COOKS POINT SUBSTATION AND TRANSMISSION LINE ADDITION

LCRA Transmission Services Corporation

August 16, 2016

Prepared by:

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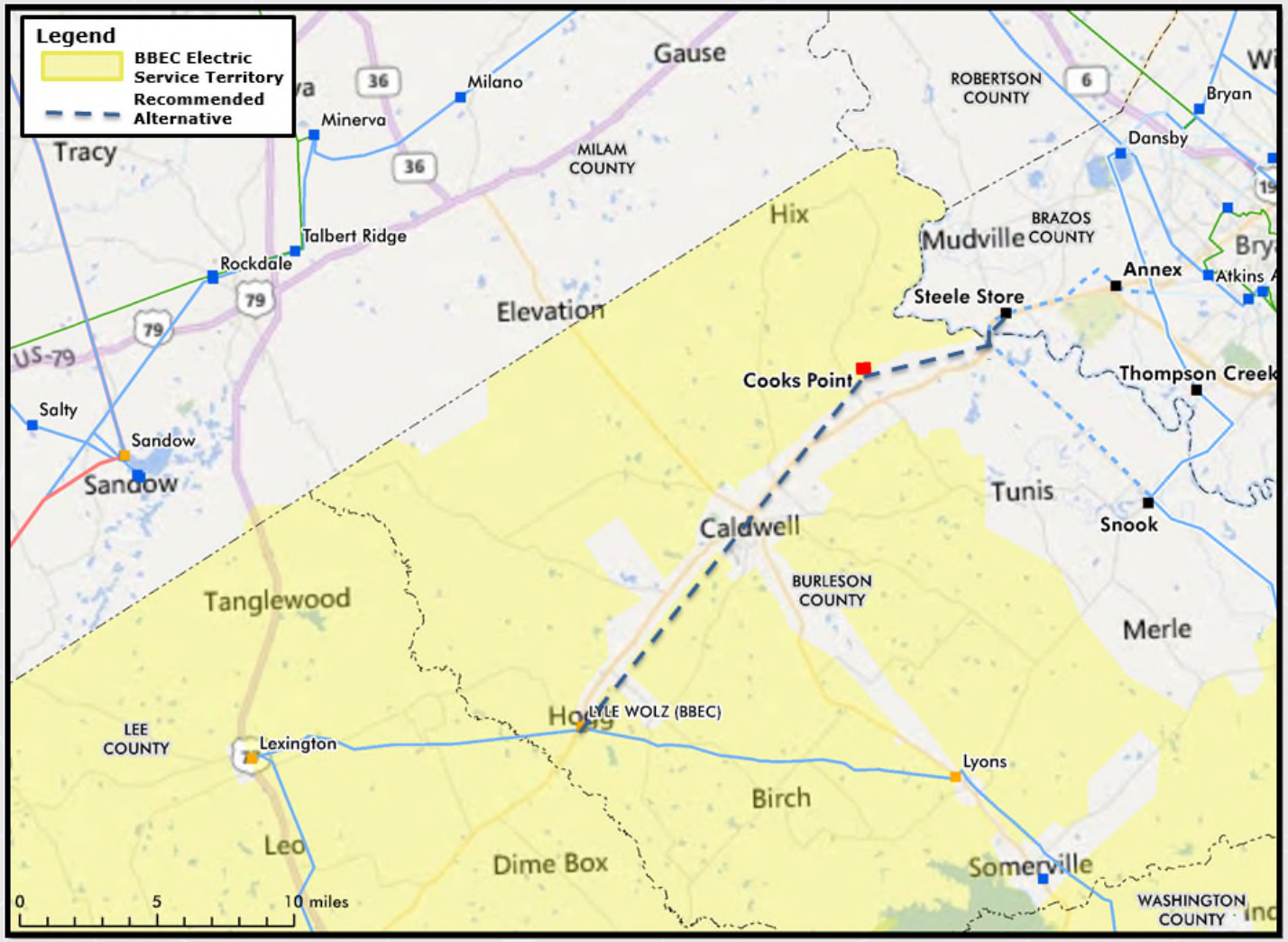
Recommended Project

- In-service date May 2021.
- Construct a new 138-kV Cooks Point substation to serve BBEC load.
- Construct a 138-kV transmission line (approximately 16.7 miles) with a minimum 440 MVA rating to connect Cooks Point to the existing Lyle Wolz substation.
- Construct a 138-kV transmission line (approximately 6.1 miles) with a minimum 495 MVA rating to connect Cooks Point to the existing Steele Store substation

Recommended Project Map



(The dashed line representing the electrical connections of the recommended alternative is not intended to represent a physical route)

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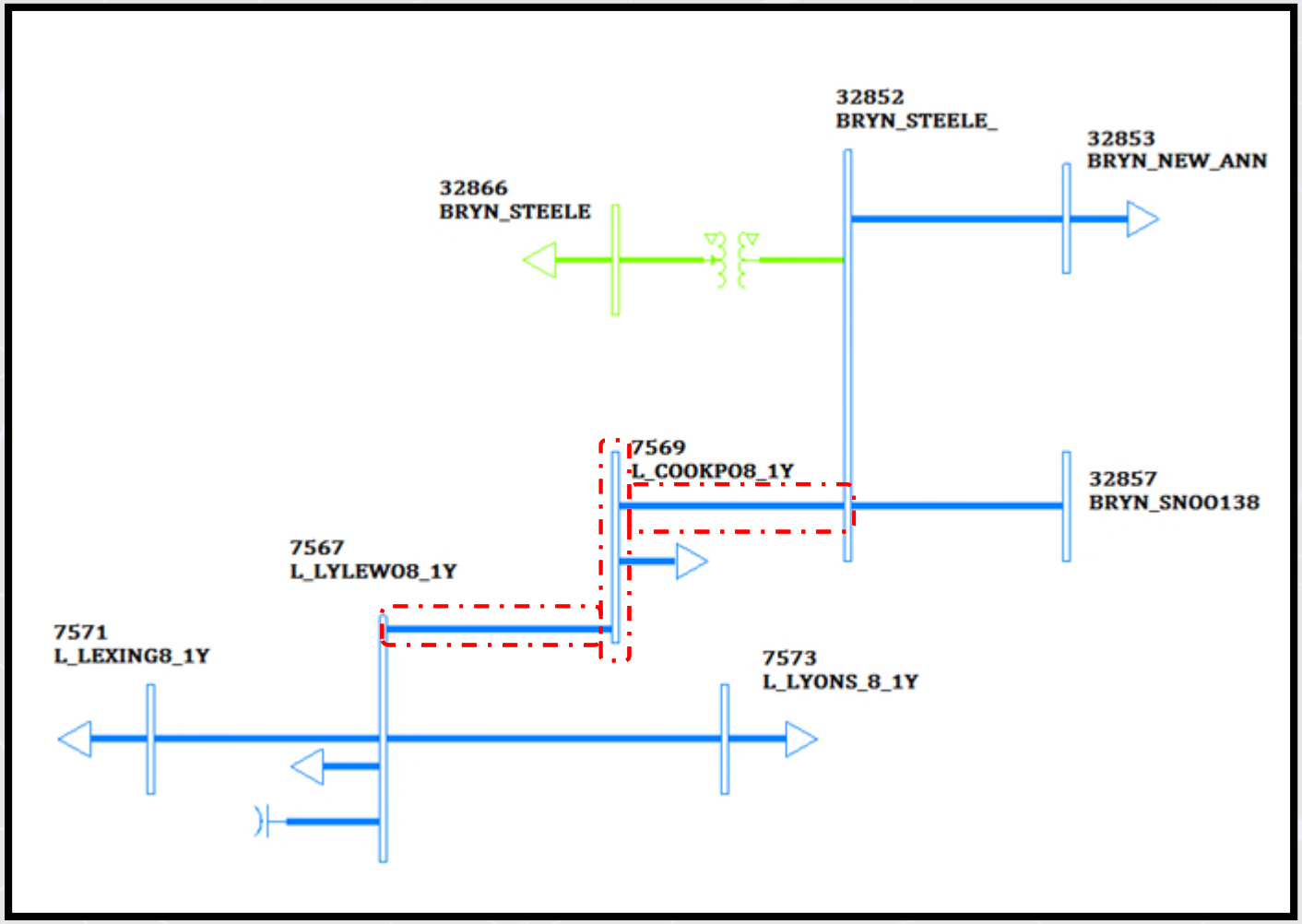
Recommended Project Diagram



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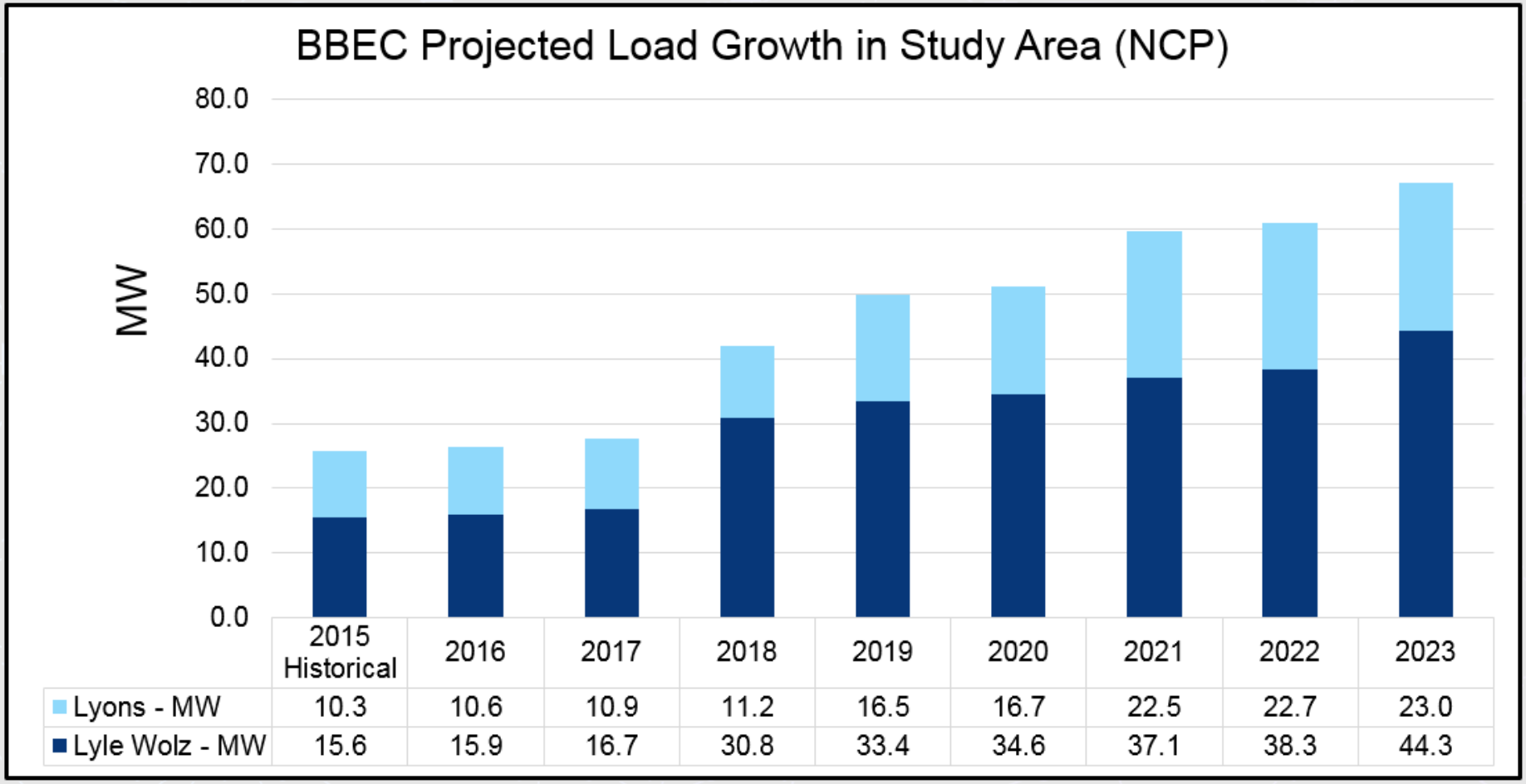
Background

- Bluebonnet Electric Cooperative (BBEC) studied the impact of load growth in northern Burleson County.
- Area is served by long distribution feeders from Lyle Wolz and Lyons substations.
- BBEC load growth is due to:
  - Ground water development for municipal water supply from Carrizo and Simsboro Aquifers
  - Woodbine-Eagle Ford (Eaglebine) oil development
- BBEC distribution system assessments show that upgrades to distribution systems will not support forecasted load growth past 2020.

Base Case Area Load Growth



	2015 Historical	2016	2017	2018	2019	2020	2021	2022	2023
Lyons - MW	10.3	10.6	10.9	11.2	16.5	16.7	22.5	22.7	23.0
Lyle Wolz - MW	15.6	15.9	16.7	30.8	33.4	34.6	37.1	38.3	44.3

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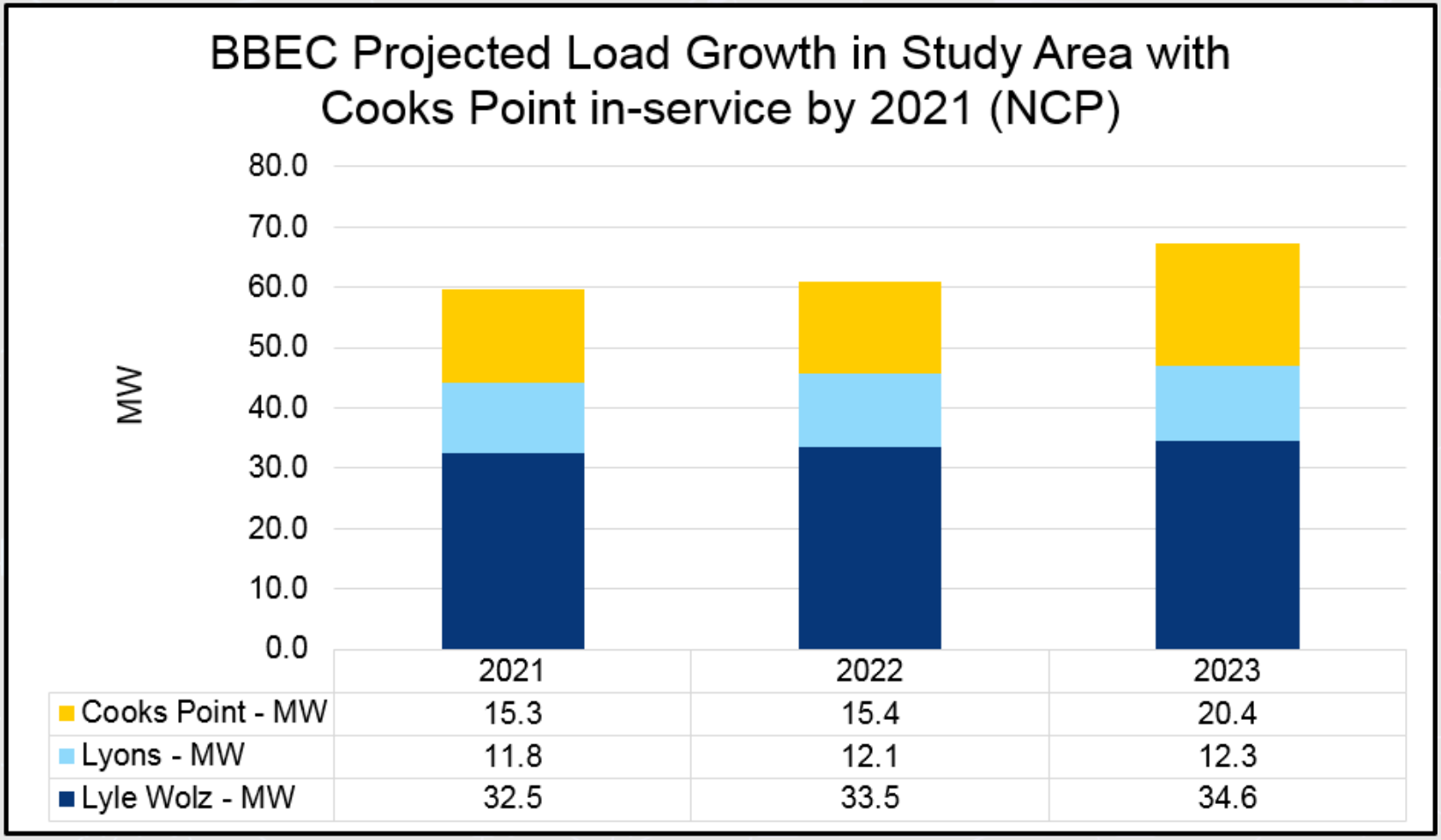
Area Load with Cooks Point



	2021	2022	2023
Cooks Point - MW	15.3	15.4	20.4
Lyons - MW	11.8	12.1	12.3
Lyle Wolz - MW	32.5	33.5	34.6

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LCRA TSC's Transmission System Planning Criteria

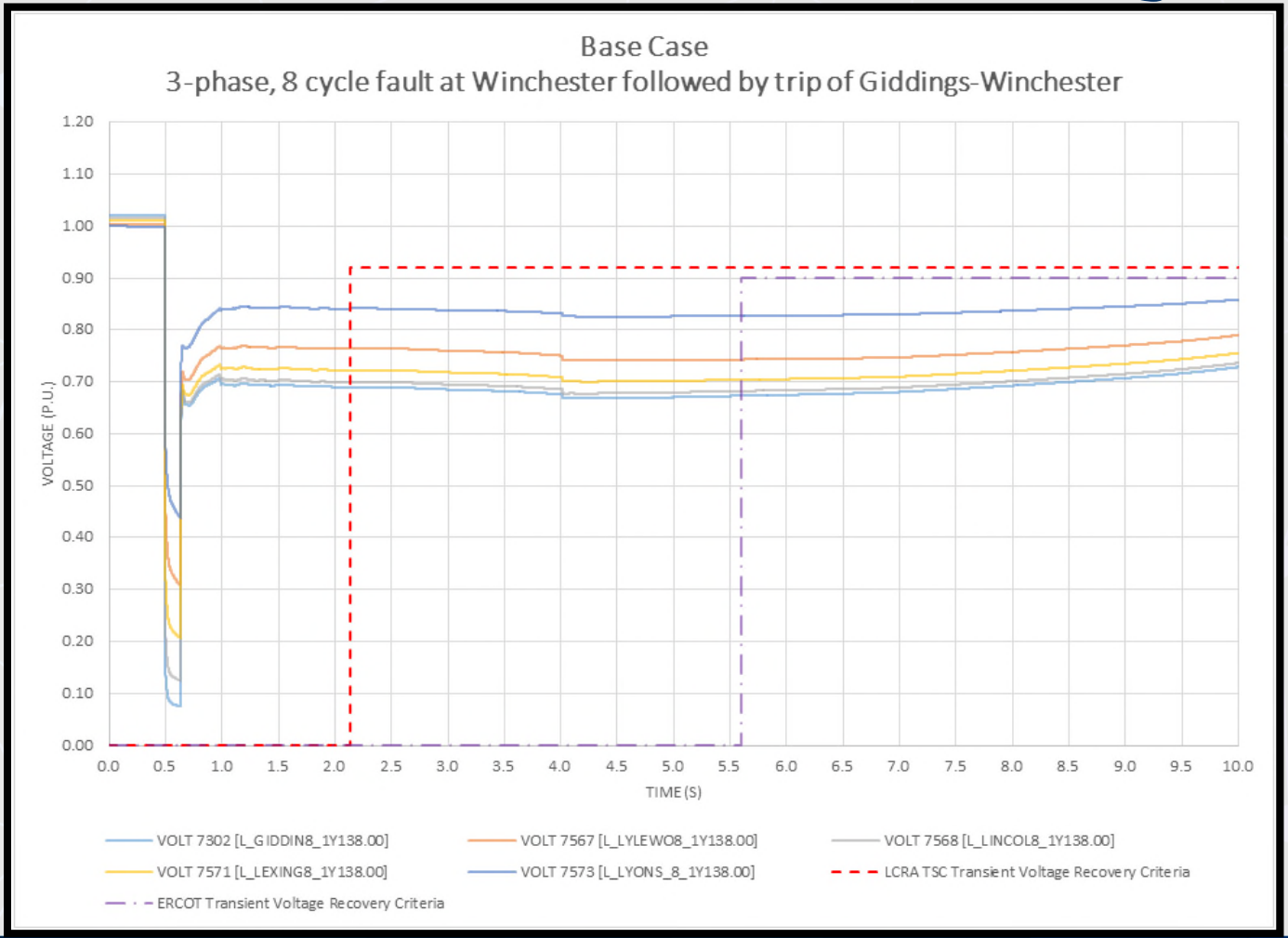
- "No more than twenty (20) MW of peak load shall be interrupted for an event resulting in the loss of a single element, except when the event is the failure of a single power transformer with a peak load greater than 20 MW."

Base Case Steady State without Cooks Point Project

2021/2022 Steady State Summary NERC P0, P1, P2.1, P3 (ERCOT2), P6.2 (ERCOT3), P7 (ERCOT1)

MONITORED ELEMENT	RATE A	RATE B	Length (mi)	Post Contingency % Loading of Rate B
7567 L_LYLEWO8_1Y138.00 7573 L_LYONS_8_1Y138.00 1	128	128	14	79.9
7572 L_GAYHIL8_1Y138.00 7573 L_LYONS_8_1Y138.00 1	128	128	11.5	98.4
7570 L_SANDHI8_1Y138.00 7572 L_GAYHIL8_1Y138.00 1	128	128	8.9	79.0
7565 L_MAXZUE8_1Y138.00 7572 L_GAYHIL8_1Y138.00 1	128	128	9	94.1
7306 L_WINCHE8_1Y138.00 7310 L_SIMGID8_1Y138.00 1	193	193	20.7	90.4

Transient Voltage Recovery without Cooks Point Project



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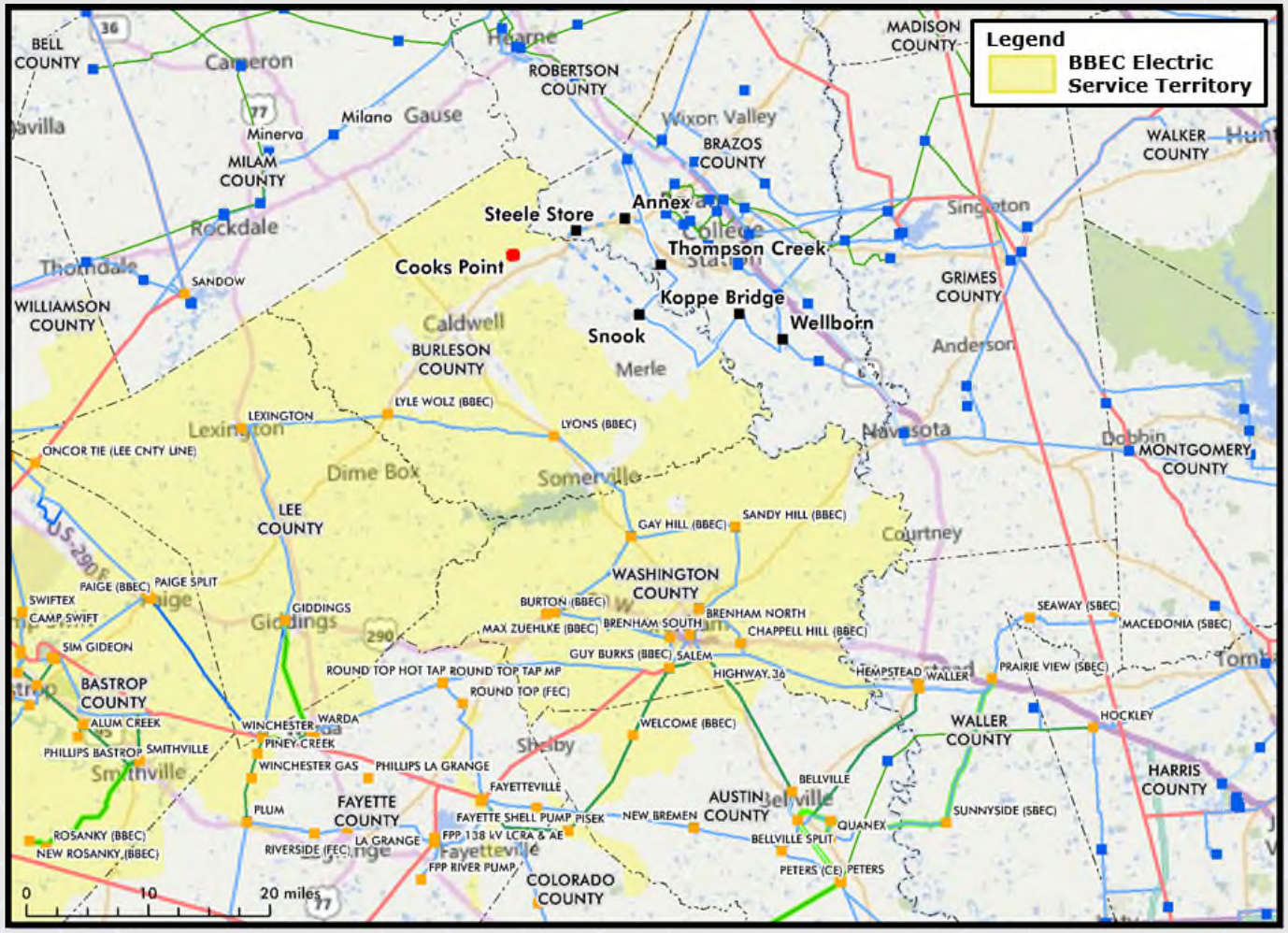
Alternatives Considered

ALT	Alternative Scope	Cost in Millions($)
1	• Steele Store to Cooks Point 138-kV Transmission Line • Cooks Point to Snook 138-kV Transmission Line	22.7
2	• Lyle Wolz to Cooks Point 138-kV Transmission Line • Cooks Point to Minerva 138-kV Transmission Line	85.7
3	• Lyle Wolz to Cooks Point 138-kV Transmission Line • Cooks Point to Sandow 138-kV Transmission Line	96.7
4	• Steele Store to Cooks Point 138-kV Transmission Line • Cooks Point to Minerva 138-kV Transmission Line	62.7
5	• Steele Store to Cooks Point 138-kV Transmission Line • Cooks Point to Sandow 138-kV Transmission Line	73.9
6	• Lyle Wolz to Cooks Point 138-kV Transmission Line • Cooks Point to Steele Store 138-kV Transmission Line	52.1

Study Area Map



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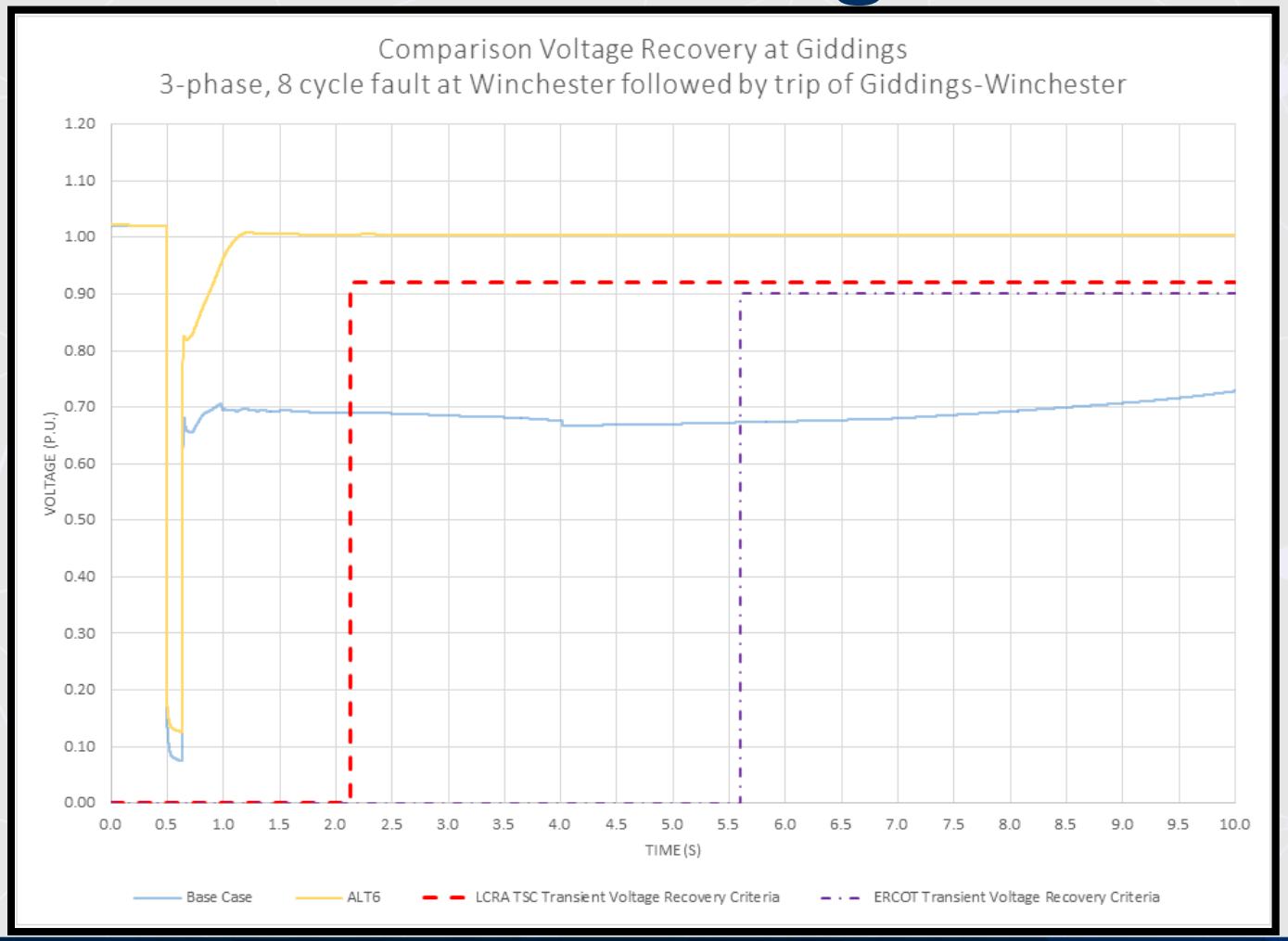
Steady State Comparison

2021/2022 Steady State Summary NERC P0, P1, P2.1, P3 (ERCOT2), P6.2 (ERCOT3), P7 (ERCOT1)

MONITORED ELEMENT	RATE A	RATE B	Length (mi)	Post Contingency % Loading of Rate B	
				BASE CASE	ALT6
7567 L_LYLEWO8_1Y138.00 7573 L_LYONS_8_1Y138.00 1	128	128	14	79.9	74.9
7572 L_GAYHIL8_1Y138.00 7573 L_LYONS_8_1Y138.00 1	128	128	11.5	98.4	65.5
7570 L_SANDHI8_1Y138.00 7572 L_GAYHIL8_1Y138.00 1	128	128	8.9	79.0	86.2
7565 L_MAXZUE8_1Y138.00 7572 L_GAYHIL8_1Y138.00 1	128	128	9	94.1	84.5
7306 L_WINCHE8_1Y138.00 7310 L_SIMGID8_1Y138.00 1	193	193	20.7	90.4	77.5

Voltage Recovery Comparison at Giddings



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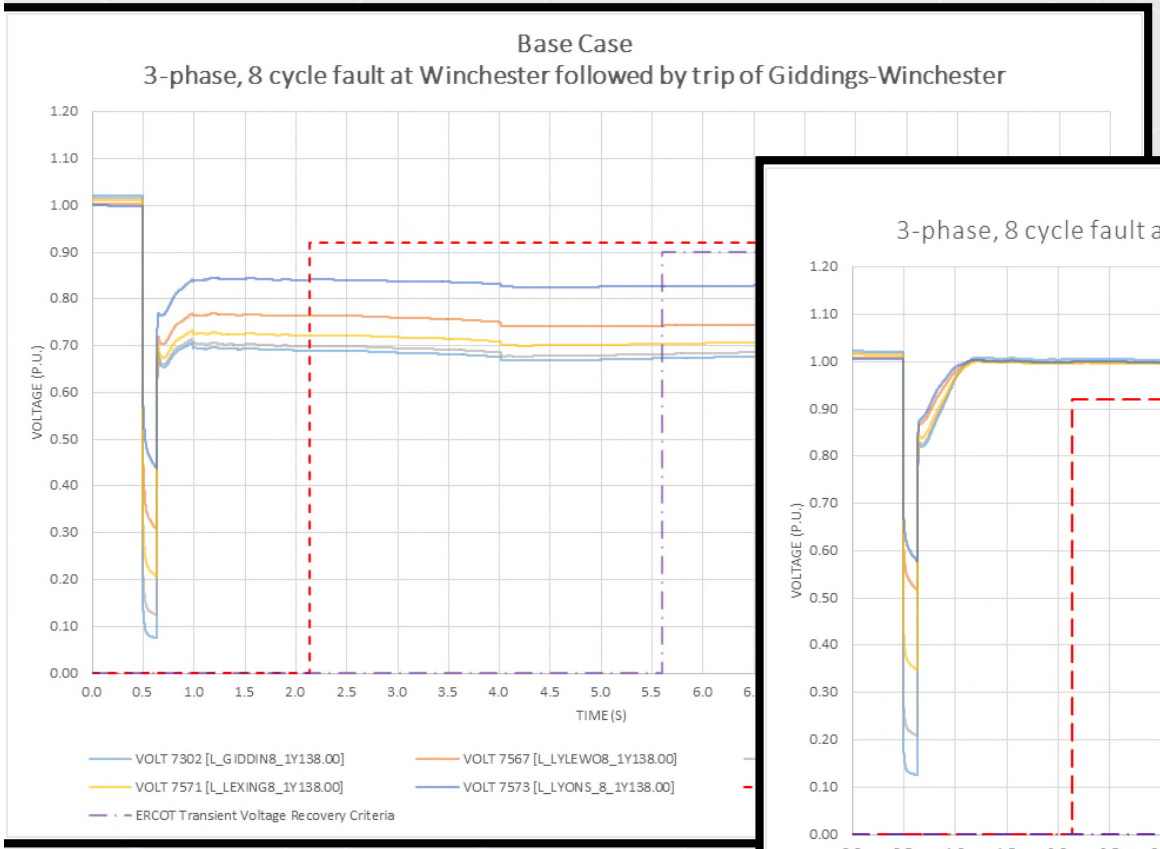
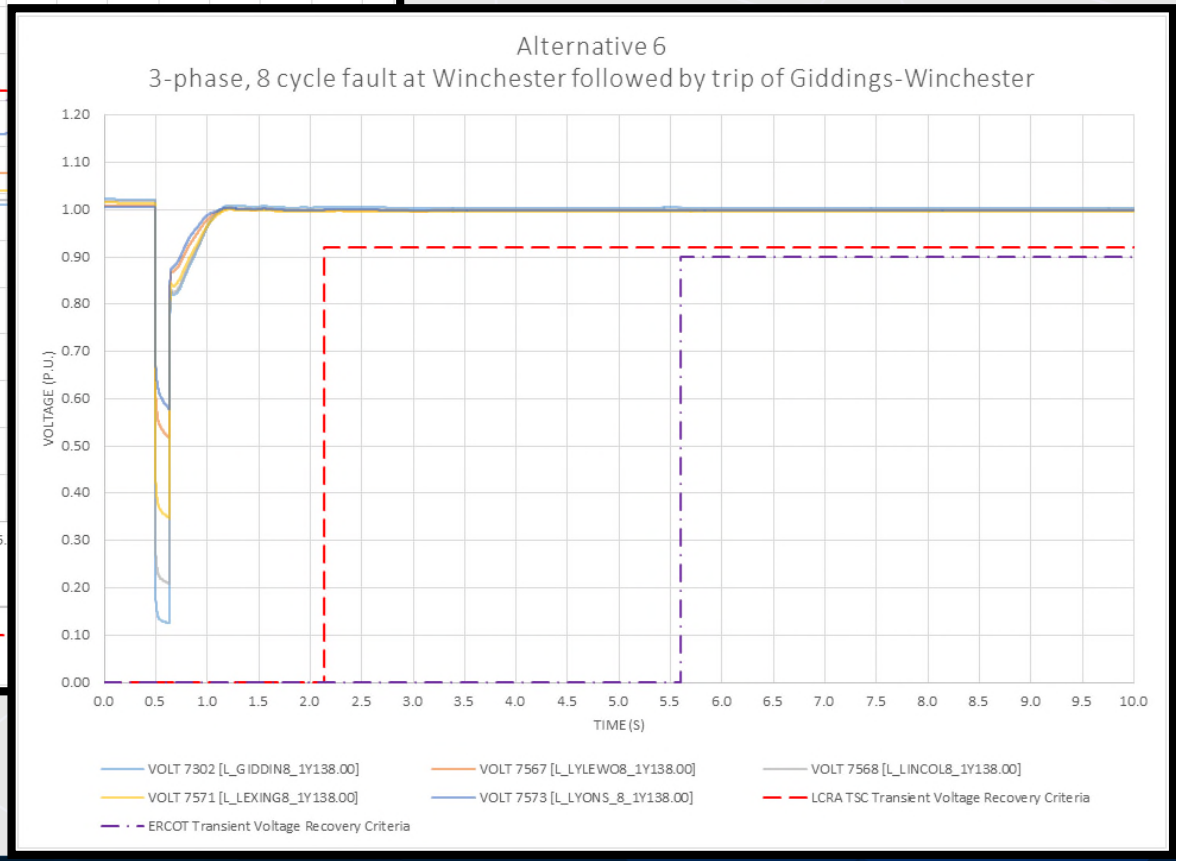
Voltage Recovery Comparison





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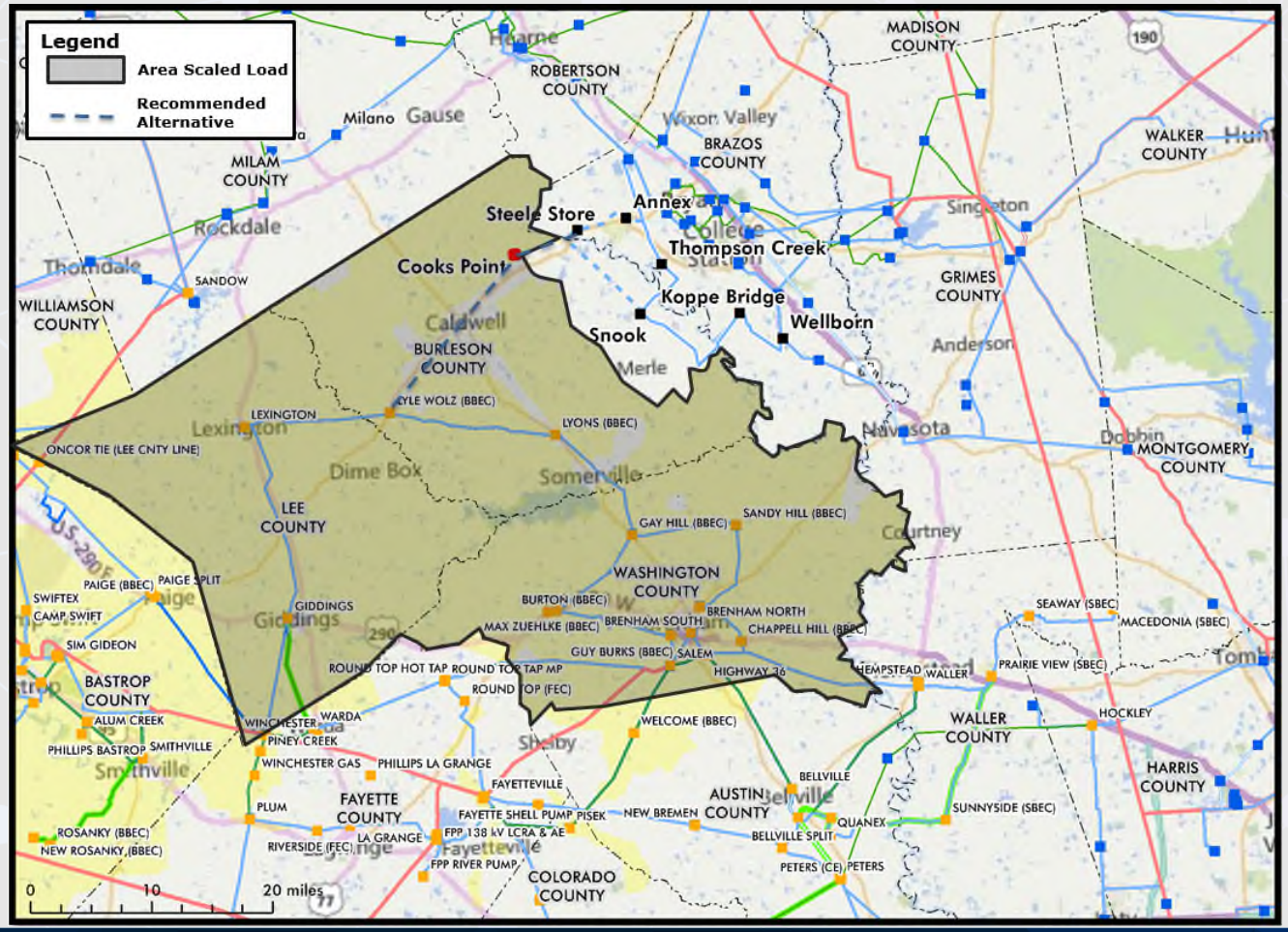
Load Loss Under Contingency

FIRST CONTINGENCY DESCRIPTION	SECOND CONTINGENCY DESCRIPTION	BASE CASE		ALT6	
		Total Load Loss (MW)	Stations Lost	Total Load Loss (MW)	Stations Lost
(B2B) - T222 GIDDINGS – WINCHESTER	(B2B) - T349 LYLE WOLZ – GAY HILL	113	5	12	1
(B2B) - T638 GIDDINGS – LINCOLN	(B2B) - T349 LYLE WOLZ – GAY HILL	79	4	12	1
ANNEX 138 TO DANSBY	GP TO WBRN	60	8	0	0
ANNEX 138 TO DANSBY	KOPPE BRIDGE TO WELLBORN	39	5	0	0
ANNEX 138 TO DANSBY	KB TO SNOOK	23	4	0	0

- Load loss in the Base Case represents the loss of service to Lee County, which includes Giddings and Lexington

Support for Long Term Load Growth

Area Scaled Load



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Support for Long Term Load Growth

- Load serving capability above the projected 2022 forecast of 266 MW in Burleson, Lee, and Washington County

Additional Load Serving Capability for 2022
NERC P1 and P7 (ERCOT1)

LIMIT TYPE	BASE CASE	ALT6
	MW	MW
THERMAL	+10	+240

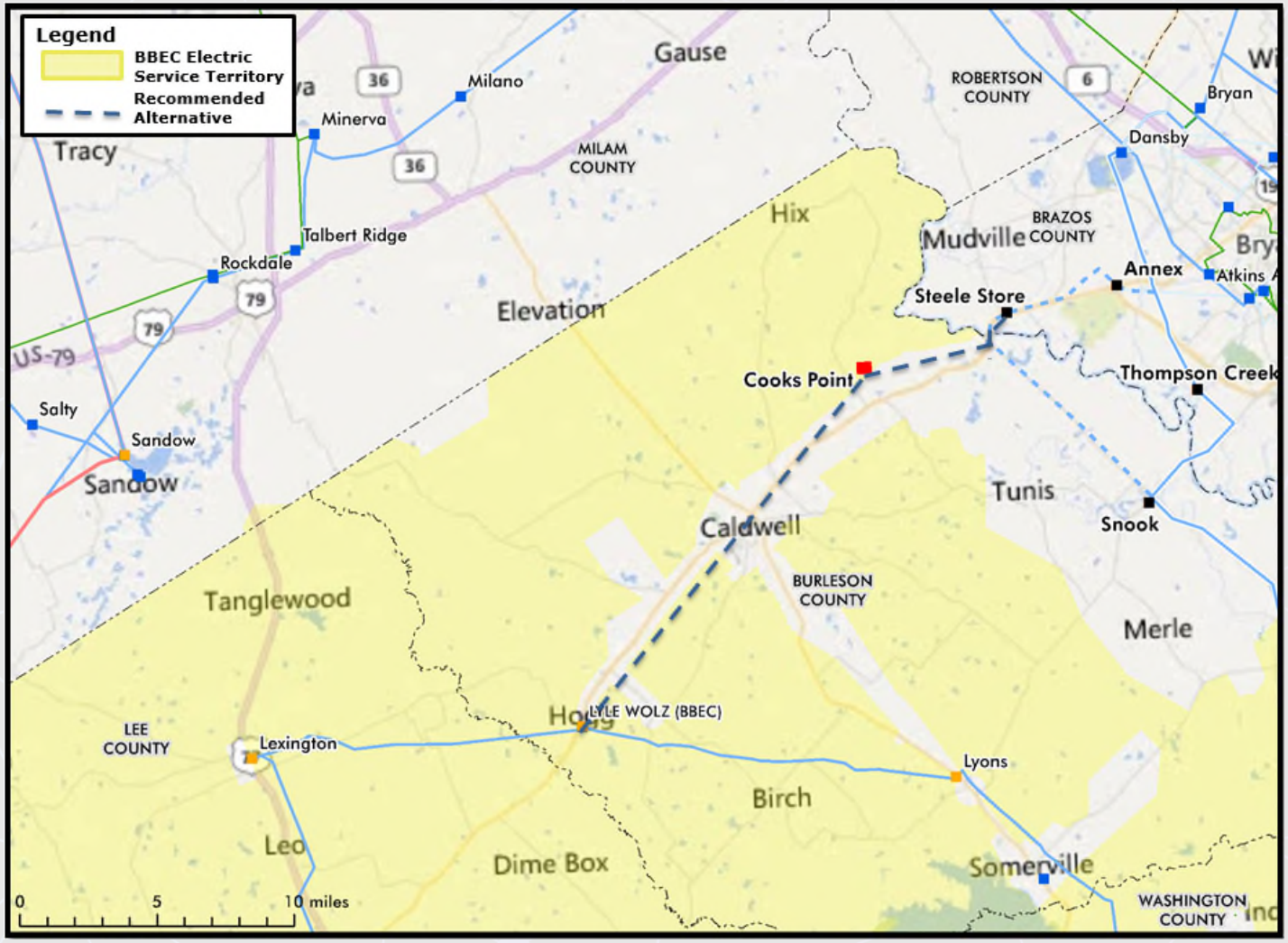
Additional Load Serving Capability for 2022
NERC P3 (ERCOT2) and P6.2 (ERCOT3)

LIMIT TYPE	BASE CASE	ALT6
	MW	MW
THERMAL	+10	+140

Project Alternative Summary

ALT	Alternative Description	Looped Transmission Service	Meets Steady State Criteria	Meets Voltage Recovery Criteria	Addresses Load Loss Concerns	Long Term Growth Benefits	Cost in Millions($)
1	Steele Store to Cooks Point; Cooks Point to Snook	YES	YES	NO	NO	NO	22.7
2	Lyle Wolz to Cooks Point; Cooks Point to Minerva	YES	YES	YES	NO	YES	85.7
3	Lyle Wolz to Cooks Point; Cooks Point to Sandow	YES	NO	YES	NO	NO	96.7
4	Steele Store to Cooks Point; Cooks Point to Minerva	YES	YES	NO	NO	NO	62.7
5	Steele Store to Cooks Point; Cooks Point to Sandow	YES	YES	NO	NO	NO	73.9
6	Lyle Wolz to Cooks Point; Cooks Point to Steele Store	YES	YES	YES	YES	YES	52.1

Questions?



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