Combined solution

General Information

Proposing entity name	Proprietary & Confidential Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Proprietary & Confidential Information
Company proposal ID	Proprietary & Confidential Information
PJM Proposal ID	987
Project title	Combined solution
Project description	The 2025-W1-987 proposal combines scope from proposals 2025-W1-152, 2025-W1-687, and 2025-W1-771. The purpose of this solution is to demonstrate the combined impact of all three large-scale solutions.
Email	Proprietary & Confidential Information
Project in-service date	06/2031
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Proprietary & Confidential Information

Project Components

1. A-113-A) Newlove - Madison 345kV
2. A-114-A) Matville - Biers Run 345kV Loop-In
3. A-115-A) Matville - Bixby 345kV Loop-In
4. A-126-C) Cole - Hayden 345kV
5. A-127-B) Cole - Beatty 345kV

6. A-12-A) Newlove - Matville 765kV
7. A-132-A) Celtic - Marysville 345kV
8. A-136-A) Buckeye Lake - Johnstown 765kV
9. A-136-B) Matville - Beatty 345kV
10. A-140-B) Newlove - Melissa 138kV
11. A-140-C) Newlove - Melissa 138kV
12. A-143-A) Martindale - Newlove (Indiana Portion) 765kV
13. A-143-B) Martindale - Newlove (Ohio Portion) 765kV
14. A-145-A) New Gwynneville (765kV substation) - Gwynneville 345kV T-Line
15. A-146-A) Gwynneville - Martindale 765kV
16. A-17-B) Matville - Adkins 345kV Loop-In
17. A-18-A) Matville - Buckeye Lake 765kV
18. A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In
19. A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In
20. A-70-A) Matville - Atlanta 345kV Loop-In
21. A-11-B) Newlove 765kV Substation
22. A-142-B) Gwynneville 765kV Substation
23. A-135-A) Johnstown 765kV Substation
24. A-144-A) Martindale 765kV Substation
25. A-19-B) Buckeye Lake 765kV Substation
26. A-13-E) Matville 765kV Substation
27. A-103-A) North Titus Melissa - London 138kV double circuit/London - Beatty 138kV single circuit
28. A-14-A) Marysville - Matville 765kV Loop-In
29. A-72-A) Matville - Flatlick 765kV Loop-In
30. A-155-A) Jefferson - Greentown 765kV Loop-In
31. A-156-A) Tanners Creek - Desoto 345kV Loop-In
32. A-157-A) Desoto - Losantville 345kV Loop- In
33. A-108-A) Melissa substation upgrades
34. A-112-A) Madison substation upgrades

35. A-118-C) West Millersport substation upgrades
36. A-119-B) Bixby terminal equipment upgrades
37. A-124-B) Cole substation upgrade
38. A-125-A) Hayden substation upgrade
39. A-131-B) Celtic substation upgrade
40. A-139-A) Cosgray 345kV substation upgrade
41. A-150-A) Bethel circuit breaker replacement
42. A-151-A) Babbit circuit switcher replacement
43. A-15-B) Marysville substation upgrade
44. A-23-A) Kirk substation upgrade
45. A-149-A) Beacon substation upgrade
46. A-154-A) Gwynneville (DEI) substation upgrade
47. A-158-A) Greentown substation upgrade
48. A-159-A) Dublin reactor addition
49. A-160-B) Beatty substation upgrades
50. A-161-A) Wilson series reactor addition
51. A-162-A) Roberts
52. B-20-A) Kammer - Buttermilk Falls 765kV
53. B-21-A) Buttermilk Falls - Mountain Stone 765kV
54. B-24-A) Mountain Stone-Juniata 500kV
55. E-07-B) Stoney Creek - Slykerville 230kV
56. E-18-B) Montour-Catawissa 230kV
57. E-20-A) Catawissa - Stoney Creek 500kV
58. E-28-B) Frackville/Columbia - Catawissa 230kV Loop-In
59. E-31-A) Mountain Stone - Westwood 765kV
60. E-34-A) Westwood - Frackville 230kV
61. E-35-A) Westwood - Spicewood 765kV
62. B-19-B) Buttermilk Falls 765kV Substation
63. B-06-C) Mountain Stone 765kV Substation

64. E-17-D) Catawissa 500kV Substation
65. E-19-C) Stoney Creek 500kV Substation
66. E-32-A) Westwood 765kV Substation
67. E-36-A) Spicewood 765kV Substation
68. B-30-A) South Bend - Keystone 500kV terminal equipment upgrade
69. B-32-A) Keystone-Juniata 500 kV terminal equipment upgrade
70. B-33-A) Mountaineer-Belmont 765 kV terminal equipment upgrade
71. B-01-A) Kammer substation upgrade
72. B-07-A) Juniata substation upgrade
73. B-34-A) Conemaugh circuit breaker upgrades
74. E-16-B) Montour substation upgrade
75. E-10-C) Slykerville (SLKY) substation upgrade
76. E-33-A) Frackville (New PPL) substation upgrade
77. B-13-A) b.3800.102 NEET/FE Interconnection - Woodside 500kV
78. B-26-A) Sandy Creek - 01-106J 138kV
79. B-27-A) 01-106J - Brandonville/01-106J - Albringht #2 138kV
80. B-25-A) Sandy Creek 500kV Substation
81. B-23-B) 502 Junction - NEET/FE Handoff
82. B-14-B) Woodside 500kV Substation upgrades
83. B-28-A) 01-106J (Bruce Mills 138kV Switchyard) substation upgrade
84. B-36-A) Fort Martin substation upgrade
85. B-39-A) Doubs substation upgrade
86. B-40-A) Brighton terminal equipment upgrades

Greenfield Transmission Line Component

Component title	A-113-A) Newlove - Madison 345kV
Project description	Proprietary & Confidential Information
Point A	Newlove

Point B	Madison	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The approximately 9-mile route heads south from the proposed Newlove substation to the existing Madison substation in Clark County, Ohio.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 812 ft above sea level to a low of 785 ft above sea level. The Project is located entirely within the Darby Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.	
Right-of-way width by segment	The majority of the route, approximately 99%, will have a ROW width of 150 ft. Approximately 1% of the route will have a ROW width of 125 ft in more congested areas. The proposed ROW will be greenfield.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses numerous aquatic resources, including wetlands and waterbodies but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Little Miami & North Fork Little Miami Rivers, some of which may require agency authorizations for navigable water & State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Three federally listed species (2 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for federally listed species intersect the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$36,510,894.00
Component cost (in-service year)	$41,308,725.00

Greenfield Transmission Line Component

Component title	A-114-A) Matville - Biers Run 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Biers Run
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads south from the proposed Matville substation before connecting with the existing Bixby - Beirs Run corridor.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, and developed, open space.

Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulatory floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the Project which will require agency authorizations for navigable water and State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the immediate vicinity of the proposed project. Also, no historic districts are crossed by the proposed route. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information

Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$8,664,478.00
Component cost (in-service year)	$9,803,061.00

Greenfield Transmission Line Component

Component title	A-115-A) Matville - Bixby 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Bixby
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1409.000000	1606.000000
Winter (MVA)	1409.000000	1606.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads south from the proposed Matville substation before connecting with the existing Bixby - Beirs Run corridor.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$9,666,367.00
Component cost (in-service year)	$10,936,608.00

Greenfield Transmission Line Component

Component title	A-126-C) Cole - Hayden 345kV
Project description	Proprietary & Confidential Information
Point A	Cole
Point B	Hayden
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 10-mile route heads north from the existing Cole substation to the Hayden substation in Franklin County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Ten federally listed species (6 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$36,812,767.00
Component cost (in-service year)	$41,650,266.00

Greenfield Transmission Line Component

Component title	A-127-B) Cole - Beatty 345kV
Project description	Proprietary & Confidential Information
Point A	Cole
Point B	Beatty
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The approximately 10-mile route heads east from the existing Beatty substation for approximately 3 miles, paralleling the existing Beatty to Cole 345kV corridor where feasible, before turning north and continuing to parallel the corridor where feasible for the remaining approximately 7 miles through Franklin County, Ohio.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 924 ft above sea level to a low of 842 ft above sea The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture, shrub/scrub, and developed, open space.	
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 45% of the route length, the remainder will be greenfield ROW.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the proposed project. However, no historic districts are crossed by the proposed route. Eleven federally listed species (6 endangered, 2 threatened, and 3 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 92% of the proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. Approximately 8% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$37,486,336.00
Component cost (in-service year)	$42,412,347.00

Greenfield Transmission Line Component

Component title	A-12-A) Newlove - Matville 765kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Matville
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 33-mile route exits the proposed Newlove substation and heads east, paralleling the North Titus - London 138kV corridor where feasible, before turning southeast to parallel the Marysville - Flatlick 765kV corridor where feasible before terminating at the proposed Matville substation. The route travels through Clark County, Madison County, and Pickaway County, Ohio.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,193 ft above sea level to a low of 840 ft above sea level. The Project is located entirely within 2 Level IV ecoregions including Loamy High Lime Till Plains and Darby Plains. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 14% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Little Miami river, which will require agency authorizations for State Scenic River crossings No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Ten federally listed species (6 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$168,082,978.00
Component cost (in-service year)	$190,170,462.00

Greenfield Transmission Line Component

Component title	A-132-A) Celtic - Marysville 345kV	
Project description	Proprietary & Confidential Information	
Point A	Celtic	
Point B	Marysville	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	

Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 20-mile route heads southeast from Marysville along the Maliszewski to Marysville 765kV corridor for 4 miles before turning further southward for the remaining approximately 16 miles through Union County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,049 ft above sea level to a low of 943 ft above sea level. The Project is entirely located within 2 Level IV ecoregions including Clayey High Lime Till Plains, and Loamy High Lime Till Plains. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, shrub/scrub, open water, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 20% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain boundary are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Six federally listed species (3 endangered, 1 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 95% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 5% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$73,650,341.00
Component cost (in-service year)	$83,328,600.00

Greenfield Transmission Line Component

Component title	A-136-A) Buckeye Lake - Johnstown 765kV
Project description	Proprietary & Confidential Information
Point A	Buckeye Lake
Point B	Johnstown
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 22-mile route exits the proposed Buckeye Lake substation and travels north through Fairfield County and Licking County, Ohio before terminating at the Johnstown substation near the existing Kammer to Maliszewski 765kV corridor.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,292 ft above sea level to a low of 887 ft above sea level. The Project is located across 2 Level IV ecoregions including Loamy High Lime Till Plains and Low Lime Drift Plain. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, and hay/pasture, shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Five federally listed species (1 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$119,777,803.00
Component cost (in-service year)	$135,517,590.00

Greenfield Transmission Line Component

Component title	A-136-B) Matville - Beatty 345kV
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Beatty
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 12-mile route travels east for approximately 2 miles and then turns north for the remaining approximately 10 miles, with the entire route located within Pickaway County and Franklin County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 884 ft above sea level to a low of 726 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. One major watercourse (Big Darby Creek) is crossed by the which will require agency authorizations for navigable water or Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$44,024,608.00
Component cost (in-service year)	$49,809,804.00

Greenfield Transmission Line Component

Component title	A-140-B) Newlove - Melissa 138kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Melissa
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000
Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant	
Nominal voltage	AC	
Nominal voltage	138	
Line construction type	Overhead	
General route description	The approximately 2-mile route travels east paralleling the East Springfield to London 138 kV where feasible.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,122 ft above sea level to a low of 1,081 ft above sea level. The Project is located within one Level IV ecoregion (Darby Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture and developed, open space.	
Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. Also, no historic districts are crossed by the proposed route. Two listed species (1 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$13,165,125.00
Component cost (in-service year)	$14,895,132.00

Greenfield Transmission Line Component

Component title	A-140-C) Newlove - Melissa 138kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Melissa
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000

Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant
Nominal voltage	AC
Nominal voltage	138
Line construction type	Overhead
General route description	The approximately 2-mile route travels east paralleling the East Springfield to London 138 kV where feasible.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,122 ft above sea level to a low of 1,081 ft above sea level. The Project is located within one Level IV ecoregion (Darby Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture and developed, open space.

Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. Also, no historic districts are crossed by the proposed route. Two listed species (1 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information

Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$8,558,656.00
Component cost (in-service year)	$9,683,335.00

Greenfield Transmission Line Component

Component title	A-143-A) Martindale - Newlove (Indiana Portion) 765kV
Project description	Proprietary & Confidential Information
Point A	Martindale
Point B	Newlove
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead

General route description	The approximately 20-mile route exits the proposed Martindale substation and travels northeast through Wayne County, Indiana to the Indiana - Ohio border where it continues as component A-143-B.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,236 ft above sea level to a low of 974 ft above sea level. The Project is located entirely within one Level IV ecoregion (Whitewater Interlobate Area). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, scrub/shrub, open water, wetlands, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the centerline. However, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$98,632,201.00
Component cost (in-service year)	$111,593,282.00

Greenfield Transmission Line Component

Component title	A-143-B) Martindale - Newlove (Ohio Portion) 765kV
Project description	Proprietary & Confidential Information
Point A	Martindale
Point B	Newlove
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 72-mile route continues where component A-143-A ended at the Indiana - Ohio border. The route travels east for approximately 63 miles through Darke County, Miami County, and Clark County, Ohio before turning south northeast of Springfield, Ohio for the remaining approximately 9 miles.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,199 ft above sea level to a low of 834 ft above sea level. The Project is located within four Level IV ecoregion (Loamy High Lime Till Plains, Mad River Interlobate Area, Whitewater Interlobate Area, and Darby Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, scrub/shrub, open water, wetlands, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses multiple aquatic resources, including wetlands and waterbodies but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. One major watercourse (Stillwater River) is crossed by the which may require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Nine listed species (4 endangered, 2 threatened, 2 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$351,377,216.00
Component cost (in-service year)	$397,551,068.00

Greenfield Transmission Line Component

Component title	A-145-A) New Gwynneville (765kV substation) - Gwynneville 345kV T-Line
Project description	Proprietary & Confidential Information
Point A	Gwynneville 765kV
Point B	Gwynneville 345kV
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately four-mile route heads south from proposed Gwynneville 765kV substation.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 906 ft above sea level to a low of 872 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.

Right-of-way width by segment	Each single circuit route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain boundary is crossed by the proposed route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information

Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$19,085,757.00
Component cost (in-service year)	$21,593,780.00

Greenfield Transmission Line Component

Component title	A-146-A) Gwynneville - Martindale 765kV
Project description	Proprietary & Confidential Information
Point A	Gwynneville 765kV
Point B	Martindale
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead

General route description	The approximately 33-mile route exits the proposed Gwynneville 765kV substation and travels northeast, with 4 miles paralleling the Greensboro to Gwynneville 345kV line. The route travels through Shelby County, Rush County, Henry County, and Wayne County, Indiana.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,095 ft above sea level to a low of 888 ft above sea level. The Project is located entirely within two Level IV ecoregions (Loamy High Lime Till Plains and Whitewater Interlobate Area). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, scrub/shrub, open water, wetlands, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 12% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. However, no historic districts are crossed by the Three listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$160,668,725.00
Component cost (in-service year)	$181,781,914.00

Greenfield Transmission Line Component

Component title	A-17-B) Matville - Adkins 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Adkins
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The approximately 2-mile route heads east from the proposed Matville substation to the existing Atlanta - Adkins 345kV transmission line.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 854 ft above sea level to a low of 813 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.	
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route.
Tower characteristics	The majority, approximately 60% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 40% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for the transmission line crossing. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$9,927,556.00
Component cost (in-service year)	$11,232,120.00

Greenfield Transmission Line Component

Component title	A-18-A) Matville - Buckeye Lake 765kV
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Buckeye Lake
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 36-mile route heads east from the proposed Matville substation for 20 miles before turning northeast for the remaining approximately 16 miles before terminating at the proposed Buckeye Lake substation. The route travels through Pickaway County and Licking County, Ohio.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,163 ft above sea level to a low of 660 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. The proposed Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The majority of the route, approximately 99%, will have a ROW width of 200 ft. Approximately 1% of the route will have a ROW width of 175 ft in more congested areas. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses numerous aquatic resources, including wetlands and waterbodies but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Big Darby Creek, Scioto River, and Hocking River, some of which will require agency authorizations for navigable water and State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Eleven listed species (6 endangered, 2 threatened, and 3 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & a detailed routing process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$200,611,766.00
Component cost (in-service year)	$226,973,801.00

Greenfield Transmission Line Component

Component title	A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In	
Project description	Proprietary & Confidential Information	
Point A	Bixby	
Point B	West Millersport	
Point C	Kirk	
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	

Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 6-mile route travels south from the existing Kirk - Bixby 345kV transmission corridor to the West Millersport substation paralleling the West Millersport to Kirk 345 kV corridor where feasible. The entire route is located in Licking County and Fairfield County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,106 ft above sea level to a low of 915 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland and developed, open space. According to the NLCD, the Project area largely consists of cultivated cropland, shrub/scrub, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 68% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the proposed route. However, no historic districts are crossed by the proposed route. Four listed species (1 endangered, 1 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$26,409,497.00
Component cost (in-service year)	$29,879,922.00

Greenfield Transmission Line Component

Component title	A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Bixby
Point B	West Millersport
Point C	Ohio Central

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 4-mile route travels south from the existing Ohio Central - Bixby 345kV transmission corridor to the West Millersport substation, with the entire route located in Licking County and Fairfield County, Ohio.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 947 ft above sea level to a low of 886 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 33% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, a single 100-year floodplain is crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Five listed species (1 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 80%, of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration. Approximately 20% of the structures will be single circuit 345kV steel monopole in a vertical conductor configuration. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$28,189,429.00
Component cost (in-service year)	$31,893,751.00

Greenfield Transmission Line Component

Component title	A-70-A) Matville - Atlanta 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Atlanta
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads east from the proposed Matville substation to the existing Atlanta - Adkins 345kV transmission line.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 849 ft above sea level to a low of 812 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 60% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 40% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for the transmission line crossing. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$11,836,697.00
Component cost (in-service year)	$13,392,136.00

Greenfield Substation Component

Component title	A-11-B) Newlove 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Newlove
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345-138kV Substation. New 765kV Breaker and a Half (BAAH) switchyard with two (2) bays, two (2) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank, one (1) 765-138kV, 2000 MVA transformer bank. New 345kV BAAH switchyard with two (2) bays, three (3) line terminals, five (5) 345kV, 5000A, 63kAIC breakers, two (2) 345-138kV, 850 MVA transformer banks.
Nominal voltage	AC
Nominal voltage	765/345/138

Transformer Information

	Name		Capacity (MVA)	
Transformer	765-345kV Xfrm #1		2400	
	High Side	Low Side		Tertiary
Voltage (kV)	765	345		
	Name		Capacity (MVA)	

Transformer	765-138kV Xfrm #1		2000
	High Side	Low Side	Tertiary
Voltage (kV)	765	138	
	Name		Capacity (MVA)
Transformer	345-138kV Xfrm #1		850
	High Side	Low Side	Tertiary
Voltage (kV)	345	138	
	Name		Capacity (MVA)
Transformer	345-138kV Xfrm #2		850
	High Side	Low Side	Tertiary
Voltage (kV)	345	138	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345-138kV Substation. New 765kV Breaker and a Half (BAAH) switchyard with two (2) bays, two (2) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank, one (1) 765-138kV, 2000 MVA transformer bank. New 345kV BAAH switchyard with two (2) bays, three (3) line terminals, five (5) 345kV, 5000A, 63kAIC breakers, two (2) 345-138kV, 850 MVA transformer banks.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to North Fork Little Miami River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Two federally listed species (1 endangered and 1 threatened) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$234,768,631.00
Component cost (in-service year)	$265,619,517.00

Greenfield Substation Component

Component title	A-142-B) Gwynneville 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Gwynneville
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, thee (3) line terminals, nine (9) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name		Capacity (MVA)
Transformer	765-345kV Xfrm #1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

	Name		Capacity (MVA)
Transformer	765-345kV Xfrm #2		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, thee (3) line terminals, nine (9) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel does not contain any NWI-mapped wetlands/waterbodies. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to the Big Blue River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Three federally listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.

Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$223,087,342.00
Component cost (in-service year)	$252,402,851.00

Greenfield Substation Component

Component title	A-135-A) Johnstown 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Johnstown
Substation description	AC Air Insulated Substation (AIS): New proposed 765kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor.
Nominal voltage	AC
Nominal voltage	765

Transformer Information

None

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor.	
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Clear Fork Licking River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Two federally listed species (1 endangered, 1 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$116,261,958.00
Component cost (in-service year)	$113,539,734.00

Greenfield Substation Component

Component title	A-144-A) Martindale 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Martindale
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV breaker and a half (BAAH) switchyard with three (3) bays, five (5) line terminals, eight (8) 345kV, 5000A, 63kAIC breakers
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name	Capacity (MVA)
Transformer	765-345kV Xfrm #1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV breaker and a half (BAAH) switchyard with three (3) bays, five (5) line terminals, eight (8) 345kV, 5000A, 63kAIC breakers

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel does not contain any NWI-mapped wetlands/waterbodies. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Martindale Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Three federally listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$171,908,993.00
Component cost (in-service year)	$194,499,246.00

Greenfield Substation Component

Component title	A-19-B) Buckeye Lake 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Buckeye Lake
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, four (4) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name		Capacity (MVA)
Transformer	765-345kV Xfmr #1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

	Name		Capacity (MVA)
Transformer	765-345kV Xfmr #2		2400
	High Side	Low Side	Tertiary

Voltage (kV)	765	345
Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, four (4) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.	
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Paw Paw Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (1 endangered, 1 threatened, and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$210,178,052.00
Component cost (in-service year)	$237,797,173.00

Greenfield Substation Component

Component title	A-13-E) Matville 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Matville
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV breaker and a half (BAAH) switchyard with three (3) bays, four (4) line terminals, eleven (11) 765kV, 5000A, 63kAIC breakers, four (4) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name	Capacity (MVA)
Transformer	765-345kV Xfmr #1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV breaker and a half (BAAH) switchyard with three (3) bays, four (4) line terminals, eleven (11) 765kV, 5000A, 63kAIC breakers, four (4) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Big Darby Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$255,822,647.00
Component cost (in-service year)	$289,439,843.00

Transmission Line Upgrade Component

Component title	A-103-A) North Titus Melissa - London 138kV double circuit/London - Beatty 138kV single circuit
Project description	Proprietary & Confidential Information
Impacted transmission line	North Titus - Melissa - London 138kV double circuit and London - Beatty 138kV single circuit
Point A	North Titus
Point B	London
Point C	Beatty
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, rolling terrain, with elevation within the Project ranging from a high of 1,192 ft above sea level to a low of 1,035 ft above sea level. The Project is located entirely within the Darby Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	138
Conductor size and type	Per Transmission Owner system
Hardware plan description	Transmission owner to responsible for hardware replacement and OHGW/OPGW selection.
Tower line characteristics	Transmission owner responsible for structure replacement analysis.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	138.000000	138.000000

	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000
Conductor size and type	Incumbent/Transmission Owner to select conductor to achieve required ratings.	
Shield wire size and type	Incumbent/Transmission Owner to select preferred shield wire.	
Rebuild line length	35	
Rebuild portion description	The entire portion from North Titus - Melissa - London - Beatty will be rebuilt. Incumbent transmission owner to determine preferred construction method for this section.	
Right of way	Rebuild in existing right of way.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	
Permitting / routing / siting	Proprietary & Confidential Information	
ROW / land acquisition	Proprietary & Confidential Information	
Materials & equipment	Proprietary & Confidential Information	
Construction & commissioning	Proprietary & Confidential Information	
Construction management	Proprietary & Confidential Information	
Overheads & miscellaneous costs	Proprietary & Confidential Information	
Contingency	Proprietary & Confidential Information	
Total component cost	$57,186,921.00	
Component cost (in-service year)	$57,186,921.00	

Transmission Line Upgrade Component

Component title	A-14-A) Marysville - Matville 765kV Loop-In
Project description	Proprietary & Confidential Information
Impacted transmission line	Marysville - Flatlick 765kV
Point A	Marysville
Point B	Matville
Point C	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project ranging from a high of 801 ft above sea level to a low of 794 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	765
Conductor size and type	Per Transmission Owner system
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	5496.000000	6667.000000
Winter (MVA)	6938.000000	8265.000000

Conductor size and type	Incumbent/Transmission Owner to select conductor to achieve required ratings.
Shield wire size and type	Incumbent/Transmission Owner to select preferred shield wire.
Rebuild line length	0.72
Rebuild portion description	Tap the existing Marysville-Flatlick 765kV circuit and loop in Matville substation. Construction will include separating the existing Marysville-Flatlick 765kV circuit and extending one segment approximately 0.72 miles into Matville substation creating the Marysville-Matville 765kV circuit.
Right of way	New right-of-way to be acquired for proposed route.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,636,719.00
Component cost (in-service year)	$2,636,719.00

Transmission Line Upgrade Component

Component title	A-72-A) Matville - Flatlick 765kV Loop-In
Project description	Proprietary & Confidential Information

Impacted transmission line	Marysville - Flatlick 765kV
Point A	Matville
Point B	Flatlick
Point C	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project ranging from a high of 801 ft above sea level to a low of 794 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.

Existing Line Physical Characteristics

Operating voltage	765
Conductor size and type	Per Transmission Owner system
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	5496.000000	6667.000000
Winter (MVA)	6938.000000	8024.000000

Conductor size and type	Incumbent/Transmission Owner to select conductor to achieve required ratings.
Shield wire size and type	Incumbent/Transmission Owner to select preferred shield wire.
Rebuild line length	0.72

Rebuild portion description	Tap the existing Marysville-Flatlick 765kV circuit and loop in Matville substation. Construction will include separating the existing Marysville-Flatlick 765kV circuit and extending one segment approximately 0.72 miles into Matville substation creating the Matville-Flatlick 765kV circuit.
Right of way	New right-of-way to be acquired for proposed route.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,496,094.00
Component cost (in-service year)	$2,496,094.00

Transmission Line Upgrade Component

Component title	A-155-A) Jefferson - Greentown 765kV Loop-In
Project description	Proprietary & Confidential Information
Impacted transmission line	Jefferson - Greentown 765kV
Point A	Jefferson
Point B	Gwynneville 765kV

Point C	Greentown
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project is around 904 feet above sea level and 888 feet above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	765
Conductor size and type	Per Transmission Owner system
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	N/A
Shield wire size and type	N/A
Rebuild line length	N/A
Rebuild portion description	Tap the existing Jefferson - Greentown 765kV circuit and loop in Gwynneville substation. Construction will include separating the existing Jefferson - Greentown 765kV circuit and extending one segment approximately 0.4 miles into Gwyneville substation creating the Jefferson - Gwynneville and Greentown - Gwynneville 765kV circuits.
Right of way	New right-of-way to be acquired for proposed route.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$3,955,078.00
Component cost (in-service year)	$3,955,078.00

Transmission Line Upgrade Component

Component title	A-156-A) Tanners Creek - Desoto 345kV Loop-In
Project description	Proprietary & Confidential Information
Impacted transmission line	Tanners Creek - Desoto 345kV
Point A	Tanners Creek
Point B	Martindale
Point C	Desoto

Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project is around 956 feet above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	345
Conductor size and type	Per Transmission Owner system
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1972.000000	2032.000000
Winter (MVA)	2123.000000	2174.000000

Conductor size and type	N/A
Shield wire size and type	N/A
Rebuild line length	N/A
Rebuild portion description	Tap the existing Tanners Creek- Desoto 345kV circuit and loop in Martindale substation. Construction will include separating the existing Tanners Creek - Desoto 345kV kV circuit and extending one segment approximately 0.4 miles into Gwyneville substation creating the Tanners Creek - Martindale and Desoto - Martindale 345kV circuits.
Right of way	New right-of-way to be acquired for proposed route.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,605,968.00
Component cost (in-service year)	$2,605,968.00

Transmission Line Upgrade Component

Component title	A-157-A) Desoto - Losantville 345kV Loop- In
Project description	Proprietary & Confidential Information
Impacted transmission line	Desoto - Losantville 345kV
Point A	Losantville
Point B	Martindale
Point C	Desoto
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project is around 956 feet above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.

Existing Line Physical Characteristics		
Operating voltage	345	
Conductor size and type	Per Transmission Owner system	
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.	
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1972.000000	2032.000000
Winter (MVA)	2123.000000	2174.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	N/A	
Rebuild portion description	Tap the existing Tanners Creek- Losantville 345kV circuit and loop in Martindale substation. Construction will include separating the existing Tanners Creek - Losantville 345kV kV circuit and extending one segment approximately 0.4 miles into Gwyneville substation creating the Losantville - Martindale and Tanners Creek - Martindale 345kV circuits.	
Right of way	New right-of-way to be acquired for proposed route.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$3,474,624.00
Component cost (in-service year)	$3,474,624.00

Substation Upgrade Component

Component title	A-108-A) Melissa substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Melissa
Substation zone	ATSI
Substation upgrade scope	Add (4) 138kV, 5000A, 63kAIC breakers to terminate (3) new lines.

Transformer Information

None

New equipment description	Add (4) 138kV, 5000A, 63kAIC breakers to terminate (3) new lines.
Substation assumptions	Assumes upgrades can occur in existing footprint. Precise location, general arrangement, and aerial imagery were not available at time of submission.
Real-estate description	Precise substation location was not available at time of submission.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,556,250.00
Component cost (in-service year)	$4,556,250.00

Substation Upgrade Component

Component title	A-112-A) Madison substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Madison
Substation zone	Dayton
Substation upgrade scope	Add (2) new 345kV breakers to create (2) line positions. Terminate (2) 345kV lines.

Transformer Information

None

New equipment description	Add two (2) 345kV, 5000A, 63kAIC breakers and two (2) line positions.
Substation assumptions	Assumes that fence line must be expanded to east to accommodate upgrades.

Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$6,646,875.00
Component cost (in-service year)	$6,646,875.00

Substation Upgrade Component

Component title	A-118-C) West Millersport substation upgrades
Project description	Proprietary & Confidential Information
Substation name	West Millersport
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard with two (2) new bays, (7) 345kV breakers.

Transformer Information

None

New equipment description	Add seven (7) 345kV, 5000A, 63KAIC breakers to create (2) BAAH bays.
Substation assumptions	Assumes that fence line must be expanded to southeast to accommodate upgrades.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$19,940,625.00
Component cost (in-service year)	$19,940,625.00

Substation Upgrade Component

Component title	A-119-B) Bixby terminal equipment upgrades
Project description	Proprietary & Confidential Information

Substation name	Bixby
Substation zone	AEP
Substation upgrade scope	Transmission owner to upgrade terminal equipment.

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,492,578.00
Component cost (in-service year)	$2,492,578.00

Substation Upgrade Component

Component title	A-124-B) Cole substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Cole
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker into existing breaker and a half (BAAH) bay to create (1) new line position. Relocate existing 345-138kV transformer into bus position. Terminate (4) 345kV lines.

Transformer Information

None

New equipment description	Add (1) new 345k, 5000A, 63kAIC breaker into existing breaker and a half (BAAH) bay to create (1) new line position.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$3,323,438.00
Component cost (in-service year)	$3,323,438.00

Substation Upgrade Component

Component title	A-125-A) Hayden substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Hayden
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard with one (1) new bay, (2) 345kV breakers. Add (1) new 345-138KV transformer.

Transformer Information

	Name	Capacity (MVA)
Transformer	Transformer 1	850

	High Side	Low Side	Tertiary
Voltage (kV)	345	138	

New equipment description	Add (2) new 345k, 5000A, 63kAIC breakers to create (1) new breaker and a half (BAAH) bay and (2) new line positions. Add (1) new 345-138kV, 850 MVA transformer.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fenceline on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$13,347,188.00
Component cost (in-service year)	$13,347,188.00

Substation Upgrade Component

Component title	A-131-B) Celtic substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Celtic
Substation zone	Celtic
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard by adding (2) 345kV breakers into existing bays and creating (2) line positions.

Transformer Information

None

New equipment description	Add (2) new 345k, 5000A, 63kAIC breakers to into existing BAAH bays to create (2) line positions.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint or on adjacent incumbent owned property. Substation is currently under construction.

Real-estate description	Substation is currently under construction. Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line or on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$6,646,875.00
Component cost (in-service year)	$6,646,875.00

Substation Upgrade Component

Component title	A-139-A) Cosgray 345kV substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Cosgray 345kV
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker and capacitor bank.

Transformer Information

None

New equipment description	Add (1) new 345kV, 5000A, 63kAIC breaker and (1) 345kV, 43.4 MVAR capacitor bank.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$3,539,766.00
Component cost (in-service year)	$3,539,766.00

Substation Upgrade Component

Component title	A-150-A) Bethel circuit breaker replacement
Project description	Proprietary & Confidential Information
Substation name	Bethel
Substation zone	AEP

Substation upgrade scope	Replace (2) existing 138KV breakers.

Transformer Information

None

New equipment description	Replace (2) existing 138KV breakers with new 138kV, 4000A, 63kAIC breakers.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$1,518,750.00
Component cost (in-service year)	$1,518,750.00

Substation Upgrade Component

Component title	A-151-A) Babbit circuit switcher replacement

Project description	Proprietary & Confidential Information
Substation name	Babbit
Substation zone	AEP
Substation upgrade scope	Replace (1) existing 138KV circuit switcher.

Transformer Information

None

New equipment description	Replace (1) existing 138KV circuit switcher with a 138KV, 2000A, 50KAIC circuit switcher.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$759,375.00
Component cost (in-service year)	$759,375.00

Substation Upgrade Component

Component title	A-15-B) Marysville substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Marysville
Substation zone	Dayton
Substation upgrade scope	Expand the existing double breaker double bus (DBDB) 765kV Switchyard by adding (1) new 765kV breaker and (1) line position. Add (1) 765-345kV transformer bank. Expand the existing 345kV breaker and a half (BAAH) switchyard by adding (3) 345kV breakers and (3) line positions.

Transformer Information

	Name	Capacity (MVA)
Transformer	Transformer 1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

New equipment description	Add (1) 765kV, 5000A, 63kAIC breaker to an existing DBDB bay to create (1) line position. Add (1) 765-345kV, 2400 MVA transformer bank. Add (3) 345kV, 5000A, 63kAIC breakers to existing BAAH bays to create (3) line positions.
Substation assumptions	Assumes required equipment upgrades can occur within existing footprint. Some line terminations may need to be reconfigured to accommodate incoming transmission lines.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$77,715,234.00
Component cost (in-service year)	$77,715,234.00

Substation Upgrade Component

Component title	A-23-A) Kirk substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Kirk
Substation zone	AEP
Substation upgrade scope	Transmission owner to upgrade terminal equipment

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,492,578.00
Component cost (in-service year)	$2,492,578.00

Substation Upgrade Component

Component title	A-149-A) Beacon substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Beacon
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker and capacitor bank.

Transformer Information

None

New equipment description	Add (1) new 345kV, 5000A, 63kAIC breaker and (1) 345kV, 43.4 MVAR capacitor bank.

Substation assumptions	Assumes required equipment upgrades occur within existing footprint. No aerial imagery was available at time of submission, however, oneline indicates future cap bank is planned.
Real-estate description	Assumes required equipment upgrades occur within existing footprint. No aerial imagery was available at time of submission, however oneline indicates future cap bank is planned.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$3,539,766.00
Component cost (in-service year)	$3,539,766.00

Substation Upgrade Component

Component title	A-154-A) Gwynneville (DEI) substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Gwynneville
Substation zone	MISO
Substation upgrade scope	Add (2) new 345kV, 5000A, 63kAIC breakers to create (2) line positions.

Transformer Information

None

New equipment description	Add (2) new 345kV, 5000A, 63kAIC breakers to create (2) line positions.
Substation assumptions	Oneline was not available at time of submission. Substation may require expansion to accommodate proposed upgrades.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$7,439,063.00
Component cost (in-service year)	$7,439,063.00

Substation Upgrade Component

Component title	A-158-A) Greentown substation upgrade
Project description	Proprietary & Confidential Information

Substation name	Greentown
Substation zone	NA
Substation upgrade scope	Transmission owner to upgrade terminal equipment.

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$6,752,344.00
Component cost (in-service year)	$6,752,344.00

Substation Upgrade Component

Component title	A-159-A) Dublin reactor addition
Project description	Proprietary & Confidential Information
Substation name	Dublin
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrades can occur within existing fence line or within minor fence line expansion to west on incumbent owned property.
Real-estate description	Assumes upgrades can occur on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information

Contingency	Proprietary & Confidential Information
Total component cost	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Substation Upgrade Component

Component title	A-160-B) Beatty substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Beatty
Substation zone	AEP
Substation upgrade scope	Expand the existing breaker and a half (BAAH) 345kV switchyard by adding (3) breakers to create (1) new bay and (2) line positions. Add (2) 138kV series reactors.

Transformer Information

None

New equipment description	Add (3) 345kV, 5000A, 63kAIC breakers to create (1) new BAAH bay with (2) line positions. Add (2) 138kV, series line reactors.
Substation assumptions	Assumes that fence line must be expanded to east to accommodate breaker additions and that reactor installation can occur within existing fence line.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation to the east.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information

Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$9,498,750.00
Component cost (in-service year)	$9,498,750.00

Substation Upgrade Component

Component title	A-161-A) Wilson series reactor addition
Project description	Proprietary & Confidential Information
Substation name	Wilson
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrade can occur within existing fence line.
Real-estate description	Assumes that upgrade occur on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Substation Upgrade Component

Component title	A-162-A) Roberts
Project description	Proprietary & Confidential Information
Substation name	Roberts
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrade can occur within existing fence line.
Real-estate description	Assumes that upgrade occur on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Greenfield Transmission Line Component

Component title	B-20-A) Kammer - Buttermilk Falls 765kV	
Project description	Proprietary & Confidential Information	
Point A	Kammer	
Point B	Buttermilk Falls	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing	

Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 114-mile primarily greenfield route exits Kammer substation to the east and travels approximately 16 miles through Marshall County, West Virginia to the Pennsylvania border. The route then travels northeast for the remaining approximately 98 miles through Greene County, Fayette County, Westmoreland County, and Indiana County, Pennsylvania to reach the proposed Buttermilk Falls substation.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the Project ranging from a high of 2,170 ft above sea level to a low of 646 ft above sea level. The Project is entirely located within 6 Level IV ecoregions including Forested Hills and Mountains, Loam High Lime Till Plains, Monongahela Transition Zone, Permian Hills, Pittsburgh Low Plateau, and Uplands and Valleys of Mixed Land Use. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, mixed forest, shrub/scrub, open water, and developed, open space.
Right-of-way width by segment	The majority of the route, approximately 90%, will have a ROW width of 200 ft. Approximately 10% of the route will have a ROW width of 175 ft in more congested areas. The proposed ROW will be an expansion of existing transmission line corridors for approximately 43% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Monongahela, Youghiogheny and Conemaugh Rivers, some of which will require agency authorizations for navigable water crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, historic districts, & architectural resources were recorded within vicinity of the route. Eight federally listed species (4 endangered and 4 proposed) No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$694,716,467.00
Component cost (in-service year)	$786,007,916.00

Greenfield Transmission Line Component

Component title	B-21-A) Buttermilk Falls - Mountain Stone 765kV
Project description	Proprietary & Confidential Information
Point A	Buttermilk Falls
Point B	Mountain Stone
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 108-mile route exits the proposed Buttermilk Falls substation and travels northeast for 20 miles through Indiana County and Cambria County, Pennsylvania to the existing Keystone - Juniata 500kV corridor. The route then turns east and, where feasible, parallels the Keystone - Juniata 500kV corridor for the remaining approximately 88 miles through Cambria County, Blair County, Huntingdon County, Mifflin County, Juniata County, and Perry County, Pennsylvania before terminating at the proposed Mountain Stone substation.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the Project ranging from a high of 2,595 ft above sea level to a low of 482 ft above sea level. The Project is located within 6 Level IV ecoregions including Forested Hills and Mountains, Northern Dissected Ridges and Knobs, Northern Limestone/Dolomite Valleys, Northern Sandstone Ridges, Northern Shale Valleys, and Uplands and Valleys of Mixed Land Use. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, mixed forest, shrub/scrub, open water, and developed, open space.
Right-of-way width by segment	The majority of the route, approximately 98%, will have a ROW width of 200 ft. Approximately 2% of the route will have a ROW width of 175 ft in more congested areas. The proposed ROW will be an expansion of existing transmission line corridors for approximately 42% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Juniata River, some of which may require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, historic districts & architectural resources were recorded within vicinity of the route. Seven federally listed species (3 endangered and 4 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$633,348,169.00
Component cost (in-service year)	$716,575,318.00

Greenfield Transmission Line Component

Component title	B-24-A) Mountain Stone-Juniata 500kV
Project description	Proprietary & Confidential Information
Point A	Mountain Stone
Point B	Juniata
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	5210.000000	5803.000000

Winter (MVA)	6173.000000	6697.000000
Conductor size and type	3 bundled 1780 KCMIL ACSS/MA3 84/19 Chukar	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	The approximately 0.6-mile route exits the proposed Mountain Stone substation and travels south before terminating at the Juniata substation.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, sloped terrain, with elevation ranging from a high of 931 ft above sea level to a low of 646 ft above sea level. The Project is located entirely within the Northern Limestone/Dolomite Valleys Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, shrub/scrub, and developed, open space.	
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed route will be greenfield.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains are crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are which will require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. Also, no historic districts are crossed by the proposed route. Five federally listed species (2 endangered, and 3 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 500kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$5,320,922.00
Component cost (in-service year)	$6,020,136.00

Greenfield Transmission Line Component

Component title	E-07-B) Stoney Creek - Slykerville 230kV
Project description	Proprietary & Confidential Information
Point A	Stoney Creek
Point B	Slykerville
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1809.000000
Winter (MVA)	1648.000000	1896.000000

Conductor size and type	2 bundled 1590 KCMIL ACSS/MA3 54/19 Falcon
Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	The approximately 1-mile greenfield route exits the proposed Stoney Creek substation heading Southeast to the assumed Slykerville substation location in Luzerne County and Carbon County, PA.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation ranging from a high of 1,798 ft above sea level to a low of 1,618 ft above sea level. The Project is entirely located entirely within the Anthracite Subregion Level IV ecoregion. According to the NLCD, the Project area largely consists of deciduous forest, shrub/scrub, barren land, and developed, open space.
Right-of-way width by segment	The route will have a 125 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 44% of the route length, the remainder will be greenfield ROW. The proposed route will be greenfield
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed which would require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. Also, no historic districts are crossed by the proposed route. Five federally listed species (3 endangered and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. See Attachment 08 – Permitting Plan.
Tower characteristics	Approximately 100% of the proposed structures will be a single circuit 230kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$7,455,730.00
Component cost (in-service year)	$8,435,475.00

Greenfield Transmission Line Component

Component title	E-18-B) Montour-Catawissa 230kV	
Project description	Proprietary & Confidential Information	
Point A	Montour	
Point B	Catawissa	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1809.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	2 bundled 1590 KCMIL ACSS/MA3 54/19 Falcon	

Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	The approximately 17-mile route runs southeast from the existing Montour substation to the proposed Catawissa substation. The route parallels about 5 miles of the existing PPL Montour to Columbia 230 kV corridor and the PPL Columbia to Frackville 230 kV corridor where possible. The route crosses through Montour County and Columbia County in Pennsylvania.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with intermittent peaks of elevation ranging from a high of 1,196 ft above sea level to a low of 450 ft above sea level. The Project is located within 2 Level IV ecoregions (North Sandstone Ridges, and Northern Shale Valleys). According to the NLCD, the Project area largely consists of deciduous forest, cultivated cropland, hay/pasture, mixed forest, open water, and developed, open space.
Right-of-way width by segment	The route will have a 125 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 52% of the route length, the remainder will be greenfield ROW. The proposed route will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. The proposed Project crosses the Susquehanna River which may require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites & architectural resources were recorded within the vicinity of the route. However, no cemeteries or historic districts are crossed by the proposed route. Six federally listed species (3 endangered, and 3 proposed) have known ranges along the proposed route. Critical habitat for one federally listed freshwater mussel species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	Approximately 94% of the proposed structures will be a single circuit 230kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 6% of the proposed structures will be ingle circuit 230kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$66,702,810.00
Component cost (in-service year)	$75,468,107.00

Greenfield Transmission Line Component

Component title	E-20-A) Catawissa - Stoney Creek 500kV
Project description	Proprietary & Confidential Information
Point A	Catawissa
Point B	Stoney Creek
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	5210.000000	5803.000000
Winter (MVA)	6173.000000	6697.000000

Conductor size and type	3 bundled 1780 KCMIL ACSS/MA3 84/19 Chukar
Nominal voltage	AC
Nominal voltage	500
Line construction type	Overhead
General route description	The approximately 26-mile route heads southeast from the proposed Catawissa substation and travels 10-miles through Columbia County, PA. The route turns east near the Schuylkill County line and continues for 16- miles before turning south to parallel the Harwood - Siegfried 230kV corridor and terminating into the proposed Stony Creek substation.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation ranging from a high of 1,877 ft above sea level to a low of 838 ft above sea level. The Project is located within 3 Level IV ecoregions (Anthracite Subregion, North Sandstone Ridges, and Northern Shale Valleys). According to the NLCD, the Project area largely consists of deciduous forest, shrub/scrub, barren land, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 5% of the route length, the remainder will be greenfield ROW. The proposed route will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are which will require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites & architectural resources were recorded within the vicinity of the route. However, no cemeteries or historic districts are crossed by the proposed route. Five federally listed species (3 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 500kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$130,558,907.00
Component cost (in-service year)	$147,715,420.00

Greenfield Transmission Line Component

Component title	E-28-B) Frackville/Columbia - Catawissa 230kV Loop-In	
Project description	Proprietary & Confidential Information	
Point A	Colombia	
Point B	Catawissa	
Point C	Frackville	
	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1809.000000
Winter (MVA)	1648.000000	1896.000000
Conductor size and type	2 bundled 1590 KCMIL ACSS/MA3 54/19 Falcon	

Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	The approximately 2-mile route travels northeast from the existing Frackville - Colombia 230kV corridor to proposed Catawissa substation in Colombia County, PA.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands and rolling terrain, with elevation ranging from a high of 949 ft above sea level to a low of 697 ft above sea level. The Project is located within 2 Level IV ecoregions (North Sandstone Ridges, and Northern Shale Valleys). According to the NLCD, the Project area largely consists of deciduous forest, cultivated cropland, hay/pasture, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed route will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain is crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. The proposed Project does not cross any waterways which will require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. Also, no historic districts are crossed by the proposed route. Four federally listed species (3 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will be a single circuit 230kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$16,792,983.00
Component cost (in-service year)	$18,999,720.00

Greenfield Transmission Line Component

Component title	E-31-A) Mountain Stone - Westwood 765kV
Project description	Proprietary & Confidential Information
Point A	Mountain Stone
Point B	Westwood
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing	
Nominal voltage	AC	
Nominal voltage	765	
Line construction type	Overhead	
General route description	The approximately 62-mile route heads north from the proposed Mountain Stone substation for approximately 18 miles through Perry County and Juniata County, Pennsylvania before heading east for the remaining approximately 44 miles through Northumberland County and Schuylkill County, Pennsylvania.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, rolling terrain with intermittent peaks and valleys, with elevation within the Project ranging from a high of 1,751 ft above sea level to a low of 379 ft above sea level. The Project is located within 4 Level IV ecoregions (Anthracite Subregion, North Sandstone Ridges, Northern Dissected Ridges and Knobs, and Northern Shale Valleys. According to the NLCD, the Project area largely consists of deciduous forest, cultivated cropland, hay/pasture, mixed forest, open water, and developed, open space.	
Right-of-way width by segment	The majority of the route, approximately 99%, will have a ROW width of 200 ft. Approximately 1% of the route will have a ROW width of 175 ft in more congested areas. The proposed ROW will be an expansion of existing transmission line corridors for approximately 31% of the route length, the remainder will be greenfield ROW.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. The proposed Project crosses the Susquehanna River, which may require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Seven federally listed species (3 endangered, and 4 proposed) have known ranges along the proposed route. The critical habitat for one federally listed freshwater mussel species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 - Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$355,274,126.00
Component cost (in-service year)	$401,960,064.00

Greenfield Transmission Line Component

Component title	E-34-A) Westwood - Frackville 230kV
Project description	Proprietary & Confidential Information
Point A	Westwood
Point B	Frackville
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1573.000000	1809.000000
Winter (MVA)	1648.000000	1896.000000

Conductor size and type	2 bundled 1590 KCMIL ACSS/MA3 54/19 Falcon
Nominal voltage	AC
Nominal voltage	230
Line construction type	Overhead
General route description	The approximately 2-mile route parallels the Frackville to Eldred 230 kV where feasible between proposed Westwood and existing Frackville substations.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, sloped terrain, with elevation within the Project ranging from a high of 1,701 ft above sea level to a low of 1,148 ft above sea level. The Project is located within 2 Level IV ecoregions (Anthracite Subregion and North Sandstone Ridges). According to the NLCD, the Project area largely consists of deciduous forest, mixed forest, and developed, open space.

Right-of-way width by segment	The route will have a 125 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 72% of the route length, the remainder will be greenfield ROW. The proposed route will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses a single aquatic resource, (stream) and could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are which will require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. Also, no historic districts are crossed by the proposed route. Four federally listed species (2 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 - Permitting Plan.
Tower characteristics	The majority, approximately 70% of the proposed structures will be a single circuit 230kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 30% of the proposed structures will be single circuit 230kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information

ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$10,419,841.00
Component cost (in-service year)	$11,789,095.00

Greenfield Transmission Line Component

Component title	E-35-A) Westwood - Spicewood 765kV
Project description	Proprietary & Confidential Information
Point A	Westwood
Point B	Spicewood
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead

General route description	The approximately 38-mile route exits Westwood substation and travels east through Schuylkill County and Carbon County, Pennsylvania, paralleling the Siegfried to Frackville 230kV corridor where feasible.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, sloping terrain with moderate peaks and valleys, with elevation ranging from a high of 1,736 ft above sea level to a low of 420 ft above sea level. The Project is located within 3 Level IV ecoregions (Anthracite Subregion, North Sandstone Ridges, and Northern Shale Valleys). According to the NLCD, the Project area largely consists of deciduous forest, cultivated cropland, hay/pasture, mixed forest, open water, scrub/shrub, wetlands and developed, open space.
Right-of-way width by segment	The majority of the route, approximately 100%, will have a ROW width of 200 ft. The proposed ROW will be an expansion of existing transmission line corridors for approximately 13% of the route length, the remainder will be greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed which will require agency authorizations for navigable water and/or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Six federally listed species (3 endangered, 1 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 - Permitting Plan.

Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$209,402,951.00
Component cost (in-service year)	$236,920,219.00

Greenfield Substation Component

Component title	B-19-B) Buttermilk Falls 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Buttermilk Falls
Substation description	AC Air Insulated Substation (AIS): New proposed 765-500kV Substation. New 765kV breaker and a half (BAAH) switchyard with one (1) bay, two (2) line terminals, five (5) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactor, one (1) 765-500kV, 3125 MVA transformer bank. New 500kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, six (6) 500kV, 5000A, 63kAIC breakers.

Nominal voltage	AC
Nominal voltage	765/500

Transformer Information

	Name	Capacity (MVA)
Transformer	765-500kV Xfrm #1	3125

	High Side	Low Side	Tertiary
Voltage (kV)	765	500	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-500kV Substation. New 765kV breaker and a half (BAAH) switchyard with one (1) bay, two (2) line terminals, five (5) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactor, one (1) 765-500kV, 3125 MVA transformer bank. New 500kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, six (6) 500kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	3125.000000	4000.000000
Winter (MVA)	3500.000000	4250.000000

Environmental assessment	Environmental constraints were evaluated within the vicinity of the proposed project Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Trout Run and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally (2 endangered and two proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.

Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$170,291,024.00
Component cost (in-service year)	$192,668,663.00

Greenfield Substation Component

Component title	B-06-C) Mountain Stone 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Mountain Stone
Substation description	AC Air Insulated Substation (AIS): New proposed 765-500kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, eight (8) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-500kV, 3125 MVA transformer banks.
Nominal voltage	AC

Nominal voltage	765/500

Transformer Information

	Name	Capacity (MVA)
Transformer	765-500kV Xfmr#1	3125

	High Side	Low Side	Tertiary
Voltage (kV)	765	500	

	Name	Capacity (MVA)
Transformer	765-500kV Xfmr#1	3125

	High Side	Low Side	Tertiary
Voltage (kV)	765	500	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-500kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, eight (8) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-500kV, 3125 MVA transformer banks.

	Normal ratings	Emergency ratings
Summer (MVA)	3125.000000	4000.000000
Winter (MVA)	3500.000000	4250.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Trout Run and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally (2 endangered and two proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$214,962,750.00
Component cost (in-service year)	$243,210,621.00

Greenfield Substation Component

Component title	E-17-D) Catawissa 500kV Substation
Project description	Proprietary & Confidential Information
Substation name	Catawissa
Substation description	AC Air Insulated Substation (AIS): New proposed 500-230kV Substation. New 500kV double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, eight (8) 500kV, 5000A, 63kAIC breakers, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV breaker and a half (BAAH) switchyard with two (2) bays, three (3) line terminals, five (5) 230kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	500/230

Transformer Information

	Name	Capacity (MVA)
Transformer	500-230kV Xfmr #1	1700

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

	Name	Capacity (MVA)
Transformer	500-230kV Xfmr #1	1700

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 500-230kV Substation. New 500kV double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, eight (8) 500kV, 5000A, 63kAIC breakers, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV breaker and a half (BAAH) switchyard with two (2) bays, three (3) line terminals, five (5) 230kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	1500.000000	2000.000000
Winter (MVA)	1500.000000	2000.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Catawissa Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (3 endangered and 1 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$117,287,040.00
Component cost (in-service year)	$132,699,520.00

Greenfield Substation Component

Component title	E-19-C) Stoney Creek 500kV Substation
Project description	Proprietary & Confidential Information
Substation name	Stoney Creek
Substation description	AC Air Insulated Substation (AIS): New proposed 500-230kV Substation. New 500kV double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, eight (8) 500kV, 5000A, 63kAIC breakers, one (1) 500kV, +/- 500 MVAR STATCOM, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV DBDB switchyard with one (1) bay, one (1) line terminal, four (4) 230kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	500/230

Transformer Information

	Name		Capacity (MVA)
Transformer	500-230kV Xfmr #1		1700
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

	Name		Capacity (MVA)
Transformer	500-230kV Xfmr #2		1700
	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 500-230kV Substation. New 500kV double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, eight (8) 500kV, 5000A, 63kAIC breakers, one (1) 500kV, +/- 500 MVAR STATCOM, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV DBDB switchyard with one (1) bay, one (1) line terminal, four (4) 230kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	1500.000000	2000.000000
Winter (MVA)	1500.000000	2000.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Catawissa Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (2 endangered and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$165,942,615.00
Component cost (in-service year)	$187,748,837.00

Greenfield Substation Component

Component title	E-32-A) Westwood 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Westwood
Substation description	AC Air Insulated Substation (AIS): New proposed 765-230kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-230kV, 1400 MVA transformer bank.
Nominal voltage	AC
Nominal voltage	765/230

Transformer Information

	Name	Capacity (MVA)
Transformer	765-230kV Xfmr #1	1400

	High Side	Low Side	Tertiary
Voltage (kV)	765	230	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-230kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-230kV, 1400 MVA transformer bank.

	Normal ratings	Emergency ratings
Summer (MVA)	1500.000000	2000.000000
Winter (MVA)	1500.000000	2000.000000

Environmental assessment

Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains no NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Dry Run and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (2 endangered and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$134,208,303.00
Component cost (in-service year)	$151,844,376.00

Greenfield Substation Component

Component title	E-36-A) Spicewood 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Spicewood
Substation description	AC Air Insulated Substation (AIS): New proposed 765-500-230kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with one (1) bay, one (1) line terminal, three (3) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactors, one (1) 765-500, 3125 MVA transformer bank. New 500kV double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, seven (7) 500kV, 5000A, 63kAIC breakers, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV breaker and a half (BAAH) switchyard with two (2) bays, four (4) line terminals, eight (8) 230kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/500/230

Transformer Information

	Name	Capacity (MVA)
Transformer	765-500kV Xfmr #1	3125

	High Side	Low Side	Tertiary
Voltage (kV)	765	500	

	Name	Capacity (MVA)
Transformer	500-230kV Xfmr #2	1700

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

	Name	Capacity (MVA)
Transformer	500-230kV Xfmr #3	1700

	High Side	Low Side	Tertiary
Voltage (kV)	500	230	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-500-230kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with one (1) bay, one (1) line terminal, three (3) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactors, one (1) 765-500, 3125 MVA transformer bank. New 500kV double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, seven (7) 500kV, 5000A, 63kAIC breakers, two (2) 500-230kV, 1700 MVA transformer banks. New 230kV breaker and a half (BAAH) switchyard with two (2) bays, four (4) line terminals, eight (8) 230kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	3125.000000	4000.000000
Winter (MVA)	3500.000000	4250.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains no NWI-mapped wetlands. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Aquashicola Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Five federally listed species (3 endangered, 1 threatened, and 1 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$234,022,718.00
Component cost (in-service year)	$264,775,225.00

Transmission Line Upgrade Component

Component title	B-30-A) South Bend - Keystone 500kV terminal equipment upgrade
Project description	Proprietary & Confidential Information
Impacted transmission line	South Bend - Keystone 500kV
Point A	South Bend
Point B	Keystone
Point C	
Terrain description	Existing line to remain intact as-is. Proposal is to uprate remote end terminals at South Bend and Keystone to match conductor ratings.

Existing Line Physical Characteristics		
Operating voltage	500	
Conductor size and type	Per transmission owner system	
Hardware plan description	Existing line to remain intact as-is. Proposal is to uprate remote end terminals at South Bend and Keystone to match conductor ratings.	
Tower line characteristics	Existing line to remain intact as-is. Proposal is to uprate remote end terminals at South Bend and Keystone to match conductor ratings.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	3573.000000	4378.000000
Winter (MVA)	4050.000000	5194.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	N/A	
Rebuild portion description	Existing line to remain intact as-is. Proposal is to uprate remote end terminals at South Bend and Keystone to match conductor ratings.	
Right of way	Existing right-of-way to remain as-is. Proposal is to uprate remote end terminals at South Bend and Keystone to match conductor ratings.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,683,750.00
Component cost (in-service year)	$4,683,750.00

Transmission Line Upgrade Component

Component title	B-32-A) Keystone-Juniata 500 kV terminal equipment upgrade
Project description	Proprietary & Confidential Information
Impacted transmission line	Keystone - Juniata 500kV
Point A	Keystone
Point B	Juniata
Point C	
Terrain description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	Per transmission owner system
Hardware plan description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.

Tower line characteristics	Existing right-of-way to remain as-is. Proposal is to upgrade terminal equipment to match conductor ratings.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	2939.000000	3732.000000
Winter (MVA)	3618.000000	4423.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	N/A	
Rebuild portion description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.	
Right of way	Existing right-of-way to remain as-is. Proposal is to upgrade terminal equipment to match conductor ratings.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	
Permitting / routing / siting	Proprietary & Confidential Information	
ROW / land acquisition	Proprietary & Confidential Information	
Materials & equipment	Proprietary & Confidential Information	
Construction & commissioning	Proprietary & Confidential Information	

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,683,750.00
Component cost (in-service year)	$4,683,750.00

Transmission Line Upgrade Component

Component title	B-33-A) Mountaineer-Belmont 765 kV terminal equipment upgrade
Project description	Proprietary & Confidential Information
Impacted transmission line	Mountaineer - Belmont 765kV
Point A	Mountaineer
Point B	Belmont
Point C	
Terrain description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.

Existing Line Physical Characteristics

Operating voltage	765
Conductor size and type	Per transmission owner system.
Hardware plan description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.
Tower line characteristics	Existing right-of-way to remain as-is. Proposal is to upgrade terminal equipment to match conductor ratings.

Proposed Line Characteristics

	Designed	Operating

Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	4558.000000	5523.000000
Winter (MVA)	5757.000000	5757.000000
Conductor size and type	N/A	
Shield wire size and type	N/A	
Rebuild line length	N/A	
Rebuild portion description	Existing line to remain intact as-is. Proposal is to uprate terminal equipment to match conductor ratings.	
Right of way	Existing right-of-way to remain as-is. Proposal is to upgrade terminal equipment to match conductor ratings.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	
Permitting / routing / siting	Proprietary & Confidential Information	
ROW / land acquisition	Proprietary & Confidential Information	
Materials & equipment	Proprietary & Confidential Information	
Construction & commissioning	Proprietary & Confidential Information	
Construction management	Proprietary & Confidential Information	
Overheads & miscellaneous costs	Proprietary & Confidential Information	
Contingency	Proprietary & Confidential Information	
Total component cost	$6,752,344.00	

Component cost (in-service year)	$6,752,344.00

Substation Upgrade Component

Component title	B-01-A) Kammer substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Kammer
Substation zone	AEP
Substation upgrade scope	Expand the existing breaker and a half (BAAH) 765kV Switchyard by adding (1) 345kV breaker and one line position.

Transformer Information

None

New equipment description	Add (1) 765kV, 5000A, 63kAIC breaker and (1) line position.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$13,504,688.00
Component cost (in-service year)	$13,504,688.00

Substation Upgrade Component

Component title	B-07-A) Juniata substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Juniata
Substation zone	PPL
Substation upgrade scope	Expand the existing 500kV switchyard by adding (2) 500kV breakers to main busses.

Transformer Information

None

New equipment description	Add (2) 5000A, 63kAIC breakers.
Substation assumptions	Assumes expansion of existing fence line to the southeast, remaining on utility owned property. Minor reconfiguration of an existing line entry may be required to support the addition of the proposed breaker/line positions.
Real-estate description	The substation fence line likely requires expansion for at least one of the new terminations, but work can be contained on utility property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information

ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$9,952,969.00
Component cost (in-service year)	$9,952,969.00

Substation Upgrade Component

Component title	B-34-A) Conemaugh circuit breaker upgrades
Project description	Proprietary & Confidential Information
Substation name	Conemaugh
Substation zone	PENELEC
Substation upgrade scope	Replace (9) 500kV breakers in existing switchyard.

Transformer Information

None

New equipment description	Replace (9) 500kV breakers with 500kV, 5000A, 63kAIC breakers.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$23,418,750.00
Component cost (in-service year)	$23,418,750.00

Substation Upgrade Component

Component title	E-16-B) Montour substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Montour
Substation zone	PPL
Substation upgrade scope	Add (1) new 230kV breaker to create (1) new line position.

Transformer Information

None

New equipment description	Add (1) 230kV, 5000A, 63kAIC breaker.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.

Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,282,813.00
Component cost (in-service year)	$2,282,813.00

Substation Upgrade Component

Component title	E-10-C) Slykerville (SLKY) substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Slykerville (SLKY)
Substation zone	PPL
Substation upgrade scope	Add (2) 230kV breakers in switchyard to accept (2) new line positions.

Transformer Information

None

New equipment description	Add (2) 230kV, 5000A, 63kAIC breakers.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	No public imagery or general arrangement was available at time of proposal submission.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,453,406.00
Component cost (in-service year)	$4,453,406.00

Substation Upgrade Component

Component title	E-33-A) Frackville (New PPL) substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Frackville (New PPL)
Substation zone	PPL

Substation upgrade scope	Terminate (1) line into an open bay position.

Transformer Information

None

New equipment description	Terminate (1) line into an open bay position.
Substation assumptions	Assumes that fence line must be expanded to east to accommodate upgrades.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to occur fully on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,282,813.00
Component cost (in-service year)	$2,282,813.00

Greenfield Transmission Line Component

Component title	B-13-A) b.3800.102 NEET/FE Interconnection - Woodside 500kV

Project description	Proprietary & Confidential Information	
Point A	b3800.102 NEET/FE Handoff	
Point B	Woodside	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	5101.000000	5332.000000
Winter (MVA)	6110.000000	6330.000000
Conductor size and type	3 bundled 1780 KCMIL ACSS/MA3 84/19 Chukar	
Nominal voltage	AC	
Nominal voltage	500	
Line construction type	Overhead	
General route description	The approximately 17-mile route in Frederick County, Virginia travels eastward from the MARL NEET/FE handoff, paralleling the existing Mt. Storm to Doubs 500kV corridor where feasible.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the Project ranging from a high of 1,262 ft above sea level to a low of 590 ft above sea level. The Project is located within 2 Level IV ecoregions (Northern Limestone/Dolomite Valleys and Northern Shale Valleys). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, shrub/scrub, and developed, open space.	
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 20% of the route length, the remainder will be greenfield ROW.	
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.	
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the Project which would require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Four federally listed species (2 endangered and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 500kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$99,094,841.00
Component cost (in-service year)	$112,116,718.00

Greenfield Transmission Line Component

Component title	B-26-A) Sandy Creek - 01-106J 138kV
Project description	Proprietary & Confidential Information
Point A	Sandy Creek
Point B	01-106J
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000

Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant
Nominal voltage	AC
Nominal voltage	138
Line construction type	Overhead
General route description	The approximately 1-mile route parallels the Hazelton to Lake Lynn 138 kV.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the Project ranging from a high of 1,836 ft above sea level to a low of 1,787 ft above sea level. The Project is located entirely within the Uplands and Valleys of Mixed Land Use Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.

Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain is crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the Project which would require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. Also, no historic districts are crossed by the proposed route. Three federally listed species (2 endangered and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators or 138kV steel 3-Pole dead ends in horizontal conductor configuration for the transmission crossing. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information

Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$5,573,578.00
Component cost (in-service year)	$6,305,991.00

Greenfield Transmission Line Component

Component title	B-27-A) 01-106J - Brandonville/01-106J - Albringht #2 138kV	
Project description	Proprietary & Confidential Information	
Point A	Brandonville	
Point B	01-106J	
Point C	Albringht	
	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000
Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant	
Nominal voltage	AC	
Nominal voltage	138	
Line construction type	Overhead	
General route description	The approximately 2-mile route parallels the Hazelton to Lake Lynn 138 kV.	

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the Project ranging from a high of 1,939 ft above sea level to a low of 1,521 ft above sea level. The Project is located entirely within the Uplands and Valleys of Mixed Land Use Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses one aquatic resource, including wetlands, lakes/ponds, and streams but the identified feature could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain is crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the Project which would require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. Also, no historic districts are crossed by the proposed route. Three federally listed species (2 endangered and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 8 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$12,272,072.00
Component cost (in-service year)	$13,884,722.00

Greenfield Substation Component

Component title	B-25-A) Sandy Creek 500kV Substation
Project description	Proprietary & Confidential Information
Substation name	Sandy Creek
Substation description	AC Air Insulated Substation (AIS): New proposed 500-138kV Substation. New 500kV ring switchyard with three (3) line terminals, three (3) 500kV, 5000A, 63kAIC breakers, one (1) 500-138kV, 485 MVA transformer bank.
Nominal voltage	AC
Nominal voltage	500

Transformer Information

	Name	Capacity (MVA)
Transformer	500-138Kv Xfrm #1	485

High Side	Low Side	Tertiary

Voltage (kV)	500	138
Major equipment description	AC Air Insulated Substation (AIS): New proposed 500-138kV Substation. New 500kV ring switchyard with three (3) line terminals, three (3) 500kV, 5000A, 63kAIC breakers, one (1) 500-138kV, 485 MVA transformer bank.	
	Normal ratings	Emergency ratings
Summer (MVA)	485.000000	619.000000
Winter (MVA)	569.000000	654.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one NWI-mapped wetland. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Big Sandy Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Three federally listed species (3 endangered and 1 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 8 – Permitting Plan.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information

Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$70,121,689.00
Component cost (in-service year)	$79,336,254.00

Transmission Line Upgrade Component

Component title	B-23-B) 502 Junction - NEET/FE Handoff
Project description	Proprietary & Confidential Information
Impacted transmission line	502 Junction - Black Oak - Woodside 500kV
Point A	502 Junction
Point B	Black Oak
Point C	Woodside
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, moderately sloped terrain, with elevation within the proposed Project ranging from a high of 2,894 ft above sea level to a low of 574 ft above sea level. The Project is located within 7 Level IV ecoregions (Northern Shale Valleys, Northern Sandstone Ridges, Northern Dissected Ridges and Knobs, Forested Hills and Mountains, Uplands and Valleys of Mixed Land Use, Monongahela Transition Zone, and Pittsburgh Low Plateau). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture, mixed forest, shrub/scrub, open water, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	500
Conductor size and type	3x bundles 1780 kcmil ACSR 84/19 Chuckar
Hardware plan description	Approved 502 Junction - Woodside 500kV project (PJM Baseline Upgrade ID b3800.102) has not been constructed so no existing hardware will be impacted.
Tower line characteristics	Approved 502 Junction - Woodside 500kV project (PJM Baseline Upgrade ID b3800.102) has not been constructed so no existing hardware will be impacted.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	500.000000	500.000000
	Normal ratings	Emergency ratings
Summer (MVA)	5101.000000	5332.000000
Winter (MVA)	6110.000000	6330.000000
Conductor size and type	3x1780 KCMIL ACSS/MA3 54/19 Chukar	
Shield wire size and type	2x0.575 48ct OPGW	
Rebuild line length	107	
Rebuild portion description	The entire circuit shall be upgraded to a double circuit from a single circuit from the point where the Fort Martin - Sandy Creek circuit joins the 502 Junction - Black Oak circuit until the point at which the Sandy Creek - Woodside circuit transitions to single circuit towers. See Attachment 4 for more information on location of double circuit structures.	
Right of way	Existing right-of-way to be used for upgrading the single circuit to a double circuit. ROW Adjustments may be required in specific locations to mitigate engineering and/or operational risks.	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year $		
Engineering & design	Proprietary & Confidential Information	
Permitting / routing / siting	Proprietary & Confidential Information	
ROW / land acquisition	Proprietary & Confidential Information	
Materials & equipment	Proprietary & Confidential Information	
Construction & commissioning	Proprietary & Confidential Information	

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$340,176,779.00
Component cost (in-service year)	$384,878,801.00

Substation Upgrade Component

Component title	B-14-B) Woodside 500kV Substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Woodside
Substation zone	APS
Substation upgrade scope	Expand the 500kV breaker and a half switchyard by adding (2) 500kV breakers to create (1) bay and (1) line position. Install (2) 500kV capacitor banks.

Transformer Information

None

New equipment description	Add (2) 500kV, 5000A, 63kAIC breakers to create (1) additional line position. Add (2) 500kV, 450 MVAR capacitor banks.
Substation assumptions	Woodside substation is currently under development and has not begun construction. Proposed expansion will be incorporated into ongoing engineering and design.
Real-estate description	Proposed expansion will not require new real estate.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year $

Engineering & design	Proprietary & Confidential Information

Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$26,146,668.00
Component cost (in-service year)	$29,582,554.00

Substation Upgrade Component

Component title	B-28-A) 01-106J (Bruce Mills 138kV Switchyard) substation upgrade
Project description	Proprietary & Confidential Information
Substation name	01-106J (Bruce Mills 138kV Switchyard)
Substation zone	APS
Substation upgrade scope	Expand the existing 138kV substation by adding (4) 138kV breakers.

Transformer Information

None

New equipment description	Add (4) 138kV, 5000A, 63kAIC breakers.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint or on adjacent incumbent owned property.
Real-estate description	No aerial imagery or parcel data was available at time of submission.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,556,250.00
Component cost (in-service year)	$4,556,250.00

Substation Upgrade Component

Component title	B-36-A) Fort Martin substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Fort Martin
Substation zone	APS
Substation upgrade scope	Expand the existing 500kV double breaker double bus (DBDB) switchyard by adding (2) 500kV breakers to create (1) new bay with (1) new line position. Replace (9) existing 500kV breakers.

Transformer Information

None

New equipment description	Add (2) 500kV, 5000A, 63kAIC breakers. Replace (9) existing 500kV breakers with 500kV, 5000A, 63kAIC breakers.

Substation assumptions	Assumes that fence line must be expanded to west to accommodate upgrades.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$4,976,484.00
Component cost (in-service year)	$4,976,484.00

Substation Upgrade Component

Component title	B-39-A) Doubs substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Doubs
Substation zone	APS
Substation upgrade scope	Transmission owner to upgrade terminal equipment

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment
Substation assumptions	Assumes that fence line must be expanded to west to accommodate upgrades.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$5,854,688.00
Component cost (in-service year)	$5,854,688.00

Substation Upgrade Component

Component title	B-40-A) Brighton terminal equipment upgrades
Project description	Proprietary & Confidential Information

Substation name	Brighton
Substation zone	PEPCO
Substation upgrade scope	Transmission owner to upgrade terminal equipment.

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on incumbent owned property.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year $	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	$2,927,344.00
Component cost (in-service year)	$2,927,344.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary and confidential information.

Financial Information

Capital spend start date	01/2026
Construction start date	10/2029
Project Duration (In Months)	65

Cost Containment Commitment

Cost cap (in current year)	Proprietary & Confidential Information
Cost cap (in-service year)	Proprietary & Confidential Information

Components covered by cost containment

1. A-113-A) Newlove - Madison 345kV - Proposer
2. A-114-A) Matville - Biers Run 345kV Loop-In - Proposer
3. A-115-A) Matville - Bixby 345kV Loop-In - Proposer
4. A-126-C) Cole - Hayden 345kV - Proposer
5. A-127-B) Cole - Beatty 345kV - Proposer
6. A-12-A) Newlove - Matville 765kV - Proposer
7. A-132-A) Celtic - Marysville 345kV - Proposer

8. A-136-A) Buckeye Lake - Johnstown 765kV - Proposer
9. A-136-B) Matville - Beatty 345kV - Proposer
10. A-140-B) Newlove - Melissa 138kV - Proposer
11. A-140-C) Newlove - Melissa 138kV - Proposer
12. A-143-B) Martindale - Newlove (Ohio Portion) 765kV - Proposer
13. A-17-B) Matville - Adkins 345kV Loop-In - Proposer
14. A-18-A) Matville - Buckeye Lake 765kV - Proposer
15. A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In - Proposer
16. A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In - Proposer
17. A-70-A) Matville - Atlanta 345kV Loop-In - Proposer
18. A-11-B) Newlove 765kV Substation - Proposer
19. A-135-A) Johnstown 765kV Substation - Proposer
20. A-19-B) Buckeye Lake 765kV Substation - Proposer
21. A-13-E) Matville 765kV Substation - Proposer
22. B-20-A) Kammer - Buttermilk Falls 765kV - Proposer
23. B-21-A) Buttermilk Falls - Mountain Stone 765kV - Proposer
24. B-24-A) Mountain Stone-Juniata 500kV - Proposer
25. E-07-B) Stoney Creek - Slykerville 230kV - Proposer
26. E-18-B) Montour-Catawissa 230kV - Proposer
27. E-20-A) Catawissa - Stoney Creek 500kV - Proposer
28. E-28-B) Frackville/Columbia - Catawissa 230kV Loop-In - Proposer
29. E-31-A) Mountain Stone - Westwood 765kV - Proposer
30. E-34-A) Westwood - Frackville 230kV - Proposer
31. E-35-A) Westwood - Spicewood 765kV - Proposer
32. B-19-B) Buttermilk Falls 765kV Substation - Proposer
33. B-06-C) Mountain Stone 765kV Substation - Proposer
34. E-17-D) Catawissa 500kV Substation - Proposer
35. E-19-C) Stoney Creek 500kV Substation - Proposer
36. E-32-A) Westwood 765kV Substation - Proposer

Cost elements covered by cost containment

Engineering & design	Yes
Permitting / routing / siting	Yes
ROW / land acquisition	Yes
Materials & equipment	Yes
Construction & commissioning	Yes
Construction management	Yes
Overheads & miscellaneous costs	Yes
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Proprietary & Confidential Information
Is the proposer offering a binding cap on ROE?	Yes
Would this ROE cap apply to the determination of AFUDC?	No
Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?	No
Is the proposer offering a Debt to Equity Ratio cap?	Proprietary & Confidential Information
Additional cost containment measures not covered above	Proprietary & Confidential Information

Additional Comments

None