. Mosby Substation Upgrade (99-2944)
43. Heritage Substation A-Frame Addition (99-3447)
44. Lexington Substation Transformer Bank #1 & #3 Replacement (99-3082)
45. Heritage Substation 500kV Expansion (99-3447)
46. Line 539 Rebuild - Bristers to Ox
47. Ox Substation Terminal Equipment Upgrade
48. Second 500kV Line - Aspen to Brambleton
49. Aspen Substation Terminal Equipment Upgrade
50. Brambleton Substation Terminal Equipment Upgrade

Greenfield Transmission Line Component

Component title	North Anna - Ladysmith 500 kV Line (99-3149)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Point A	North Anna
Point B	Ladysmith
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	PERMANENT FACILITIES TO BE INSTALLED: 1. Install sixty-two (62) 500kV 5CHT steel lattice tower tangent structures on foundations [15.061]. 2. Install fourteen (14) 500kV 93HADE steel lattice tower deadend structures on foundations [15.056]. 3. Install two (2) 500kV custom engineered steel H-Frame tangent structures on foundations [15.230]. 4. Install two (2) 500kV A-frame backbone structures [15.900]. 5. Install approximately 14.53 miles of 3-phase 3-1351.5 ACSR (45/7) “Dipper” conductor from North Anna Substation to Ladysmith Substation. 6. Install approximately 14.53 miles of two (2) DNO-10100 OPGW from North Anna Substation to Ladysmith Substation. a. Assumes a total of eighteen (18) Fiber splices throughout the line. i. 9 splices per DNO-10100 OPGW	
Terrain description	The project area is in the central Virginia Piedmont region with elevations ranging from approximately 250 to 360 feet. The terrain is predominately vegetated existing right-of-way consisting of moderate slopes. The line will cross no major roads, several small streams, and Lake Anna.	
Right-of-way width by segment	Additional ROW is not expected to be required for this project, assuming no other projects impacts the ROW. If anything at North Anna occurs that causes Project 993149 to leave North Anna Substation out the eastern side instead of the western side, additional ROW would likely be required between North Anna Substation up to the proposed river crossing. Refer to "993149 T-Line Scope of Work" for Proposed ROW Configuration.	
Electrical transmission infrastructure crossings	Significant crossings were attempted to be accounted for but will need further investigation in detailed design.	
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of "993149 Real Estate and Permitting Summary" document attached to this submission.	
Environmental impacts	Refer to section A.4 of "993149 Real Estate and Permitting Summary" document attached to this submission.	

Tower characteristics	Refer to "993149 T-Line Scope of Work" for complete description
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$69,705,886.00
Component cost (in-service year)	$74,655,004.00

Substation Upgrade Component

Component title	North Anna Substation (99-3149)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	366

Substation upgrade scope	Install substation material: 1. Two (2), 500 kV, 63kAIC, 5000A SF6 Circuit Breakers. 2. Four (4), 500 kV, 5000A Double End Break Switches. 3. Five (5), 500 kV Coupling Capacitor Voltage Transformers. 4. Six (6), 396KV, 318kV MCOV Surge Arresters 5. Approximately 4500 FT. of 6 IN. Sch. 80 AL tube bus 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Remove Substation Equipment: 1. Two (2), 500 kV Coupling Capacitor Voltage Transformers. Install relay material: 1. Two (2), 4507 - 1Ø CCVT Potential Makeup Box. 2. Two (2), 4510 - SEL-2411 Equipment Annunciator. 3. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 4. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor. 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables). 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box. 7. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box.

Transformer Information

None

New equipment description	1. Two (2), 500 kV, 63kAIC, 5000A SF6 Circuit Breakers. 2. Four (4), 500 kV, 5000A Double End Break Switches. 3. Five (5), 500 kV Coupling Capacitor Voltage Transformers. 4. Six (6), 396KV, 318kV MCOV Surge Arresters. 5. Two (2), 4507 - 1Ø CCVT Potential Makeup Box. 6. Two (2), 4510 - SEL-2411 Equipment Annunciator. 7. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel. 8. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor. 9. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables). 10. One (1), 4506 – 3Ø CCVT Potential Makeup Box. 11. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box.
Substation assumptions	1. The scope of work depicted on the drawings assumes no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000 A ratings.
Real-estate description	No additional real-estate will be needed for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$9,124,627.30
Component cost (in-service year)	$9,772,475.52

Substation Upgrade Component

Component title	Ladysmith Substation (99-3149)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Ladysmith
Substation zone	366
Substation upgrade scope	Install substation material: 1. Two (2), 500 kV, 63kAIC, 5000A SF6 Circuit Breakers. 2. Four (4), 500 kV, 5000A Double End Break Switches. 3. Five (5), 500 kV Coupling Capacitor Voltage Transformers. 4. Six (6), 396KV, 318kV MCOV Surge Arresters 5. Approximately 3000 feet of 6 IN AL BUS (Sch. 80) 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Remove Substation Material: 1. Two (2), 500 kV Coupling Capacitor Voltage Transformers. Install relay material: 1. Two (2), 4507 - 1Ø CCVT Potential Makeup Box 2. Two (2), 4510 - SEL-2411 Equipment Annunciator 3. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 4. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Two (2), 500 kV, 63kAIC, 5000A SF6 Circuit Breakers. 2. Four (4), 500 kV, 5000A Double End Break Switches. 3. Five (5), 500 kV Coupling Capacitor Voltage Transformers. 4. Six (6), 396KV, 318kV MCOV Surge Arresters 5. Two (2), 4507 - 1Ø CCVT Potential Makeup Box 6. Two (2), 4510 - SEL-2411 Equipment Annunciator 7. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 8. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 9. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 10. One (1), 4506 – 3Ø CCVT Potential Makeup Box 11. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000A ratings.
Real-estate description	No additional real-estate will be needed for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$7,738,720.90
Component cost (in-service year)	$8,288,170.19

Greenfield Transmission Line Component

Component title	New 500 kV Line (North Anna - Spotsylvania) (993169)	
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Point A	North Anna	
Point B	Sportsylvania	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT [13.94 Miles]	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	New 500 kV line will be parallel to existing Line #573.	
Terrain description	The project area is in the central Virginia Piedmont region with elevations ranging from approximately 300 to 450 feet. The terrain is predominately vegetated existing right-of-way consisting of moderate slopes. The line will cross no major roads, several small streams, and Lake Anna.	
Right-of-way width by segment	Existing Right-of-Way parallel to Line #573 will be used.	
Electrical transmission infrastructure crossings	East side of existing 500 kV line from structure 8 to structure 75 (See attached Cross Section Drawing - 2)., West side of existing 500 kV line from structure 3 to structure 7 (See attached Cross Section Drawing - 1)., West side of existing 500 kV line from structure 82 to structure 87 (See attached Cross Section Drawing - 1).	
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of 993169 Real Estate and Permitting Summary.	

Environmental impacts	Refer to section A.4 of 993169 Real Estate and Permitting Summary.
Tower characteristics	MODIFICATIONS TO EXISTING FACILITIES: 1. Transfer one (1) set of proposed 3-phase 1351.5 ACSR (45/7) Dipper to existing backbone at Spotsylvania Substation. PERMANENT FACILITIES TO BE INSTALLED: 1. Install sixty-eight (68) 500/230kV custom engineered steel monopole double circuit tangent structures on foundations [15.205]. 2. Install six (6) 500kV custom engineered steel monopole deadend structures on foundations [15.212]. 3. Install nineteen (19) 230kV custom engineered steel monopole deadend structures on foundations [Modified 15.212 configuration with 12.425 assemblies]. 4. Install thirteen (13) 500kV custom engineered large angle steel 3-pole deadend structures on foundations [Modified 15.212 w/ two additional poles to catch the bottom two phases]. a. Modifications were necessary to reduce groundline moments. 5. Install one (1) 500kV substation backbone structures (15.900) at North Anna Substation. 6. Install approximately 13.94 miles of 3-phase 3-1351.5 ACSR (45/7) Dipper conductor from North Anna Substation to Spotsylvania Substation. 7. Install approximately 13.94 miles of one (1) DNO-10100 OPGW from North Anna Substation to Spotsylvania Substation. a. Includes installation of 8 splices per DNO-10100 OPGW 8. Install approximately 13.94 miles of one (1) DNO-11410 OPGW from North Anna Substation to Spotsylvania Substation. a. Includes installation of 8 splices per DNO-11410 OPGW.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$131,667,253.00

Component cost (in-service year)	$141,015,628.00

Substation Upgrade Component

Component title	North Anna Equipment Uprate (993169)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	366
Substation upgrade scope	Install substation material: 1. Two (2) 500 kV, 5000A Double End Break Switches 2. Two (2) 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3) 500 kV CCVTs 5. Approximately 150 FT of 6 in. Sch. 80 AL tube bus. 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Purchase and install relay material: 1. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 2. One (1), 4506 – 3Ø CCVT Potential Makeup Box 3. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 4. Two (2), 4526_D – CB w/ BCM Fiber Optic Makeup Box 5. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 6. Two (2), 4510 SEL-2411 Equipment Annunciator

Transformer Information

None

New equipment description	1. Two (2) 500 kV, 5000A Double End Break Switches 2. Two (2) 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3) 500 kV CCVTs 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 8. Two (2), 4526_D – CB w/ BCM Fiber Optic Makeup Box 9. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 10. Two (2), 4510 SEL-2411 Equipment Annunciator
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole connections to maintain 5000A ratings. 4. Reuse the existing CCVT makeup box.
Real-estate description	The substation will not be expanded for this project.

Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,338,876.40
Component cost (in-service year)	$5,717,936.20

Substation Upgrade Component

Component title	Spotsylvania Equipment Uprate (993169)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Spotsylvania
Substation zone	366

Substation upgrade scope	Install substation material: 1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Four (4) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3) 500 kV CCVTs. 5. Approximately 2000 FT 6 in. Sch. 80 AL tube bus. 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Relocate Substation Material: 1. Three (3), 500 kV CCVTs. 2. One (1), 500kV, 4000A Wave Trap Remove Substation Material: 1. Three (3), 500 kV, 4000A Double End Break Switches. 2. One (1), 500 kV, 50kAIC, 4000A, SF6 Circuit Breaker. 3. Approximately 600 FT 6 in. Sch. 40 AL tube bus. Re-use Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator (CB 515T594) 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (CB 515T594) 3. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel (CB 515T594) Install relay material: 1. Three (3), 4510 – SEL-2411 Equipment Annunciator 2. Three (3), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Three (3), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/Reclosing Panel 4. Four (4), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Four (4), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Four (4) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3) 500 kV CCVTs. 5. Three (3), 4510 – SEL-2411 Equipment Annunciator 6. Three (3), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 7. Three (3), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/Reclosing Panel 8. Four (4), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 9. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 10. One (1), 4506 – 3Ø CCVT Potential Makeup Box 11. Four (4), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole connections to maintain 5000A ratings.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$8,902,480.00
Component cost (in-service year)	$9,534,556.08

Transmission Line Upgrade Component

Component title	Vint Hill to Meadow Brook Uprate (99-3227)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line #535
Point A	Vint Hill
Point B	Meadow Brook
Point C	
Terrain description	The project area is in the northern Virginia Piedmont region with elevations ranging from approximately 190 to 430 feet. The terrain is predominately vegetated existing right-of-way and urban development consisting of moderate slopes.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	3-1351.5 ACSR (45/7) 90°C MOT

Hardware plan description	New hardware will be used.
Tower line characteristics	This scope (993227) accounts for costs for adding tower extensions for all existing suspension towers between structure 535/162 (2114/27) and Meadow Brook Substation.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Shield wire size and type	Existing Shield wire will remain
Rebuild line length	42.91 Miles
Rebuild portion description	The majority of Line 535 is double circuit on 5/2 structures with Line 2114, Line 2199, or Line 655 at different locations throughout the corridor. The remainder of Line 535 near Meadow Brook Substation is single circuit. To accommodate the uprate, the existing suspension towers are to have AMPJACK body extensions installed. The extensions will range from ten (10) to twenty (20) feet. The uprate will occur utilizing existing structures, conductor, and most of the existing hardware while increasing the maximum operating temperature (MOT) of the circuit from 90°C to 110°C. The existing 500kV strain and suspension clamps will need to be replaced with high temp hardware. In addition to the tower extensions, the 500kV and/or underbuilt 230kV/34.5kV circuits may need to be re-tensioned due to the impacts of the tower extensions and to meet wire clearances. The existing line primarily consists of lattice tower structures and steel monopole structures.
Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$100,629,680.00
Component cost (in-service year)	$107,774,387.28

Substation Upgrade Component

Component title	Vint Hill Substation Relay Reset (99-3227)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Vint Hill
Substation zone	366
Substation upgrade scope	Relay Reset Only

Transformer Information

None

New equipment description	N/A
Substation assumptions	1. Relay Settings and protection & control design will be revised as part of the SPE scope of work. 2. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary.
Real-estate description	Substation is not being expanded.

Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$19,210.00
Component cost (in-service year)	$20,574.00

Transmission Line Upgrade Component

Component title	Line 573 Rebuild - North Anna to Spotsylvania (99-3405)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line #573
Point A	North Anna
Point B	Spotsylvania
Point C	

Terrain description	The project area is in the central Virginia Piedmont region with elevations ranging from approximately 300 to 450 feet. The terrain is predominately vegetated existing right-of-way consisting of moderate slopes. The line will cross no major roads, several small streams, and Lake Anna.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	New hardware will be used for line rebuild.
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Shield wire size and type	(2) DNO-10100 OPGW
Rebuild line length	14 miles

Rebuild portion description	EXISTING FACILITIES TO BE REMOVED: 1. Remove sixty-six (66) existing single circuit steel suspension tower structures on foundations as follows: a. Structures 573/3-7, 11-12, 14-20, 22-23, 25-31, 33-37, 39-74, 76-77. 2. Remove eight (8) existing single circuit steel double deadend tower structures on foundations as follows: a. Structures 573/1-2, 10, 13, 24, 32, 38, 77A. 3. Remove two (2) existing single circuit steel running angle tower structures on foundations as follows: a. Structures 573/21, 75. 4. Remove two (2) existing single circuit steel suspension H-frame structures on foundations as follows: a. Structures 573/8-9. 5. Remove approximately 14.02 miles of 2-2500 ACAR (84/7) conductor from existing backbone structure 573/1A to existing structure 573/78 6. Remove approximately 14.02 miles of one (1) 45/45 MM2 614 OPGW from existing structure 573/1A to existing structure 573/78. 7. Remove approximately 14.02 miles of one (1) 7#7 Alumoweld shield wire from existing structure 573/1A to existing structure 573/78. PERMANENT FACILITIES TO BE INSTALLED: 1. Install sixty-four (64) 500/230kV double circuit steel V-string suspension towers [Reference Drawing 15.300] on foundations as follows: a. Structures 573/3-4, 6-9, 11-12, 14-20, 22-23, 25-31, 33-37, 39-48, 50-51, 53-55, 87-74, 76-77. 2. Install four (4) 500/230kVdouble circuit steel V-string running angle towers [Reference Drawing 15.805] on foundations as follows: a. Structures 573/5, 21, 49, 75. 3. Install two (2) 500/230kV double circuit steel double deadend heavy angle 3-pole structures [Reference Drawing 15.226] on foundations as follows: a. Structures 573/1, 32. 4. Install eight (8) 500/230kV double circuit steel double deadend small/medium angle 3-pole structures [Reference Drawing 15.225] on foundations as follows: a. Structures 573/2, 10, 13, 24, 38, 52, 66, 77A. 5. Install approximately 14.02 miles of 3-phase 3-1351.5 ACSR (45/7) “Dipper” conductor from existing structure 573/1A to existing structure 573/78. 6. Install approximately 14.02 miles of two (2) DNO-10100 OPGW wire from existing structure 573/1A to existing structure 573/78.
Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$96,424,161.39
Component cost (in-service year)	$103,270,276.85

Substation Upgrade Component

Component title	North Anna Substation Terminal Equipment Uprate (99-3405)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 500 kV, 5000A Double End Break Switches. 2. One (1), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Approximately 1200 FT 6 in. Sch. 80 AL tube bus. 4. Foundations and steel structures as required. 5. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Relocate Substation Material: 1. Three (3), 500kV Coupling Capacitor Voltage Transformers. 2. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. Remove Substation Material: 1. Four (4), 500 kV, 3000A Double End Break Switches. 2. One (1), 500 kV, Motor Operator 3. One (1), 500 kV, 50kAIC, 5000A, SF6 Circuit Breaker. 4. One (1), 500 kV, 5000A, 115-300kHz, Wave Trap. 5. Approximately 1200 FT 6 in. Sch. 40 AL tube bus. Reuse Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator (CB 57302) 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (CB 57302) 3. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel (CB 57302) Purchase & Install Relay Material: 1. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 2. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 3. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Four (4), 500 kV, 5000A Double End Break Switches. 2. One (1), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Approximately 1200 FT 6 in. Sch. 80 AL tube bus. 4. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 6. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000A ratings.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$4,566,459.10
Component cost (in-service year)	$4,890,677.59

Substation Upgrade Component

Component title	Spotsylvania Substation Terminal Equipment Uprate (99-3405)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Spotsylvania
Substation zone	366

Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2), 500 kV, 5000A Double End Break Switches. 2. Two (2), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Approximately 1200 FT 6 in. Sch. 80 AL tube bus. 5. Foundations and steel structures as required. 6. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Relocate Substation Material: 1. Three (3), 500kV Coupling Capacitor Voltage Transformers. Remove Substation Material: 1. Two (2), 500 kV, 4000A Double End Break Switches. 2. One (1), 500 kV, 50kAIC, 4000A, SF6 Circuit Breaker. 3. One (1), 500 kV, 4000A, 115-300kHz, Wave Trap. 4. Approximately 1200 FT 6 in. Sch. 40 AL tube bus. Reuse Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator (CB 515T573) 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (CB 515T573) 3. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel (CB 515T573) Purchase & Install Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel 4. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 6. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Two (2), 500 kV, 5000A Double End Break Switches. 2. Two (2), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. One (1), 4510 – SEL-2411 Equipment Annunciator 5. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 6. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel 7. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 8. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 9. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000A ratings.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$4,938,518.20
Component cost (in-service year)	$5,289,152.78

Transmission Line Upgrade Component

Component title	Line 594 Rebuild - Spotsylvania to Morrisville (99-3406)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line #594
Point A	Morrisville
Point B	Spotsylvania
Point C	
Terrain description	The project area is in the central and northern Virginia Piedmont region with elevations ranging from approximately 200 to 450 feet. The terrain is a combination of vegetated existing right-of-way consisting of moderate slopes. The line will cross two primary roads, several small streams, the Rapidan River, and the Rappahannock River.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT

Hardware plan description	New hardware will be used for line rebuild.	
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Shield wire size and type	(2) DNO-10110 shield wire	
Rebuild line length	18.75 Miles	

Rebuild portion description	EXISTING FACILITIES TO BE REMOVED: 1. Remove ninety (90) existing single circuit 5LT towers as follows: a. Structures 594/79-93, 95-118, 120-124, 128-130,132-134A-146, 148-149A-153,155-161, 163-165, 168-170, 172-177, 179, and 180 2. Remove four (4) existing single circuit 5LA towers as follows: a. Structures 594/127, 147, 166, and 171 3. Remove four (4) existing single circuit 5MT towers as follows: a. Structures 594/125, 151, 162, and 178 4. Remove two (2) existing single circuit 5MA towers as follows: a. Structures 594/154 and 594/167 5. Remove one (1) existing single circuit 5DE towers as follows: a. Structure 594/119 6. Remove one (1) existing single circuit 5DE-L towers as follows: a. Structure 594/126 7. Remove one (1) existing single circuit 5HA-R towers as follows: a. Structure 594/131 8. Remove one (1) existing single circuit 5HT towers as follows: a. Structure 594/94 9. Remove approx. 18.75 miles of 3-phase 2-2500 ACAR (84/7) conductor from structure 593/78 to 594/181 10. Remove approx. 18.75 miles of one (1) 7#7 Alumoweld shield wire from structure 593/78 to 594/181 11. Remove approx. 18.75 miles of one (1) 45/45 MM2 614 OPGW wire from structure 593/78 to 594/181 MODIFICATIONS TO EXISTING FACILITIES: 1. Install three 500kV conductor strain assemblies (35.252) and two OPGW strain assemblies (96.100) on the following two existing structures: 593/78 and 594/181 PERMANENT FACILITIES TO BE INSTALLED: 1. Install ninety-four (94) 500/230 kV 5-2KT self-support steel tangent lattice towers on foundations as follows: a. Structures 594/79-118, 120-125, 128-130, 132-134-134A-135-146, 148-149-149A-150153, 155-165, 168-169, and 172-180 2. Install seven (7) 500/230 kV 5-2 MA self-support steel tangent lattice towers on foundations as follows: a. Structures 594/127, 147, 154, 166-167, and 170-171 3. Install two (2) 500/230 kV 3-pole steel dead-end structures (small/medium angle 0° -70°) on foundations as follows: a. Structures 594/119, and 131 4. Install one (1) 500/230 kV 3-pole steel dead-end structures (small/medium angle 0° -70°) [Reference Drawing 15.226] on foundations as follows: a. Structures 594/126 5. Install approx. 18.71 miles of 1-set of 3-phase 3-1351.5 ACSR (45/7) 110°C MOT conductor as follows: a. From Structure 593/78 to Structure 594/181 6. Install approx. 18.71 miles of two (2) DNO-10110 shield wire as follows: a. From Structure 593/78 to Structure 594/181
Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$110,360,666.59
Component cost (in-service year)	$118,196,273.92

Substation Upgrade Component

Component title	Morrisville Substation Terminal Equipment Uprate (99-3406)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Morrisville
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. One (1), 500kV, 63kAIC, 5000 A, SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 500kV Coupling Capacitor Voltage Transformers 4. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester 5. Approximately 700 FT of 6 in. Sch. 80 AL tube bus 6. Foundation and Steel Structures as required 7. Conductors Connectors, conduit, control cables, and grounding material as necessary per engineering standards Remove Substation Material: 1. One (1), 500kV, 50kAIC, SF6 Circuit Breaker 2. One (1), 500kV, 4000A Wave Trap 3. Three (3), 500kV Coupling Capacitor Voltage Transformers 4. One (1), 500kV, 4000A, Double End Break Switch 5. One (1), 500kV, 3000A, Double End Break Switch 6. Approximately 700 FT of 5 in. Sch. 40AL tube bus 7. Foundations and steel Structures as required 8. Conductors Connectors, conduit, control cables, and grounding material as necessary per engineering standards Re-use Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator Purchase & Install Relay Material: 1. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 2. One (1), 1515 – 24” Single SEL-351 500kV Transmission Breaker w/o Reclosing Panel 3. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 4. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 5. One (1), 4506 – 3Ø CCVT Potential Makeup Box 6. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. One (1), 500kV, 63kAIC, 5000 A, SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 500kV Coupling Capacitor Voltage Transformers 4. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester 5. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 6. One (1), 1515 – 24” Single SEL-351 500kV Transmission Breaker w/o Reclosing Panel 7. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 8. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 9. One (1), 4506 – 3Ø CCVT Potential Makeup Box 10. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$3,743,839.00
Component cost (in-service year)	$4,009,651.57

Substation Upgrade Component

Component title	Spotsylvania Substation Terminal Equipment Uprate (99-3406)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Spotsylvania
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. One (1), 500kV, 63kAIC, 5000 A, SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester 4. Approximately 150 FT of 6 in. Sch. 80 AL tube bus 5. Foundation and Steel Structures as required 6. Conductors Connectors, conduit, control cables, and grounding material as necessary per engineering standards Remove Substation Material: 1. One (1), 500kV, 4000A 50kAIC, SF6 Circuit Breaker 2. One (1), 500kV, 4000A Wave Trap 3. Two (2), 500kV, 4000A, Double End Break Switch 4. Approximately 150 FT of 5 in. Sch. 40AL tube bus 5. Foundations and steel Structures as required 6. Conductors Connectors, conduit, control cables, and grounding material as necessary per engineering standards Re-use Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/Reclosing Panel 3. One (1), 1515 – 24” Single SEL-351 500kV Transmission Breaker w/o Reclosing Panel Purchase & Install Relay Material: 1. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 2. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 3. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. One (1), 500kV, 63kAIC, 5000 A, SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester 4. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 6. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$2,889,617.30
Component cost (in-service year)	$3,094,779.81

Transmission Line Upgrade Component

Component title	Line 576 Rebuild - North Anna to Midlothian (99-3410)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 576
Point A	North Anna
Point B	Midlothian
Point C	

Terrain description	The project area is in the central Virginia Piedmont region with elevations ranging from approximately 130 to 260 feet. The terrain is predominately vegetated existing right-of-way with several areas of dense residential development consisting of minimal slopes. The line will include rebuilt crossings of Interstate 64, Jefferson Highway (Route 33), Midlothian Turnpike (Route 60), CSX railroads, Lake Anna, the James River, and the Little River. The line starts in Louisa County and runs through Hanover County, Goochland County, and Powhatan County, and terminates in Chesterfield County.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	New hardware will be used for line rebuild.
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110° C MOT
Shield wire size and type	(2) DNO-10110 shield wire
Rebuild line length	41.13 Miles

Rebuild portion description	EXISTING FACILITIES TO BE REMOVED: 1. Remove two (2) existing single circuit 5DE tower structures. 2. Remove nine (9) existing single circuit 5HA tower structures. 3. Remove two (1) existing single circuit 5HT tower structure. 4. Remove ten (10) existing single circuit 5LA tower structures. 5. Remove one hundred sixty-six (166) existing single circuit 5LT tower structures. 6. Remove five (5) existing single circuit 5MA tower structures. 7. Remove fourteen (14) existing single circuit 5MT tower structures. 8. Remove one (1) existing single circuit 2-pole H-frame structure. 9. Remove approx. 41.13 miles of 2-2500 ACAR (84/7) conductor from existing backbone structure 576/1A to existing backbone structure 576/209A (563/209A) 10. Remove approx. 41.13 miles of two (2) fiber optic GW 45/45 MM2 614 from existing backbone structure 576/1A to existing backbone structure 576/209A (563/209A) MODIFICATIONS TO EXISTING FACILITIES: 1. Install three (3) 500kV conductor strain assemblies (35.252) and two (2) OPGW strain assemblies (96.100) on the following structures: a. Structures 576/1A and 576/209A(563/209A) PERMANENT FACILITIES TO BE INSTALLED: 1. Install one hundred eighty-nine (189) 500kV 5-2 KT Tower [Reference Drawing 15.300] on foundations as follows: a. Structures 2-29, 31, 33-69, 71-72, 74, 76-107, 109-118, 120-129, 131-135, 137-142, 144145,147-153, 155-160, 162, 164-171, 173-202, 204, and 206-207. 2. Install six (6) 500kV 5-2 MA Tower [Reference Drawing 15.805] on foundations as follows: a. Structures 30, 70, 108, 119, 146, and 205 3. Install two (2) 500/230kV 3 Pole Steel DC DDE Heavy Angle [Reference Drawing 15.226] on foundations as follows: a. Structures 1 and 209 4. Install thirteen (13) 500/230kV 3 Pole Steel DC DDE Small/Medium Angle [Reference Drawing 15.225] on foundations as follows: a. Structures 32, 73, 75, 108, 130, 136, 143, 154, 161, 163, 172, 203, and 208 5. Install approximately 41.13 miles of two (2) DNO-10100 OPGW wire as follows: a. From structure 576/1A to structure 576/209A (563/209A) 6. Install approx. 41.13 miles of three 3-phase 3-1351.5 ACSR (45/7) “Dipper” conductor as follows: a. From structure 576/1A to structure 576/209A (563/209A).
Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$239,896,756.25
Component cost (in-service year)	$256,929,425.94

Substation Upgrade Component

Component title	North Anna Terminal Equipment Uprate (993410)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 500kV, 5000A Double End Break Switches 2. Three (3), 500kV, Capacitor Coupling Voltage Transformers 3. Approximately 600’ of 6 IN SCH 80 AL Tubular Bus and Connectors 4. Conductors, connectors, insulators, conduit, control cable, foundations, steel structures, and grounding connections as per engineering standards Remove Substation Material: 1. One (1), 500kV, 4000A Wave Trap 2. Three (3), 500kV, Capacitor Coupling Voltage Transformers 3. Approximately 600 ft of 6 IN SCH 40 AL Tubular Bus and Connectors 4. Conductors, connectors, insulators, conduit, control cable, foundations, steel structures, and grounding connections as per engineering standards Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 2. One (1) 4506 – 3Ø CCVT Potential Makeup Box 3. One (1) Panel Retirement

Transformer Information

None

New equipment description	1. Four (4), 500kV, 5000A Double End Break Switches 2. Three (3), 500kV, Capacitor Coupling Voltage Transformers 3. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 4. One (1) 4506 – 3Ø CCVT Potential Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 4. It was determined that the GA would not need any additional equipment or equipment relocation thus it has been omitted from the submittal.

Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$2,436,020.90
Component cost (in-service year)	$2,608,978.49

Substation Upgrade Component

Component title	Midlothian Substation Terminal Equipment Uprate (99-3410)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Midlothian
Substation zone	366

Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 2. Four (4), 500kV, Capacitor Coupling Voltage Transformers 3. Approximately 2800’ of 6 IN SCH 80 AL Tubular Bus and Connectors 4. Conductors, connectors, insulators, conduit, control cable, foundations, steel structures, and grounding connections as per engineering standards. Remove Substation Material: 1. One (1), 500kV, 4000A Wave Trap 2. Two (2), 500kV, 50kAIC, 4000A SF6 Circuit Breakers 3. Four (4), 500kV, Capacitor Coupling Voltage Transformers 4. Approximately 2800’ of 6 IN SCH 40 AL Tubular Bus and Connectors 5. Conductors, connectors, insulators, conduit, control cable, foundations, steel structures, and grounding connections as per engineering standards. Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 2. Two (2), 4510 – SEL-2411 Equipment Annunciator 3. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/Reclosing Panel 4. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box 6. One (1) 4506 – 3Ø CCVT Potential Makeup Box 7. One (1) 4507 – 1Ø CCVT Potential Makeup Box

Transformer Information

None

New equipment description	1. Two (2), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 2. Four (4), 500kV, Capacitor Coupling Voltage Transformers 3. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 4. Two (2), 4510 – SEL-2411 Equipment Annunciator 5. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/Reclosing Panel 6. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 7. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box 8. One (1) 4506 – 3Ø CCVT Potential Makeup Box 9. One (1) 4507 – 1Ø CCVT Potential Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 4. It was determined that the GA would not need any additional equipment or equipment relocation thus it has been omitted from the submittal.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$6,475,916.40
Component cost (in-service year)	$6,935,706.04

Transmission Line Upgrade Component

Component title	Line 37 Rebuild - Spotsylvania - Wilderness D.P. (99-3420)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 37
Point A	Spotsylvania
Point B	Lake of the Woods D.P.
Point C	Wilderness D.P.
Terrain description	The project area is in the northern Virginia Piedmont region with elevations ranging from approximately 190 to 430 feet. The terrain is predominately vegetated existing right-of-way and urban development consisting of moderate slopes.
Existing Line Physical Characteristics	
Operating voltage	115
Conductor size and type	336.4 ACSR (26/7) 150°C MOT
Hardware plan description	New hardware will be used for line rebuild.
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	115.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1573.000000
Winter (MVA)	1648.000000	1648.000000
Conductor size and type	2-768.2 ACSS/TW/HS (20/7) 250°C MOT	
Shield wire size and type	DNO-11410 shield wire	
Rebuild line length	8.96	
Rebuild portion description	The rebuild consists of installing approximately 7 miles of a new 500/230kV double circuit line adjacent to existing Line 594 from Spotsylvania Substation (STR. 594/79) to nearby existing structure 594/121 where Line 37 will branch off to Wilderness D.P. Substation (STR.37/509). Line 37 structures will be designed for future uprate to 230kV standard. [Refer to 993420_Conceptual Scope & One Lines for complete description]	
Right of way	Existing Right-of-Way shall be used.	
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Component Cost Details - In Current Year $		
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$10,034,956.61
Component cost (in-service year)	$10,747,438.52

Greenfield Transmission Line Component

Component title	New 500 kV Line - Spotsylvania to Morrisville (99-3420)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Point A	Spotsylvania
Point B	Vint Hill
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT [13.94 Miles]
Nominal voltage	AC
Nominal voltage	500
Line construction type	Overhead
General route description	The 500/230kV double circuit line will run adjacent to existing Line 594 from Spotsylvania Substation (STR. 594/79) to nearby existing structure 594/121 (Line 37 scope over in a different component). At structure 594/121, the new Line #5XX will remain parallel to existing Line 594 for approximately 11.19 miles within the existing corridor until Morrisville Substation.

Terrain description	The project area is in the northern Virginia Piedmont region with elevations ranging from approximately 190 to 430 feet. The terrain is predominately vegetated existing right-of-way and urban development consisting of moderate slopes.
Right-of-way width by segment	Existing Right-of-Way shall be used.
Electrical transmission infrastructure crossings	To be determined in detailed design.
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of 993420 Real Estate and Permitting Summary.
Environmental impacts	Refer to section A.4 of 993420 Real Estate and Permitting Summary.
Tower characteristics	The new Line will primarily consist of 500/230kV custom-engineered structures on concrete foundations.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$90,314,609.42
Component cost (in-service year)	$96,726,947.00

Substation Upgrade Component

Component title	Spotsylvania Substation Terminal Equipment Uprate (99-3420)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Spotsylvania
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 500 kV, 5000A Double End Break Switches. 2. Three (3), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3), 500 kV Capacitive Coupled Voltage Transformer. 5. Approximately 2100 FT 6 in. Sch. 80 AL tube bus. 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Remove Substation Material: 1. Two (2), 500 kV, 4000A Double End Break Switches. 2. One (1), 500 kV, 50kAIC, 4000A, SF6 Circuit Breaker. 3. Approximately 2100 FT 6 in. Sch. 40 AL tube bus. Reuse Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator (CB H1T573) 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (CB H1T573) 3. One (1), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel (CB H1T573) Purchase & Install Relay Material: 1. Two (2), 4510 – SEL-2411 Equipment Annunciator 2. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Two (2), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel 4. Three (3), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Four (4), 500 kV, 5000A Double End Break Switches. 2. Three (3), 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3), 500 kV Capacitive Coupled Voltage Transformer. 5. Two (2), 4510 – SEL-2411 Equipment Annunciator 6. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 7. Two (2), 1515 – 24” Dual 500KV SEL-351 Transmission Breaker w/ Reclosing Panel 8. Three (3), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 9. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 10. One (1), 4506 – 3Ø CCVT Potential Makeup Box 11. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000A ratings.

Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$8,095,108.20
Component cost (in-service year)	$8,669,860.67

Substation Upgrade Component

Component title	Vint Hill Substation Relay Reset (99-3420)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Vint Hill
Substation zone	366
Substation upgrade scope	Relay Reset Only

Transformer Information

None

New equipment description	N/A
Substation assumptions	1. Relay Settings and protection & control design will be revised as part of the SPE scope of work. 2. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$19,210.00
Component cost (in-service year)	$20,573.91

Greenfield Transmission Line Component

Component title	New 500 kV Line - Lexington to Dooms (99-3177)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Point A	Lexington

Point B	Dooms	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	PERMANENT FACILITIES TO BE INSTALLED: 1. Install one hundred fifty-eight (158) 500kV custom engineered steel monopole tangent structures on foundations [15.200]. 2. Install eighteen (18) 500kV custom engineered steel monopole deadend structures on foundations [15.212]. 3. Install fourteen (14) 500kV custom engineered large angle steel 3-pole deadend structures on foundations [Modified 15.212 w/ two additional poles to catch the bottom two phases]. a. Modifications were necessary to reduce groundline moments. 4. Install approximately 40.50 miles of 3-phase 3-1351.5 ACSR (45/7) “Dipper” conductor from Lexington Substation to Dooms Substation. 5. Install approximately 40.50 miles of two (2) DNO-10100 OPGW from Lexington Substation to Dooms Substation. a. Assumes a total of forty (40) Fiber splices throughout the line. i. Twenty (20) splices per DNO-10100 OPGW	
Terrain description	The project area is in the Shenandoah Valley region with elevations ranging from approximately 1200 to 2100 feet. The terrain is predominately vegetated existing right-of-way and adjacent vegetated expanded right-of-way. The line will cross four primary roads and several small streams.	
Right-of-way width by segment	The new 500 kV line will run parallel to the existing Line # 555, and about 60 ft wide additional right of way would be needed for the entire length of the the line. 90 ft wide right of way would be needed at both Lexington and Dooms substations. Refer to section A.2 of "993177 Real Estate and Permitting Summary" document attached to this submission.	
Electrical transmission infrastructure crossings	Several electrical crossings at each of the connecting substation locations (Lexington and Dooms).	
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of "993177 Real Estate and Permitting Summary" document attached to this submission.	

Environmental impacts	Refer to section A.4 of "993177 Real Estate and Permitting Summary" document attached to this submission.
Tower characteristics	PERMANENT FACILITIES TO BE INSTALLED: 1. Install one hundred fifty-eight (158) 500kV custom engineered steel monopole tangent structures on foundations [15.200]. 2. Install eighteen (18) 500kV custom engineered steel monopole deadend structures on foundations [15.212]. 3. Install fourteen (14) 500kV custom engineered large angle steel 3-pole deadend structures on foundations [Modified 15.212 w/ two additional poles to catch the bottom two phases]. a. Modifications were necessary to reduce groundline moments. 4. Install approximately 40.50 miles of 3-phase 3-1351.5 ACSR (45/7) “Dipper” conductor from Lexington Substation to Dooms Substation. 5. Install approximately 40.50 miles of two (2) DNO-10100 OPGW from Lexington Substation to Dooms Substation. a. Assumes a total of forty (40) Fiber splices throughout the line. i. Twenty (20) splices per DNO-10100 OPGW
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$228,555,740.00
Component cost (in-service year)	$244,783,198.00

Substation Upgrade Component

Component title	Dooms Substation Terminal Equipment Upgrade (99-3177)

Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Dooms
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 500kV, 5000A Double End Break Switches 2. Three (3), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3), 500kV CCVT 5. Approximately 1000FT of 6 IN. Sch. 80 AL tube bus and connectors 6. Foundations and steel structures as required 7. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards 8. Approximately 600FT of Design Level 1 Fence along with appropriate security infrastructure Remove Substation Material: 1. Two (2), 500kV, 4000A Double End Break Switches 2. One (1), 500kV, 50kAIC, 4000A, SF6 Circuit Breakers 3. Approximately 350FT of 6 IN Sch. 40 AL tube bus and connectors 4. Approximately 1000FT of 5 IN Sch. 40 AL tube bus and connectors Reuse Relay Material (If Possible): 1. One (1), 4510 - SEL-2411 Equipment Annunciator 2. One (1), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor 3. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box Purchase & Install Relay Material: 1. Two (2), 4510 - SEL-2411 Equipment Annunciator 2. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Two (2), 1515 – 24” Single SEL-351 500kV Transmission Breaker w/ Reclosing Panel

Transformer Information

None

New equipment description	1. Four (4), 500kV, 5000A Double End Break Switches 2. Three (3), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3), 500kV CCVT
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole and 8-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$14,343,562.70
Component cost (in-service year)	$15,361,955.97

Substation Upgrade Component

Component title	Lexington Substation Terminal Equipment Upgrade (99-3177)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Lexington
Substation zone	366

Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4), 500kV, 5000A Double End Break Switches. 2. Three (3), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3), 500kV Capacitor Coupling Voltage Transformer 5. Approximately 1200 FT. of 6 in. Sch. 80 AL tube and connectors. 6. Approximately 600FT. of Design Level 1 Fence along with appropriate security infrastructure 7. Foundations and steel structures as required. 8. Conductor, connectors, conduit, control cable, and grounding material as necessary per engineering standards. Remove Substation Material: 1. Two (2), 500kV, 4000A Double End Break Switches. 2. One (1), 500kV, 50kAIC, 4000A, SF6 Circuit Breakers. 3. Approximately 1200 FT. of 6 in. Sch. 40 AL tube and connectors Relocate Substation Material: 1. Three (3), 500kV, Capacitor Coupling Voltage Transformer Reuse Relay Material (If Possible): 1. One (1), 4510 – SEL 2411 Equipment Annunciator 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel Purchase & Install Relay Material: 1. Three (3), 4510 - SEL-2411 Equipment Annunciator 2. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. One (1), 1511 – 24” Single SEL-351 Transmission Breaker w/o Reclosing Panel 4. Three (3), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box 8. One (1), 5203 – 24” Traveling Wave Fault Locator Panel

Transformer Information

None

New equipment description	1. Four (4), 500kV, 5000A Double End Break Switches. 2. Three (3), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3), 396 kV, 318 kV MCOV Station Class Surge Arresters. 4. Three (3), 500kV Capacitor Coupling Voltage Transformer
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole and 8-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$14,343,562.70
Component cost (in-service year)	$15,361,955.97

Transmission Line Upgrade Component

Component title	Line 541 Rebuild - Front Royal to Morrisville (99-3226)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 541
Point A	Front Royal
Point B	Morrisville
Point C	
Terrain description	The project area is in the Shenandoah Valley region with elevations ranging from approximately 260 to 1760 feet. The terrain is predominately vegetated existing right-of-way consisting of mostly moderate slopes. The line will cross three railroads, I-66, John Marshall Highway, Lee Highway, and Route 15 and will cross the Shenandoah River, Rappahannock River, and the Appalachian Trail.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	New hardware will be used for line rebuild.

Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Shield wire size and type	(2) DNO-10110 shield wire	
Rebuild line length	46.68 Miles	

Rebuild portion description	EXISTING FACILITIES TO BE REMOVED: 1. Remove (146) existing single circuit steel lattice towers. 2. Remove (112) existing single circuit steel monopoles. 3. Remove (17) existing single circuit steel H-frame structures. 4. Remove approx. 46.68 miles of twin bundled (2) 2500 ACAR (84/7) from structure 541/11A inside of Front Royal Substation to 541/284 inside of Morrisville Substation. 5. Remove approx. 46.68 miles of dual (2) 7#7 Alumoweld shield wire from structure 541/11A inside of Front Royal Substation to 541/284 inside of Morrisville Substation. PERMANENT FACILITIES TO BE INSTALLED: 1. Install (95) SC 500kV Suspension Lattice Towers (93SST) on foundations. 2. Install (7) SC 500kV Suspension Lattice Towers (93JMA) on foundations. 3. Install (25) DC 500/230kV Suspension Lattice Towers (5-2kT) on foundations. 4. Install (1) DC 500/230kV Suspension Lattice Tower (5-2 MA) on a foundation. 5. Install (89) SC 500kV Suspension Engineered Steel Monopoles on foundations. 6. Install (1) SC 500kV Suspension Delta Configuration Engineered Steel Monopole on a foundation. 7. Install (11) SC 500kV Small Angle DDE Engineered Steel Monopoles on foundations. 8. Install (1) SC 500kV Delta Configuration DDE Engineered Steel Monopole on a foundation. 9. Install (11) SC 500kV Large Angle DDE Engineered Steel Monopoles on foundations. 10. Install (1) DC 500/230kV 3-Pole Medium Angle DDE Engineered Steel Structure on a foundation. 11. Install (2) DC 500/230kV 3-Pole Heavy Angle DDE Engineered Steel Structures on foundations. 12. Install (13) SC 500kV DDE Steel H-Frame Engineered Steel Structures on foundations. 13. Install (14) SC 500kV 3-Pole Medium Angle DDE Engineered Steel Structures on foundations. 14. Install (1) SC 500kV 3-Pole Heavy Angle DDE Engineered Steel Structure on a foundation. 15. Install (3) DC 500/230kV DDE Engineered Steel H-Frame structures on foundations. 16. Install approx. 46.68 miles of 3-phase, triangular bundled (3) 1351.5 ACSR (45/7) conductor from structure 541/11A inside of Front Royal Substation to 541/284 inside of Morrisville Substation. 17. Install approx. 46.68 miles of two (2) DNO-10100 OPGW from structure 541/11A inside of Front Royal Substation to 541/284 inside of Morrisville Substation. a. This includes two (2) splices per structure on eighteen (18) structures.
Right of way	No additional right of way is required for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$346,014,066.92
Component cost (in-service year)	$370,581,065.67

Substation Upgrade Component

Component title	Front Royal Substation Terminal Equipment Upgrade (99-3226)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Front Royal
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3) 396kV MOV, 318kV MCOV Surge Arresters 4. Approximately 2100 FT 6 in. Sch. 80 AL tube bus. 5. Conductor, connectors, conduit, control cable, foundations, steel structures and grounding material as necessary per engineering standards. Remove Substation Material: 1. Four (4), 500 KV 4000A Double End Break Switches 2. Two (2) 500 kV, 50kAIC, 4000A, SF6 Circuit Breakers. 3. One (1), 500KV 4000A Line Trap Purchase & Install Relay Material: 1. Two (2), 4535 – 500kV GE Circuit Breaker Condition Monitor OR 4536 – 500kV Axion Circuit Breaker Condition Monitor 2. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box 3. Two (2), 4510 - SEL-2411 Equipment Annunciator 4. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 5. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (1515 - Use w/ 1510) 6. Three (3) Panel Retirement

Transformer Information

None

New equipment description	1. Four (4) 500 kV, 5000A Double End Break Switches. 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers. 3. Three (3) 396kV MOV, 318kV MCOV Surge Arresters

Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work. 4. It was determined that the GA would not need any additional equipment or equipment relocation thus it has been omitted from the submittal.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$9,124,627.30
Component cost (in-service year)	$9,772,475.52

Substation Upgrade Component

Component title	Morrisville Substation Terminal Equipment Upgrade (99-3226)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Morrisville

Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. One (1), 500kV, 63kAIC, 5000A , SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 500kV Coupling Capacitor Voltage Transformers, Relay Accuracy 4. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester 5. Approximately 800 FT of 6 in. Sch. 80 AL tube bus 6. Foundation and Steel Structures as required 7. Conductors Connectors, conduit, control cables, foundation, steel structures, and grounding material as necessary per engineering standards Remove Substation Material: 1. One (1), 500kV, 40kAIC, SF6 Circuit Breaker 2. One (1), 500kV, 4000A Wave Trap 3. Three (3), 500kV Coupling Capacitor Voltage Transformers 4. One (1), 500kV, 4000A, Double End Break Switch 5. One (1), 500kV, 3000A, Double End Break Switch 6. Approximately 800 FT of 5 in. Sch. 40AL tube bus 7. Foundations and steel Structures as required Purchase & Install Relay Material: 1. One (1), 4510 – SEL-2411 Equipment Annunciator 2. One (1), 1510 – 24” Dual SEL-351 Transmission Breaker Panel w/ Reclosing 3. One (1), 1515 – 24” Single SEL-351 500kV Transmission Breaker Panel w/ Reclosing 4. One (1), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 5. One (1), 1340 – Dual SEL 411L DCB/Fiber, CD/Fiber Line Panel 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. One (1), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box 8. Two (2), Panel Retirement

Transformer Information

None

New equipment description	1. One (1), 500kV, 63kAIC, 5000A , SF6 Circuit Breaker 2. Two (2), 500kV, 5000A Double End Break Switches 3. Three (3), 500kV Coupling Capacitor Voltage Transformers, Relay Accuracy 4. Three (3), 396kV, 318kV MCOV Station Class Surge Arrester
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$3,743,839.00
Component cost (in-service year)	$4,009,651.57

Greenfield Transmission Line Component

Component title	New 500 kV Line - North Anna to Rawlings (99-3409)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Point A	North Anna
Point B	Rawlings
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Nominal voltage	AC
Nominal voltage	500
Line construction type	Overhead

General route description	1. From North Anna Substation to Structure 576/130, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. This section of line 5XXX is approx. 25.40 miles long. 2. From Structure 576/130 to Midlothian Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. Existing line 2009 will be relocated onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 15.58 miles long. 3A. From Midlothian Substation to Trabue Junction at Structure 563/193, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 50’ expanded ROW, on the north side of existing ROW, adjacent to existing lines 563, 242, 282. Existing line 2066 will be underbuilt onto the newly installed towers for line 5XXX for this section. Idle line 153 will be removed. This section of line 5XXX is approx. 3 miles long. 3B. From Trabue Junction at Structure 563/193 to Structure 563/186, new 500kV steel lattice tower structures on foundations hall be constructed in a 25’ expanded ROW on the north side of existing ROW, adjacent to existing lines 563, 242, and 282. Idle line 153 will be removed. This section of line 5XXX is approx. 1.3 miles long. 3C. From Structure 563/186 to 563/162, new 500kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW. Adjacent existing lines 563 and 219 shall both be reconstructed onto new 500/230kV steel lattice tower structures and line 2066 shall be underbuilt onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 4.3 miles long. 4. From Structure 563/162 to Reams DP, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 563. This section of line 5XXX is approx. 27.72 miles long. 5. From Reams DP to Rawlings Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 125’ expanded ROW, on the north side of the existing ROW, adjacent to existing line 511. this section of line 5XXX is approx. 21.45 miles long.
Terrain description	The project spans from the southwest Virginia into central Virginia. The southern portion consists mostly of farmland, but as the project moves east and north, the areas become more suburban. There are numerous stream and wetlands crossing as well as minor arterial roads. There is a crossing over The James River and MI-64. There are elevation changes along the route with the highest being approximately 603 feet and the lowest being approximately 226 feet.

Right-of-way width by segment	1. From North Anna Substation to Structure 576/130, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. This section of line 5XXX is approx. 25.40 miles long. 2. From Structure 576/130 to Midlothian Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. Existing line 2009 will be relocated onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 15.58 miles long. 3A. From Midlothian Substation to Trabue Junction at Structure 563/193, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 50’ expanded ROW, on the north side of existing ROW, adjacent to existing lines 563, 242, 282. Existing line 2066 will be underbuilt onto the newly installed towers for line 5XXX for this section. Idle line 153 will be removed. This section of line 5XXX is approx. 3 miles long. 3B. From Trabue Junction at Structure 563/193 to Structure 563/186, new 500kV steel lattice tower structures on foundations hall be constructed in a 25’ expanded ROW on the north side of existing ROW, adjacent to existing lines 563, 242, and 282. Idle line 153 will be removed. This section of line 5XXX is approx. 1.3 miles long. 3C. From Structure 563/186 to 563/162, new 500kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW. Adjacent existing lines 563 and 219 shall both be reconstructed onto new 500/230kV steel lattice tower structures and line 2066 shall be underbuilt onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 4.3 miles long. 4. From Structure 563/162 to Reams DP, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 563. This section of line 5XXX is approx. 27.72 miles long. 5. From Reams DP to Rawlings Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 125’ expanded ROW, on the north side of the existing ROW, adjacent to existing line 511. this section of line 5XXX is approx. 21.45 miles long.
Electrical transmission infrastructure crossings	Some substantial line crossings include lines 2066, 262, 282 in between Midlothian Sub and Str. 563/162 and line 2009 near structure 576/130.
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of 993409 Real Estate Communication and Permitting Summary.
Environmental impacts	Refer to section A.4 of 993409 Real Estate Communication and Permitting Summary.

Tower characteristics	1. From North Anna Substation to Structure 576/130, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. This section of line 5XXX is approx. 25.40 miles long. 2. From Structure 576/130 to Midlothian Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 576. Existing line 2009 will be relocated onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 15.58 miles long. 3A. From Midlothian Substation to Trabue Junction at Structure 563/193, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 50’ expanded ROW, on the north side of existing ROW, adjacent to existing lines 563, 242, 282. Existing line 2066 will be underbuilt onto the newly installed towers for line 5XXX for this section. Idle line 153 will be removed. This section of line 5XXX is approx. 3 miles long. 3B. From Trabue Junction at Structure 563/193 to Structure 563/186, new 500kV steel lattice tower structures on foundations hall be constructed in a 25’ expanded ROW on the north side of existing ROW, adjacent to existing lines 563, 242, and 282. Idle line 153 will be removed. This section of line 5XXX is approx. 1.3 miles long. 3C. From Structure 563/186 to 563/162, new 500kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW. Adjacent existing lines 563 and 219 shall both be reconstructed onto new 500/230kV steel lattice tower structures and line 2066 shall be underbuilt onto the newly installed towers for line 5XXX for this section. This section of line 5XXX is approx. 4.3 miles long. 4. From Structure 563/162 to Reams DP, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 40’ expanded ROW, on the east side of the existing ROW, adjacent to existing line 563. This section of line 5XXX is approx. 27.72 miles long. 5. From Reams DP to Rawlings Substation, new 500/230kV steel lattice tower structures on foundations shall be constructed in a 125’ expanded ROW, on the north side of the existing ROW, adjacent to existing line 511. this section of line 5XXX is approx. 21.45 miles long.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$783,460,509.30
Component cost (in-service year)	$839,086,205.47

Substation Upgrade Component

Component title	North Anna Substation Terminal Equipment Upgrade (99-3409)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	North Anna
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Two (2) 500 kV, 5000A Double End Break Switches 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3) 500 kV Coupling Capacitor Voltage Transformers, Relay Accuracy 5. Approximately 150 FT of 6 in. Sch. 80 AL tube bus. 6. Foundations and steel structures as required. 7. Conductor, connectors, conduit, control cable, Foundations, steel structures, and grounding material as necessary per engineering standards. Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 2. One (1), 4506 – 3Ø CCVT Potential Makeup Box 3. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 4. Two (2), 1515 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (use w/ 1510) 5. Two (2), 4526_D – CB w/ BCM Fiber Optic Makeup Box 6. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 7. Two (2), 4510 - SEL-2411 Equipment Annunciator

Transformer Information

None

New equipment description	1. Two (2) 500 kV, 5000A Double End Break Switches 2. Two (2) 500 kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3) 396 kV, 318 kV MCOV Station Class Surge Arresters 4. Three (3) 500 kV Coupling Capacitor Voltage Transformers, Relay Accuracy

Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and protection & control design to add transmission breakers will be revised as part of the SPE scope of work. 3. 4-hole pad connections must be replaced with 6-hole and 8-hole connections to maintain 5000A ratings. 4. It was determined that the GA would not need equipment relocation thus it has been omitted from the submittal.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,338,876.40
Component cost (in-service year)	$5,717,936.20

Substation Upgrade Component

Component title	Rawlings Substation Terminal Equipment Upgrade (99-3409)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Rawlings

Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Three (3), 500kV,63KAIC, 5000A, SF6 Circuit Breaker 2. Four (4), 500kV, 5000A Double End Break Switches 3. Three (3), 396 kV MOV, 318 MCOV, Station Class Arrester 4. Three (3), 500kV Capacitor Coupling Voltage Transformer 5. Approximately 1000ft of 6 IN SCH 80 AL Tubular Bus and Connectors 6. Conductors, connectors, insulators, conduit, control cable, foundations, steel structures, and grounding connections as per engineering standards Relocate Substation Material: 1. Three (3), 396 kV MOV, 318 MCOV, Station Class Arrester Remove Substation Material: 1. Three (3), 500kV, 4000A Double End Break Switches 2. One (1), 500kV, 50kA, 5000A, SF6 Circuit Breaker 3. Approximately 1000 Ft of 6 IN SCH 40 AL Tubular Bus and Connectors Purchase & Install Relay Material: 1. Three (3), 4510 - SEL-2411 Equipment Annunciator 2. Three (3), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel 3. Three (3), 1515 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing Panel (use w/ 1510) 4. One (1), 1340 – 24” Dual SEL-411L DCB/Fiber, CD/Fiber Line Panel (500kV w/ 2 Fiber Cables) 5. Three (3), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 6. One (1), 4506 – 3Ø CCVT Potential Makeup Box 7. Three (3), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Three (3), 500kV,63KAIC, 5000A, SF6 Circuit Breaker 2. Four (4), 500kV, 5000A Double End Break Switches 3. Three (3), 396 kV MOV, 318 MCOV, Station Class Arrester 4. Three (3), 500kV Capacitor Coupling Voltage Transformer
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,942,702.70
Component cost (in-service year)	$6,364,634.91

Substation Upgrade Component

Component title	Elmont Substation Transformer Uprate (99-3428)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Elmont
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Eight (8), 500-230 kV, 480 MVA, 1-phase units. 2. Eight (8) 180kV, 144kV MCOV Surge Arresters. 3. Eight (8) 396kV, 318kV MCOV Surge Arresters. 4. Conductors, connectors, insulators, conduit, control cables, foundations, steel structures, and grounding connections as per engineering standards Remove Substation Material: 1. Eight (8), 500-230 kV, 280 MVA, 1-phase units. 2. Eight (8) 180kV, 144kV MCOV Surge Arresters. 3. Eight (8) 396kV, 318kV MCOV Surge Arresters 4. Conductors, connectors, insulators, conduit, control cables, foundations, steel structures, and grounding connections as per engineering standards Purchase & Install Relay Material: 1. Two (2), 1218 - Transformer SPR Blocking Package (Install w/ Shell Type Transformer) 2. Two (2), 1217 – 24” Dual SEL-487E Transmission Transformer Diff. Panel 3. Eight (8), SPR Relay Auxiliary Package 4. Six (6), 4526_E – 1Ø Transformer Fiber Optic Makeup Box 5. Two (2), 4526_F – 1Ø Spare Transformer Fiber Optic Makeup Box 6. Two (2), 4542 – Transformer Makeup Box 7. Eight (8), 7614 – Transformer Critical Low Oil Assembly 8. Two (2), Panel Retirements

Transformer Information

Name	Capacity (MVA)

Transformer	TX 1		1440
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	
	Name		Capacity (MVA)
Transformer	TX 2		1440
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

New equipment description	1. Eight (8), 500-230 kV, 480 MVA, 1-phase units. 2. Eight (8) 180kV, 144kV MCOV Surge Arresters. 3. Eight (8) 396kV, 318kV MCOV Surge Arresters.
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. 4-hole pad connections must be replaced with 6-hole pad connections to maintain 5000A ratings. 3. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$64,995,810.90
Component cost (in-service year)	$69,610,513.58

Transmission Line Upgrade Component

Component title	Line 559 Cut-In to Auburn Farm Substation (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 559
Point A	Mosby
Point B	Auburn Farm
Point C	Clifton
Terrain description	NA
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	Existing Hardware are assumed to be in good condition. Existing hardware will be replaced as needed for cut-in.
Tower line characteristics	Existing structures will be replaced as need for cut-in.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings

Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Shield wire size and type	(2) DNO-10110 shield wire	
Rebuild line length	0.49	
Rebuild portion description	Refer to "992944 Scope, One Lines & Phasing Diagrams" for complete description.	
Right of way	Existing Right-of-Way shall be used.	
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Component Cost Details - In Current Year $		
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Total component cost	$3,846,410.00	
Component cost (in-service year)	$4,119,506.00	

Transmission Line Upgrade Component

Component title	Line 569 Cut-In to Auburn Farm Substation (99-2944)

Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 569
Point A	Loudoun
Point B	Auburn Farm
Point C	Morrisville
Terrain description	NA
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	Existing Hardware are assumed to be in good condition. Existing hardware will be replaced as needed for cut-in.
Tower line characteristics	Existing structures will be replaced as need for cut-in.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Shield wire size and type	(2) DNO-10110 shield wire
Rebuild line length	0.26
Rebuild portion description	Refer to "992944 Scope, One Lines & Phasing Diagrams" for complete description.

Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$3,846,410.00
Component cost (in-service year)	$4,119,506.00

Transmission Line Upgrade Component

Component title	Line 2008 Cut-In to Auburn Farm Substation (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 2008
Point A	Loudoun
Point B	Auburn Farm
Point C	Lincoln Park
Terrain description	NA

Existing Line Physical Characteristics	
Operating voltage	230
Conductor size and type	2-636 ACSR (24/7) 150°C MOT [0.17 Miles], 2-768.2 ACSS/TW/HS (45/7) 250°C MOT [3.88 Miles], 1033.5 ACSS (45/7) 150°C MOT [0.48 Miles], 1590 ACSR(45/7) 125°C MOT [2.21 Miles]
Hardware plan description	Existing Hardware are assumed to be in good condition. Existing hardware will be replaced as needed for cut-in.
Tower line characteristics	Existing structures will be replaced as need for cut-in.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1573.000000
Winter (MVA)	1648.000000	1648.000000

Conductor size and type	2-768.2 ACSS/TW/HS (20/7) 250°C MOT
Shield wire size and type	(2) DNO-10410 shield wire
Rebuild line length	0.21 Miles
Rebuild portion description	Refer to "992944 Scope, One Lines & Phasing Diagrams" for complete description.
Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$2,564,273.00
Component cost (in-service year)	$2,746,337.00

Transmission Line Upgrade Component

Component title	Line 2173 Cut-In to Auburn Farm Substation (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 2008
Point A	Loudoun
Point B	Auburn Farm
Point C	Elklick
Terrain description	NA
Existing Line Physical Characteristics	
Operating voltage	230
Conductor size and type	2-636 ACSR (24/7) 150°C MOT [0.07 Miles], 2-768.2 ACSS/TW/HS (45/7) 250°C MOT [4.05 Miles], 1233.6 ACSS/TW/H5285 (38/19) 250°C MOT [0.13 Miles]
Hardware plan description	Existing Hardware are assumed to be in good condition. Existing hardware will be replaced as needed for cut-in.
Tower line characteristics	Existing structures will be replaced as need for cut-in.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	230.000000	230.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1573.000000
Winter (MVA)	1648.000000	1648.000000
Conductor size and type	2-768.2 ACSS/TW/HS (20/7) 250°C MOT	
Shield wire size and type	(2) DNO-10410 shield wire	
Rebuild line length	0.32 Miles	
Rebuild portion description	Refer to "992944 Scope, One Lines & Phasing Diagrams" for complete description.	
Right of way	Existing Right-of-Way shall be used.	
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Component Cost Details - In Current Year $		
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	

Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$2,564,273.00
Component cost (in-service year)	$2,746,337.00

Greenfield Substation Component

Component title	Auburn Farm - New Substation (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Auburn Farm
Substation description	The 500 kV, 5000 Amps ring bus will be set up for redundant breaker configuration. Six breakers will be installed initially, and redundant breakers will be installed in future. The ring bus will have four 500 kV line terminals and two Transformer terminals. Two (2) 1400MVA 500-230 kV transformers will be installed at the proposed Substation. The 230 kV, 4000 Amps bus will be set up for three rows of breaker-and-a-half configuration. Two rows to be installed initially and four 230 kV lines will be terminated on the substation. The new Auburn Farm Substation will be built on the existing Dominion laydown yard near Mosby Substation. The project will develop the site to current Dominion Energy standards and install the ground grid. The substation will require 20 FT tall Level 1 security fence. The project will build new laydown yard(s) nearby.
Nominal voltage	AC
Nominal voltage	500/230

Transformer Information

	Name		Capacity (MVA)
Transformer	Transformer 1		1400
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	
	Name		Capacity (MVA)
Transformer	Transformer 2		1400

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

Major equipment description	Refer to "99-2944 Auburn Farm Scope of Work" for complete description.

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Environmental assessment	Environment assessment will be completed and all required permits will be procured.
Outreach plan	Outreach Plans will be according to Dominion standards.
Land acquisition plan	The new Auburn Farm Substation will be built on the existing Dominion laydown yard near Mosby Substation.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Total component cost	$115,436,107.30
Component cost (in-service year)	$123,632,070.60

Substation Upgrade Component

Component title	Clifton Substation Relay Reset (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Clifton
Substation zone	366
Substation upgrade scope	Drawing work, Relay Reset and Field support

Transformer Information

None

New equipment description	NA
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$25,450.00
Component cost (in-service year)	$27,256.95

Substation Upgrade Component

Component title	Elklick Substation Upgrade (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Elklick
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Conductor and connectors that are required per engineering standards Remove Substation Material: 1. One (1), 230kV, 3000A Wave Trap Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 2. One (1), Panel Retirement

Transformer Information

None

New equipment description	1. One (1), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$190,247.30
Component cost (in-service year)	$203,754.54

Substation Upgrade Component

Component title	Lincoln Park Substation Upgrade (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Lincoln Park
Substation zone	366
Substation upgrade scope	Drawing work, Relay Reset and Field support

Transformer Information

None

New equipment description	NA
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.

Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$25,450.00
Component cost (in-service year)	$27,256.95

Substation Upgrade Component

Component title	Loudoun Substation Upgrade (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Loudoun
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Conductor and connectors that are required per engineering standards Remove Substation Material: 1. One (1), Wave Trap Purchase & Install Relay Material: 1. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 2. Three (3), Panel Retirement

Transformer Information

None

New equipment description	1. Three (3), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$532,830.90
Component cost (in-service year)	$570,662.00

Substation Upgrade Component

Component title	Morrisville Substation Upgrade (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Morrisville

Substation zone	366
Substation upgrade scope	Drawing work, Relay Reset and Field support

Transformer Information

None

New equipment description	NA
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$25,450.00
Component cost (in-service year)	$27,256.95

Substation Upgrade Component

Component title	Mosby Substation Upgrade (99-2944)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Mosby
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Conductor and connectors that are required per engineering standards Remove Substation Material: 1. One (1), 500kV, 3000A Wave Trap Purchase & Install Relay Material: 1. One (1), 1340 – 24” Dual SEL-411L CD/Fiber Line Panel 2. One (1), Panel Retirement

Transformer Information

None

New equipment description	NA
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Component Cost Details - In Current Year $

Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$213,242.70
Component cost (in-service year)	$228,383.25

Transmission Line Upgrade Component

Component title	Heritage Substation A-Frame Addition (99-3447)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 570
Point A	Heritage Substation
Point B	NA
Point C	
Terrain description	NA
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Hardware plan description	Existing hardware is assumed to be in good condition.
Tower line characteristics	Existing structures are assumed to be in good condition.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110° C MOT	
Shield wire size and type	(2) DNO-10410 shield wire	
Rebuild line length	0.07 Miles	
Rebuild portion description	EXISTING FACILITIES TO BE REMOVED: 1. One (1) existing 500kV single circuit steel deadend lattice tower 570/123. 2. Approximately 0.07 miles of 3 phase tri-bundled (3) 1351.5 ACSR (45/7) “Dipper” conductor. 3. Approximately 0.07 miles of dual (2) DNO-9809 fiber. a. The removed fiber will be used to create a splice on the proposed structure. MODIFICATIONS TO EXISTING FACILITIES: 1. Transfer existing line 570 conductor from structure 570/123 to proposed structure 570/123. 2. Transfer one span of dual DNO-9809 fiber to the proposed 570/123 structure. 3. Install 4 assumed member reinforcements on 570/124. PERMANENT FACILITIES TO BE INSTALLED: 1. Install one (1) 500kV single circuit steel A-Frame backbone [Reference Drawing 15.900] on foundations. 2. Install one (1) 500kV single circuit steel lattice 93HA_DE tower [Reference Drawing 15.630] on foundations as follows: a. Structure 570/123 3. Install approximately 0.07 miles of 3-phase tri-bundled (3) 1351.5 ACSR (45/7) 110 MOT “Dipper” conductor as follows: a. 0.08 miles from structure 570/123 to A-Frame 4. Install approximately 0.07 miles of dual (2) DNO-10100 OPGW as follows: a. 0.08 miles from structure 570/123 to A-Frame	
Right of way	We are assuming that the slight change in the existing line centerline would not cause substantial change to the existing ROW. The entirety of the span from existing 123-124 appears to be Dominion property, so any changes required are assumed to be non-consequential.	
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Component Cost Details - In Current Year $		
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	

Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$4,041,160.00
Component cost (in-service year)	$4,328,082.36

Substation Upgrade Component

Component title	Lexington Substation Transformer Bank #1 & #3 Replacement (99-3082)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Lexington
Substation zone	366
Substation upgrade scope	Purchase & Install Substation Material: 1. Seven (7), 500-230 kV, 280 MVA 1-Ph Transformers (includes one spare unit) 2. Seven (7), 396 kV MO (S), 318 kV MCOV, Surge Arresters 3. Seven (7), 180 kV MO (S), 144 kV MCOV, Surge Arresters 4. One (1), 230 kV, 3000 Amps, 50 kA, SF6 Circuit Breaker 5. One (1), 230 kV, 3000 Amps, Double-End Break Disconnect Switch 6. Oil Containment system for the new Transformers. 7. One (1) Firewall for Transformer Bank #1. 8. Rigid Bus and steel structures as required. 9. Conductor, connectors, conduit, control cable, foundations, structures, and grounding material as per engineering standards. Remove Substation Material: 1. Eight (8), 500-230 kV, 112 MVA 1-Ph Transformers (includes two spare units) 2. Seven (7), 396 kV MO (S), 318 kV MCOV, Surge Arresters 3. Seven (7), 180 kV MO (S), 144 kV MCOV, Surge Arresters 4. One (1), 230kV, 2000A, 40kA, SF6 Circuit Breaker 5. One (1), 230kV, 3000A, Center Break Switch Purchase & Install Relay Material: 1. Seven (7), SPR Relay Auxiliary Package (Not Needed if SPR Blocking Package Installed) 2. Seven (7), 7614 – Transformer Critical Low Oil Assembly 3. Three (3), 4542 – Transformer M.U. Box 4. One (1), 4526_A – Circuit Breaker Fiber Optic Makeup Box 5. Two (2), 4526_E – 1Ø Transformer Fiber Optic Makeup Box 6. One (1), 4526_F – 1Ø Spare Transformer Fiber Optic Makeup Box 7. One (1), Panel Retirement (Panel 0)

Transformer Information

Name	Capacity (MVA)

Transformer	Existing Transformer 1		840	
	High Side	Low Side		Tertiary
Voltage (kV)	500	230		
	Name		Capacity (MVA)	
Transformer	Existing Transformer 3		840	
	High Side	Low Side		Tertiary
Voltage (kV)	500	230		

New equipment description	1. Seven (7), 500-230 kV, 280 MVA 1-Ph Transformers (includes one spare unit) 2. Seven (7), 396 kV MO (S), 318 kV MCOV, Surge Arresters 3. Seven (7), 180 kV MO (S), 144 kV MCOV, Surge Arresters 4. One (1), 230 kV, 3000 Amps, 50 kA, SF6 Circuit Breaker 5. One (1), 230 kV, 3000 Amps, Double-End Break Disconnect Switch 6. Oil Containment system for the new Transformers. 7. One (1) Firewall for Transformer Bank #1.
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$54,149,503.60
Component cost (in-service year)	$57,994,118.78

Substation Upgrade Component

Component title	Heritage Substation 500kV Expansion (99-3447)
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Heritage
Substation zone	366
Substation upgrade scope	Purchase and install substation material: 1. Four (4), 500kV, 5000A Double End Break Switches 2. Two (2), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3), 396kV, 318kV MCOV Station Class Surge Arresters 4. One (1), 500kV, 5000A Wave Trap 5. One (1), 500kV Backbone Structure (by Transmission) 6. Approximately 1,700 FT. of 6 in. Sch. 80 AL tube and connectors. 7. Approximately 320 FT. of 20’ Level One Security Fence with Security Integrators and associated infrastructure 8. Necessary grading, permitting, etc. for the substation expansion. 9. Ground grid for the substation expansion as per Dominion Energy Standards. 10. Conduit and control cables as required. 11. Foundations and steel structures as required. 12. Conductor and connectors as necessary per engineering standards. Relocate existing substation material: 1. Three (3), 500kV Coupling Capacitor Voltage Transformers, Meter Accuracy 2. Three (3), 500kV Metering CTs 3. Approximately 600 FT. of substation fence. Remove substation material: 1. One (1), 500kV, 4000A Wave Trap 2. Existing conductor and connectors as required. Purchase and install relay material: 1. Two (2), 1510 – 24” Dual SEL-351 Transmission Breaker w/ Reclosing 2. Two (2), 4535 or 4536 – 500kV Circuit Breaker Condition Monitor 3. One (1), 4506 – 3Ø CCVT Potential Makeup Box 4. Two (2), 4510 – SEL-2411 Equipment Annunciator 5. Two (2), 4526_D – C.B. w/ BCM Fiber Optic Makeup Box

Transformer Information

None

New equipment description	1. Four (4), 500kV, 5000A Double End Break Switches 2. Two (2), 500kV, 63kAIC, 5000A, SF6 Circuit Breakers 3. Three (3), 396kV, 318kV MCOV Station Class Surge Arresters 4. One (1), 500kV, 5000A Wave Trap
Substation assumptions	1. The scope of work depicted on the drawings assumes that there is no overlap with other designs and construction activities, except if mentioned in this Project Summary. 2. Relay Settings and P&C design will be revised as part of the SPE Scope of Work.
Real-estate description	Substation is not being expanded.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$12,717,362.00
Component cost (in-service year)	$13,620,294.70

Transmission Line Upgrade Component

Component title	Line 539 Rebuild - Bristers to Ox
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Impacted transmission line	Line 539

Point A	Bristers
Point B	Ox
Point C	
Terrain description	The project area is in the northern Virginia Piedmont region with elevations ranging from approximately 190 to 430 feet. The terrain is predominately vegetated existing right-of-way and urban development consisting of moderate slopes. The line will include crossings of Prince William Parkway, Ox Road, Quantico Marine Corps Base, and the Occoquan River, in addition to -crossing several smaller roads and streams within the existing right-of-way.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	2-2500 ACAR (84/7) 90°C MOT
Hardware plan description	New hardware will be used for line rebuild.
Tower line characteristics	Existing Structures will be removed and new structures will be used for this rebuild.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000

Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT
Shield wire size and type	(2) DNO-10110 shield wire
Rebuild line length	22.89 miles
Rebuild portion description	Rebuild approximately 22.89 miles between the existing Bristers and existing Ox substations. The conductor used along this path will be (3) 1351.5 ACSR (45/7) “DIPPER” @ 110C MOT.

Right of way	Existing Right-of-Way shall be used.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$175,000,000.00
Component cost (in-service year)	$187,425,000.00

Substation Upgrade Component

Component title	Ox Substation Terminal Equipment Upgrade
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Ox
Substation zone	366
Substation upgrade scope	Install (2) 500 kV 63 kA breaker with associated substation equipment rated to 5000 Amp 500 kV standards.

Transformer Information

None

New equipment description	1. Two (2) 500 kV, 63kAIC, 5000A Circuit Breakers
Substation assumptions	1. The scope of work assumes that there is no overlap with other designs and construction activities.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,000,000.00
Component cost (in-service year)	$5,355,000.00

Greenfield Transmission Line Component

Component title	Second 500kV Line - Aspen to Brambleton
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Point A	Aspen
Point B	Brambleton

Point C

	Normal ratings	Emergency ratings
Summer (MVA)	4357.000000	4357.000000
Winter (MVA)	5155.000000	5155.000000
Conductor size and type	3-1351.5 ACSR (45/7) 110°C MOT	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	Line #206 (Thunderball – Brambleton) will be wrecked and rebuilt with 5/2 structures to accommodate the new Aspen - Brambleton 500kV Line.	
Terrain description	The project area is in the northern Virginia Piedmont region with elevations ranging from approximately 280 to 340 feet. The terrain is predominately vegetated existing right-of-way and urban development consisting of moderate slopes. The line will cross one primary road, several small streams, and Goose Creek.	
Right-of-way width by segment	Existing Right-of-Way will be used.	
Electrical transmission infrastructure crossings	To be determined in detailed design.	
Civil infrastructure/major waterway facility crossing plan	Refer to section A.5 of the Real Estate and Permitting Summary.	
Environmental impacts	Refer to section A.4 of the Real Estate and Permitting Summary.	
Tower characteristics	Line #206 (Thunderball – Brambleton) will be wrecked and rebuilt with 5/2 structures to accommodate the new Aspen - Brambleton 500kV Line.	
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	
Component Cost Details - In Current Year $		
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.	

Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$60,000,000.00
Component cost (in-service year)	$64,260,000.00

Substation Upgrade Component

Component title	Aspen Substation Terminal Equipment Upgrade
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Aspen
Substation zone	366
Substation upgrade scope	Install (2) 500 kV 63 kA GIS breaker with associated substation equipment rated to 5000 Amp 500 kV standards.

Transformer Information

None

New equipment description	1. Two (2) 500 kV, 63kAIC, 5000A Circuit Breakers
Substation assumptions	1. The scope of work assumes that there is no overlap with other designs and construction activities.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,000,000.00
Component cost (in-service year)	$5,355,000.00

Substation Upgrade Component

Component title	Brambleton Substation Terminal Equipment Upgrade
Project description	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Substation name	Brambleton
Substation zone	366
Substation upgrade scope	Install (2) 500 kV 63 kA GIS breaker with associated substation equipment rated to 5000 Amp 500 kV standards.

Transformer Information

None

New equipment description	1. Two (2) 500 kV, 63kAIC, 5000A GIS Circuit Breakers

Substation assumptions	1. The scope of work assumes that there is no overlap with other designs and construction activities.
Real-estate description	The substation will not be expanded for this project.
Construction responsibility	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Benefits/Comments	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Component Cost Details - In Current Year $	
Engineering & design	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Permitting / routing / siting	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
ROW / land acquisition	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Materials & equipment	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction & commissioning	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Construction management	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Overheads & miscellaneous costs	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Contingency	The redacted information is proprietary to the Company; therefore, it is privileged and confidential.
Total component cost	$5,000,000.00
Component cost (in-service year)	$5,355,000.00

Congestion Drivers

None

Existing Flowgates

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S885	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S886	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-N1-ST21	314912	8LEXNGTN	314856	6LEXNGT2	1	500/230	345/345	Summer Thermal	Included
2024W1-IPD-S884	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S889	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST13	314918	8NO ANNA	314934	8SPOTSYL	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S887	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S651	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S652	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S649	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S650	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S892	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S654	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S107	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S655	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S653	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S658	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-WT4	314912	8LEXNGTN	314854	6LEXNGT1	1	500/230	345/345	Winter Thermal	Included
2024W1-IPD-S659	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S901	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST24	314912	8LEXNGTN	314854	6LEXNGT1	1	500/230	345/345	Summer Thermal	Included
2024W1-N1-WT3	314912	8LEXNGTN	314856	6LEXNGT2	1	500/230	345/345	Winter Thermal	Included
2024W1-IPD-S656	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S657	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S662	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S660	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S902	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S343	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S661	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S863	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1IPDSNEW9	314911	8LADYSMITH	314918	8NO ANNA	1	500	345	Summer IPD	Included
2024W1-IPD-S743	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S864	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S752	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S746	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S867	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S747	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S868	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S744	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S865	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S745	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S866	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S750	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S871	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S59	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S751	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S872	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S748	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S869	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S749	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S870	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S753	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S874	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S754	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S875	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S873	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1IPDSNEW10	314911	8LADYSMITH	314918	8NO ANNA	1	500	345	Summer IPD	Included
2024W1-IPD-S757	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S878	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S758	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S879	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S473	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	Summer Gen Deliv	Included
2024W1-N1-ST46	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S755	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S876	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST47	314991	8VALLEY SC	314926	8VALLEY	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S756	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S877	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S882	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S759	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S880	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S325	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S881	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST62	314991	8VALLEY SC	314926	8VALLEY	1	500/500	345/345	Summer Thermal	Included
2024W1-32GD-S103	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S102	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-N1-ST60	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1-32GD-S101	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S100	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S106	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S105	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S104	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S99	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S98	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S97	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S851	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S852	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S845	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S846	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S843	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S844	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S849	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S850	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S847	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S848	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S853	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S457	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S741	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S862	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S742	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S735	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S856	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S736	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S857	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S733	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S854	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S734	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S855	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S739	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S860	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S459	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S740	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S861	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S737	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S858	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S738	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S859	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S81	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S508	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S506	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S85	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S84	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S83	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S510	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S82	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S504	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S443	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-32GD-S86	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S92	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S91	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S90	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S517	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S89	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S96	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S95	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S94	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S93	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	2032 Summer Gen Deliv	Included
2024W1-32GD-S88	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S515	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-32GD-S87	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	2032 Summer Gen Deliv	Included
2024W1-IPD-S513	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S842	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S840	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S451	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-GD-S41	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S838	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S839	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S727	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S728	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S725	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S726	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S731	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S490	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S732	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S729	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S730	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S723	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S724	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S492	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S497	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S494	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S500	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S502	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S434	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S463	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S705	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S706	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S703	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S704	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S467	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S709	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S710	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S465	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S707	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S708	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S416	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S414	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S469	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S711	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S284	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S712	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S421	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S418	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S716	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S717	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S714	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S715	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S478	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S720	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S424	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S721	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S718	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S719	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S291	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S713	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S427	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S722	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S481	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S432	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S429	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S683	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S684	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1N1SVM1310	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S687	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S28	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1N1SVM1311	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S446	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S688	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1N1SVM1308	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S685	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1N1SVM1309	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S444	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S686	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S402	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S400	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST92	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1N1SVM1303	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S449	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S691	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST93	314929	8FRONT ROYAL	314916	8MORRSVL	1	500/500	345/345	Summer Thermal	Included
2024W1N1SVM1304	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S692	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S689	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST91	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S690	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST96	314991	8VALLEY SC	314926	8VALLEY	1	500/500	345/345	Summer Thermal	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1N1SVM1307	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-N1-ST97	314991	8VALLEY SC	314926	8VALLEY	1	500/500	345/345	Summer Thermal	Included
2024W1N1SVM1305	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S451	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1N1SVM1306	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S397	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S694	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S453	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S695	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S693	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S33	314914	8MDLTHAN	314918	8NO ANNA	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S698	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S35	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S457	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S699	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S696	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST109	314934	8SPOTSYL	314916	8MORRSVL	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S455	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S697	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S31	314918	8NO ANNA	314911	8LADYSMITH	1	500	345	Summer Gen Deliv	Included
2024W1-IPD-S412	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S702	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S461	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1N1SVM1312	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S700	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S404	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S459	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S701	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S410	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S407	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S408	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S903	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST118	314908	8ELMONT	314218	6ELMONT	2	500/230	345/345	Summer Thermal	Included
2024W1-IPD-S665	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST1	314934	8SPOTSYL	314916	8MORRSVL	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S666	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S908	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-GD-S21	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer Gen Deliv	Included
2024W1-N1-ST119	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S663	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S905	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST120	314901	8BATH CO	314991	8VALLEY SC	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S664	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S906	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S669	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S911	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S670	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S912	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S667	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S668	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S910	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N0-SVM1	314918	8NO ANNA	314918	8NO ANNA	1	500	345	Summer Voltage Magnitude	Included
2024W1-IPD-S671	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S672	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S914	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S673	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-IPD-S676	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S435	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S677	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S674	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S675	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST4	314918	8NO ANNA	314934	8SPOTSYL	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S680	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-N1-ST5	314934	8SPOTSYL	314916	8MORRSVL	1	500/500	345/345	Summer Thermal	Included
2024W1-IPD-S681	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S678	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S437	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S679	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S442	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S440	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included
2024W1-IPD-S682	314918	8NO ANNA	314934	8SPOTSYL	1	500	345	Summer IPD	Included

New Flowgates

The redacted information is proprietary to the Company; therefore, it is privileged and confidential.

Financial Information

Capital spend start date	06/2025
Construction start date	06/2025
Project Duration (In Months)	48

Additional Comments

None