

Varner - East Fayette - Melbourne 345kV & 138kV

General Information

Proposing entity name	Company proprietary information.
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Company proprietary information.
Company proposal ID	Company proprietary information.
PJM Proposal ID	258
Project title	Varner - East Fayette - Melbourne 345kV & 138kV
Project description	Build greenfield 345kV single-circuit line from Varner (AEP) - Melbourne (ATSI) and a greenfield 138kV single-circuit line from Varner (AEP) - East Fayette (ATSI). Perform substation upgrades at Varner Station (AEP), Melbourne (ATSI), and East Fayette Station (ATSI). The Varner - Melbourne 345kV line and Varner - East Fayette 138kV line will be on a shared double-circuit tower for approximately 37 miles of the route in Indiana and Ohio. Each single circuit line will be on it's own single-circuit structure for the final 15-18 miles of the route. Construction responsibility for this proposal includes AEP, ATSI, and Grid Growth Ventures.
Email	Company proprietary information.
Project in-service date	09/2031
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Company proprietary information.

Project Components

1. Melbourne 345kV Station upgrade
2. Varner 345/138kV Station upgrade

3. East Fayette 138kV Station upgrade
4. Varner - Melbourne 345kV (Indiana)
5. Varner - East Fayette 138kV (Indiana)
6. Varner - Melbourne 345kV (Ohio)
7. Varner - East Fayette 138kV (Ohio)
8. Varner - South Butler 345kV tie-in
9. Dunton Lake - South Butler 345kV tie-in to Varner
10. Varner - Melbourne 345kV (Ohio - GGV)
11. Varner - East Fayette 138kV (Ohio - GGV)

Substation Upgrade Component

Component title	Melbourne 345kV Station upgrade
Project description	Company proprietary information.
Substation name	Melbourne
Substation zone	ATSI
Substation upgrade scope	Reconfigure a four breaker 345kV ring bus station into a three-string breaker-and-half configuration, while adding two new 345kV line exits. Station expansion will add a new string with two 345kV circuit breakers. Additionally, the existing two strings at Melbourne will receive an additional breaker to complete the string. P&C upgrades will include new line relays, breaker control relays, and bus protection for the breaker-and-half configuration.

Transformer Information

None	
New equipment description	Install: four 345kV, 4000A Circuit Breakers; eight 345KV 4000A double end break switches; two 345kV A-Frame deadend structures; 345kV Bus Support structures; 3-phase sets of 345KV CCVTs; Bus Tubing and jumper/connector assemblies; 345kV surge arresters; new relaying panels for line protection and bus protection.
Substation assumptions	Melbourne station is still in development, and it is assumed the work to re-configure the station layout, protection & control design modifications, and site layout updates can be accommodated in the existing design work.

Real-estate description	The acquisition of additional fee lands is not required for the Melbourne Substation located in Fulton County, Ohio.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$15,872,306.00
Component cost (in-service year)	\$19,497,486.00
Substation Upgrade Component	
Component title	Varner 345/138kV Station upgrade
Project description	Company proprietary information.
Substation name	Varner
Substation zone	AEP

Substation upgrade scope	Add a 345KV breaker-and-half yard to existing Varner 345/138kV station. In the existing configuration, the 345/138kV power transformer directly feeds South Butler station. The new configuration includes three breaker-and-a-half strings, with nine circuit breakers and six line exits. The existing 345/138kV power transformer will connect to the newly created 345kV buswork. In the existing 138kV yard, one circuit breaker and line exit will be added for the greenfield line to East Fayette.
Transformer Information	
None	
New equipment description	New major equipment includes nine 345kV, 5000A, 63kA circuit breakers; eighteen 345kV, 4000A, 100kA disconnect switches, one 138kV, 3000A, 40kA circuit breaker, two 138kV, 3000A, 100kA disconnect switches, the necessary deadend structures, bus support structures, jumper/connector assemblies, buswork, station service equipment, control/AC cable, and protection & control upgrades necessary to support the expanded substation.
Substation assumptions	The substation pad at the existing site is already graded and no additional site work will be required for the project. Station service upgrades will be required for the project.
Real-estate description	The acquisition of additional fee lands is not required for the Varner Substation located in DeKalb County, Indiana.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.

Total component cost	\$34,133,515.00
Component cost (in-service year)	\$41,929,493.00
Substation Upgrade Component	
Component title	East Fayette 138kV Station upgrade
Project description	Company proprietary information.
Substation name	East Fayette
Substation zone	ATSI
Substation upgrade scope	The existing station is a 138kV double bus-double breaker configuration. An additional double bus-double breaker string will be added for the greenfield 138kV line to Varner (AEP).
Transformer Information	
None	
New equipment description	Install two 138kV, 3000A, 40kA circuit breakers and associated disconnect switches, CCVTs, bus support structures and buswork, control cable and AC cables, and new relaying equipment for the addition of the new line to Varner (AEP).
Substation assumptions	A minor station expansion will be required for the new double bus-double breaker string. The station has existing bus protection relays. Revenue metering is required for the new line to Varner (AEP).
Real-estate description	The acquisition of additional fee lands is not required for the East Fayette Substation located in Fulton County, Ohio.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.

Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$4,443,933.00
Component cost (in-service year)	\$5,458,912.00

Greenfield Transmission Line Component

Component title	Varner - Melbourne 345kV (Indiana)
Project description	Company proprietary information.
Point A	Varner
Point B	Melbourne
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1385.000000	1841.000000
Winter (MVA)	1750.000000	2092.000000
Conductor size and type	2 – 954 kcmil (54/7) ACSS Cardinal	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	

General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner substation and the greenfield Melbourne substation as the two endpoints. The evaluation resulted in the Bid Route of approximately 7 miles of greenfield line through Dekalb County in Indiana. The 345kV greenfield line exits the existing Varner substation from the east and travel in a predominantly eastern/northeastern direction until it reaches the IN/OH State line. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the existing and greenfield substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.
Terrain description	The topography for the Indiana portion of the Varner - Melbourne 345kV greenfield line is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels in Indiana. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.
Right-of-way width by segment	The Varner - Melbourne 345kV line will be on a shared double-circuit structure with the Varner - East Fayette 138kV line for the portion of the route in Indiana (~7 miles) and will encompass a ROW width of 130 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	41.372481, -84.850847
Civil infrastructure/major waterway facility crossing plan	The Varner - Melbourne 345kV greenfield line route crosses & runs parallel with multiple railroads, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.475090° -84.289891° Creek (Unnamed), 41.474795° -84.341762° Brush Creek, 41.474783° -84.343855° Owl Creek, 41.474605° -84.375026° Tiffin River, 41.465712° -84.420311° Tiffin River, 41.465375° -84.421311° Tiffin River, 41.464790° -84.423043° Beaver Creek, 41.459292° -84.439214° Prairie Creek, 41.445084° -84.488838° Lick Creek, 41.443420° -84.568510° Dry Creek, 41.382266° -84.641755° Lost Creek, 41.378961° -84.676730° St Joseph River, 41.379888° -84.801727° St Joseph River (Slough), 41.379926° -84.804404° St Joseph River (Slough), 41.379949° -84.806128° St Joseph River, 41.375780° -84.823502° St Joseph River, 41.375538° -84.824481° Creek (Unnamed), 41.361077° -84.901974° Railroad, Coordinates Norfolk Southern, 41.360999° -84.904679° Abandoned Railroad, 41.445130° -84.526834°

Environmental impacts	Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	For the portion of the line route in Indiana, this 345kV line is proposed to utilize one side of double circuit self-supporting steel lattice tower structures with the phases arranged in AEP's patented BOLD configuration. All towers are expected to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$23,904,124.00
Component cost (in-service year)	\$29,363,744.00

Greenfield Transmission Line Component

Component title	Varner - East Fayette 138kV (Indiana)	
Project description	Company proprietary information.	
Point A	Varner	
Point B	East Fayette	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	257.000000	360.000000
Winter (MVA)	325.000000	404.000000
Conductor size and type	1 - 795 kcmil (26/7) ACSS Drake	
Nominal voltage	AC	
Nominal voltage	138	
Line construction type	Overhead	
General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner and East Fayette substations as the two endpoints. The evaluation resulted in the Bid Route of approximately 7 miles of greenfield line through Dekalb County in Indiana. The 138kV greenfield line exits the existing Varner substation from the east and travels in a predominantly eastern/northeastern direction until it reaches the IN/OH State line. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the two existing substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.	
Terrain description	The topography along the Varner - East Fayette 138kV greenfield line is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels in both Indiana and Ohio. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.	

Right-of-way width by segment	The Varner - East Fayette 138kV greenfield line will be on a shared double-circuit tower with the Varner - Melbourne 345kV line for the portion of the project in Indiana (~7 miles) and will encompass a ROW width of 130 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	41.372481, -84.850847
Civil infrastructure/major waterway facility crossing plan	The Varner - East Fayette 138kV greenfield line route crosses & runs parallel with a railroad, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.476008° -84.282017° Branch (Unnamed), 41.512221° -84.278307° Brush Creek, 41.521002° -84.277690° Branch (Unnamed), 41.616734° -84.280530° Branch (Unnamed), 41.625241° -84.280955° Old Bean Creek, 41.631152° -84.281249° Old Bean Creek, 41.632202° -84.281307° Bean Creek, 41.635486° -84.282062° Spring Creek, 41.670141° -84.305700° Railroad, Coordinates Norfolk Southern, 41.525562° -84.277401°
Environmental impacts	Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	For the portion of the line route in Indiana, this 138kV line is proposed to utilize one side of double circuit self-supporting steel lattice tower structures with the phases arranged in AEP's patented BOLD configuration. All towers are expected to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.

ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$20,578,652.00
Component cost (in-service year)	\$25,278,746.00

Greenfield Transmission Line Component

Component title	Varner - Melbourne 345kV (Ohio)
Project description	Company proprietary information.
Point A	Varner
Point B	Melbourne
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1385.000000	1841.000000
Winter (MVA)	1750.000000	2092.000000
Conductor size and type	2 – 954 kcmil (54/7) ACSS Cardinal	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	

General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner substation and the greenfield Melbourne substation as the two endpoints. The evaluation resulted in the Bid Route of approximately 48 miles of greenfield line through four counties (Defiance, Williams, Henry and Fulton) in Ohio. This component represents ~18 miles of the line route located in Ohio on single-circuit 345kV structures. From the IN border, the 345kV greenfield line travels in a predominantly eastern/northeastern direction until it reaches the greenfield Melbourne substation from the west. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the existing and greenfield substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.
Terrain description	The topography along the Varner - Melbourne 345kV greenfield line is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels in Ohio. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.
Right-of-way width by segment	The final ~18-mile segment of the route will be on single-circuit 345kV monopole structures and will require a right-of-way width of 130 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	41.445078, -84.526850, 41.474481, -84.386261
Civil infrastructure/major waterway facility crossing plan	The Varner - Melbourne 345kV greenfield line route crosses & runs parallel with multiple railroads, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.475090° -84.289891° Creek (Unnamed), 41.474795° -84.341762° Brush Creek, 41.474783° -84.343855° Owl Creek, 41.474605° -84.375026° Tiffin River, 41.465712° -84.420311° Tiffin River, 41.465375° -84.421311° Tiffin River, 41.464790° -84.423043° Beaver Creek, 41.459292° -84.439214° Prairie Creek, 41.445084° -84.488838° Lick Creek, 41.443420° -84.568510° Dry Creek, 41.382266° -84.641755° Lost Creek, 41.378961° -84.676730° St Joseph River, 41.379888° -84.801727° St Joseph River (Slough), 41.379926° -84.804404° St Joseph River (Slough), 41.379949° -84.806128° St Joseph River, 41.375780° -84.823502° St Joseph River, 41.375538° -84.824481° Creek (Unnamed), 41.361077° -84.901974° Railroad, Coordinates Norfolk Southern, 41.360999° -84.904679° Abandoned Railroad, 41.445130° -84.526834°

Environmental impacts	Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	The final ~18 miles of this 345kV line is proposed to utilize single circuit tubular steel monopole structures. The phases are planned to be in an alternating configuration. Structures are expected to be direct embedded structures or to be supported by drilled concrete pier foundations. Tower drawings for the 345kV monopole structures are included as an attachment.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$56,157,049.00

Component cost (in-service year)	\$68,983,125.00
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Greenfield Transmission Line Component

Component title	Varner - East Fayette 138kV (Ohio)
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Project description	Company proprietary information.
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Point A	Varner
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Point B	East Fayette
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Point C	
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	Normal ratings	Emergency ratings
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Summer (MVA)	257.000000	360.000000
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Winter (MVA)	325.000000	404.000000
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Conductor size and type	1 – 795 kcmil (26/7) ACSS Drake
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Nominal voltage	AC
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Nominal voltage	138
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Line construction type	Overhead
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General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner and East Fayette substations as the two endpoints. The evaluation resulted in the Bid Route of approximately 45 miles of greenfield line through four counties (Defiance, Williams, Henry and Fulton) in Ohio. From the IN/OH State line the 138kV greenfield line travels in a predominantly eastern/northeastern direction until it reaches the existing East Fayette substation from the south. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the two existing substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.
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Terrain description	The topography along the Varner - East Fayette 138kV greenfield line in Ohio is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.
Right-of-way width by segment	The final ~15-mile segment of the route will be on single-circuit 138kV monopole structures and will require a right-of-way width of 100 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	41.445078, -84.526850, 41.474481, -84.386261
Civil infrastructure/major waterway facility crossing plan	The Varner - East Fayette 138kV greenfield line route crosses & runs parallel with a railroad, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.476008° -84.282017° Branch (Unnamed), 41.512221° -84.278307° Brush Creek, 41.521002° -84.277690° Branch (Unnamed), 41.616734° -84.280530° Branch (Unnamed), 41.625241° -84.280955° Old Bean Creek, 41.631152° -84.281249° Old Bean Creek, 41.632202° -84.281307° Bean Creek, 41.635486° -84.282062° Spring Creek, 41.670141° -84.305700° Railroad, Coordinates Norfolk Southern, 41.525562° -84.277401°
Environmental impacts	Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	The final ~15 miles of this 138kV line is proposed to utilize single circuit tubular steel monopole structures. The phases are planned to be in a alternating configuration. Structures are expected to be direct embedded structures or to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	

Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$34,704,031.00
Component cost (in-service year)	\$42,630,314.00

Greenfield Transmission Line Component

Component title	Varner - South Butler 345kV tie-in
Project description	Company proprietary information.
Point A	Varner
Point B	South Butler
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1160.000000	1160.000000
Winter (MVA)	1160.000000	1160.000000
Conductor size and type	2 – 954 kcmil (54/7) ACSR Cardinal	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The ~0.4-mile cut-in has a straight-line path to the location of the proposed Varner 345kV yard and makes a right angle turn at the final transmission line deadend to terminate into Varner.
Terrain description	The terrain for the proposed cut-in is relatively flat undeveloped land.
Right-of-way width by segment	The right-of-way width for this segment will be 150 feet.
Electrical transmission infrastructure crossings	N/A
Civil infrastructure/major waterway facility crossing plan	N/A
Environmental impacts	Land use along the cut-in corridor has residential development in the area but is not adjacent to any environmentally sensitive areas.
Tower characteristics	This single circuit 345kV line is proposed to utilize tubular steel monopole structures. The phases are planned to be in a vertical or alternating configuration. Structures are expected to be direct embedded structures or to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.

Total component cost	\$4,000,001.00
Component cost (in-service year)	\$4,913,588.00

Greenfield Transmission Line Component

Component title	Dunton Lake - South Butler 345kV tie-in to Varner	
Project description	Company proprietary information.	
Point A	Dunton Lake	
Point B	Varner	
Point C	South Butler	
	Normal ratings	Emergency ratings
Summer (MVA)	1160.000000	1160.000000
Winter (MVA)	1160.000000	1160.000000
Conductor size and type	2 – 954 kcmil (54/7) ACSR Cardinal	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The ~0.5-mile double-circuit cut-in will follow the existing drive path to the substation from the termination point on the existing line to the north of the substation.	
Terrain description	The terrain for the proposed cut-in is relatively flat undeveloped land.	
Right-of-way width by segment	The right-of-way width for this segment will be 150 feet.	
Electrical transmission infrastructure crossings	N/A	
Civil infrastructure/major waterway facility crossing plan	N/A	

Environmental impacts	Land use along the cut-in corridor has residential development in the area but is not adjacent to any environmentally sensitive areas.
Tower characteristics	This double circuit 345kV line is proposed to utilize tubular steel monopole structures with davit arms. The phases are planned to be in a vertical configuration. Structures are expected to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$6,500,002.00
Component cost (in-service year)	\$7,984,580.00
Greenfield Transmission Line Component	
Component title	Varner - Melbourne 345kV (Ohio - GGV)
Project description	Company proprietary information.
Point A	Varner
Point B	Melbourne

Point C

	Normal ratings	Emergency ratings
Summer (MVA)	1385.000000	1841.000000
Winter (MVA)	1750.000000	2092.000000
Conductor size and type	2 – 954 kcmil (54/7) ACSS Cardinal	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner substation and the greenfield Melbourne substation as the two endpoints. The evaluation resulted in the Bid Route of approximately 48 miles of greenfield line through four counties (Defiance, Williams, Henry and Fulton) in Ohio. This component represents ~30 miles of the line route located in Ohio in double-circuit structures. From the IN border, the 345kV greenfield line travels in a predominantly eastern/northeastern direction until it reaches the greenfield Melbourne substation from the west. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the existing and greenfield substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.	
Terrain description	The topography for the Indiana portion of the Varner - Melbourne 345kV greenfield line is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels in Indiana. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.	
Right-of-way width by segment	The Varner - Melbourne 345kV line will be on a shared double-circuit structure with the Varner - East Fayette 138kV line for ~30 miles of the route in Ohio and will encompass a ROW width of 130 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.	
Electrical transmission infrastructure crossings	41.372481, -84.850847	

Civil infrastructure/major waterway facility crossing plan

The Varner - Melbourne 345kV greenfield line route crosses & runs parallel with multiple railroads, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.475090° -84.289891° Creek (Unnamed), 41.474795° -84.341762° Brush Creek, 41.474783° -84.343855° Owl Creek, 41.474605° -84.375026° Tiffin River, 41.465712° -84.420311° Tiffin River, 41.465375° -84.421311° Tiffin River, 41.464790° -84.423043° Beaver Creek, 41.459292° -84.439214° Prairie Creek, 41.445084° -84.488838° Lick Creek, 41.443420° -84.568510° Dry Creek, 41.382266° -84.641755° Lost Creek, 41.378961° -84.676730° St Joseph River, 41.379888° -84.801727° St Joseph River (Slough), 41.379926° -84.804404° St Joseph River (Slough), 41.379949° -84.806128° St Joseph River, 41.375780° -84.823502° St Joseph River, 41.375538° -84.824481° Creek (Unnamed), 41.361077° -84.901974° Railroad, Coordinates Norfolk Southern, 41.360999° -84.904679° Abandoned Railroad, 41.445130° -84.526834°

Environmental impacts

Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.

Tower characteristics

The Varner - Melbourne 345kV line will be on a shared double-circuit structure with the Varner - East Fayette 138kV line for ~30 miles of the route in Ohio. The ~30 mile line segment (owned by Grid Growth Ventures) is proposed to utilize one side of double circuit self-supporting steel lattice tower structures with the phases arranged in AEP's patented BOLD configuration. All towers are expected to be supported by drilled concrete pier foundations.

Construction responsibility

Company proprietary information.

Benefits/Comments

Company proprietary information.

Component Cost Details - In Current Year \$

Engineering & design

Company proprietary information.

Permitting / routing / siting

Company proprietary information.

ROW / land acquisition

Company proprietary information.

Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$131,033,112.00
Component cost (in-service year)	\$160,960,625.00

Greenfield Transmission Line Component

Component title	Varner - East Fayette 138kV (Ohio - GGV)
Project description	Company proprietary information.
Point A	Varner
Point B	East Fayette

Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	257.000000	360.000000
Winter (MVA)	325.000000	404.000000
Conductor size and type	1 – 795 kcmil (26/7) ACSS Drake	
Nominal voltage	AC	
Nominal voltage	138	
Line construction type	Overhead	

General route description	The Proposing Entity assessed environmental and land use constraints and opportunities within an area that included the existing Varner substation and the greenfield East Fayette substation as the two endpoints. The evaluation resulted in the Bid Route of approximately 45 miles of greenfield line through four counties (Defiance, Williams, Henry and Fulton) in Ohio. This component represents ~30 miles of the line route located in Ohio in double-circuit structures. From the IN border, the 345kV greenfield line travels in a predominantly eastern/northeastern direction until it reaches the greenfield Melbourne substation from the west. No habitable structures are present within the proposed ROW. Overall, the Bid Route selected is the most direct route between the existing and greenfield substations and has the least overall impact on land use and environmental resources based on the Proposing Entity's qualitative review. The Bid Route significantly reduces the number of new access roads, enhancing overall constructability.
Terrain description	The topography along the Varner - East Fayette 138kV greenfield line in Ohio is relatively flat with some gently rolling hills. Land use in the area encompasses mostly agricultural lands with some rural residential parcels. The line crosses low density developed areas, a small amount of highly vegetated (wooded) rural land, state/county highways, railroads, streams, and existing utilities.
Right-of-way width by segment	The Varner - East Fayette 138 kV greenfield line will be on a shared tower with the Varner - Melbourne 345kV greenfield line for ~30 miles of the route in Ohio and have a ROW of 130 feet. The route will parallel/cross existing rights-of-way to include interstates, roads, railroads, existing transmission lines/utilities, existing pipelines and best minimizes potential impacts to the natural and human environments.
Electrical transmission infrastructure crossings	41.445078, -84.526850, 41.474481, -84.386261
Civil infrastructure/major waterway facility crossing plan	The Varner - East Fayette 138kV greenfield line route crosses & runs parallel with a railroad, numerous water features, and large underground pipelines. Body of Water, Coordinates Owl Creek, 41.476008° -84.282017° Branch (Unnamed), 41.512221° -84.278307° Brush Creek, 41.521002° -84.277690° Branch (Unnamed), 41.616734° -84.280530° Branch (Unnamed), 41.625241° -84.280955° Old Bean Creek, 41.631152° -84.281249° Old Bean Creek, 41.632202° -84.281307° Bean Creek, 41.635486° -84.282062° Spring Creek, 41.670141° -84.305700° Railroad, Coordinates Norfolk Southern, 41.525562° -84.277401°

Environmental impacts	Land use along the Bid Route corridor is a predominantly rural agricultural landscape with pockets of residential development. The route intersects FEMA-mapped floodplains and/or floodways, and NWI-mapped wetlands primarily adjacent to streams and low-lying areas. The route also crosses named and unnamed streams in various locations. Based on existing aerial photography, the proposed route likely has unmapped wetland or drainage features. The timing of construction will be executed in accordance with state and federal agency criteria as needed. Desktop studies and record reviews for the line route will be conducted for wetlands and streams and cultural resources prior to onsite investigations. Following field studies, data will be digitized and provided to engineering so that pole locations maximize avoidance of sensitive resources. For example, poles will be placed outside of or span wetlands, streams, and floodplains to the greatest extent possible. Existing access and roads will be utilized to access pole locations. If necessary, temporary access roads to pole locations will be identified and field surveyed for environmental and cultural resources and will be adjusted to avoid or minimize impacts.
Tower characteristics	This ~30-mile segment is proposed to utilize one side of double circuit self-supporting steel lattice tower structures with the phases arranged in AEP's patented BOLD configuration. All towers are expected to be supported by drilled concrete pier foundations.
Construction responsibility	Company proprietary information.
Benefits/Comments	Company proprietary information.
Component Cost Details - In Current Year \$	
Engineering & design	Company proprietary information.
Permitting / routing / siting	Company proprietary information.
ROW / land acquisition	Company proprietary information.
Materials & equipment	Company proprietary information.
Construction & commissioning	Company proprietary information.
Construction management	Company proprietary information.
Overheads & miscellaneous costs	Company proprietary information.
Contingency	Company proprietary information.
Total component cost	\$96,254,580.00
Component cost (in-service year)	\$118,238,796.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Company proprietary information.

Financial Information

Capital spend start date	03/2027
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Construction start date	10/2029
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Project Duration (In Months)	54
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Cost Containment Commitment

Cost cap (in current year)	Company proprietary information.
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Cost cap (in-service year)	Company proprietary information.
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Components covered by cost containment

1. Varner - Melbourne 345kV (Ohio - GGV) - PROPOSER
2. Varner - East Fayette 138kV (Ohio - GGV) - PROPOSER

Cost elements covered by cost containment

Engineering & design	Yes
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Permitting / routing / siting	No
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ROW / land acquisition	No
Materials & equipment	No
Construction & commissioning	No
Construction management	No
Overheads & miscellaneous costs	No
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Company proprietary information.
Is the proposer offering a binding cap on ROE?	No
Is the proposer offering a Debt to Equity Ratio cap?	Company proprietary information.
Additional cost containment measures not covered above	Company proprietary information.

Additional Comments

None