

# Boxwood-Bremo 138 kV Sag Study and Partial Rebuild

## General Information

Proposing entity name	AEPSCT
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	AEP_C
PJM Proposal ID	949
Project title	Boxwood-Bremo 138 kV Sag Study and Partial Rebuild
Project description	Perform a sag study and address identified locations of concern on the Boxwood-Arvonias 138 kV line. Rebuild the AEP owned portion of line between Arvonias and Dominion's Bremo station.
Email	nckoebler@aep.com
Project in-service date	06/2029
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	Rebuild between Arvonias and Bremo will address 1940s era infrastructure.

## Project Components

1. Boxwood-Bremo 138 kV Sag Study and Partial Rebuild

### Transmission Line Upgrade Component

Component title	Boxwood-Bremo 138 kV Sag Study and Partial Rebuild
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Project description	Perform full scope sag study and mitigation on the 138 kV line between Boxwood and Arvonias stations. Rebuild the AEP owned portion of the Arvonias-Bremo 138 kV line, approximately 1 mile. It is estimated that a total of 6 miles of existing line will incorporate new prop structures to mitigate sag clearance issues and allow for a higher emergency rating. Remote end settings will be adjusted as needed due to the rebuild portion.	
Impacted transmission line	Boxwood-Bremo	
Point A	Boxwood	
Point B	Bremo	
Point C	Clifford, Colleen Switch, James River, Soapstone, Scottsville, Arvonias	
Terrain description	Terrain of the line consists is a mix between mountainous and rural.	
Existing Line Physical Characteristics		
Operating voltage	138	
Conductor size and type	397 ACSR	
Hardware plan description	Existing hardware on the sag studied portion of the line will be reused except where tower replacements are required. The rebuilt section will have all existing hardware removed.	
Tower line characteristics	1940s era steel lattice towers.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	138.000000	138.000000
	Normal ratings	Emergency ratings
Summer (MVA)	167.000000	245.000000
Winter (MVA)	210.000000	271.000000
Conductor size and type	795 ACSR	
Shield wire size and type	2 - 0.646" 144 count Fiber OPGW	

Rebuild line length	1 mile
Rebuild portion description	Rebuild approximately 1 mile of line between the proposed location of Arvonja station and where the AEP ownership ends towards Brema station.
Right of way	ROW easements will be supplemented as needed to perform sag study mitigation work and the rebuild work.
Construction responsibility	AEP
Benefits/Comments	Replaces 1949 vintage structures and conductors with new infrastructure on the 1 mile rebuild portion. Note that this proposal must be executed with the Dominion rebuild as well, which is proposed by Dominion under PJM proposal ID 2024-W1-873. Ratings reflected in this proposal are the AEP only ratings.

Component Cost Details - In Current Year \$

Engineering & design	Detailed cost breakdown
Permitting / routing / siting	Detailed cost breakdown
ROW / land acquisition	Detailed cost breakdown
Materials & equipment	Detailed cost breakdown
Construction & commissioning	Detailed cost breakdown
Construction management	Detailed cost breakdown
Overheads & miscellaneous costs	Detailed cost breakdown
Contingency	Detailed cost breakdown
Total component cost	\$10,575,967.00
Component cost (in-service year)	\$10,575,967.00

**Congestion Drivers**

None

## Existing Flowgates

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-GD-W123	242563	05BOXWD	242603	05CLIFFR	1	138	205	Winter Gen Deliv	Included
2024W1-GD-W129	242563	05BOXWD	242603	05CLIFFR	1	138	205	Winter Gen Deliv	Included
2024W1-GD-W17	242563	05BOXWD	242603	05CLIFFR	1	138	205	Winter Gen Deliv	Included
2024W1-IPD-S43	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S44	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S45	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S46	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S48	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S50	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S51	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S56	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S57	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S58	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S53	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-IPD-S54	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer IPD	Included
2024W1-GD-S6	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S294	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S295	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S296	242563	05BOXWD	242603	05CLIFFR	1	138	205	Summer Gen Deliv	Included
2024W1-N1-ST77	242563	05BOXWD	242603	05CLIFFR	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST78	242563	05BOXWD	242603	05CLIFFR	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST79	242563	05BOXWD	242603	05CLIFFR	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST71	242563	05BOXWD	242603	05CLIFFR	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST63	242563	05BOXWD	242603	05CLIFFR	1	138/138	205/205	Summer Thermal	Included
2024W1-GD-S297	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S298	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S11	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer Gen Deliv	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-GD-S299	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer Gen Deliv	Included
2024W1-IPD-S55	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S63	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S66	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S75	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S76	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S78	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S72	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S81	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S82	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S59	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S60	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-IPD-S61	242603	05CLIFFR	242613	05COLLEEN SS	1	138	205	Summer IPD	Included
2024W1-N1-ST108	242603	05CLIFFR	242613	05COLLEEN SS	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST99	242603	05CLIFFR	242613	05COLLEEN SS	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST111	242603	05CLIFFR	242613	05COLLEEN SS	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST112	242603	05CLIFFR	242613	05COLLEEN SS	1	138/138	205/205	Summer Thermal	Included
2024W1-N1-ST113	242603	05CLIFFR	242613	05COLLEEN SS	1	138/138	205/205	Summer Thermal	Included
2024W1-IPD-S62	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S83	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S85	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S94	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S73	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S74	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S71	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-GD-S301	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S304	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S305	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer Gen Deliv	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-GD-S12	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer Gen Deliv	Included
2024W1-IPD-S98	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-IPD-S99	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138	205	Summer IPD	Included
2024W1-N1-ST114	242613	05COLLEEN SS	244423	05JAMES RIVR	1	138/138	205/205	Summer Thermal	Included
2024W1-IPD-S100	242792	05SCOTSV	244446	05SOAPSTONE	1	138	205	Summer IPD	Included
2024W1-GD-SNEW15	242792	05SCOTSV	999	NEWBUS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-SNEW16	242792	05SCOTSV	999	NEWBUS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-SNEW12	242792	05SCOTSV	999	NEWBUS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-SNEW24	242792	05SCOTSV	999	NEWBUS	1	138	205	Summer Gen Deliv	Included
2024W1-GD-LL1	242792	05SCOTSV	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1-GD-LL2	242792	05SCOTSV	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1-GD-LL3	242792	05SCOTSV	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1-GD-LL4	242792	05SCOTSV	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1-GD-SNEW25	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW13	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW14	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW17	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW18	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW19	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW20	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW21	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW22	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW23	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1IPDSNew138	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew139	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew140	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew141	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew142	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1IPDSNew143	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew144	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew145	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew146	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew147	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew148	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew149	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew150	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew151	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew152	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew153	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew154	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew155	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew156	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew157	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew158	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew159	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew160	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew161	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1IPDSNew162	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer IPD	Included
2024W1-GD-SNEW1	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW2	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW3	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW4	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW5	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW6	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW7	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW8	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1-GD-SNEW9	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW10	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1-GD-SNEW11	999	NEWBUS	314746	4BREMO	1	138	205/345	Summer Gen Deliv	Included
2024W1N1LLTNEW1	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Light Load Thermal	Included
2024W1N1LLTNEW2	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Light Load Thermal	Included
2024W1N1LLTNEW3	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Light Load Thermal	Included
2024W1N1LLTNEW4	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Light Load Thermal	Included
2024W1N1LLTNEW5	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Light Load Thermal	Included
2024W1GDLLNEW1	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1GDLLNEW2	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1GDLLNEW3	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1GDLLNEW4	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load Gen Deliv	Included
2024W1IPDLLNEW1	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW2	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW3	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW4	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW5	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW6	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW7	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW8	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW9	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW10	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1IPDLLNEW11	999	NEWBUS	314746	4BREMO	1	138	205/345	Light Load IPD	Included
2024W1N1STNEW1	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW2	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW3	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW4	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW5	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included



FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2024W1N1STNEW6	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW7	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW8	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW9	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW10	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1N1STNEW11	999	NEWBUS	314746	4BREMO	1	138/138	205/345	Summer Thermal	Included
2024W1-GD-S317	244446	05SOAPSTONE	242792	05SCOTSV	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S321	244446	05SOAPSTONE	242792	05SCOTSV	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S322	244446	05SOAPSTONE	242792	05SCOTSV	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S24	244446	05SOAPSTONE	242792	05SCOTSV	1	138	205	Summer Gen Deliv	Included
2024W1-IPD-S79	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer IPD	Included
2024W1-IPD-S95	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer IPD	Included
2024W1-IPD-S96	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer IPD	Included
2024W1-IPD-S101	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer IPD	Included
2024W1-GD-S306	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S314	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S315	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer Gen Deliv	Included
2024W1-GD-S17	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer Gen Deliv	Included
2024W1-IPD-S92	244423	05JAMES RIVR	244446	05SOAPSTONE	1	138	205	Summer IPD	Included

## New Flowgates

None

## Financial Information

Capital spend start date 03/2025

Construction start date 11/2028

Project Duration (In Months) 51

## Additional Comments

None