

# Black Oak 500 kV Substation: Install New Bay Position for SVC and Install Transformer High Side Breaker

## General Information

Proposing entity name	Company specific
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Yes
Company proposal ID	Company specific
PJM Proposal ID	21
Project title	Black Oak 500 kV Substation: Install New Bay Position for SVC and Install Transformer High Side Breaker
Project description	Install two new 500 kV breakers on the existing open SVC string to create a new bay position. Relocate & Re-terminate facilities as necessary to move the 500 kV SVC into the new bay position. Install a 500 kV breaker on the 500/138 kV #3 transformer. Upgrade relaying at Black Oak Substation.
Email	Company specific
Project in-service date	06/2027
Tie-line impact	No
Interregional project	No
Is the proposer offering a binding cap on capital costs?	No
Additional benefits	Adding the new SVC bay position and high side transformer breaker will prevent the Black Oak SVC from tripping for a faulted Black Oak 500/138 kV #3 transformer, faulted Black Oak 500 kV Bus, and multiple 500 kV stuck breakers.

## Project Components

1. Install two new 500 kV breakers on the existing open SVC string to create a new bay position.

2. Install a 500 kV breaker on the Black Oak 500/138 kV #3 Transformer

## Substation Upgrade Component

Component title	Install two new 500 kV breakers on the existing open SVC string to create a new bay position.
Project description	Install two new 500 kV breakers and disconnect switches on the existing open SVC string to create a new bay position. Relocate & Re-terminate facilities as necessary to move the 500 kV SVC into the new bay position. Upgrade relaying at Black Oak Substation.
Substation name	Black Oak (Bus # 235103)
Substation zone	APS (Zone 1203)
Substation upgrade scope	- Install (2) 500kV, 3000A, 50kAIC circuit breakers. - Install (4) 500kV, 3000A GOAB disconnect switches. - Install (1) lot of cables, fittings, conduits, and grounding for new equipment. - Install (2) breaker control panels (each containing (1) SEL-451 BFT). - Install (1) bus protection panel containing (2) SEL-487Bs. - Install (1) lot of control cables.

## Transformer Information

None	
New equipment description	- Install (2) 500kV, 3000A, 50kAIC circuit breakers. - Install (4) 500kV, 3000A GOAB disconnect switches. - Install (1) lot of cables, fittings, conduits, and grounding for new equipment. - Install (2) breaker control panels (each containing (1) SEL-451 BFT). - Install (1) bus protection panel containing (2) SEL-487Bs. - Install (1) lot of control cables.
Substation assumptions	- Existing AC system is adequate. - SCADA RTU and DC system to be evaluated during engineering. - Existing 500kV B Bus will have modifications for connection of the new bus similar to what was done when the SVC was connected to the A Bus. - There is adequate space in the control house for the new panels. - There may be a need for lead abatement and asbestos removal, but neither are included in this estimate.
Real-estate description	None - The existing Black Oak Substation will not need to be expanded.
Construction responsibility	Company specific
Benefits/Comments	Adding the new SVC bay position will prevent the Black Oak SVC from tripping for a faulted Black Oak 500/138 kV #3 transformer, faulted Black Oak 500 kV Bus, and multiple 500 kV stuck breakers.

## Component Cost Details - In Current Year \$

Engineering & design	This information is considered confidential and proprietary
Permitting / routing / siting	This information is considered confidential and proprietary
ROW / land acquisition	This information is considered confidential and proprietary
Materials & equipment	This information is considered confidential and proprietary
Construction & commissioning	This information is considered confidential and proprietary
Construction management	This information is considered confidential and proprietary
Overheads & miscellaneous costs	This information is considered confidential and proprietary
Contingency	This information is considered confidential and proprietary
Total component cost	\$14,116,856.48
Component cost (in-service year)	\$15,685,539.86

### **Substation Upgrade Component**

Component title	Install a 500 kV breaker on the Black Oak 500/138 kV #3 Transformer
Project description	Install a 500 kV breaker on the Black Oak 500/138 kV #3 Transformer. Upgrade relaying at Black Oak Substation.
Substation name	Black Oak (Bus # 235103)
Substation zone	APS (Zone 1203)
Substation upgrade scope	- Relocate 500kV #3 Transformer MOAB disconnect switch. - Install (1) 500kV high switch stand. - Install (1) 500kV, 3000A, 50kAIC circuit breaker. - Install (2) 500kV, 3000A GOAB disconnect switches. - Install (1) 500kV CVT (for B Bus). - Install (1) lot of cables, rigid bus, steel structures, fittings, conduits, and grounding. - Reconfigure #3 Transformer and 500kV Bus protection for the new breaker. - Update MOAB disconnect switch (BOL6A) inoperable in the normally open position. - Install (1) breaker control panel containing (1) SEL-451 BFT. - Install (2) bus protection panels (each containing (2) SEL-487Bs). - Install (1) lot of control cables and SEL cables.

### **Transformer Information**

<b>Name</b>	<b>Capacity (MVA)</b>
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Transformer	Black Oak 500/138 kV #3 Transformer	449/465 SN/SE, 529/544 WN/WE	
	<b>High Side</b>	<b>Low Side</b>	<b>Tertiary</b>
Voltage (kV)	500.00	138.00	
New equipment description	<p>- Relocate 500kV #3 Transformer MOAB disconnect switch. - Install (1) 500kV high switch stand. - Install (1) 500kV, 3000A, 50kAIC circuit breaker. - Install (2) 500kV, 3000A GOAB disconnect switches. - Install (1) 500kV CVT (for B Bus). - Install (1) lot of cables, rigid bus, steel structures, fittings, conduits, and grounding. - Reconfigure #3 Transformer and 500kV Bus protection for the new breaker. - Update MOAB disconnect switch (BOL6A) inoperable in the normally open position. - Install (1) breaker control panel containing (1) SEL-451 BFT. - Install (2) bus protection panels (each containing (2) SEL-487Bs). - Install (1) lot of control cables and SEL cables.</p>		
Substation assumptions	<p>- Existing AC/DC systems and SCADA RTU are adequate. - There is adequate space in the control house for the new panels. - There may be a need for lead abatement and asbestos removal, but neither are included in this estimate.</p>		
Real-estate description	None - Black Oak Substation does not need to be expanded.		
Construction responsibility	Company specific		
Benefits/Comments	Adding the new high side transformer breaker will prevent the Black Oak 500 kV Bus A from tripping during a Black Oak #3 500/138 kV transformer fault.		

**Component Cost Details - In Current Year \$**

Engineering & design	This information is considered confidential and proprietary
Permitting / routing / siting	This information is considered confidential and proprietary
ROW / land acquisition	This information is considered confidential and proprietary
Materials & equipment	This information is considered confidential and proprietary
Construction & commissioning	This information is considered confidential and proprietary
Construction management	This information is considered confidential and proprietary
Overheads & miscellaneous costs	This information is considered confidential and proprietary
Contingency	This information is considered confidential and proprietary

Total component cost \$3,256,664.36

Component cost (in-service year) \$3,629,261.47

### 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
2022W1-N2-VD13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD10	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD11	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD3	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD4	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD5	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD6	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD7	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD8	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD9	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD130	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD142	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD232	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD142	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD212	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD142	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD222	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD142	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD152	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD130	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD162	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD172	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD182	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD140	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD202	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD142	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD152	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD332	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD152	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD342	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD152	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included



FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD37	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD15	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD38	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD15	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD39	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD40	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD41	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD42	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD53	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD54	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD55	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD56	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM19	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD46	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM19	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD47	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM19	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD48	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included



FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM19	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD49	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD170	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM197	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD50	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD171	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM198	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD51	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD172	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD52	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD63	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD64	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD65	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD66	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM93	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD67	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD57	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD178	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD58	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD179	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD59	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD180	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD60	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD181	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD61	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD182	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD62	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD73	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD74	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD75	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD76	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM102	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD77	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM102	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD78	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM102	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM94	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD63	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM95	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD69	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM96	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD70	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM97	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD71	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM98	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD72	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM99	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM100	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM101	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM112	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM113	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM114	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM115	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM105	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD79	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM106	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included



FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM15	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM16	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM6	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM17	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM7	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM8	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM9	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM10	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM11	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM13	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM12	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM23	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM24	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM25	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM26	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM14	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included





FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VM4	2235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	3235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	4235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	5235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	6235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	9235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM6	0235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	0235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	1235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM5	2235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM6	4235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM6	5235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM1	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM6	6235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM67235103	7235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM68235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM69235103	9235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM190235103	90235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM70235103	70235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM191235103	91235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM71235103	71235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM19235103	9235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM63235103	63235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM61235103	61235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM18235103	8235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM62235103	62235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM75235103	75235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM76235103	76235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM77235103	77235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM78235103	78235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM79235103	79235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM80235103	80235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM81235103	81235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM82235103	82235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM73235103	73235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM74235103	74235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM72235103	72235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included



FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VM86	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM87	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM88	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD22	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM89	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD32	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM90	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD42	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM91	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD52	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM92	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD62	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VM83	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM84	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VM85	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-SVD10	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD11	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD12	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD13	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD14	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD15	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD16	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD17	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD82	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD92	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD72	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD21	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-SVD22	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD23	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD24	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD25	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD26	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD27	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD28	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD29	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD30	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD31	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD32	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD33	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD34	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD35	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD36	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD37	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD38	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD39	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD40	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-SVD41	235103	01BLACKO	235103	01BLACKO	1	500	201	Summer N-1-1 Voltage Drop	Included
2022W1-N2-VD130	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD132	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD133	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD134	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD139	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD182	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD182	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD182	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD192	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD872	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD882	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD892	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD902	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD912	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD922	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD832	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD842	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD852	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD862	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD932	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD992	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD1002	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD1012	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD1022	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD932	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD942	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

FG #	Fr Bus No.	From Bus Name	To Bus No.	To Bus Name	CKT	Voltage	TO Zone	Analysis type	Status
2022W1-N2-VD95	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD96	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD97	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD100	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD110	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD111	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD112	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD103	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD104	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD105	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD106	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD107	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD108	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD120	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD121	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD1	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD122	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD2	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD113	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD114	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD115	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD116	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD117	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD118	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD119	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included
2022W1-N2-VD123	235103	01BLACKO	235103	01BLACKO	1	500	201	Winter N-1-1 Voltage Drop	Included

## New Flowgates

None

## Financial Information

Capital spend start date	06/2024
Construction start date	06/2024
Project Duration (In Months)	36

## Additional Comments

None