



A Touchstone Energy® Cooperative 

INTERCONNECTION FACILITY STUDY

for

Generation Interconnection Request 2022-104

**113MW Solar Generation Interconnection
in Bryan County, OK.**

November 2025

SUMMARY

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), Western Farmers Electric Cooperative (WFEC) performed the following facility Study to satisfy the Facility Study agreement executed by the requesting customer for SPP Generation Interconnection request GEN-2022-104. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system. The requirements for interconnection consist of building a new 138kV station at the POI with breakers and relaying operating as a 3-breaker ring bus. The total cost for WFEC to accommodate the interconnection request at the 138kV POI is \$9,000,000.

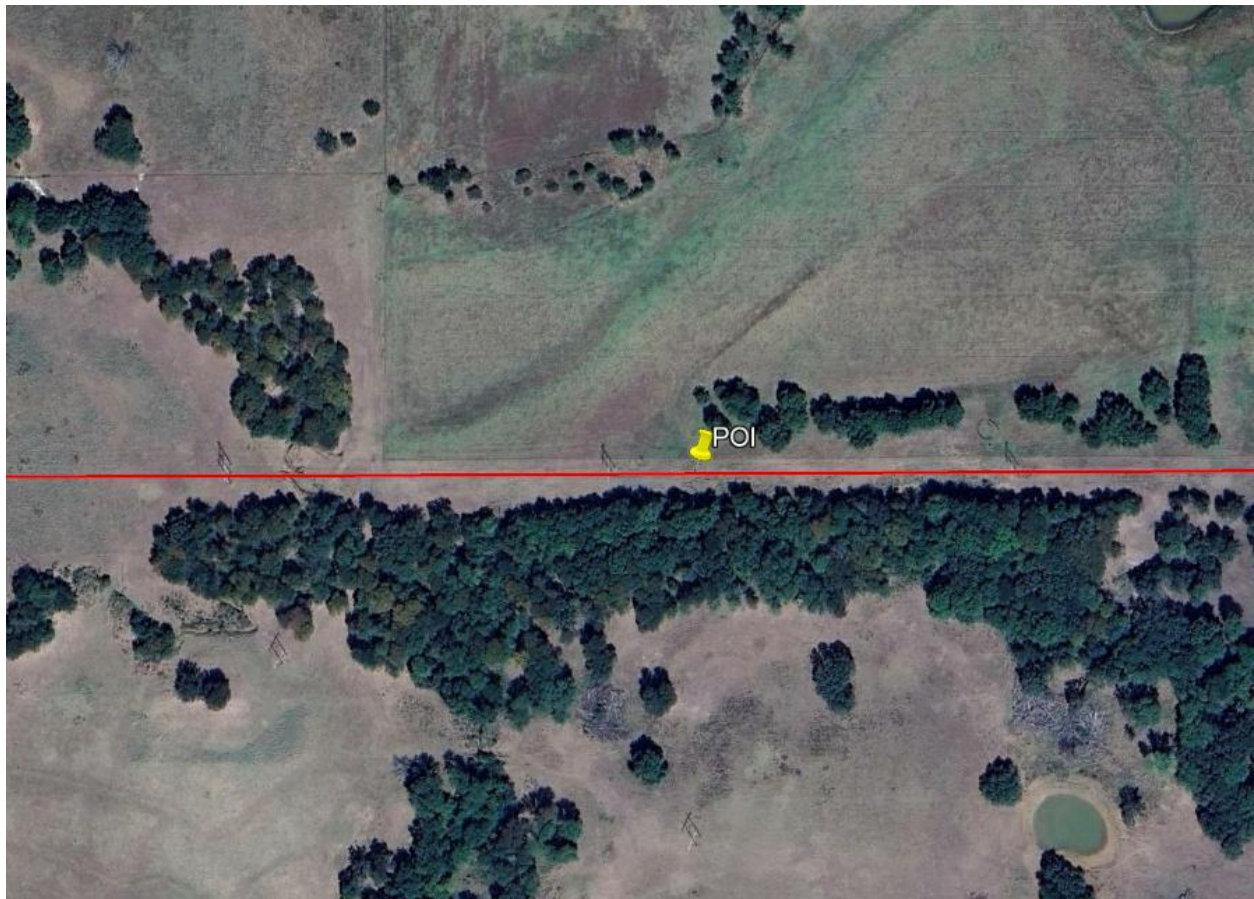


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Introduction

The Southwest Power Pool has requested a facility Study for the purpose of interconnecting 113MW of Battery/Storage within the service territory of WFEC in Bryan County, Oklahoma. The proposed 138kV POI (34° 4'48.63"N, 96°28'22.44"W) is in between Brown Switch Station and South Coleman Junction on the Brown – Hugo 138kV transmission circuit.

The cost for adding a new 138kV Switching Station (WFEC Silo Switch Station) at the POI with breakers and relaying to is estimated at \$9,000,000.

Network constraints within WFEC may be verified with a transmission service request and associated studies.

The primary objective of this study is to identify WFEC interconnection facilities. Figure 1 below shows the proposed interconnection of GEN-2022-104.



To accommodate an interconnection for GEN 2022-104 WFEC will construct a new 138kV three-breaker ring bus, equipping a terminal for the following three lines: SWPA Brown 138kV, WFEC Hugo 138kV, and the customer's GEN-2022-104 138kV interconnecting transmission line. The customer will construct a new 138kV transmission line from their collector sub to the point of demarcation. WFEC will require the customer to install OPGW for communications from Customer's collector sub to WFEC's switch station.

The total cost for the interconnection facilities at POI is estimated at \$9,000,000. This cost does not include the construction of the 138kV line from the customer substation to the point of demarcation at the edge of WFEC's property. The customer is responsible for this 138kV line up to the point of interconnection.

This facility study does not guarantee the availability of transmission service necessary to deliver additional generation to any specific point inside or outside of the SPP transmission system. The transmission network facilities may not be adequate to deliver any additional generation output to the system. If the customer requests firm transmission service under the SPP open access transmission tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP OATT.

Short Circuit Fault Duty Evaluation:

It is standard practice for WFEC to recommend replacing a circuit breaker when the current through the breaker for a potential fault exceeds 100% of its interrupting rating, as determined by the ANSI/IEEE standard C37-010-2016 breaker rating methods. Existing levels of available fault current at the nearby Brown 138kV station is shown below. As an inverter-based resource (IBR) the maximum fault current contribution is estimated at 1.4 times peak load current of the Inverter during the subtransient period. This equates to an increase in available fault current of approximately 660A at the POI (Silo Switch Station), so no breakers are expected to exceed capacity with the proposed interconnection.

WFEC has evaluated the potential maximum fault current in this area and no issues with short circuit duty ratings are expected on existing WFEC breakers with the proposed interconnection of 113MW of solar generation on the Brown – South Coleman Junction 138kV transmission line.

Table 1: Brown Switch Station 138kV Breaker Capacity

BUS	BREAKER	DUTY %	DUTY (A)	BKR CAPACITY (A)
Brown 138kV	138kV Breakers (x3) (12, 62, 72)	36%	22500 (2LG)	40000

Interconnection Cost

Table 2: Transmission Owner Interconnection Facilities

Transmission Owner Interconnection Facilities (TOIF)		Cost Estimate (\$)	Estimated Lead Time
UID: 158080			
<u>WFEC Silo Switch Interconnection Substation:</u> Construct one 138kV line terminal, line switches, dead end structures, line relaying, communications, revenue metering, line arrestors, and all associated equipment and facilities necessary to accept transmission line from Interconnection Customer’s Generating Facility.	Engineering: \$ 100,000 ROW: \$ 100,000 Material: \$ 900,000 <u>Construction: \$ 900,000</u> TOTAL: \$ 2,000,000	60 Months	

Table 3: Non-Shared Network Upgrades

Non-Shared Network Upgrades Description		Cost Estimate (\$)	Estimated Lead Time
UID: 158081			
<u>WFEC Silo Switch Interconnection Substation:</u> Construct 138kV three-terminal ring bus, 2000A continuous rating, 40kA short circuit rating, breakers (3), terminate existing WFEC Brown-Hugo 138kV transmission line, switches, foundations, overhead static, ground grid, gravel, grading, fence, acquire land, line relaying and communications.	Engineering: \$ 350,000 ROW: \$ 350,000 Material: \$ 3,150,000 <u>Construction: \$ 3,150,000</u> TOTAL: \$ 7,000,000	60 Months	



FACILITY STUDY

for

DISIS-2022-001 Upgrade Request UID: 172088

Woodward 138/69kV Transformer CT Tap Adjustment
Woodward County
Oklahoma

July 29th, 2026

Benjamin Sasu.
Senior Transmission Planning Engineer
OG&E Electric Services

Summary

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), Oklahoma Gas and Electric (OG&E) performed the following Facility Study to satisfy the Facility Study Agreement executed by the requesting customer for SPP DISIS-2022-001 UID 172088. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff. The requirement consists of Woodward 138/69kV Transformer CT Tap Adjustment to be established by UID 172088. The total cost for OKGE to complete the necessary work is estimated at **\$30,000**.

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of Adjusting the Transformer CT TAP at Woodward 138/69kV within the service territory of OKGE Electric services (OKGE) in Woodward County Oklahoma. The cost for this upgrade at Woodward Substation is estimated at **\$30,000**.

Network Constraints in the Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Other Network Constraints in the American Electric Power West (AEPW), Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Interconnection Facilities

The primary objective of this study is to identify attachment facilities. The requirements for this upgrade consist of testing and Adjusting the Transformer CT TAP at Woodward 138/69kV.

The total cost for OKGE to complete the work is estimated at **\$30,000**.

This Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the Southwest Power Pool (SPP) transmission system. The transmission network facilities may not be adequate to deliver the additional generation output to the transmission system. If the customer requests firm transmission service under the SPP Open Access Transmission Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP OATT.

The cost of testing and Adjusting Transformer CT TAP at Woodward 138/16kV is listed in Table 1.

Short Circuit Fault Duty Evaluation

It is standard practice for OG&E to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its interrupting rating with re-closer de-rating applied, as determined by the ANSI/IEEE C37.5-1979, C37.010-1979 & C37.04-1979 breaker rating methods.

For this line rebuild, no breakers were found to exceed their interrupting capability after the addition of the new equipment. OG&E found no breakers that exceeded their interrupting capabilities on their system. Therefore, there is no short circuit upgrade costs associated with UID 172088 interconnection

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2026 DOLLARS)
Lead Time	6 months
OKGE – Interconnection Facilities-	\$0
OKGE – Network Upgrades- Woodward 138/69kV Transformer CT Tap Adjustment	\$30,000
OKGE - Right-of-Way for 138kV terminal addition	No Additional ROW
Total	\$30,000

Prepared by:
Benjamin Sasu.
Senior Transmission Planning Engineer
sasube@oge.com

July 29th, 2026

Reviewed by:
Adam Snapp, P.E.
Director - Transmission Planning
snappad@oge.com

July 29th, 2026

UFTVTV





FACILITY STUDY

for

DISIS-2022-001 Network Upgrade Request UID: 170698

Line Rebuild between WOODWRD4 TO WINDFARM4 138Kv Line 1
Harper County
Oklahoma

November 5th, 2025

Benjamin Sasu.
Senior Transmission Planning Engineer
OG&E Electric Services

Summary

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), Oklahoma Gas and Electric (OG&E) performed the following Facility Study to satisfy the Facility Study Agreement executed by the requesting customer for SPP DISIS-2022-001 UID 170698. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff. The requirement for network upgrades and rebuilding line between Woodward District to Windfarm Switching Station to a minimum of 478MVA to be established by UID 170698. The total cost for OKGE to complete the necessary work is estimated at **\$18,105,000**

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of rebuilding the 138kV line transmission line between Woodward District to Windfarm Switching Station Substations within the service territory of OKGE Electric services (OKGE) in Harper County Oklahoma. The cost for network upgrades and rebuilding the line, and associated equipment's at WOODWRD4 Substation and WINDFARM4 Substation is estimated at **\$18,105,000.**

Network Constraints in the Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Other Network Constraints in the American Electric Power West (AEPW), Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Interconnection Facilities

The primary objective of this study is to identify attachment facilities. The requirements for rebuilding the 138kV line consists of replacing existing transmission poles and installing 12 miles of transmission conductor. This 138kV rebuild shall be constructed and maintained by OKGE..

The total cost for OKGE to complete the work is estimated at **\$18,105,000**.

This Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the Southwest Power Pool (SPP) transmission system. The transmission network facilities may not be adequate to deliver the additional generation output to the transmission system. If the customer requests firm transmission service under the SPP Open Access Transmission Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP OATT.

The cost of network upgrades and rebuilding the 12 miles, 138kV line of the OKGE transmission system is listed in Table 1.

Short Circuit Fault Duty Evaluation

It is standard practice for OG&E to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its interrupting rating with re-closer de-rating applied, as determined by the ANSI/IEEE C37.5-1979, C37.010-1979 & C37.04-1979 breaker rating methods.

For this line rebuild, no breakers were found to exceed their interrupting capability after the addition of the new equipment. OG&E found no breakers that exceeded their interrupting capabilities on their system. Therefore, there is no short circuit upgrade costs associated with UID 170698 interconnection

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2025 DOLLARS)
Lead Time	36 months
OKGE – Interconnection Facilities-	\$0
OKGE – Network Upgrades- Rebuild 13.7 miles of 138kV transmission line from Cottonwood Creek to Crescent Substation	\$18,105,000
OKGE - Right-of-Way for 138kV terminal addition	No Additional ROW
Total	\$18,105,000

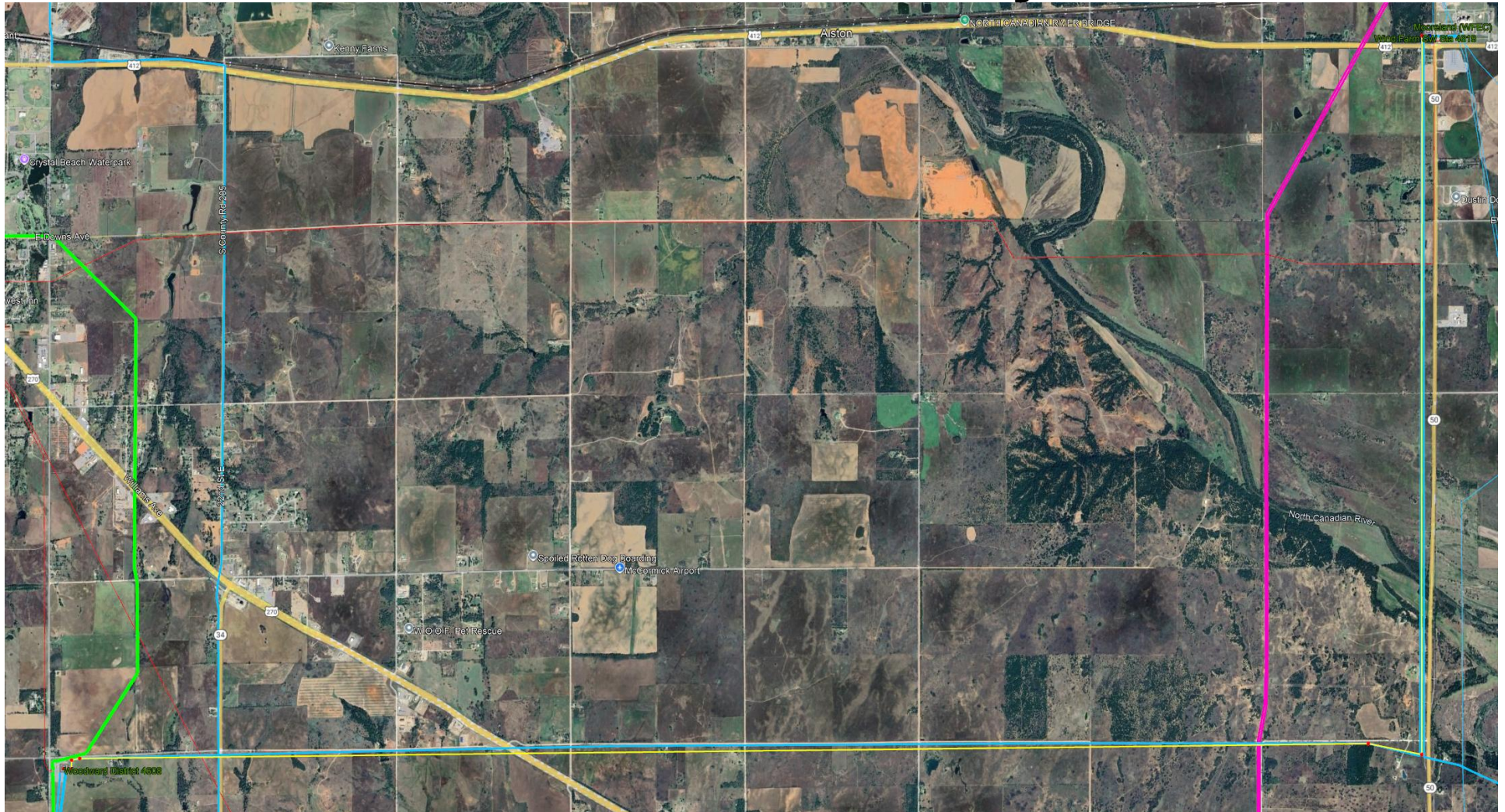
Prepared by:
Benjamin Sasu.
Senior Transmission Planning Engineer
sasube@oge.com

November 5th, 2025

Reviewed by:
Adam Snapp, P.E.
Senior Manager- Transmission Planning
snappad@oge.com

November 5th, 2025

Woodward District to Windfarm Switching Station





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FACILITY STUDY FOR NETWORK UPGRADES

**as Requested by Southwest Power Pool
(SPP)**

DISIS-2022-001

November 2025

Summary

The Southwest Power Pool (SPP or Transmission Provider) evaluated the generation facilities requesting to interconnect to Western Farmers Electric Cooperative (WFEC or Transmission Owner) transmission system in the Definitive Interconnection System Impact Study (DISIS-2022-001). The requests for interconnection were placed with SPP in accordance with the Scope of Interconnection Facilities Study GIP Section 8.10 and the Interconnection Facilities Study Procedures in accordance with GIP Section 8.11.

To accommodate the Interconnection Customer's (IC) requests, SPP identified multiple network upgrades required as part of the DISIS study results. WFEC performed this Facility Study for the Network Upgrades. The table below identifies the specific transmission elements impacted and addressed in this Facility Study along with the projected project duration for completing the specific upgrade.

Table 1: Cost Estimate for Network Upgrades

Upgrade Name	SCERT UID	TO Estimated Cost	Project Time Estimate (months)
Twin Lakes Junction to Twin Lakes Switch Station 138kV Line Rebuild	170699	\$6,795,000	36
Caney Creek to Texoma Junction 138kV Line Rebuild	170700	\$500,000	36
Jensen to El Reno Switch Station 138kV Line Rebuild	170703	\$1,863,000	36
Crescent to Twin Lakes Switch Station 138kV Line Rebuild	170706	\$2,826,000	36
Kiersey to Colbert 138kV Line Rebuild	170708	\$8,001,000	36

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Description of Network Upgrades

Table 2: Twin Lakes Switch Station – Twin Lakes Junction & Twin Lakes Switch Station – OG&E Crescent Cost Estimate

Shared Network Upgrades Description	Cost Estimate (\$)	Estimated Lead Time
UID: 170699		
<u>Twin Lakes Switch – Twin Lakes Junction 138kV Line</u> <u>Rebuild:</u> Rebuild 7.55 miles of 138kV transmission from Twin Lakes Switch to Twin Lakes Junction.	Engineering: \$ 339,750.00 ROW: \$ 339,750.00 Material: \$ 3,057,750.00 Construction: \$ 3,057,750.00 TOTAL: \$ 6,795,000.00	36 Months

Shared Network Upgrades Description	Cost Estimate (\$)	Estimated Lead Time
UID: 170706		
<u>WFEC Twin Lakes SW – OG&E Crescent 138kV Line</u> <u>Rebuild:</u> Rebuild 3.14 miles of 138kV transmission from WFEC Twin Lakes Switch to OG&E Crescent.	Engineering: \$ 141,300.00 ROW: \$ 141,300.00 Material: \$ 1,271,700.00 Construction: \$ 1,271,700.00 TOTAL: \$ 2,826,000.00	36 Months

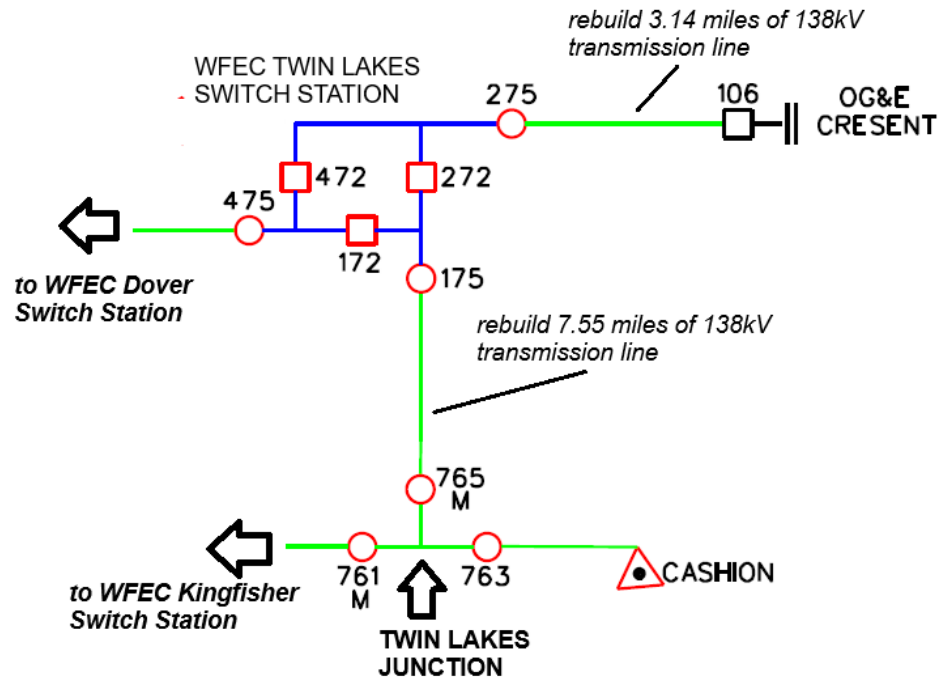


Figure 1: One-line Diagram: Twin Lakes Switch Station – OG&E Crescent 138kV & Twin Lakes Switch Station to Twin Lakes Junction

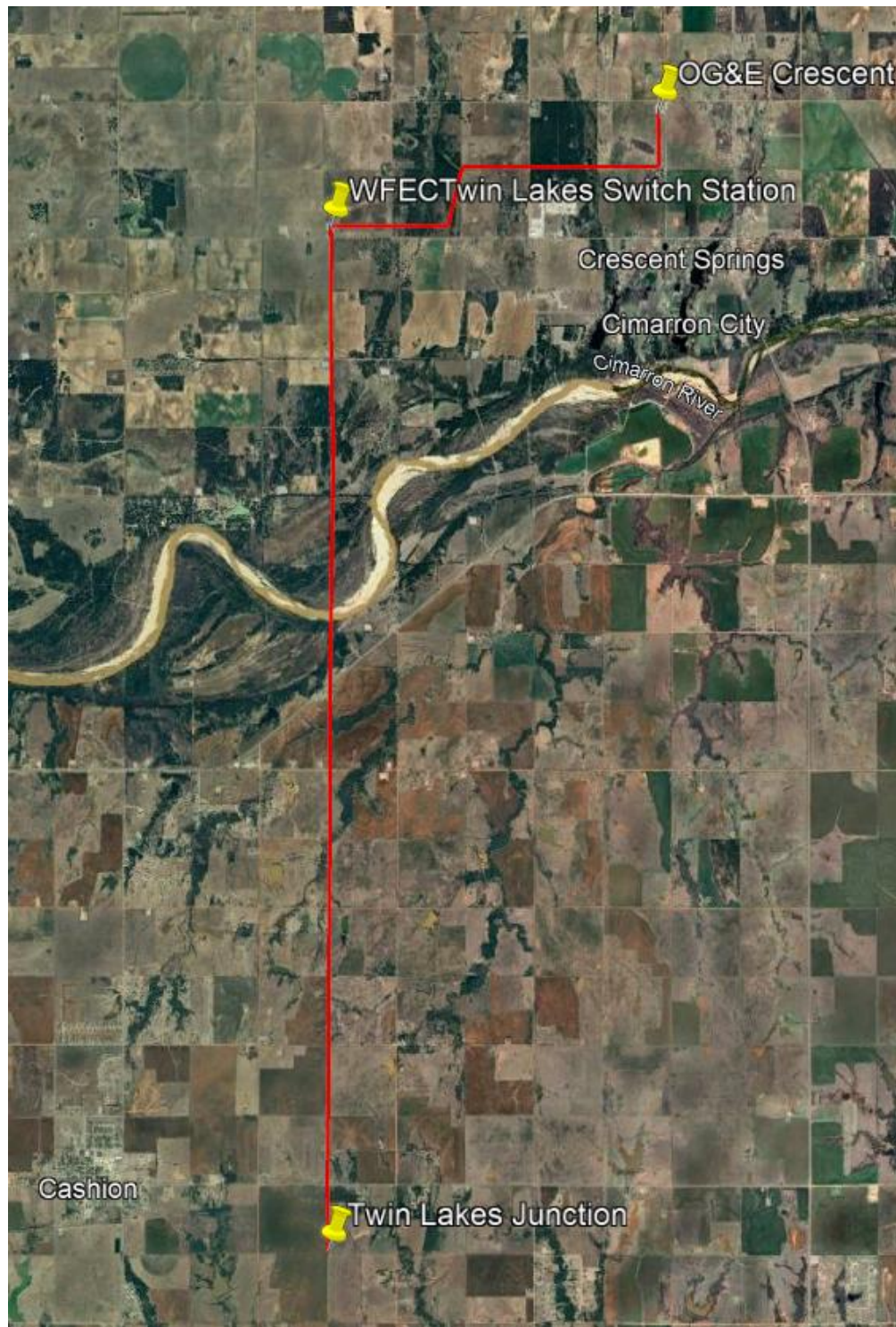


Figure 2: Geographic: Twin Lakes Switch Station – OG&E Crescent 138kV & Twin Lakes Switch Station to Twin Lakes Junction

Table 3: Texoma Junction – OG&E Caney Creek Cost Estimate

Shared Network Upgrades Description	Cost Estimate (\$)	Estimated Lead Time
UID: 170703		
WFEC Texoma Junction – OG&E Caney Creek 138kV Line Rebuild: Rebuild 0.17 miles of 138kV transmission from WFEC Texoma Junction to OG&E Caney Creek.	Engineering: \$ 25,000 ROW: \$ 25,000 Material: \$ 225,000 Construction: \$ 225,000 TOTAL: \$ 500,000	36 Months

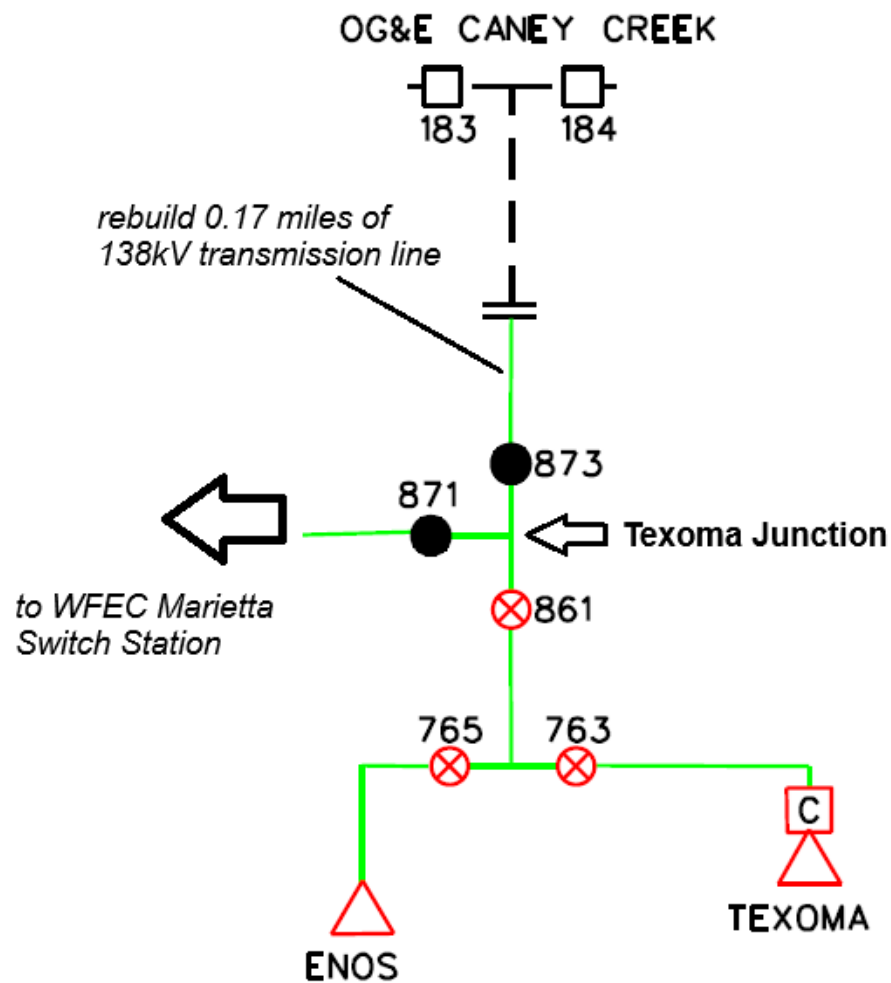


Figure 3: One-line Diagram: Texoma Junction – OG&E Caney Creek 138kV

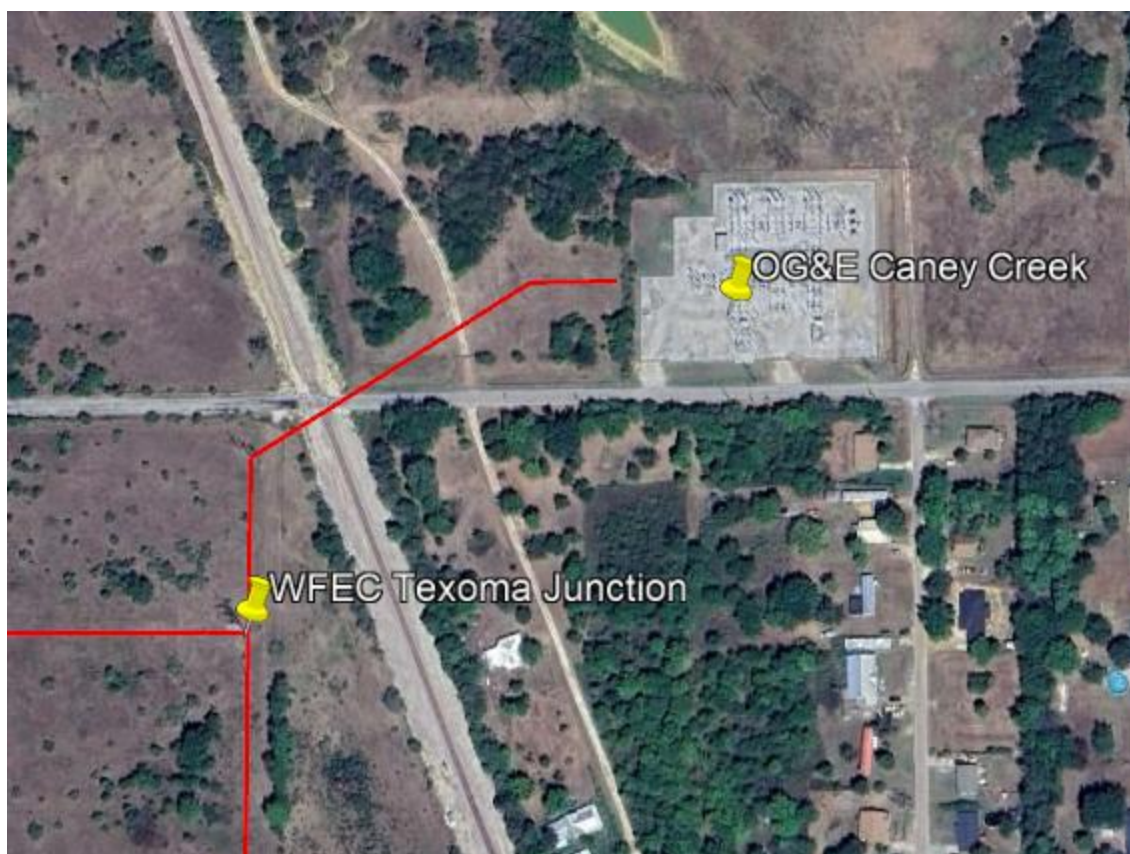


Figure 4: Geographic: Texoma Junction – OG&E Caney Creek 138kV

Table 4: El Reno Switch Station – OG&E Jensen Cost Estimate

Shared Network Upgrades Description	Cost Estimate (\$)	Estimated Lead Time
UID: 170703		
WFEC El Reno SW – OG&E Jensen 138kV Line Rebuild: Rebuild 2.07 miles of 138kV transmission from WFEC El Reno Switch to OG&E Jensen.	Engineering: \$ 93,150.00 ROW: \$ 93,150.00 Material: \$ 838,350.00 <u>Construction: \$ 838,350.00</u> TOTAL: \$1,863,000.00	36 Months

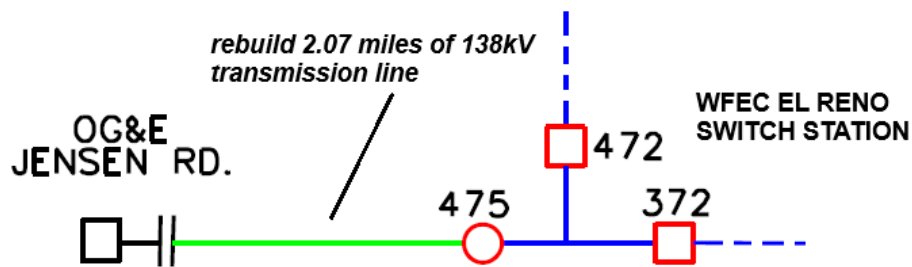


Figure 5: One-line Diagram: El Reno Switch Station – OG&E Jensen 138kV

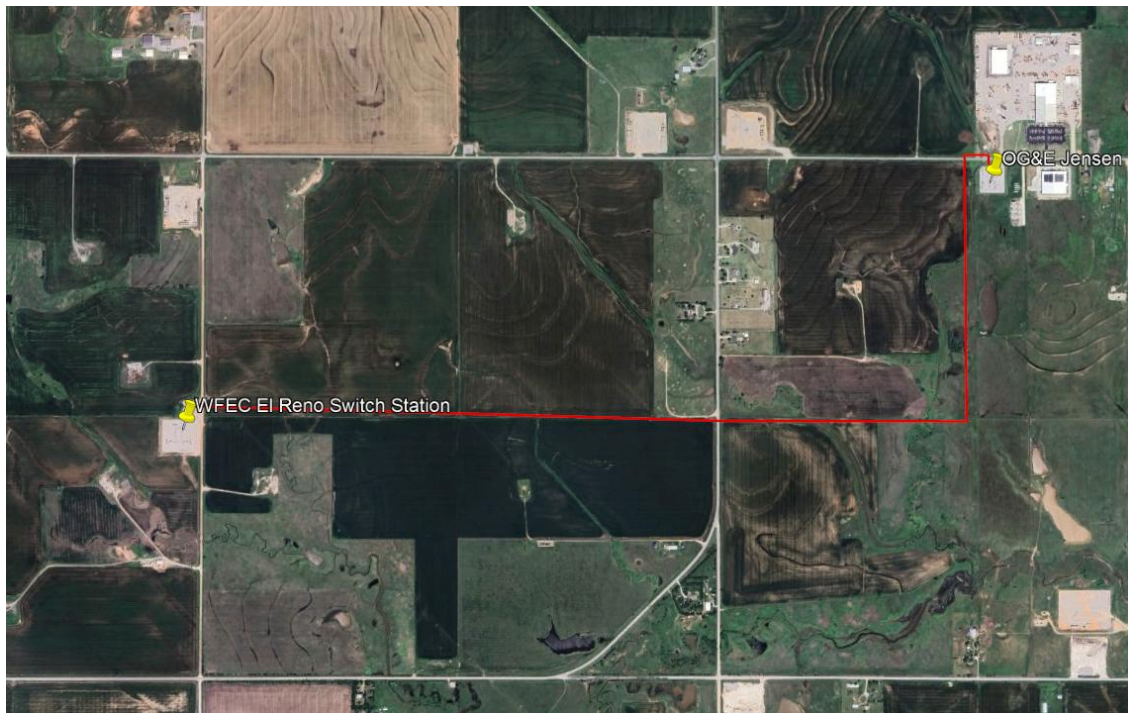


Figure 6: Geographic: El Reno Switch Station – OG&E Jensen 138kV

Table 5: Texoma Junction – OG&E Caney Creek Cost Estimate

Shared Network Upgrades Description	Cost Estimate (\$)	Estimated Lead Time
UID: 170708		
Kersey Substation – Colbert Substation 138kV Line Rebuild: Rebuild 8.89 miles of 138kV transmission from Kersey Substation to Colbert Substation.	Engineering: \$ 400,050.00 ROW: \$ 400,050.00 Material: \$ 3,600,450.00 Construction: \$ 3,600,450.00 TOTAL: \$ 8,001,000.00	36 Months

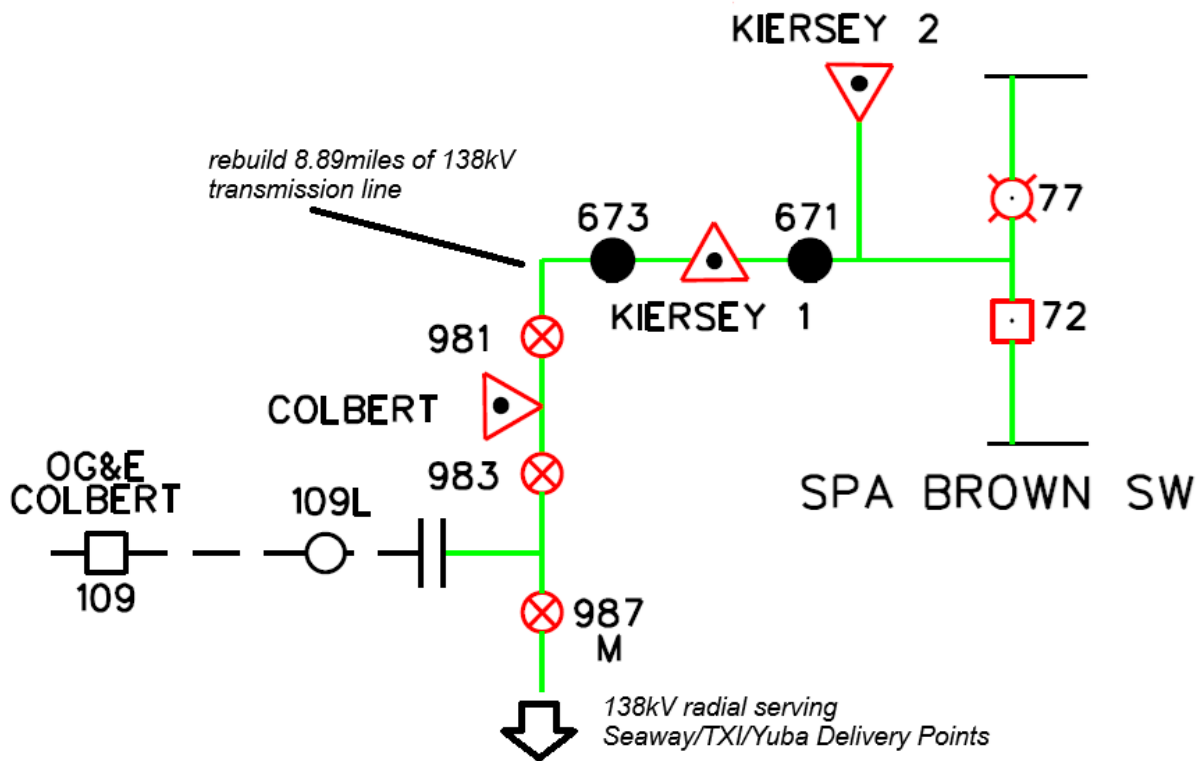


Figure 7: One-line Diagram: Kersey Substation – Colbert Substation 138kV

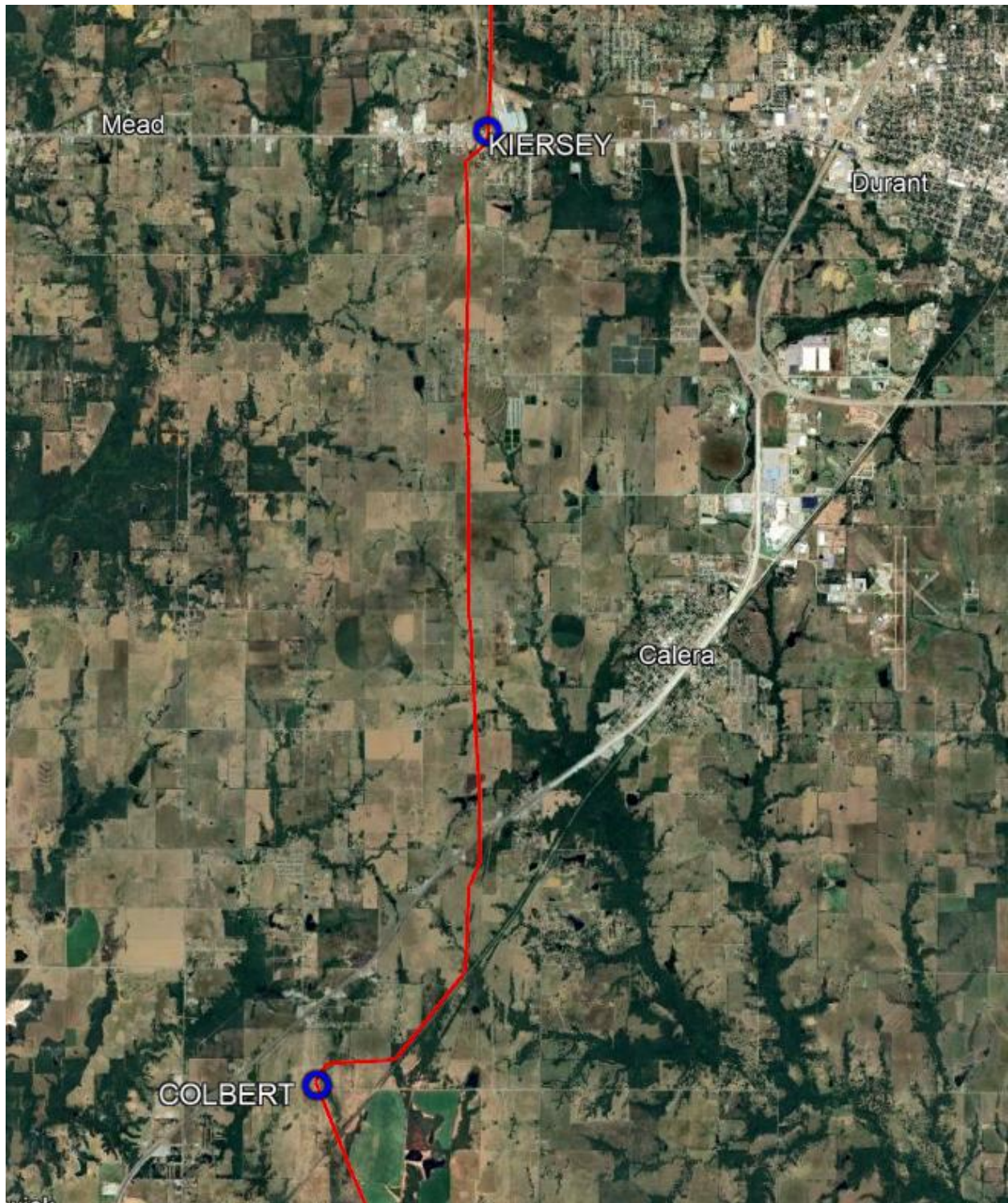


Figure 8: Geographic: Kiersey Substation – Colbert Substation 138kV