Colorado Rule 3627 – Ten Year Transmission Plan

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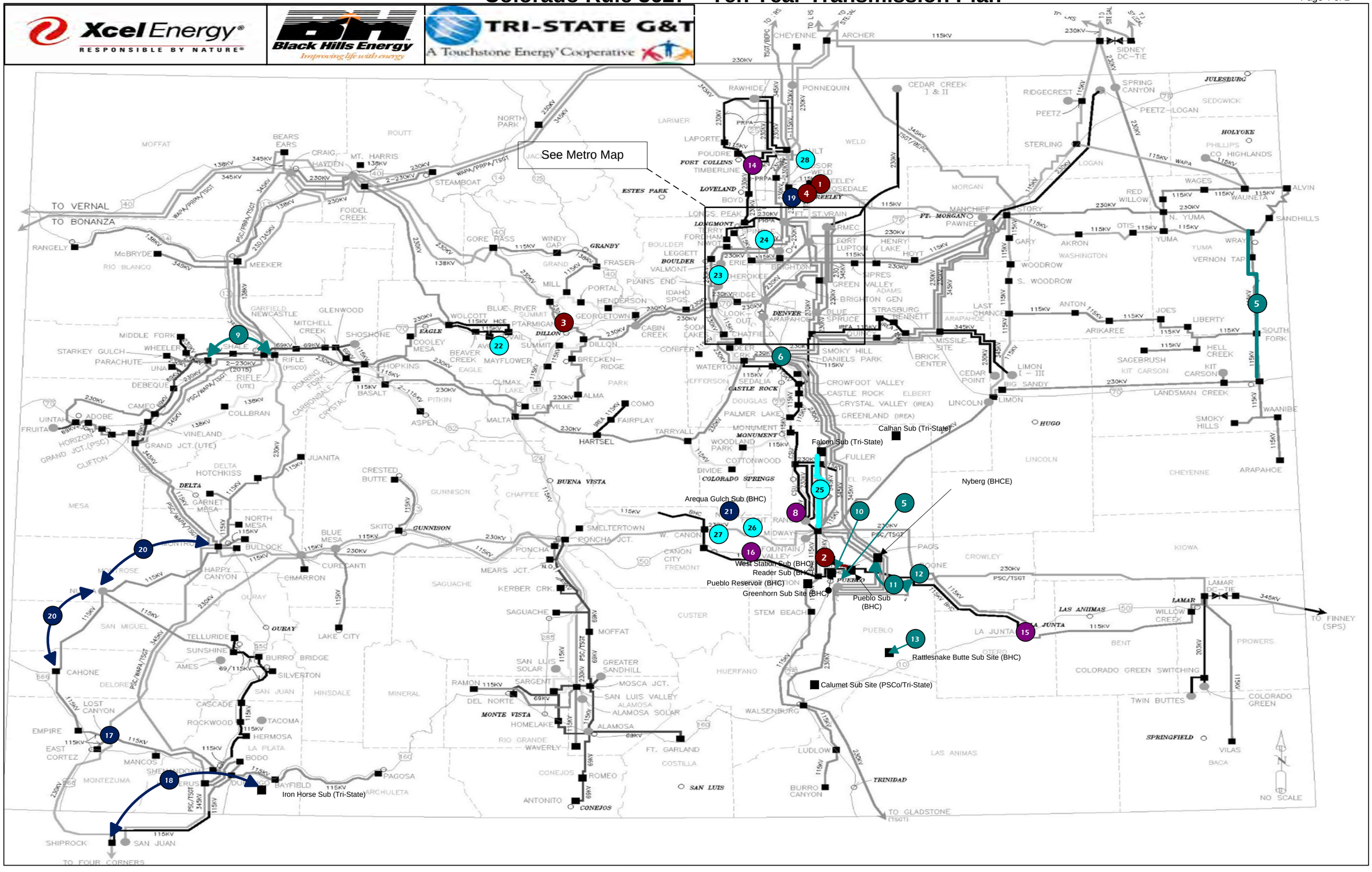
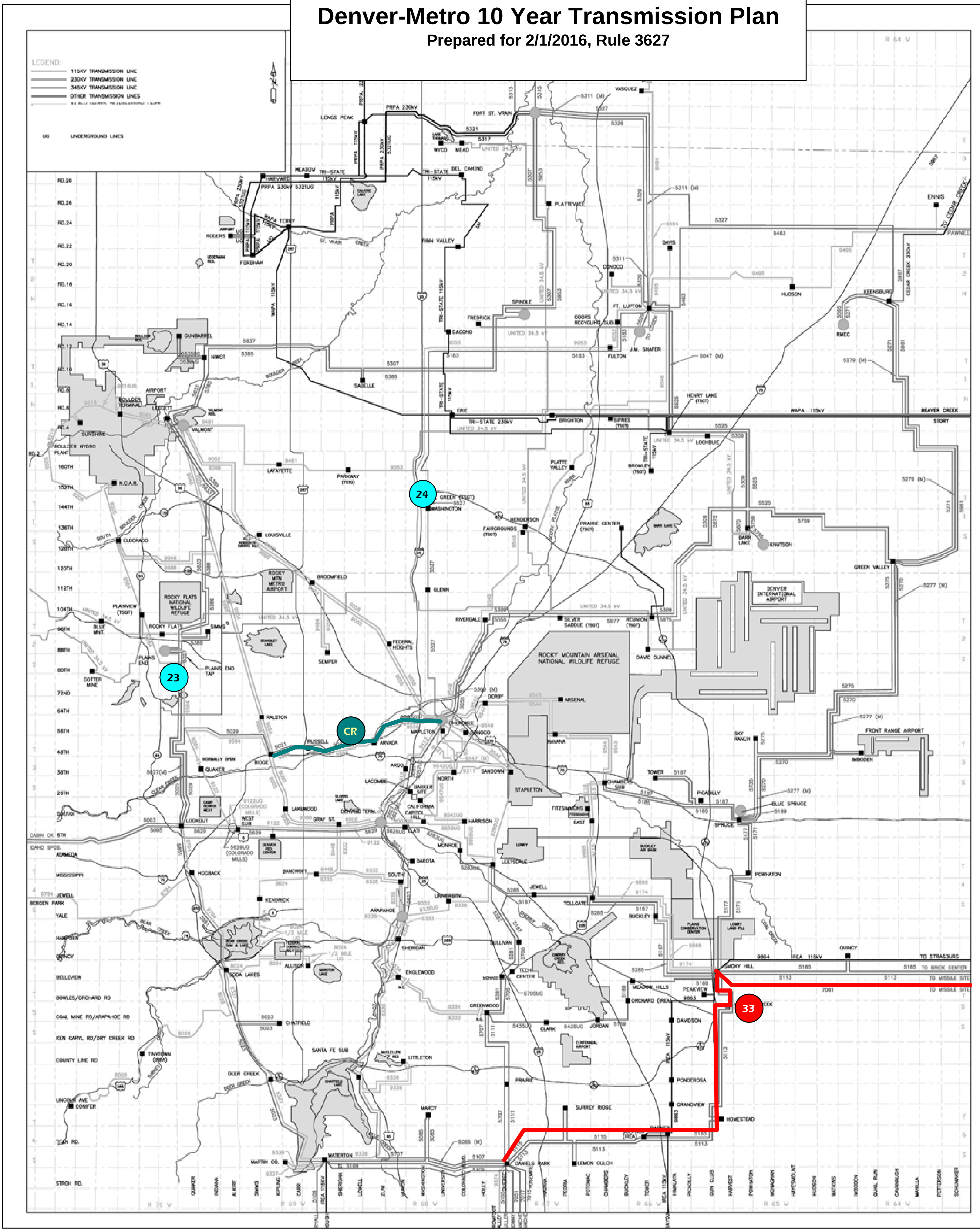


All projects are subject to change and routes have yet to be determined.

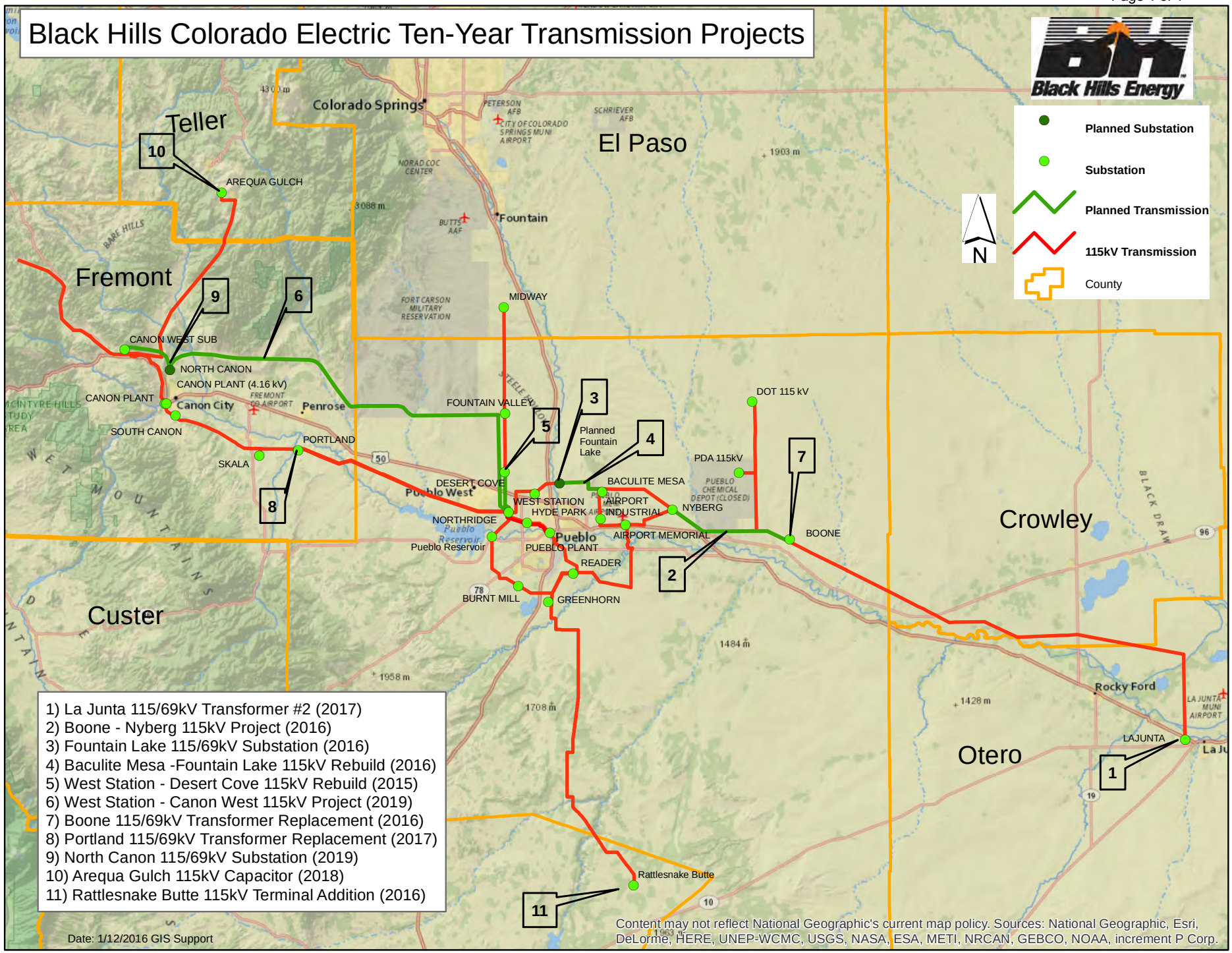
2014 - 2015	2016	2017	2018	2019
1 Rosedale Substation (New, PSCo)	5 Baculite Mesa-Fountain Lake 115 kV Upgrade (and Fountain Lake Substation, BHCE)	14 Avery Distribution Substation (New, PSCo)	17 Lost Canyon Main Switch 115 kV (New, Tri-State)	22 Avon – Gilman 115 kV (New, PSCo)
2 W.Station-Desert Cove 115 kV (Upgrade, BHCE)	6 Burlington-Wray 230 kV (New, Tri-State)	15 La Junta 115/69 kV Transformer #2 (New, BHCE)	18 San Juan Basin Energy Connect Project (Tri-State)	23 Moon Gulch Distribution Substation (New, PSCo)
3 Ptarmigan Substation (New, PSCo)	7 Happy Canyon Substation (New, PSCo)	16 Portland 115/69 kV Transformer Replacement (Upgrade, BHCE)	19 Southwest Weld Expansion Project (New, Tri-State, PSCo)	24 Thornton Distribution Substation (New, PSCo)
4 Monfort-DCP Midstream 115kV Transmission (New, PSCo)	9 Rifle-Parachute 230 kV #2 (New, PSCo)	8 Keller – Front Range 230 kV (CSU)	20 Western Colorado Transmission Upgrade Project (Upgrade, Tri-State)	25 Falcon-Midway 115 kV Upgrade (Tri-State)
	10 Pueblo West Tap Line Uprate (Upgrade, Tri-State)		21 Arequa Gulch 115kV Capacitor (New, BHCE)	26 W. Station – Canon West 115kV Project (New, BHCE)
	11 Boone-Nyberg 115 kV (New, BHCE)			27 North Canon 115/69 kV Substation (New, BHCE)
	12 Boone 115/69 kV Transformer (Replacement, BHCE)			28 Ault – Monfort 115kV Transmission (New, PSCo)
	13 Rattlesnake Butte 115 kV Terminal Addition (Upgrade, BHCE)			

Denver-Metro 10 Year Transmission Plan

Prepared for 2/1/2016, Rule 3627



CR	**2016** Cherokee-Ridge 230 kV Conversion (New, PSCo)
24	**2019** Thornton Distribution Substation (New, PSCo)
33	**2022** Pawnee-Daniels Park 345 kV Transmission (PSCo)
23	**2019** Moon Gulch Distribution Substation (New, PSCo)


Black Hills Colorado Electric Ten-Year Transmission Projects
Black Hills Energy
Planned Substation
Substation
Planned Transmission
115kV Transmission
County
N
Teller
El Paso
Fremont
Custer
Crowley
Otero
Colorado Springs
Fountain
Penrose
Canon City
Pueblo
Pueblo West
Rocky Ford
LAJUNTA
AREQUA GULCH
CANON WEST SUB
NORTH CANON
CANON PLANT (4.16 kV)
CANON PLANT
SOUTH CANON
SKALA
PORTLAND
MIDWAY
FOUNTAIN VALLEY
Planned Fountain Lake
DESERT COVE
WEST STATION
HYDE PARK
BACULITE MESA
AIRPORT INDUSTRIAL
NYBERG
PDA 115kV
DOT 115 kV
BOONE
AIRPORT MEMORIAL
NORTHRIDGE
Pueblo Reservoir
PUEBLO PLANT
READER
BURNT MILL
GREENHORN
Rattlesnake Butte
1) La Junta 115/69kV Transformer #2 (2017)
2) Boone - Nyberg 115kV Project (2016)
3) Fountain Lake 115/69kV Substation (2016)
4) Baculite Mesa -Fountain Lake 115kV Rebuild (2016)
5) West Station - Desert Cove 115kV Rebuild (2015)
6) West Station - Canon West 115kV Project (2019)
7) Boone 115/69kV Transformer Replacement (2016)
8) Portland 115/69kV Transformer Replacement (2017)
9) North Canon 115/69kV Substation (2019)
10) Arequa Gulch 115kV Capacitor (2018)
11) Rattlesnake Butte 115kV Terminal Addition (2016)
Date: 1/12/2016 GIS Support
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Appendix D

Black Hills Project Summary

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Summary

Category	Project	Planned ISD	Description and Purpose	Est. Cost - 2015 USD	NERC Reliability Criteria	Alternatives Reviewed
Transmission	West Station-Desert Cove 115 kV Transmission Line Rebuild	2015	Rebuild 115 kV line from West Station to Desert Cove substations (Final 2012 BHCT LTP Report_021913.pdf). Improved reliability in the Pueblo area.	$3,700,000	TPL-002, TPL-003	None
Substation	Rattlesnake Butte 115 kV Terminal Addition	2016	Convert Rattlesnake Butte substation to a ring bus configuration and add a terminal to interconnect a wind generation project.	$1,850,000		None
Transmission	Boone-Nyberg 115 kV Line #2	2016	Increased reliability and capacity by rebuilding the existing circuit with larger conductor and adding a second circuit, both on monopole steel structures within existing ROW.(Boone 230-115 kV T2 Project Report_Rev1-2.pdf and BHCE 115 kV System and Lamar DC Tie Final Report.pdf)	$10,000,000	TPL-003	(1) Boone 230/115 kV transformer #2 (preferred alternative), (2) Boone-Nyberg 115 kV line #2, (3) Rocky Ford 69 kV generation, (4) Reader-S. Fowler-La Junta (BH) 115 kV line
Substation	Fountain Lake 115/69 kV Substation	2016	New 115/69 kV substation at Belmont Tap on the West Station - Overton 69 kV line (NERC Category C Study_WPC.pdf). Additional voltage support and load growth capacity.	$12,800,000	TPL-003	(1) Ftn. Lake 115/69 kV sub., (2) Ftn. Lake 115/13.2 kV sub., (3) Ftn. Lake 115/69 kV and 115/13.2 kV sub., (4) Airport Memorial 115/69 kV sub., (5) Ftn. Lake 115/69 kV sub. and Santa Fe 115/13.2 kV sub.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Summary

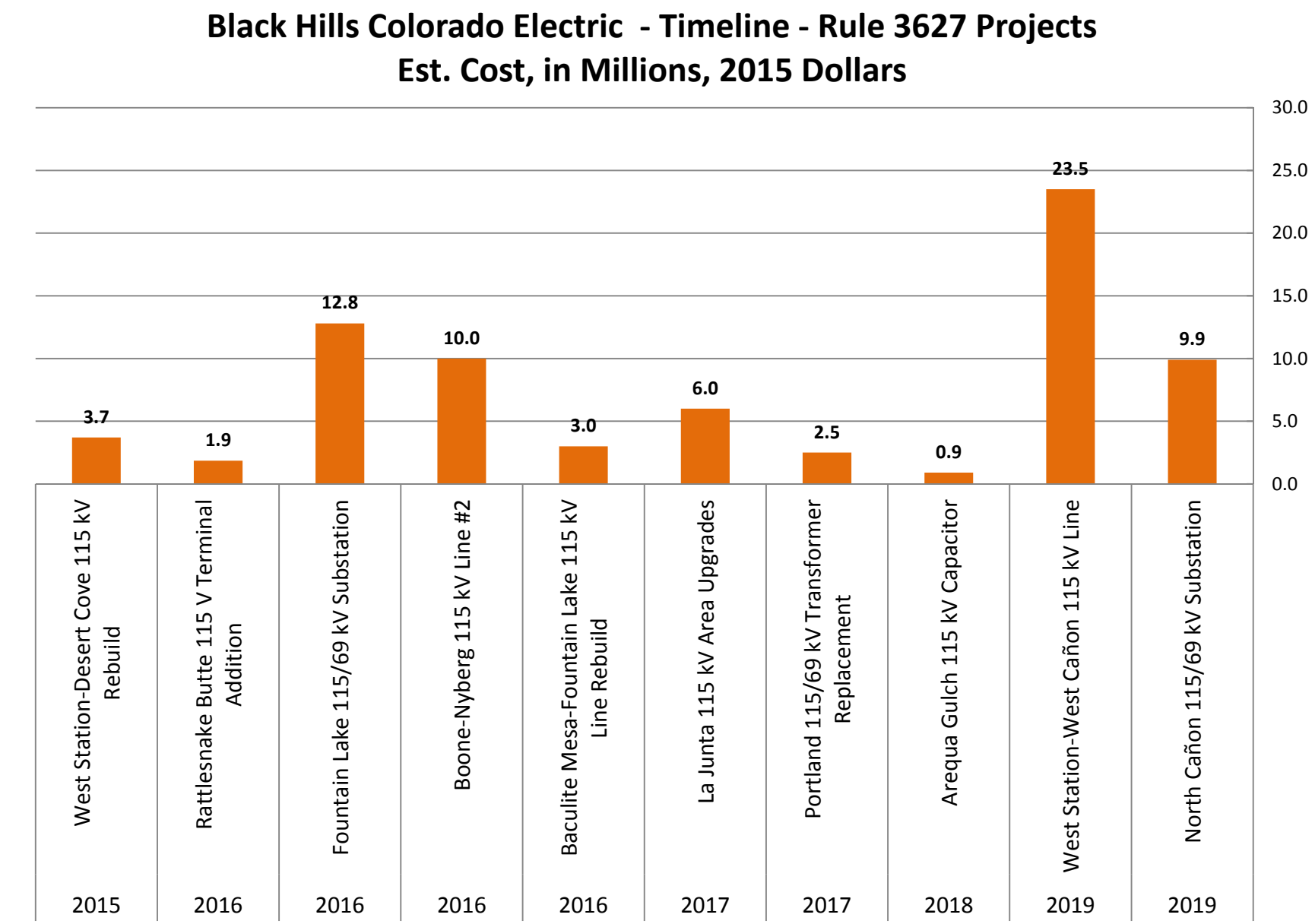
Category	Project	Planned ISD	Description and Purpose	Est. Cost - 2015 USD	NERC Reliability Criteria	Alternatives Reviewed
Transmission	Baculite Mesa-Fountain Lake 115 kV Line Rebuild	2016	Rebuild existing 115 kV line between Baculite Mesa and new Ftn. Lake substation (Final 2010 BHCT LTP Report.pdf). Increased reliability and generation interconnection.	$3,000,000	TPL-003	None
SB-100	La Junta 115 kV Area Upgrades	2017	Add transformation capacity at BHCE's Boone and La Junta substations (Final La Junta Tie Study_041609.pdf). Add a 69 kV capacitor. Improved reliability in the La Junta area.	$6,000,000	TPL-002, TPL-003	(1) Replace La Junta (BH) transformer only, (2) Replace transformer and add 69 kV line, or (3) Replace transformer, add 69 kV line, and add 115 kV line.
Distribution	Portland 115/69 kV Transformer Replacement	2017	Replace existing 25 MVA Portland transformer with 80 MVA unit (Final 2012 BHCT LTP Report_021913.pdf). Improve reliability and add additional transformation capacity.	$2,500,000	TPL-002, TPL-003	None
Substation	Arequa Gulch 115 kV Capacitor	2018	Improved voltage support	$900,000	TPL-002	(1) Add a 115 kV capacitor or (2) Add a 69 kV capacitor
Transmission	West Station-West Cañon 115 kV Line	2019	New transmission line connecting West Station and West Cañon with load service substation at North Cañon. Increased reliability and load service. (Final 2014 BHCT LTP Report)	$23,500,000	TPL-003	(1) Line with load service substation at Portland or Penrose (2) West Station-Cañon City 115 kV line (3) Joint 230/115 kV double circuit

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Summary

Category	Project	Planned ISD	Description and Purpose	Est. Cost - 2015 USD	NERC Reliability Criteria	Alternatives Reviewed
Substation	North Cañon 115/69 kV Substation	2019	New 115/69 kV substation at North Cañon on the planned West Station – West Cañon 115 kV line. Increased reliability and load service. (Final 2014 BHCT LTP Report)	$9,900,000	TPL-003	None

Note: Projects completed prior to 2015 were omitted from this table but included in the detailed project sheets for reference.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Summary



Note: Projects completed prior to 2015 were omitted from this chart but included in the detailed project sheets for reference.

Appendix D:

Black Hills Project Sheets

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Pueblo-Hyde Park-West Station 115 kV Transmission Line

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Rebuild existing Pueblo-Hyde Park-West Station 115 kV line (2009 SB07-100 Report_Filed.pdf).
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	Pueblo 115 kV
Point of Termination:	West Station 115 kV
Intermediate Points:	Hyde Park 115 kV
Length of Line (in Miles):	4.5
Type of Project:	Transmission Line
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improved reliability in the Pueblo area.
Estimated Cost (in 2014 Dollars):	$2.7 Million
Schedule:	
Construction Date:	2013
Planned Completion/In-Service Date:	2014
Regulatory Info:	Approved - Colorado PUC: Decision No. C10-0644
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

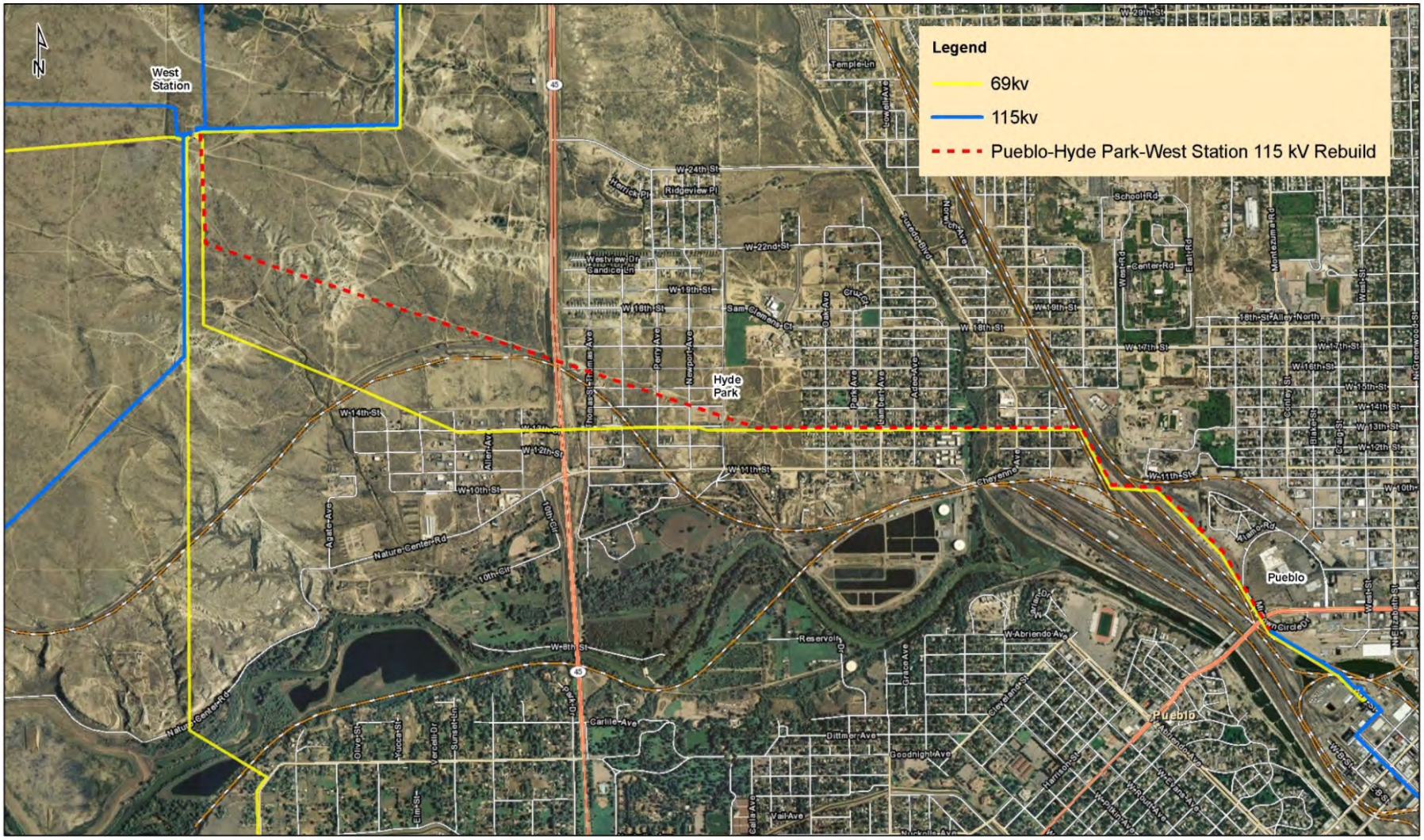
Pueblo-Hyde Park-West Station 115 kV Project

Three individual line segments comprise the parallel path between Reader on the south end of the BHCE system and West Station on the north end. The Pueblo-Hyde Park-West Station 115 kV line is one of those segments that had reached its maximum utilization in planning assessments. The project rebuilt the 4.5 mile line segment between Pueblo and West Station through Hyde Park using 795 kcmil 26/7 Strand ACSR "Drake" conductor. The project utilized the existing line right-of-way.

The project was completed and operational in 2014 at an estimated cost of $2.7 million. The Colorado Public Utilities Commission found that the project was in the ordinary course of business and that a CPCN was not necessary.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Map Printed 07/06/11



Map 6

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Reader 115/69 kV Transformer Replacement

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Replace existing 2 x 41 MVA Reader transformers with 80 MVA units.
Voltage Class:	115 kV
Facility Rating:	80 MVA each
Point of Origin/Location:	Reader 115 kV (near Pueblo, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	0
Type of Project:	Substation
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improve reliability and add additional transformation capacity.
Estimated Cost (in 2014 Dollars):	$6.5 Million
Schedule:	
Construction Date:	2013
Planned Completion/In-Service Date:	2014
Regulatory Info:	Approved - Colorado PUC: Decision No. C10-0644
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Reader 115/69 kV Transformer Project

The Reader 115/69 kV transformer project was identified to replace two existing parallel transformers at Reader with larger capacity 80 MVA units to accommodate load growth. The project was placed into service in 2014 at an estimated cost of $6.5 million. The Colorado Public Utilities Commission found that the project was in the ordinary course of business and that a CPCN was not necessary.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Cañon City 115 kV Capacitor Bank Project

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	A 10 MVAR switched shunt capacitor at the Cañon City 115 kV substation. The original project consisted of a 20 MVAR capacitor. 10 MVAR of that has since been placed into service on the Cañon City 69 kV bus.
Voltage Class:	115 kV
Facility Rating:	10 MVAR
Point of Origin/Location:	Cañon City 115 kV (near Cañon City, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improved voltage support and reliability in the Cañon City area.
Estimated Cost (in 2013 Dollars):	$500,000
Schedule:	
Construction Date:	2014
Planned Completion/In-Service Date:	2014
Regulatory Info:	Approved - Colorado PUC: Decision No. C11-0749
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Pueblo Reservoir 115kV Distribution Substation

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	New 115kV distribution substation on the West Station-Burnt Mill 115 kV line to accommodate local load growth.
Voltage Class:	115 kV
Facility Rating:	25 MVA
Point of Origin/Location:	Pueblo Reservoir Substation (near Pueblo, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load interconnection
Estimated Cost (in 2014 Dollars):	$5.7 Million
Schedule:	
Construction Date:	2013
Planned Completion/In-Service Date:	2014
Regulatory Info:	Approved – Colorado PUC: Decision No. C13-0879
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Pueblo Reservoir 115kV Distribution Substation

This project consisted of constructing a new distribution substation by tapping BHCE's Burnt Mill-West Station 115kV transmission line. The substation was built to ultimately accommodate two 115/13.2kV, 25 MVA transformers, but only one bank was installed initially. The substation was located near CO-96W and Pueblo Reservoir Road near the Pueblo Reservoir, Colorado. This project was required to serve new pump station load as well as contingency back up for existing infrastructure and support future load growth in western Pueblo. The estimated project cost was approximately $5.7 million with a completion and in-service date in 2014.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Pueblo Reservoir 115kV Distribution Substation

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Boone-Nyberg 115 kV Project

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Rebuild existing Boone-DOT Tap-Nyberg 115 kV line and add a new parallel circuit on double circuit structures.
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	Boone 115 kV
Point of Termination:	Nyberg 115 kV
Intermediate Points:	DOT Tap 115 kV load tap
Length of Line (in Miles):	9
Type of Project:	Transmission Line
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increase reliability
Estimated Cost (in 2014 Dollars):	$10 Million
Schedule:	
Construction Date:	2015
Planned Completion/In-Service Date:	2016
Regulatory Info:	Approved – Colorado PUC: Decision No. C13-0879
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Boone-Nyberg 115 kV Transmission Project

This project was identified as the preferred alternative to adding a second 230/115 kV transformer at PSCo's Boone substation in late 2012. The 'Second Boone 230/115 kV Transformer' project was subsequently cancelled.

This project consists of rebuilding the existing 9 mile segment of 115 kV line between the Boone 115 kV substation and the Nyberg 115 kV substation, as well as adding a second 115 kV circuit between the aforementioned substations. The project will place the new line and the rebuilt line on double circuit monopole steel structures, and will be located within the existing right-of-way. Both lines will utilize 795 kcmil 26/7 Strand ACSR "Drake" conductor. The project will not be designed for future 230 kV operation.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Map Printed 11/18/13
Line Route shown is for informational purposes only.

0 2.5 5 Miles

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2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

West Station-Desert Cove 115kV Rebuild Project

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Rebuild the existing West Station to Desert Cove 115kV line using double circuit structures to accommodate a future West Station-West Cañon 115 kV line.
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	West Station 115kV
Point of Termination:	Desert Cove 115kV
Intermediate Points:	
Length of Line (in Miles):	4.0
Type of Project:	Transmission Line
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improve reliability in the Pueblo area
Estimated Cost (in 2015 Dollars):	$3.7 Million
Schedule:	
Construction Date:	2015
Planned Completion/In-Service Date:	2015
Regulatory Info:	Approved – Colorado PUC: Decision No. C13-0879
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

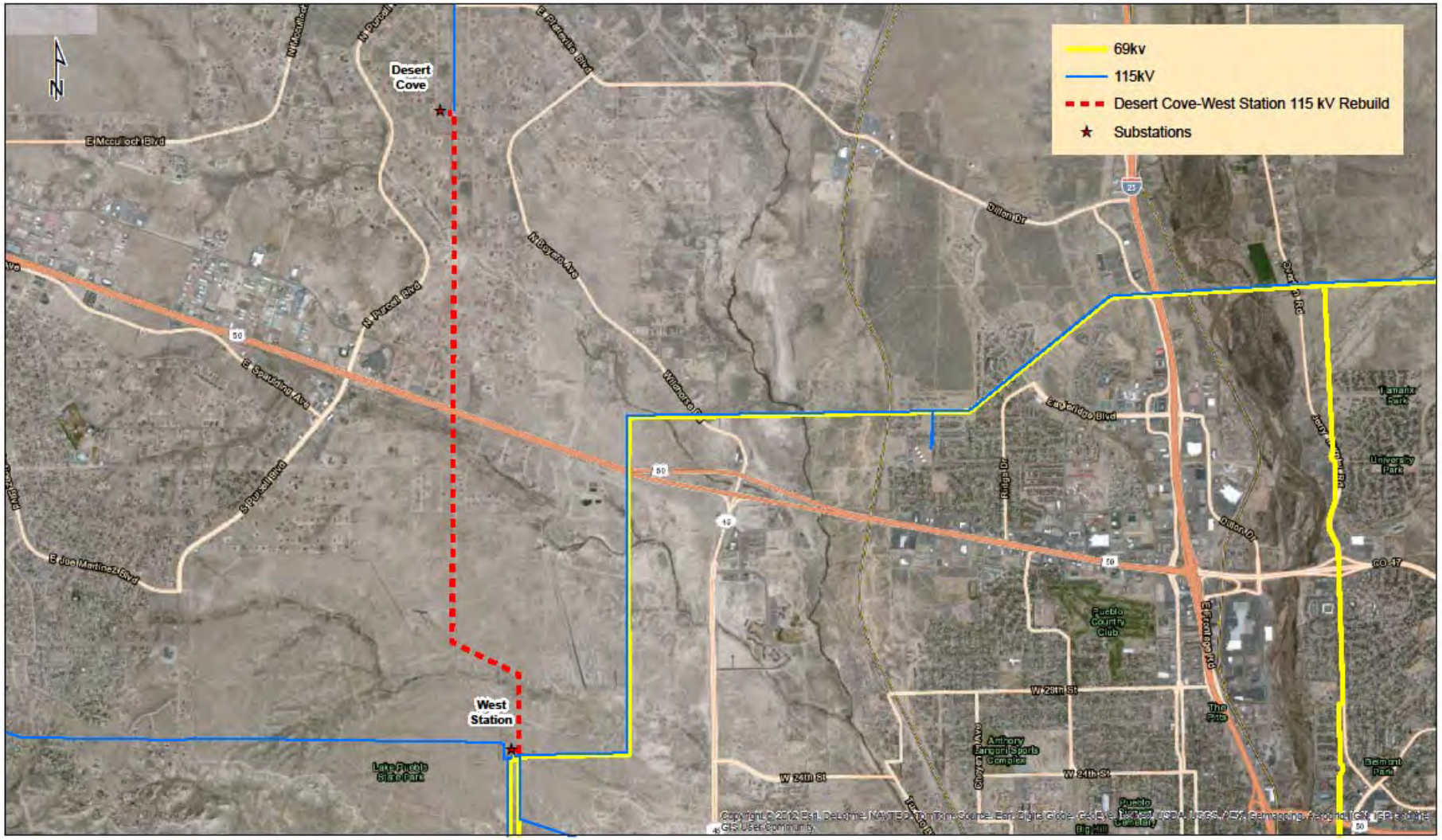
West Station-Desert Cove 115 kV Rebuild Project

Three individual line segments comprise the parallel path between West Station on the south end and Midway on the north end. The West Station-Desert Cove 115 kV line is one of those segments that had reached its maximum utilization in planning assessments. The project rebuilt the 4 mile line segment between West Station and Desert Cove. A future project is planned for 2017-2018 to upgrade terminal equipment at West Station, resulting in increased facility ratings on the West Station-Desert Cove 115 kV line.

The project consisted of double circuit 115 kV construction utilizing 795 kcmil 26/7 Strand ACSR "Drake" conductor within the existing right-of-way. The use of double circuit structures for this project will accommodate the proposed future West Station-West Cañon 115 kV line.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Desert Cove-West Station 115 kV Rebuild



Map Printed 04/23/2013
Line Route shown is for informational purposes only.

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2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Rattlesnake Butte 115 kV Substation Terminal

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Add a new terminal to the Rattlesnake Butte 115 kV substation and convert to a ring bus configuration.
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	Rattlesnake Butte 115kV Substation
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Generation Interconnection
Estimated Cost (in 2015 Dollars):	$1.85M
Schedule:	
Construction Date:	2016
Planned Completion/In-Service Date:	2016
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Rattlesnake Butte 115 kV Terminal Addition

The Rattlesnake Butte terminal addition is planned as part of the BHCT-G18 large generator interconnection process for a new 60 MW wind generation facility. The project will convert the existing two terminal straight bus to a three terminal ring bus. The project is currently planned for completion in 2016 at an estimated cost of $1.85 million.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Portland 115/69 kV #2 Transformer Replacement

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Replace the existing 115/69 kV transformer #2 at the Portland substation with an 80MVA unit.
Voltage Class:	115 kV
Facility Rating:	80 MVA
Point of Origin/Location:	Portland 115kV Substation (near Florence, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Transformer
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improve reliability and add transformation capacity
Estimated Cost (in 2015 Dollars):	$2.5M
Schedule:	
Construction Date:	2017
Planned Completion/In-Service Date:	2017
Regulatory Info:	Approved – Colorado PUC: Decision No. C13-0879
Regulatory Date:	
Permitting Info:	
Permitting Date:	
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Portland 115/69 kV Transformer Project

The Portland 115/69 kV transformer project was identified to replace the smaller of two existing parallel transformers at Portland with a larger capacity 80 MVA unit to accommodate load growth. The project is currently planned for completion in 2017 at an estimated cost of $2.5 million.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Fountain Lake 115/69 kV Substation

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	New 115/69 kV substation at Belmont Tap on the West Station - Overton 69 kV line (NERC Category C Study_WPC.pdf).
Voltage Class:	115 kV
Facility Rating:	80 MVA
Point of Origin/Location:	Fountain Lake 115 kV (near Pueblo, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	0
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Additional voltage support and load growth capacity.
Estimated Cost (in 2015 Dollars):	$12.8 Million
Schedule:	
Construction Date:	2016
Planned Completion/In-Service Date:	2016
Regulatory Info:	Approved - Colorado PUC: Decision No. C07-0553
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
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Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

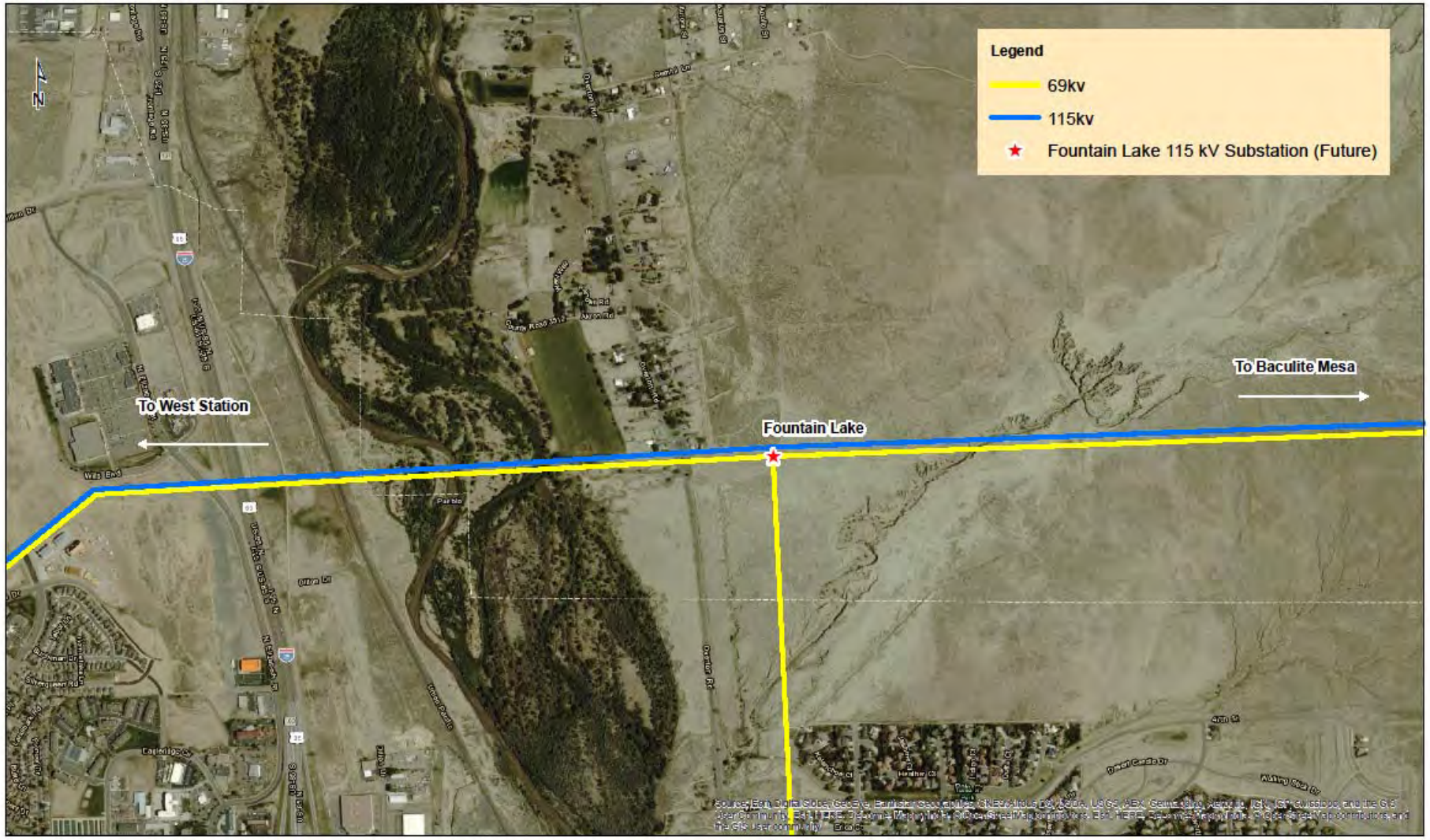
Fountain Lake 115 kV Substation Project

The Fountain Lake (previously known as Overton) 115 kV distribution substation project was initially developed to address low system voltage issues by shifting load off of existing distribution lines that were near their allowable capacity. Additional benefits to the 69 kV system were identified through reduced power flow on the 115/69 kV transformers in the Pueblo area, as well as local 69 kV lines. The project provided additional operating flexibility in the area as well as help accommodate future loads in an area with good growth potential.

The scope of the project was subsequently modified to include a 115/69 kV transformer as well as the original 115/13.2 kV distribution transformer. The expanded scope provided additional operational flexibility as well as the ability to maintain reliability during potential future replacements of the West Station 115/69 kV transformers. The location of the substation was reviewed to optimize local land use as well as minimize unnecessary line crossings in the area. The project is currently planned for completion and operation in 2016 at an estimated cost of $12.8 million. The Colorado Public Utilities Commission found that the project was in the ordinary course of business and that a CPCN was not necessary.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

BHE Fountain Lake 115 kV Substation



Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

La Junta 115 kV Area Upgrades

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Increase 115/69kV transformation capacity at BHCE's La Junta and Boone substations to 50 MVA; add new 2 x 6 MVAR 69 kV cap bank at Rocky Ford (La Junta 115kV Tie Project Review Report_Draft - Rev3, 7/09/14).
Voltage Class:	115 kV
Facility Rating:	Varies
Point of Origin/Location:	Black Hills Colorado Electric La Junta 115 kV substation
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improved reliability in the La Junta area.
Estimated Cost (in 2015 Dollars):	$6.0 Million
Schedule:	
Construction Date:	2017
Planned Completion/In-Service Date:	2017
Regulatory Info:	Approved - Colorado PUC: Decision No. C09-1240
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

La Junta 115 kV Area Upgrades

The La Junta 115 kV Interconnection project as initially scoped consisted of a new parallel 115 kV and 69 kV line between the Tri-State and Black Hills La Junta substations. The connection of the two substations, which are approximately 0.5 miles apart, would provide increased reliability to the local area. An increase in 115/69 kV transformation capacity at the BHCE-owned La Junta substation, a 69 kV capacitor, a larger 115/69 kV transformer at Boone and local terminal equipment upgrades were also a part of this project to enhance load service in the area.

As the project drivers evolved over time, the need to operate the 115 kV tie line normally open became apparent. Joint participation in the project was no longer of value to Tri-State G&T. The scope of the project was reviewed in 2015 and it was determined that the benefits of the project did not justify the cost. The 115 kV and 69 kV lines between the two La Junta substations were removed from the project scope. The other local upgrades remain in scope as originally planned. The project is currently planned for completion and operation in 2017 at an estimated cost of $6.0 million. The Colorado Public Utilities Commission found that the original project was in the ordinary course of business and that a CPCN was not necessary. A subsequent ruling was not pursued.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Baculite Mesa-Fountain Lake 115 kV Line Rebuild

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	Rebuild existing 115 kV line between Baculite Mesa and planned new Fountain Lake (previously known as Overton) substation (Final 2010 BHCT LTP Report.pdf) as well as reconfigure the connection to the Northridge substation.
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	Baculite Mesa 115 kV
Point of Termination:	Future Fountain Lake 115 kV substation site
Intermediate Points:	
Length of Line (in Miles):	4
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increased reliability and generation interconnection.
Estimated Cost (in 2015 Dollars):	$3.0 Million
Schedule:	
Construction Date:	2016
Planned Completion/In-Service Date:	2016
Regulatory Info:	Approved - Colorado PUC: Decision No. C11-0749, Docket No. 11M-317E
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

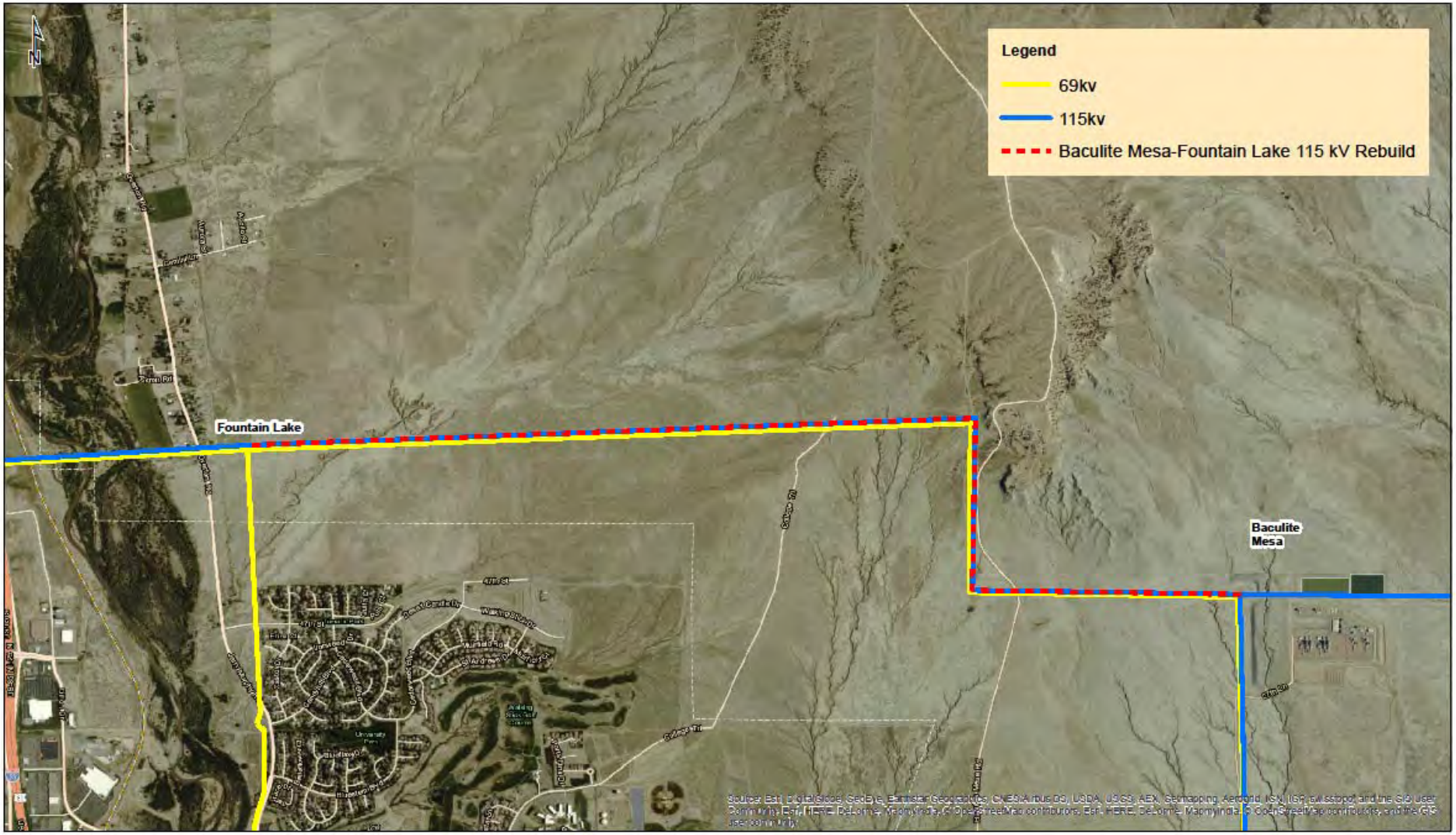
Baculite Mesa-Fountain Lake 115 kV Project

Three individual line segments comprise the parallel path between Baculite Mesa and West Station/Midway. The Baculite Mesa-Fountain Lake 115 kV line is one of those segments that has reached its maximum utilization in planning assessments. The planned project will rebuild the 4 mile line segment between Baculite Mesa and the planned Fountain Lake substation (previously known as Overton) using 795 kcmil 26/7 Strand ACSR "Drake" conductor. The project will utilize the existing line right-of-way. The scope of this project was expanded to reconfigure the termination into the Northridge substation from the line corridor. This was done to avoid unnecessary reductions in the thermal rating of the rebuilt line between Baculite Mesa and Northridge.

The project is currently planned for completion and operation in 2016 at an estimated cost of $3 million. The Colorado Public Utilities Commission found that the project was in the ordinary course of business and that a CPCN was not necessary.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Bacultie Mesa-Fountain Lake 115 kV Rebuild



Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Arequa Gulch 115 kV Capacitor Bank Project

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	A 12 MVAR switched shunt capacitor at the Arequa Gulch 115 kV substation for voltage support due to increased load growth.
Voltage Class:	115 kV
Facility Rating:	12 MVAR
Point of Origin/Location:	Arequa Gulch 115 kV (near Cripple Creek, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improved voltage support and reliability in the Cripple Creek area.
Estimated Cost (in 2013 Dollars):	$900,000
Schedule:	
Construction Date:	2018
Planned Completion/In-Service Date:	2018
Regulatory Info:	Approved - Colorado PUC: Decision No. C15-0590
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

West Station-West Cañon 115 kV Transmission Project

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	Possible joint 230 kV project
Project Description:	New 115 kV line from West Station to West Cañon with load service substation at North Cañon.
Voltage Class:	115 kV
Facility Rating:	221 MVA
Point of Origin/Location:	West Station 115kV
Point of Termination:	West Cañon 115kV
Intermediate Points:	North Cañon 69 kV
Length of Line (in Miles):	42
Type of Project:	Transmission Line and Substation
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increased reliability
Estimated Cost (in 2015 Dollars):	$23.5 Million
Schedule:	
Construction Date:	2019
Planned Completion/In-Service Date:	2019
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

North Cañon 115/69 kV Substation

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	New 115/69 kV substation at North Cañon on the West Station – West Cañon 115 kV line.
Voltage Class:	115 kV
Facility Rating:	80 MVA
Point of Origin/Location:	North Cañon 69 kV substation (near Cañon City, CO)
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	0
Type of Project:	Substation
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increased reliability and load growth capacity.
Estimated Cost (in 2015 Dollars):	$9.9 Million
Schedule:	
Construction Date:	2019
Planned Completion/In-Service Date:	2019
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Wes Wingen
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

West Station-West Cañon 115 kV Line and North Cañon Substation

The proposed West Station – West Cañon 115 kV line would provide additional import capacity into the Cañon City 115 kV system. The new North Cañon 115:69 kV substation would decrease the loading on the existing Portland & Cañon City 115:69 kV transformers. The addition of a new 230 kV circuit (potential joint project) between Midway and West Cañon/Poncha would help to alleviate through flow issues on the BHCE 115 kV network. A summary of the project components is as follows:

- Rebuild the existing Desert Cove – Fountain Valley 115 kV transmission line using double circuit structures to facilitate the addition of the new West Station to West Cañon 115 kV circuit. The planned West Station - Desert Cove 115 kV rebuild project currently has an in-service date of 2015 and this project would continue the progress started on the West Station-Desert Cove rebuild within existing right-of-way.
- Obtain new transmission right-of-way between Fountain Valley and West Cañon for either 115 kV single circuit H-Frame structures (BHCE-only project) or 230 kV double circuit structures (joint project).
- New right-of-way is being explored that would parallel to the existing Midway -West Cañon 230 kV line for a majority of the line length to minimize disruption to the surrounding area. The existing corridor is considered WECC Risk Class 1[1]: Area Following Existing Linear Corridor and is preferable to higher Risk Class corridors.
- Construct a new 115/69 kV substation located in the North Cañon area to support the Cañon City 69 kV network. Upgrades to the existing 69 kV facilities are required to integrate the new substation into the 69 kV network.
- The facility rating of the West Station – North Cañon – West Cañon 115 kV circuit should be at least 221 MVA Summer and 274 MVA Winter (795 ACSR Drake @ 100^{o}C).
- The line section between the new North Cañon 115:69 kV substation and West Cañon would utilize the existing 115 kV or 230 kV transmission corridors wherever possible. These existing corridors are also WECC Risk Class 1.
- Add new 115 kV line terminal positions at West Station and West Cañon 115 kV substations to accommodate the additional transmission line.

Black Hills included this project in the 2015 Rule 3205 filing for informational purposes only. Transmission planning analysis is underway to continue to define the project scope. The project with potential joint participation is under consideration in the San Luis Valley Subcommittee within the Colorado Coordinated Planning Group (CCPG). In the absence of interest in joint participation in the project by other entities, the project would be designed, constructed, and operated as a single 115 kV circuit.

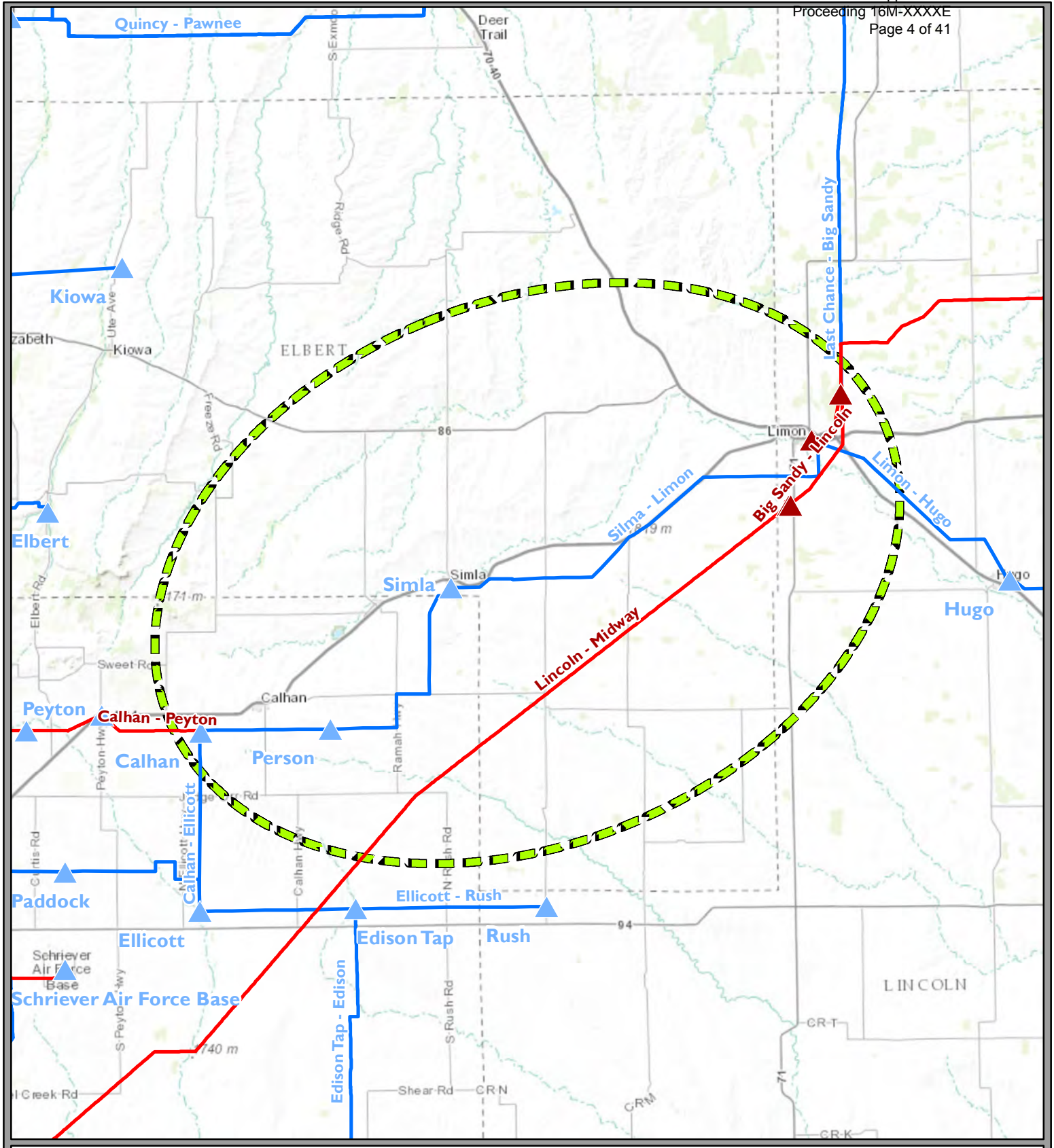
[1] Refer to https://www.wecc.biz/TransmissionExpansionPlanning/Pages/Environmental-and-Cultural-Considerations.aspx for details on the WECC Long Term Planning Tool.

Black Hills/Colorado Electric Utility Company, LP
2016 Rule 3627 Report – Appendix D – Black Hills Project Sheets

Tri-State's 2016 Ten Year Transmission Plan Projects
Table of Contents

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Big Sandy - Calhan 230 kV Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	New 230 kV transmission line between the existing Big Sandy and Calhan Substations. Expand existing Calhan Substation. Proposed rebuild of the Mountain View 69 kV line for the Limon to Calhan Substation section.
Voltage Class:	230 kV
Facility Rating:	642 MVA
Point of Origin/Location:	Big Sandy (near Limon, Colorado)
Point of Termination:	Calhan (West of Limon)
Intermediate Points:	
Length of Line (in Miles):	55.0
Type of Project:	Transmission Line and Substation
Development Status:	Planned
Routing:	West from Big Sandy to Calhan along CO Highway 24
Subregional Planning Group:	CCPG
Purpose of Project:	Support Member load between Denver and Colorado Springs
Project Driver (Primary):	????
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$53,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2021
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	303-254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_Transmissio nProjects.cfm



Tri-State Generation and Transmission

Big Sandy-Calhan 230kV Project

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 2.75 5.5 11 Miles

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Last Updated: 11/19/2015
Author: ykevrop

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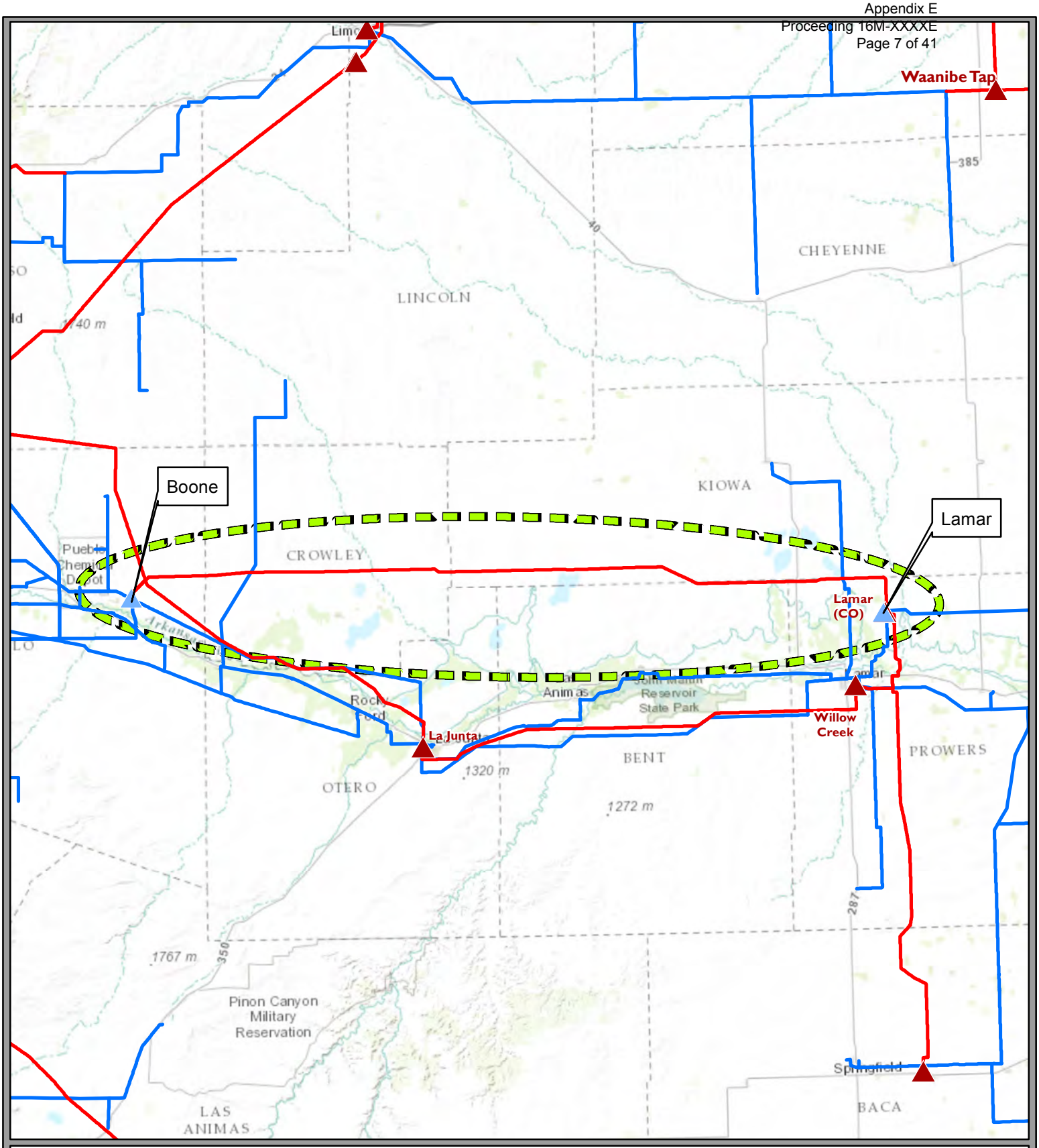
Big Sandy-Calhan 230kV Line

In order to remedy current transmission service constraints in the Mountain View Electric Association (MVEA) member service territory, which includes load load-serving deficiencies and projected future growth that would overload existing facilities, Tri-State proposes to construct a 230 kV line from its Big Sandy substation (located northwest of Limon, Colorado) to the recently constructed Calhan substation. The primary purposes of the planned transmission line are threefold: mitigate projected overloads of Tri-State's 230-115 kV Fuller transformer, increase Tri-State's ability to deliver planned Tri-State generation in southeastern Colorado to its members in the area, and provide a bulk transmission connection to the eastern side of MVEA's load area. The project is presently planned to be financed and constructed solely by Tri-State.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Boone - Lamar 230 kV Line

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct 230 kV transmission line from Boone Substation to Lamar Substation.
Voltage Class:	230 kV
Facility Rating:	642 MW
Point of Origin/Location:	Boone
Point of Termination:	Lamar
Intermediate Points:	
Length of Line (in Miles):	100 miles
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability - Remove generation operating restrictions & support renewable resource development in eastern Colorado
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$65,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303)254-3339
Website Information	



Tri-State Generation and Transmission

Boone-Lamar 230kV Line

- Station - Other Utility
- Station - Tri-State
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 5 10 20 Miles

Last Updated: 12/18/2015
Author: ykevrop

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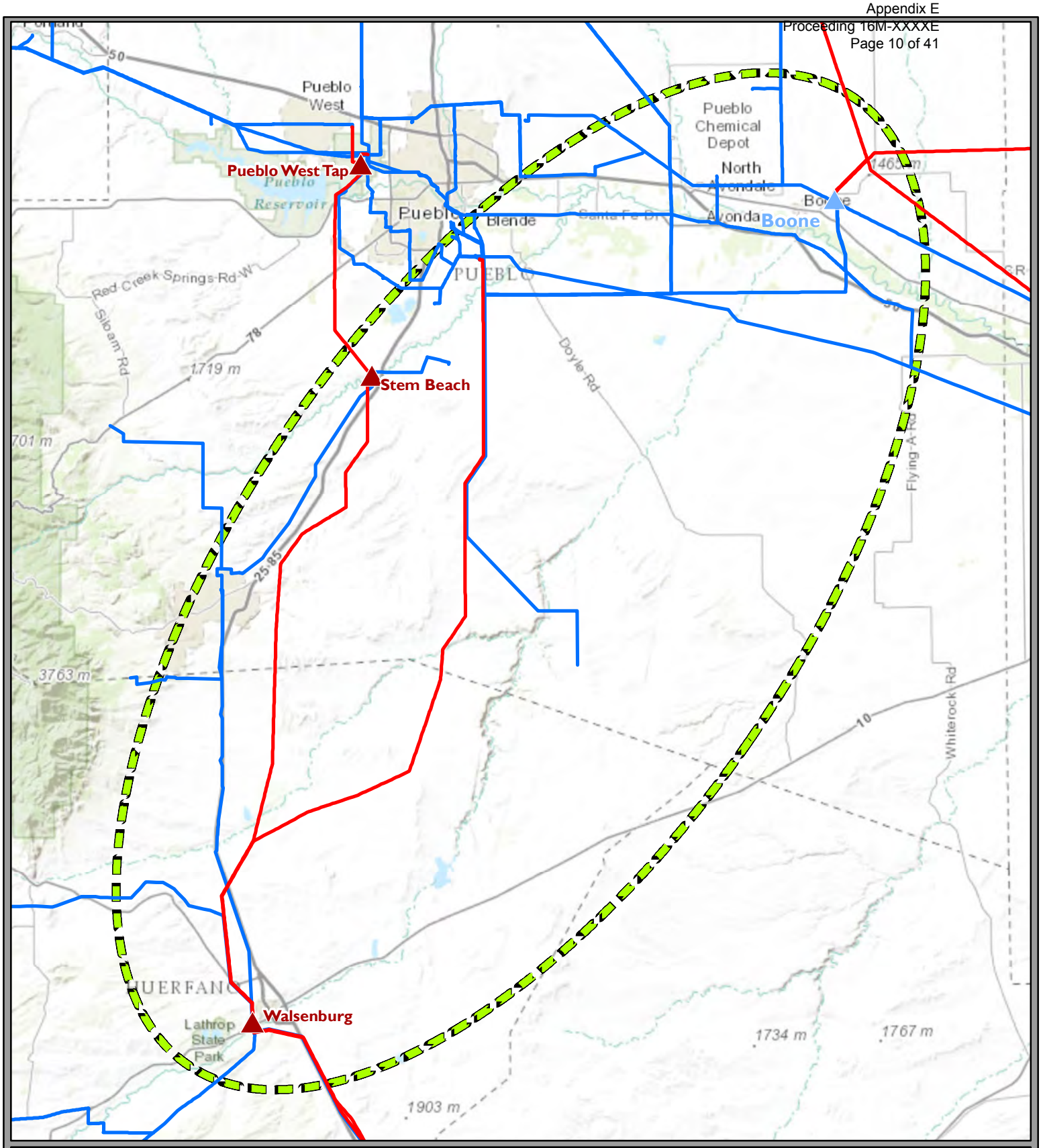
Boone-Lamar 230 kV Line

The Boone-Lamar 230 kV line is a conceptual project that is intended to align with, but be a scaled down element of the much larger, conceptual Lamar Front Range project. The Lamar Front Range project was designed to accommodate as much as 2000 MW of new generation and envisions a substantial 345 kV transmission network in eastern and southeastern Colorado.

Several Tri-State studies have shown the need for an additional 230 kV transmission line between the Lamar and Boone substations under scenarios with increased generation in eastern and southeastern Colorado, but at levels less than what was considered by the Lamar Front Range project. Tri-State is currently constructing a new 230 kV transmission line between Lamar and Burlington, which will alleviate reliability issues and allow more generation in the region. However, if the needs of the region continue to grow, the next logical expansion of the eastern Colorado transmission system would be an additional 230 kV transmission line between Boone and Lamar.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Boone-Walsenburg 230 kV Line

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct a 230 kV transmission line from Boone Substation to Walsenburg Substation.
Voltage Class:	230 kV
Facility Rating:	642 MVA
Point of Origin/Location:	Boone
Point of Termination:	Walsenburg
Intermediate Points:	Avondale
Length of Line (in Miles):	69 Miles
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability - eliminate the need for the existing Walsenburg Remedial Action Scheme (RAS).
Project Driver (Primary):	????
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$45,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303)254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_Transmissio nProjects.cfm



Tri-State Generation and Transmission

Boone-Walsenburg Line

- Station - Other Utility
- Station - Tri-State
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 2.25 4.5 9 Miles

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Last Updated: 12/18/2015
Author: ykevrop

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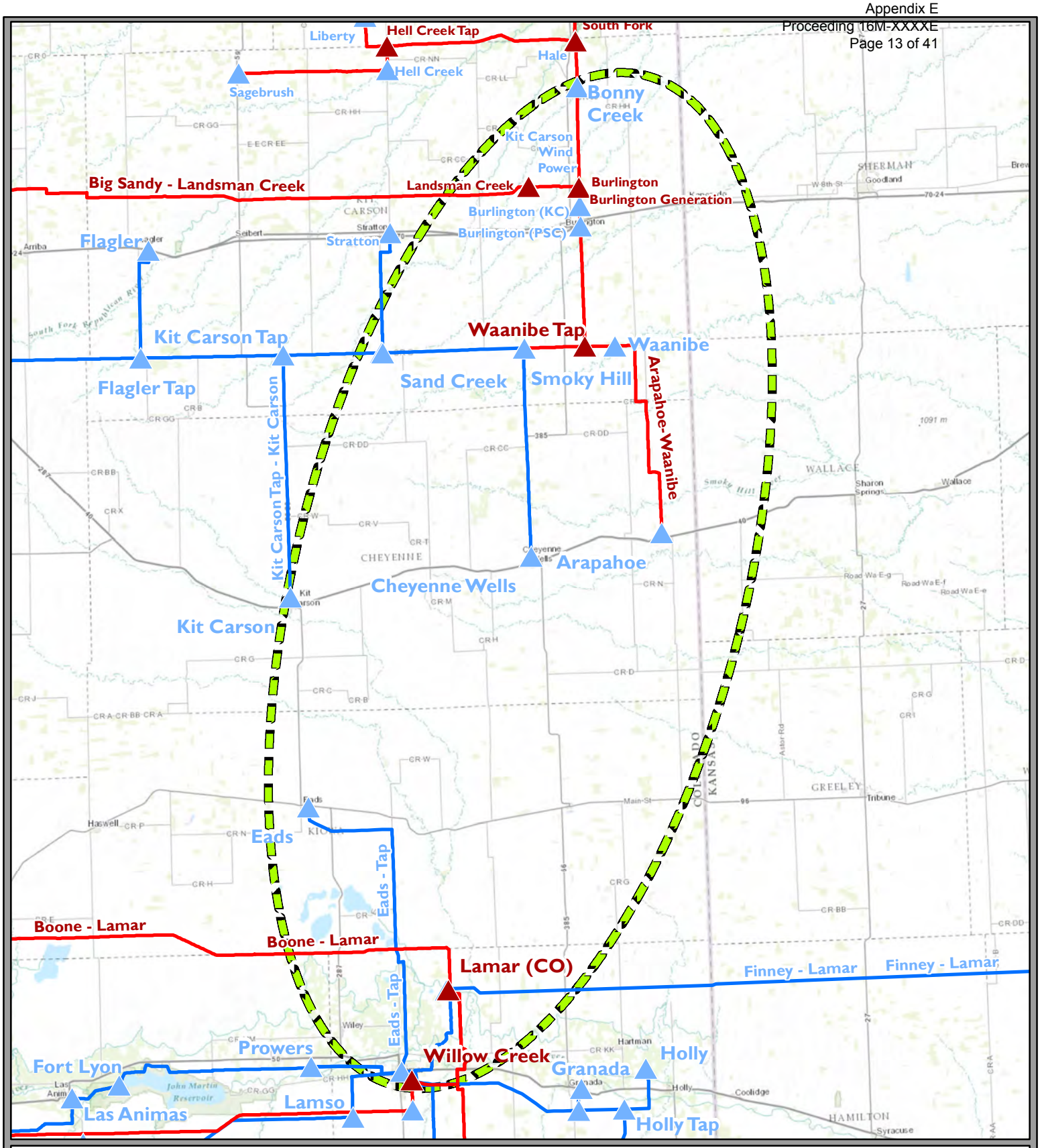
Boone-Walsenburg 230kV Line

Presently, the loss of the Comanche-Walsenburg 230kV transmission line results in severe thermal overloading on the 115kV transmission system in the area. To prevent the overloading, a Remedial Action Scheme (RAS) is in place that trips the Walsenburg-Gladstone 230kV line, resulting in the loss of load and reduced reliability in Northeast New Mexico.

To mitigate the need to trip the Walsenburg-Gladstone line, a second 230kV transmission line is proposed to be built between the existing Boone Substation and existing Walsenburg Substation. The line will be routed from Boone to a location north of Walsenburg called Calumet, where it will then join with the existing Comanche-Walsenburg 230kV line and continue to Walsenburg via a double circuit configuration. The transmission line will also increase reliability in the Pueblo, Colorado area and Northeast New Mexico in addition to foregoing the need for the RAS.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Burlington-Lamar 230 kV Transmission Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct a 230 kV transmission line from Boone Substation to Lamar Substation
Voltage Class:	230 kV
Facility Rating:	642 MVA
Point of Origin/Location:	Burlington
Point of Termination:	Lamar
Intermediate Points:	
Length of Line (in Miles):	107 Miles
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Member network service, load-serving, reliability
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$53,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2020
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303)254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Burlington-Lamar 345/230kV Transmission Project

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- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 4.5 9 18 Miles

N

Last Updated: 11/30/2015
Author: ricgar

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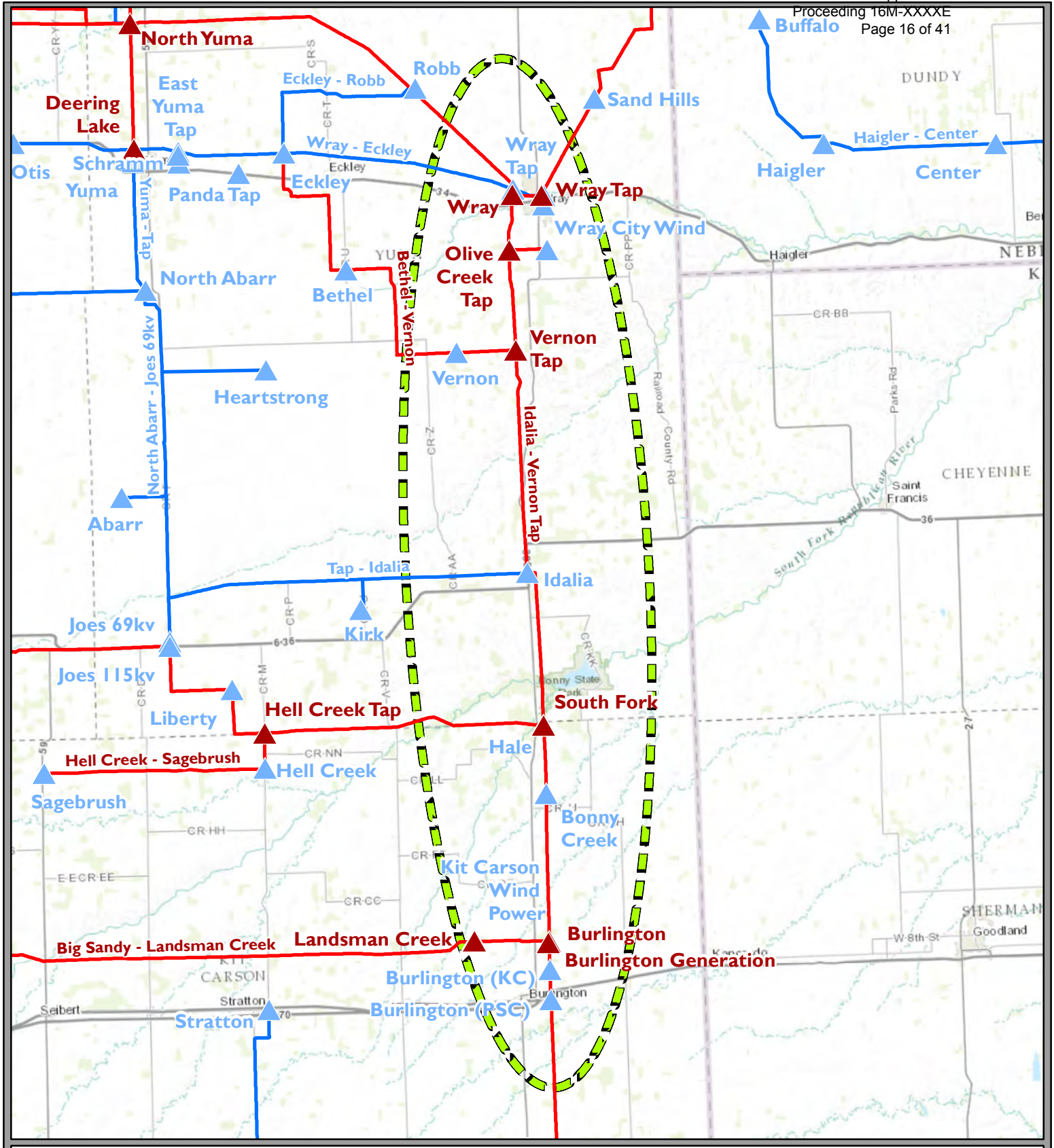
Burlington-Lamar 230kV Transmission Project

Past studies in the Boone-Lamar area of Colorado have shown voltage collapse for the Boone-Lamar 230kV line outage with cross-trips of all generation injected at Lamar 230kV. In order to mitigate these violations and provide for future growth and potential new generation, Tri-State determined the best solution was to construct a new transmission line from the existing Burlington substation to the existing Lamar substation.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Burlington - Wray 230kV Line Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct new 230kV line from the existing Burlington Substation to the existing Wray Substation.
Voltage Class:	230 kV
Facility Rating:	642 MVA
Point of Origin/Location:	Burlington, CO
Point of Termination:	Wray, CO
Intermediate Points:	
Length of Line (in Miles):	72.0
Type of Project:	Transmission Line
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Improve load-serving capability, remove generation operating restrictions & support renewable resource development in eastern Colorado.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$66,500,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2016
Regulatory Info:	CPUC: CPCN granted : COPUC-C11-0042
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Burlington-Wray 230 kV Line

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 3 6 12 Miles

Last Updated: 11/19/2015
Author: ykevrop

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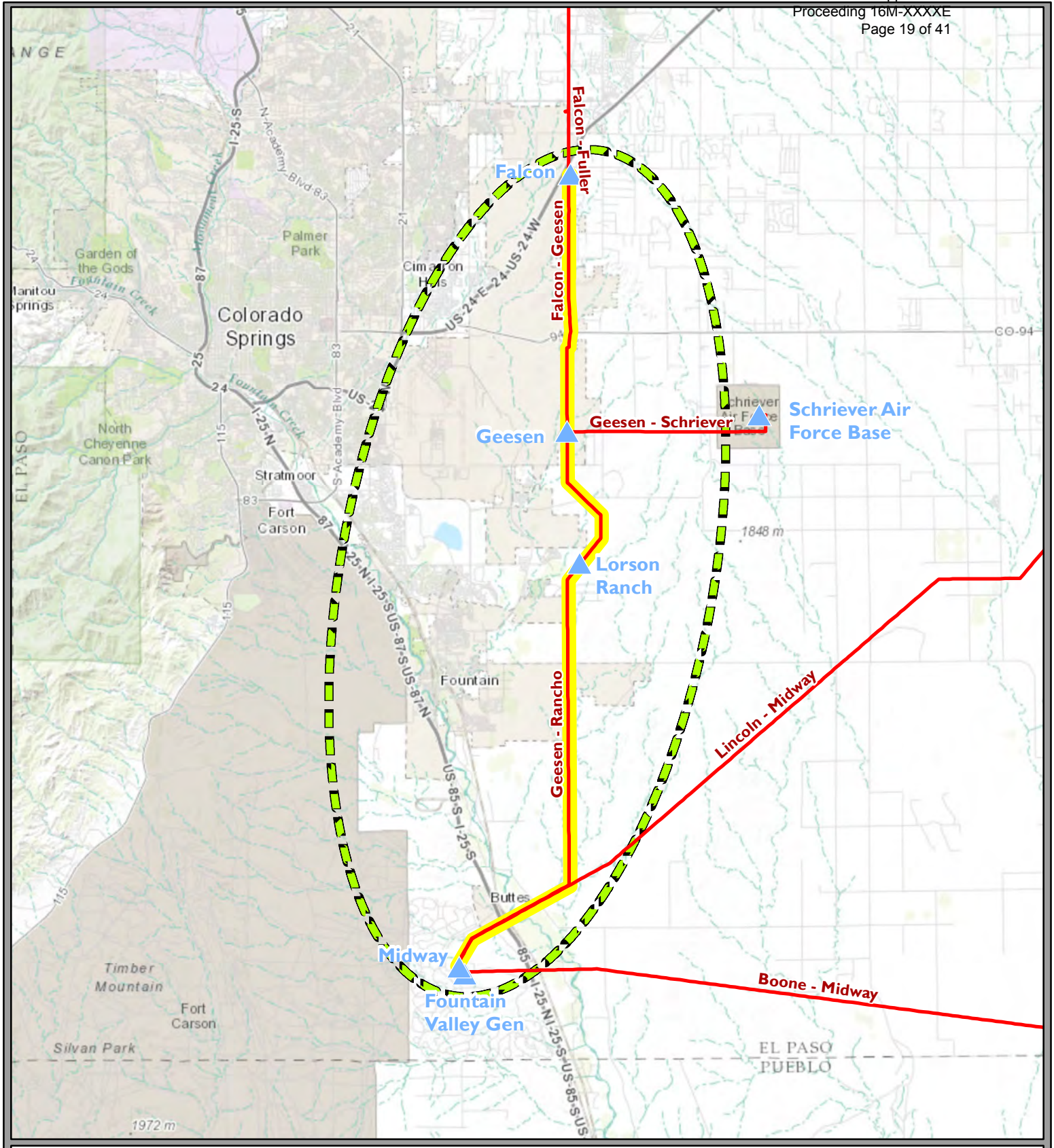
Burlington-Wray 230kV Line

The transmission system in northeastern Colorado has been forecasted to have an increased load in the coming years as well as increase in the development of renewable generation resources (namely wind). To accommodate the load growth and to increase the export capability for existing and planned generation, Tri-State has decided to build a 230kV transmission line between the existing Burlington and Wray substations.
The planned line will complete a continuous 230kV path through northeastern Colorado, substantially increase the limit of the load serving path through the area, and greatly improve the reliability of the transmission system in the area. The project is to be financed and built solely by Tri-State.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Falcon-Midway 115 kV Line Uprate Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Planned uprate of existing 115 kV line between Falcon and Midway.
Voltage Class:	115 kV
Facility Rating:	146 MVA
Point of Origin/Location:	Falcon
Point of Termination:	Midway
Intermediate Points:	
Length of Line (in Miles):	27.0
Type of Project:	Distribution
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increase conductor thermal rating.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$5,416,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2019
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	303-254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Falcon – Midway 115 kV Line Uprate

- Station - Other Utility
- Transmission Line - Tri-State
- Project Area
- Project Transmission Line - TSGT

0 1.25 2.5 5 Miles

N

Last Updated: 11/30/2015
Author: ricgar

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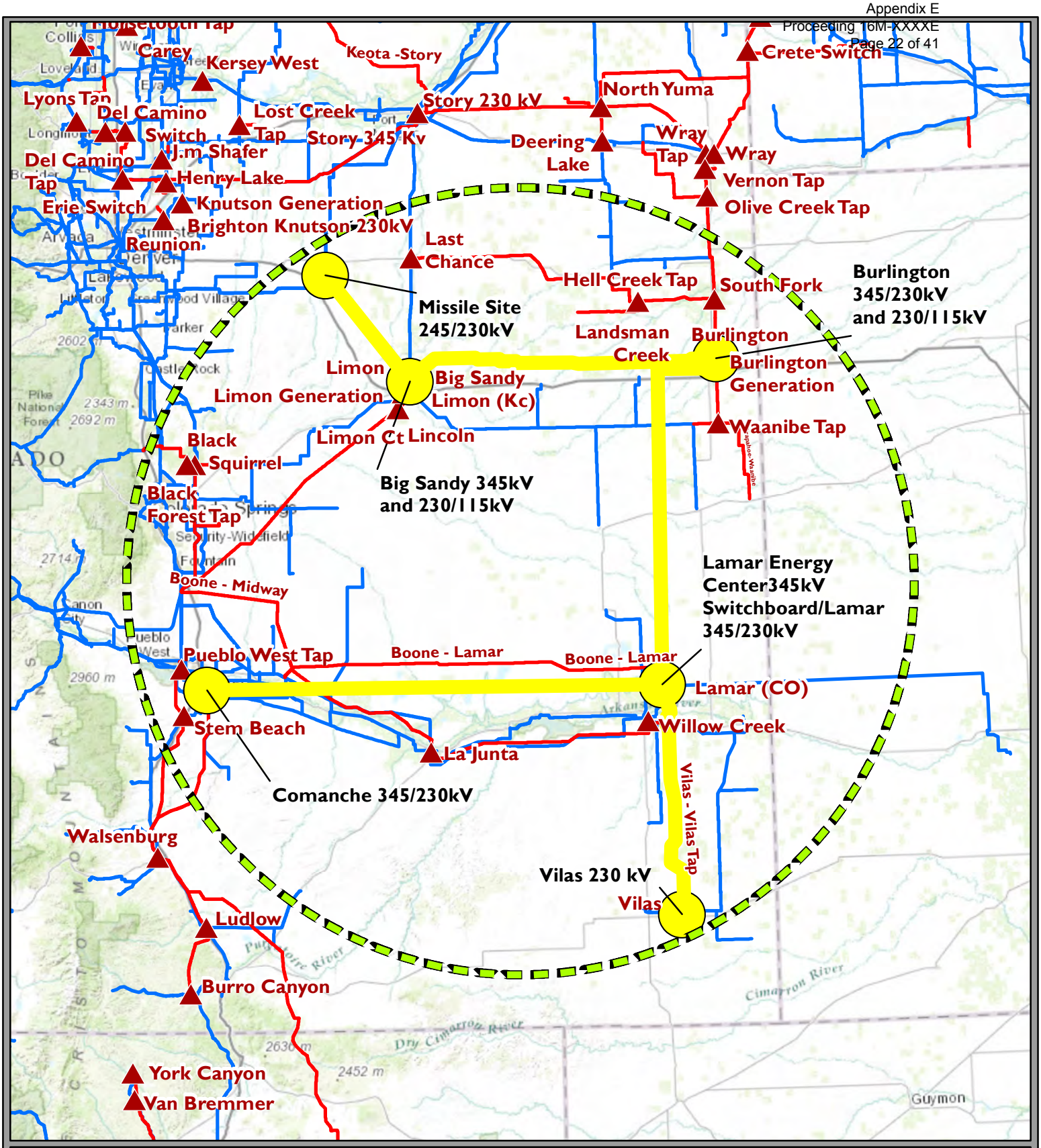
Falcon-Midway 115kV Line Uprate

The current Falcon-Midway 115kV transmission line has a thermal rating of 95MVA, which leads to forecasted overloads by the summer of 2018 from an outage on Tri-State's 115kV Falcon-Fuller line. In order to mitigate this problem, Tri-State is raising, moving, or rebuilding structures along the line to increase the overall line rating to 140MVA. The increased capacity will help serve Mountain View Electric Association's (MVEA) customer load in the area. The project is being built and financed solely by Tri-State.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Lamar-Front Range Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	Public Service Company of Colorado/Xcel Energy
Project Description:	Two high voltage transmission paths from Lamar Substation to Pueblo area and a second path from Lamar to substations near Brush and/or Deer Trail.
Voltage Class:	345 kV
Facility Rating:	2000 MW
Point of Origin/Location:	Lamar, CO
Point of Termination:	TBD: Comanche, Story, Pawnee, Avondale, Lamar, Lamar Energy Center, Burlington, Big Sandy, Missile Site
Intermediate Points:	Burlington, Big Sandy, Boone
Length of Line (in Miles):	300-350
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	Burlington, Big Sandy, Boone
Subregional Planning Group:	CCPG
Purpose of Project:	Tri-State reliability, system load-serving connectivity as regional power provider & future resources. Xcel Senate Bill 07-100 & reliability.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$900,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Lamar-Front Range Project

- Station - Tri-State
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area
- Project Feature

Project Feature

0 10 20 40 Miles

N

Last Updated: 11/30/2015
Author: ricgar

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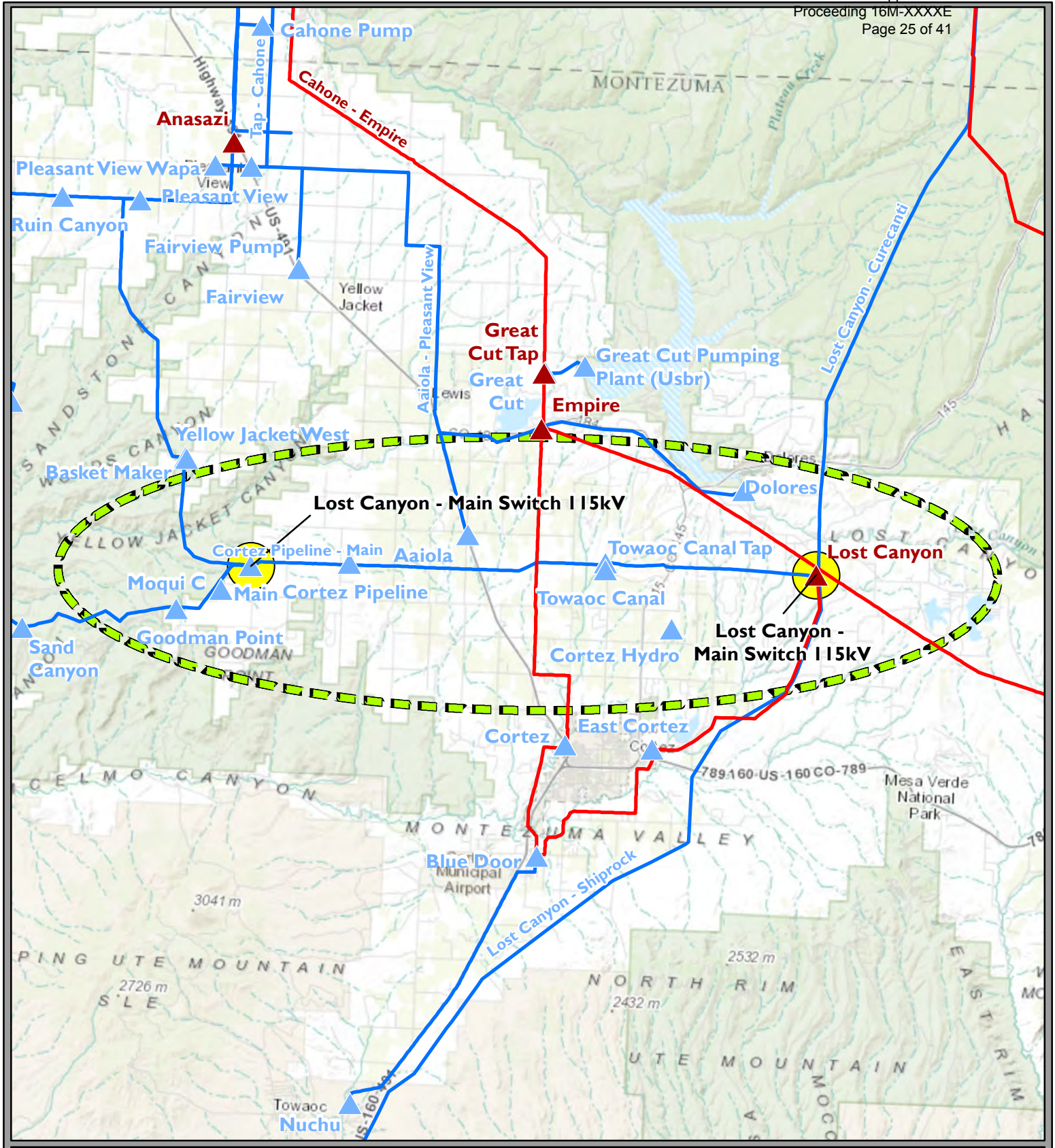
Lamar-Front Range Project

The Lamar-Front Range Project is a plan developed jointly through the CCPG to significantly improve load-serving capability, reliability, and potential resource accommodation in eastern and southeastern Colorado. The project could provide connectivity to the bulk transmission systems of Tri-State and PSCo, and provide strong "looped service" to areas with long radial transmission configurations. In concept, the project could create a transmission system capable of at least 2000 MW of new generation in eastern and southeastern Colorado.

This conceptual project identifies the transmission element additions that are needed to meet both companies' needs, including delivery of future generation to loads in the Denver and Front Range areas. The present conceptual project involves double circuit 345 kV transmission lines connecting Lamar to the Pueblo area and Lamar to the Burlington and Big Sandy substations. Transmission connections in the Pueblo area and connections from Big Sandy to Missile Site, Story, and Pawnee are also currently being evaluated.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Lost Canyon - Main Switch 115 kV Line

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	New 115 kV transmission line between Lost Canyon and Main Switch Substations.
Voltage Class:	115 kV
Facility Rating:	238 MVA
Point of Origin/Location:	Lost Canyon
Point of Termination:	Main Switch
Intermediate Points:	
Length of Line (in Miles):	16.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increase load serving capability of CO2 loop
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$17,800,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2018
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303)254-3339
Website Information	



Tri-State Generation and Transmission

Lost Canyon - Main Switch 115kV

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area
- Project Feature

0 1.25 2.5 5 Miles

N

Last Updated: 11/19/2015
Author: ykevrop

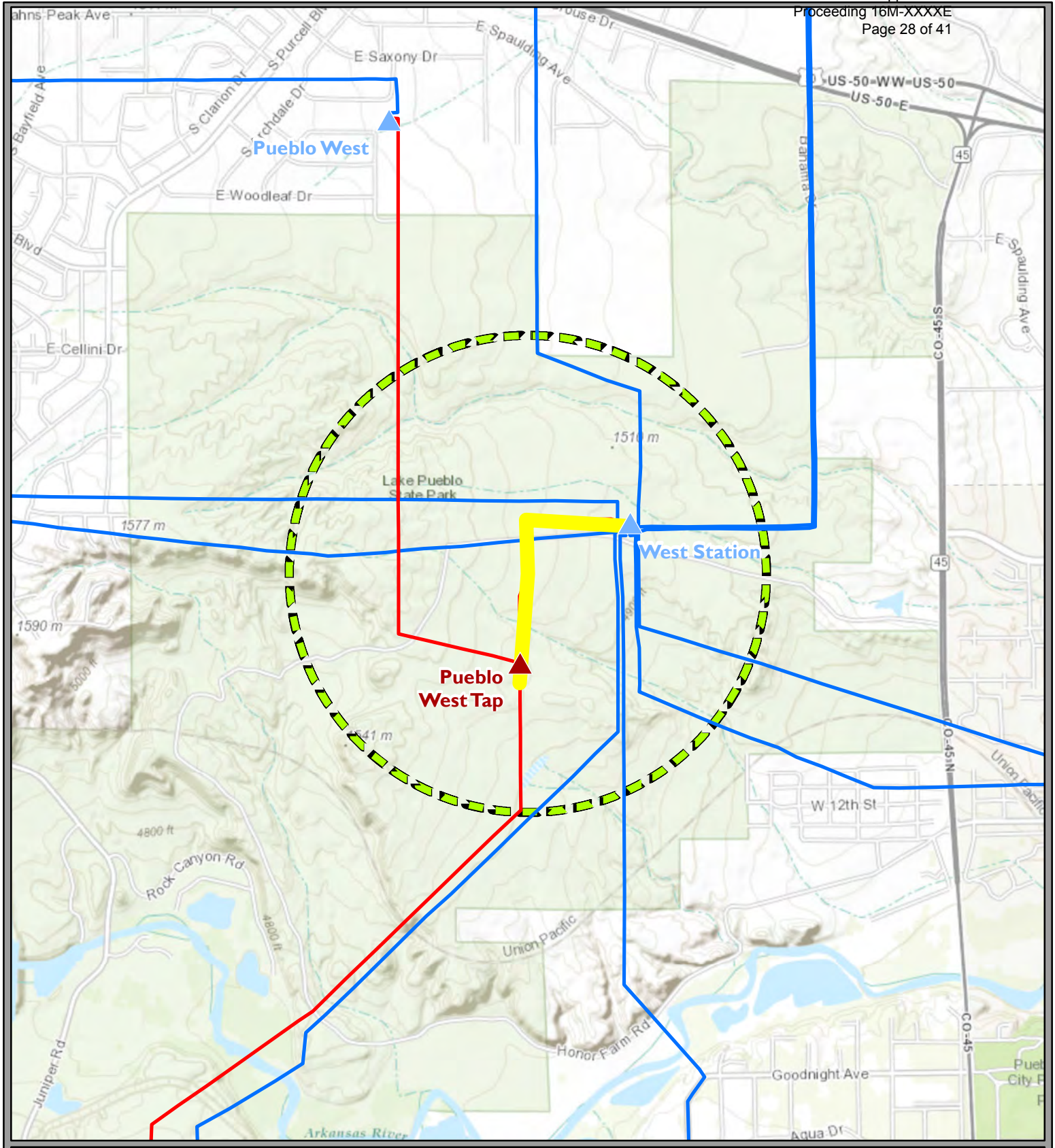
Document Path: \\hqstore\geostore\Products\SystemPlanning\2016_PUC\Maps\MXD\Overview_LostCanyonMainSwitch115kV.mxd

Lost Canyon – Main Swich 115 kV Line

There is heavy load growth in the CO2 Loop consisting of the Yellow Jacket Switch-Main Switch-Sand Canyon-Hovenweep-Yellow Jacket 115 kV system. Constructing the new Lost Canyon-Main Switch 115 kV line will provide support to meet the future load growth for CO2 Loop.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Pueblo West Tap Line Uprate

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Upgrade existing 115 kV line conductor
Voltage Class:	115 kV
Facility Rating:	130 MVA
Point of Origin/Location:	West Station
Point of Termination:	Pueblo West Tap
Intermediate Points:	
Length of Line (in Miles):	0.5 Miles
Type of Project:	Transmission Line
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability, eliminate overloading of existing line for NERC Category B contingency
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$576,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2016
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Pueblo West Tap Line Uprate

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area
- Project Feature

0 0.15 0.3 0.6 Miles

N

Last Updated: 11/20/2015
Author: ykevrop

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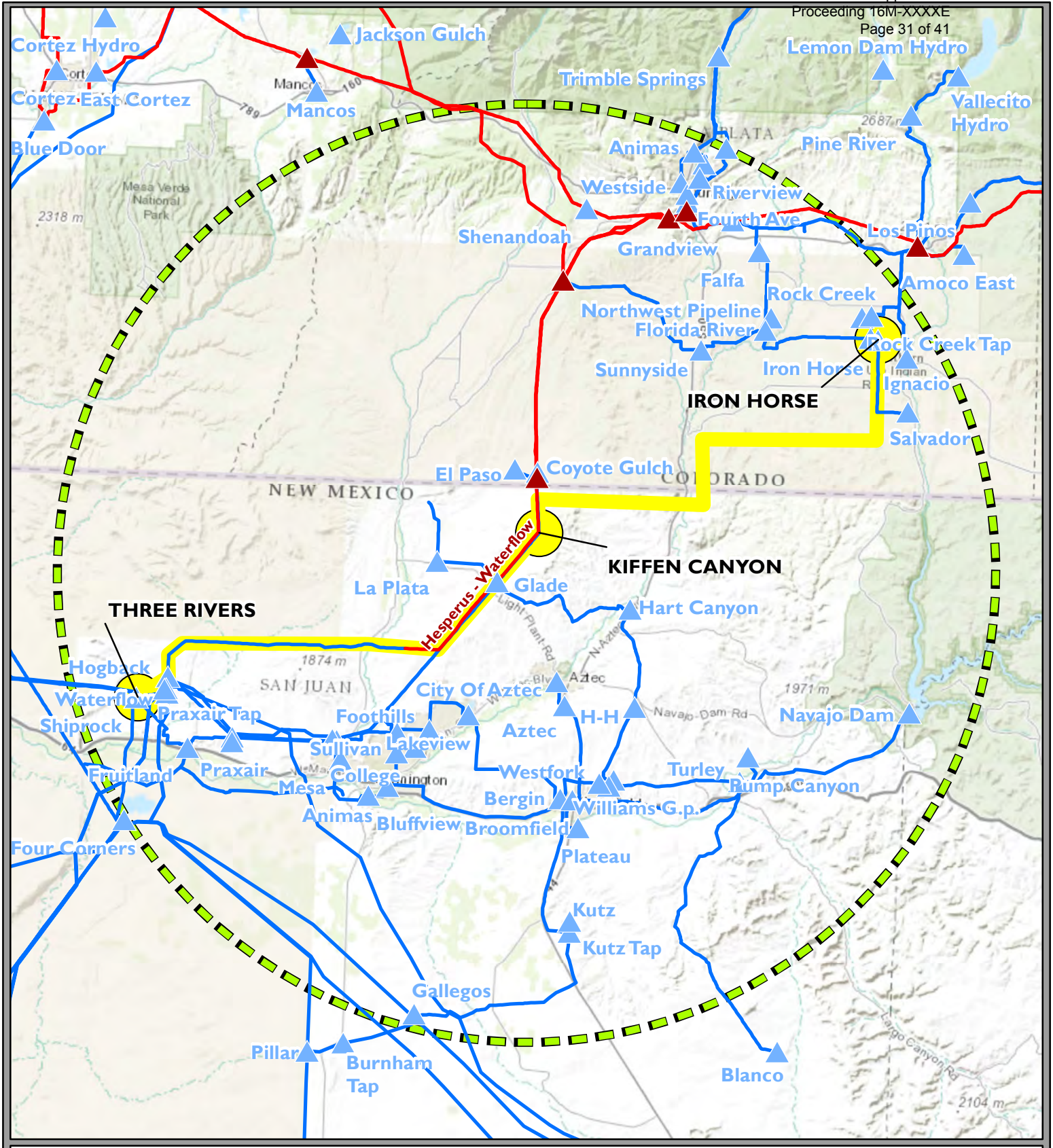
Pueblo West Tap Line Uprate

During Tri-State's annual transmission assessment, it was found that the Pueblo West Tap-West Station 115kV line would become thermally overloaded after certain contingency/outages. In order to prevent these overload conditions, it was determined the best fix would be to uprate the existing line from 95MVA to 130MVA by rebuilding 0.3 miles of the existing transmission line.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
San Juan Basin Energy Connect Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	New 230 kV transmission line between existing WAPA Shiprock Substation in New Mexico to a new 230 kV Iron Horse Substation. New 345 kV transmission line between existing WAPA Shiprock Substation in New Mexico to a new 345 kV Three Rivers Substation. A new 230 kV Kiffen Canyon Substation and a new 345/230 kV Three Rivers Substation will also be required.
Voltage Class:	230 kV
Facility Rating:	600 MVA, 230kV Line, 300MVA PST
Point of Origin/Location:	Shiprock,New Mexico
Point of Termination:	Iron Horse (near Ignacio, CO)
Intermediate Points:	Kiffen Canyon, Three Rivers
Length of Line (in Miles):	70.0
Type of Project:	Transmission Line and Substation
Development Status:	Under Construction
Routing:	From Shiprock east to Three Rivers east to Kiffen Canyon north to Iron Horse
Subregional Planning Group:	CCPG and SWAT
Purpose of Project:	To serve approximately 100 MW of new industrial load in SW Colorado.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$113,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2018
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

San Juan Basin Energy Connect Project

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area
- Project Feature

Project Feature

0 2.75 5.5 11 Miles

N

Last Updated: 11/19/2015
Author: ykevrop

Tri-State Generation and Transmission Association provides GIS data to aid the development of Tri-State projects. No user of Tri-State's GIS data and maps may sell any portion of the information provided therein. Tri-State makes no warrantee regarding accuracy or completeness of the data and maps. Users shall rely only upon proper field verification of Tri-State GIS data.

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Geographic Information Systems

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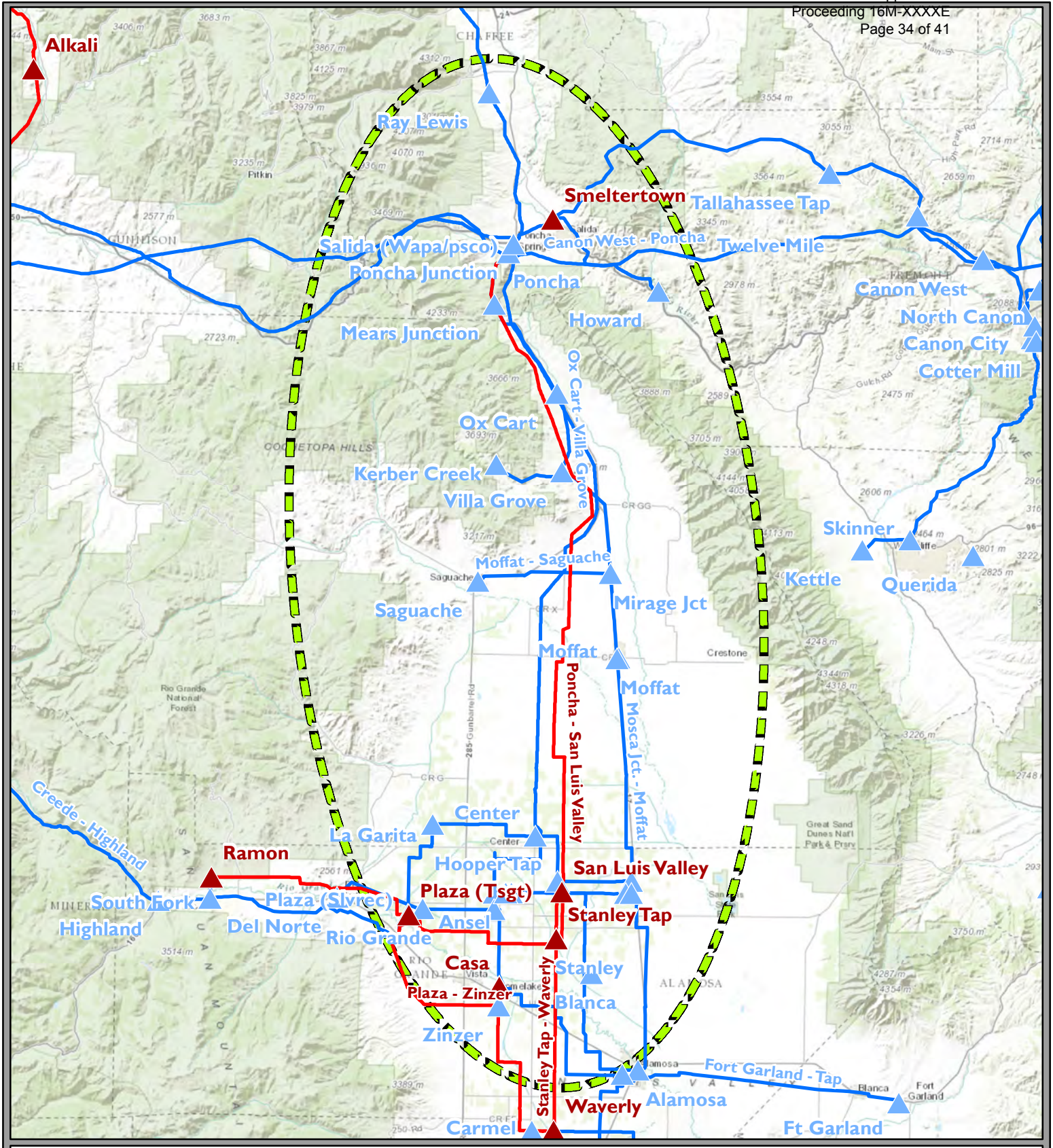
San Juan Basin Energy Connect Project

Southwest Colorado loads have the potential to grow by as much as 200 MW over the next ten years. Various transmission configurations were studied to serve the southwest Colorado load requirements. At present, the preferred alternative is a 230 kV transmission line originating at the Shiprock Substation 345 kV bus, going through a proposed new Kiffen Canyon Substation, in the Glade Tap area, and terminating at a new 230 kV substation called Iron Horse near Ignacio, Colorado. This configuration has the additional benefit of adding an independent second source to the Ignacio/Pagosa Springs area, significantly improving reliability.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
San Luis Valley-Poncha 230 kV Line #2

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct a second 230 kV transmission line from San Luis Valley to Poncha.
Voltage Class:	230 kV
Facility Rating:	631 MVA
Point of Origin/Location:	San Luis Valley
Point of Termination:	Poncha
Intermediate Points:	
Length of Line (in Miles):	62 Miles
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Provide reliable and adequate load support to San Luis Valley
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$58,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2022
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	303-254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_Transmissio



Tri-State Generation and Transmission

San Luis Valley 230kV Line Development

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 4 8 16 Miles

N

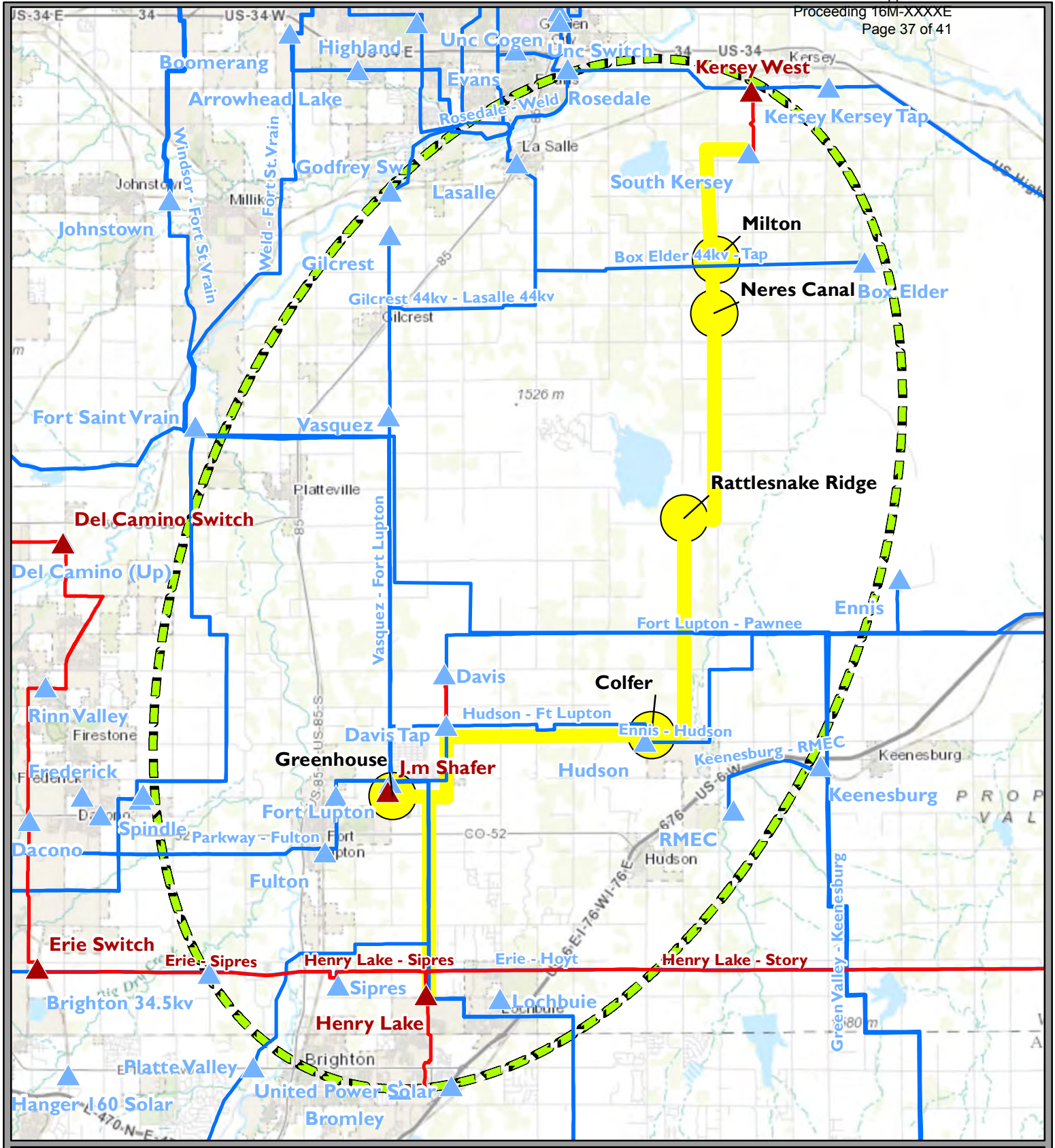
Last Updated: 11/20/2015
Author: ykevrop

San Luis Valley – Poncha 230 kV #2

New high-voltage transmission must be built in the San Luis Valley (SLV) region of south-central Colorado to restore electric system reliability and customer load-serving capability, and to accommodate development of potential generation resources. . Tri-State Generation and Transmission (Tri-State) and Public Service Company of Colorado (Public Service) facilitated a study effort through the Colorado Coordinated Planning Group (CCPG) to perform an evaluation of the transmission system immediately in and around the SLV and develop system alternatives that would improve the transmission system between the SLV and Poncha Springs (Poncha), Colorado. Both Tri-State and Public Service have electric customer loads in the SLV region that are served radially from transmission that originates at or near Poncha. The study concluded that, at a minimum, an additional 230 kV line is needed to increase system reliability. Studies show that this could be accomplished by either adding a new 230 kV line or rebuilding an existing lower voltage line to and operating it at 230 kV.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Southwest Weld Expansion Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Construct approximately 49 aggregated miles of 115 kV and 230 kV transmission lines with six potential load-serving substations and/or line taps.
Voltage Class:	230 kV
Facility Rating:	300 MW
Point of Origin/Location:	JM Shafer
Point of Termination:	Del Camino, South Kersey, Henry Lake
Intermediate Points:	Davis, Colfer (Hudson)
Length of Line (in Miles):	49 miles
Type of Project:	Other
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load-serving
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$112,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2018
Regulatory Info:	CPCN filed 8/2014
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	Http://www.tristategt.org/transmissionPlanning/puc2627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Southwest Weld Expansion Project

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area
- Project Feature

Project Feature

0 1.25 2.5 5 Miles

N

Last Updated: 11/20/2015
Author: ykevrop

Tri-State Generation and Transmission Association provides GIS data to aid the development of Tri-State projects. No user of Tri-State's GIS data and maps may sell any portion of the information provided therein. Tri-State makes no warrantee regarding accuracy or completeness of the data and maps. Users shall rely only upon proper field verification of Tri-State GIS data.

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Geographic Information Systems

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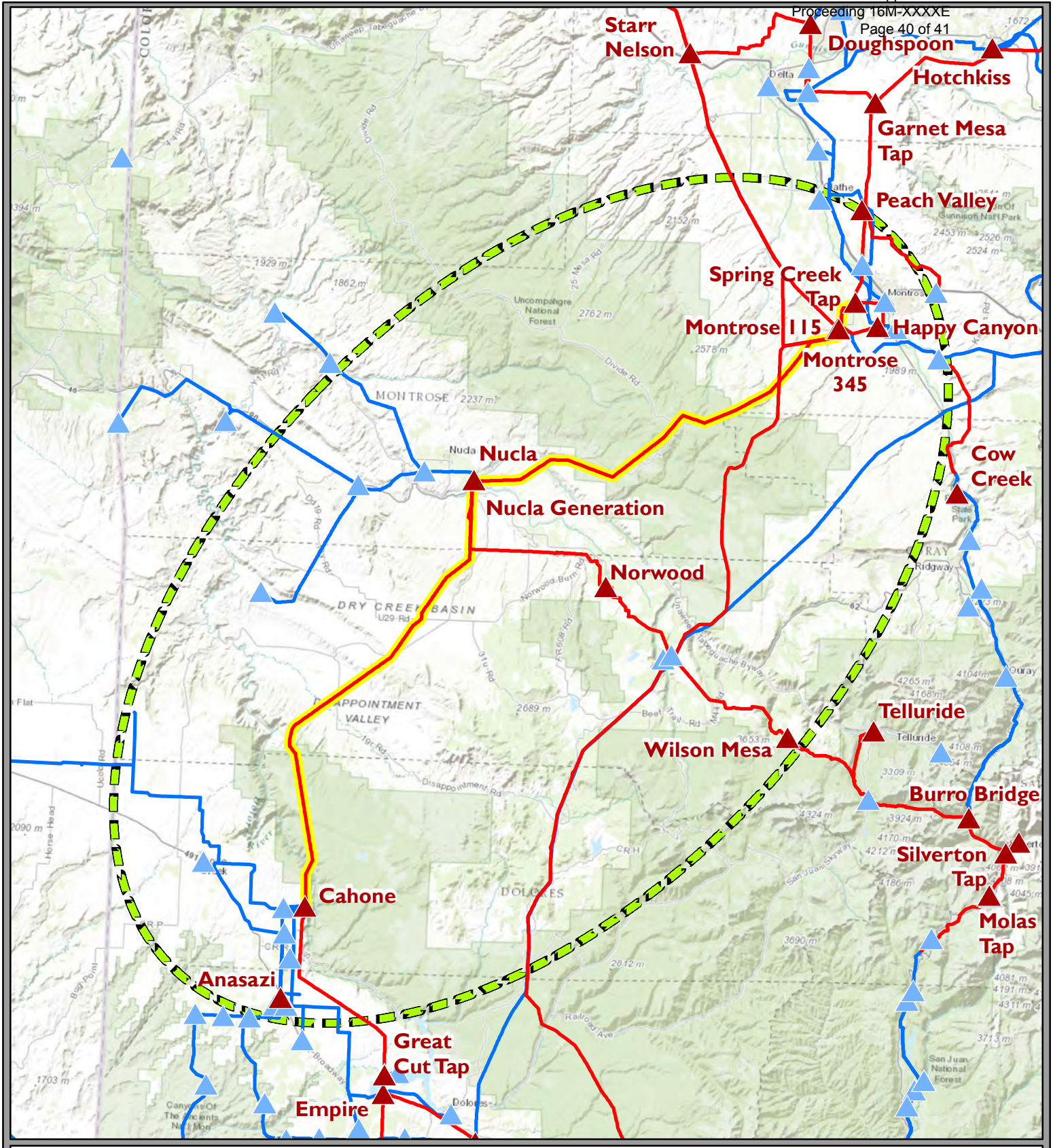
Southwest Weld Expansion Project

Due to large scale oil and gas development in Southwest Weld County and native load growth, Tri-State is planning on constructing approximately 49 aggregate miles of 115kV and 230 kV transmission lines to meet the forecasted demand of approximately 300MW within the next five years. Six potential 115kV load-serving substations and/or line taps will be constructed by Tri-State, while new 69kV transmission lines and substations will be constructed by United Power for the project.

Tri-State Generation and Transmission Association
2016-2026 Transmission Plan
Western Colorado Transmission Upgrade Project

Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	
Project Description:	Upgrade existing transmission line and facilities from Montrose Substation to Cahone Substation from 115 kV operation to 230 kV. A new Maverick 230/115kV substation will be constructed near Nucla substation. A new Maverick - Nucla 115kV line will constructed
Voltage Class:	230 kV
Facility Rating:	645 MVA
Point of Origin/Location:	Montrose
Point of Termination:	Cahone
Intermediate Points:	Nucla, Maverick
Length of Line (in Miles):	80 Miles
Type of Project:	Transmission Line and Substation
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability - eliminate need for existing Nucla Remedial Action Scheme and replace failing structures.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$122,000,000
Schedule:	
Construction Date:	2014
Planned In-Service Date:	2018
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	(303) 254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm



Tri-State Generation and Transmission

Western Colorado Transmission Upgrade Project

TRI-STATE G&T
A Touchstone Energy® Cooperative
Geographic Information Systems

- Station - Tri-State
- Station - Other Utility
- Transmission Line - Tri-State
- Transmission Line - Other Utility
- Project Area

0 3.75 7.5 15 Miles

N

Last Updated: 12/16/2015
Author: ykevrop

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Western Colorado Transmission Upgrade Project (Montrose-Nucla-Cahone 230 kV Line)

The 40 mile long Montrose – Nucla and Nucla – Cahone 115kV transmission lines are old, overloaded, undersized, and must be rebuilt. To ensure continued reliability of the southwest Colorado transmission system, Tri-State is replacing them with new, higher capacity lines rated for 230kV operation. This project will increase the load serving capability of the southwest Colorado transmission system and also eliminate the need for the existing Nucla Remedial Action Scheme (RAS), which trips the Montrose-Nucla line when it starts to overload after contingencies/outages in the area.

Appendix F

PSCo

10-Year Transmission Projects

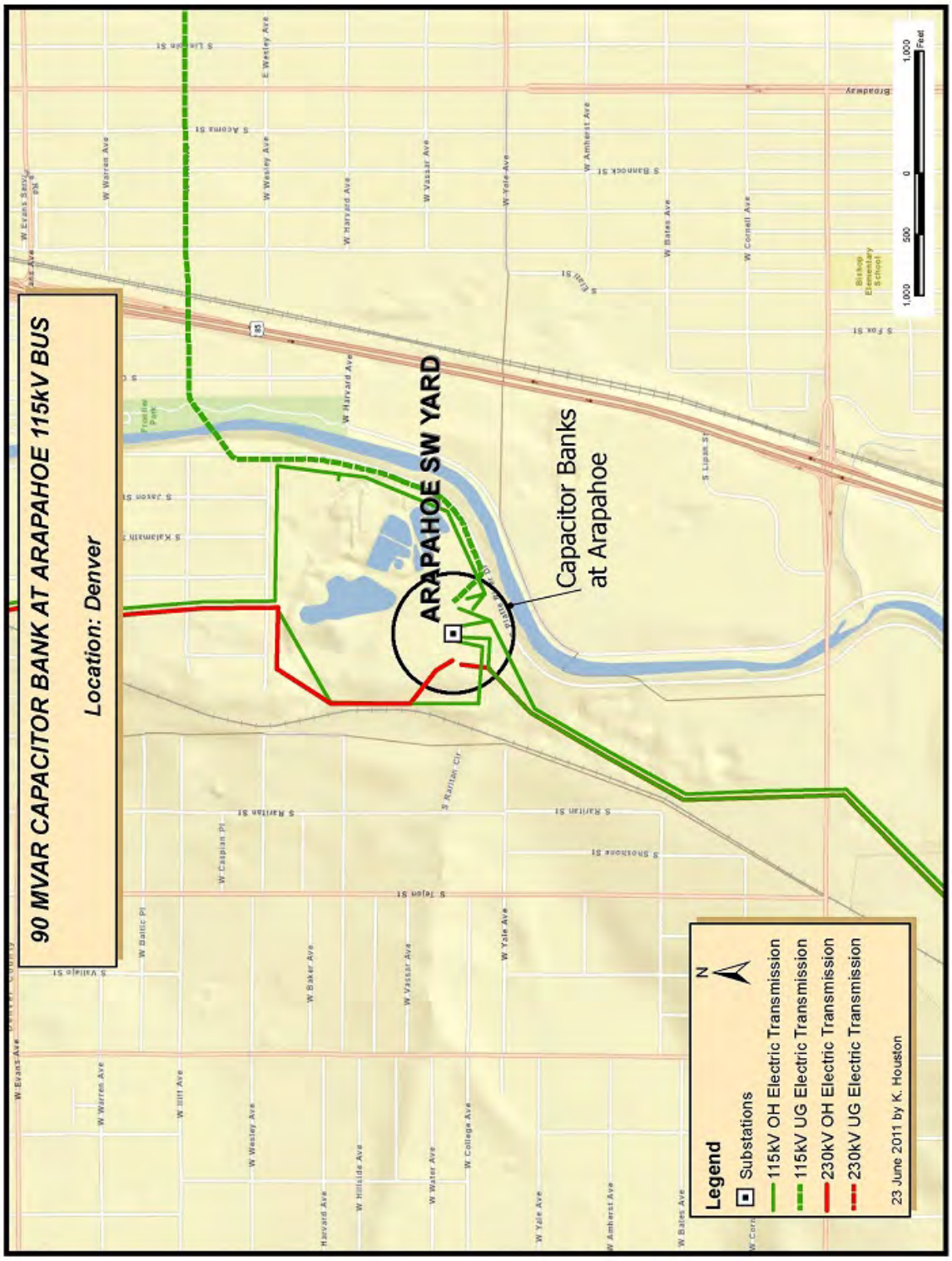
Substation Projects

Transmission Projects

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Arapahoe 90 MVAR Capacitor

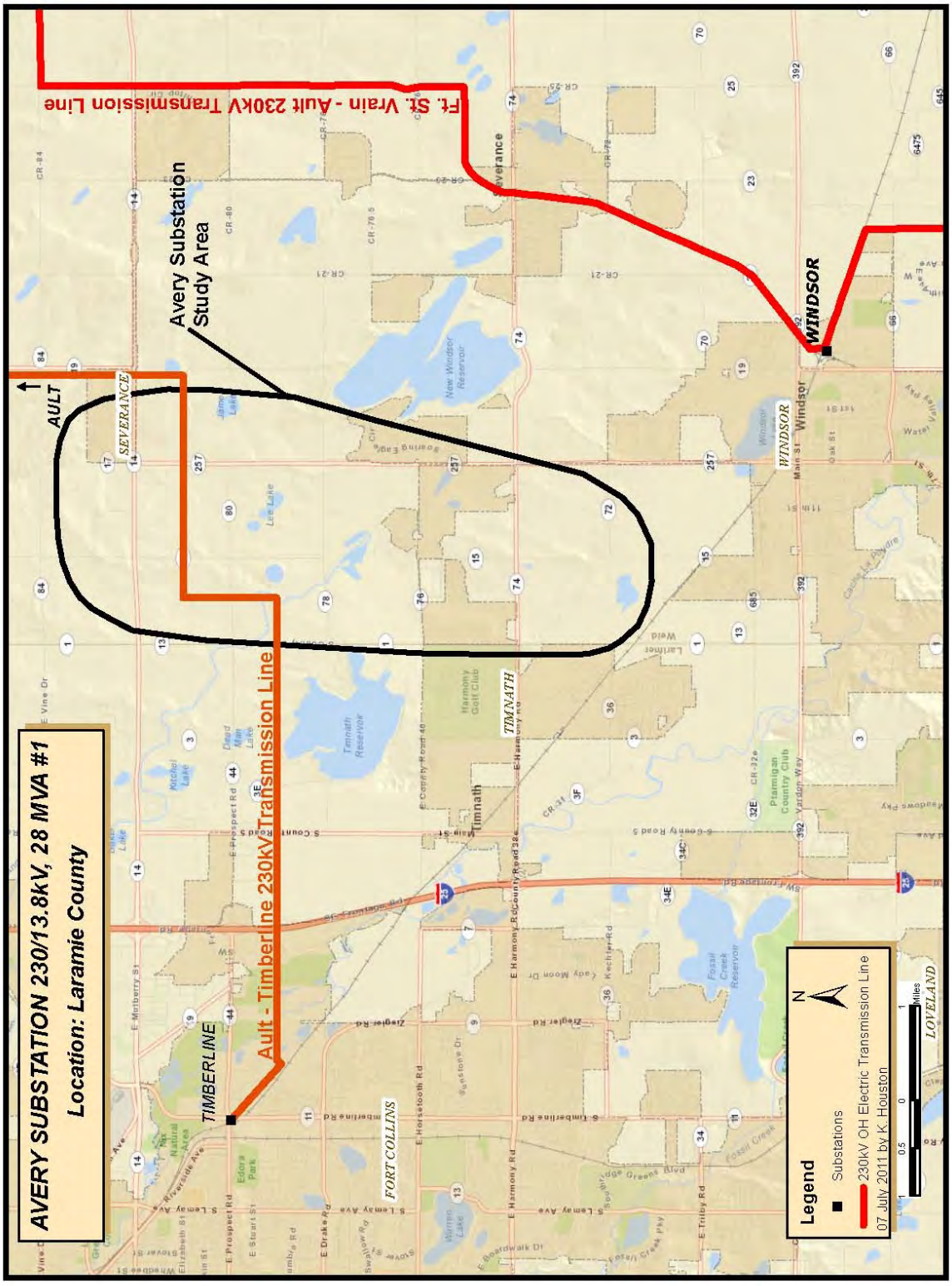
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Install a 90 MVAR Capacitor bank at Arapahoe 115 kV bus.
Voltage Class:	115 kV
Facility Rating:	90 MVAR
Point of Origin/Location:	Arapahoe
Point of Termination:	Arapahoe
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability. Project needed to provide voltage support in the Denver metro area.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$4,200,000
Schedule:	
Construction Date:	2012
Planned In-Service Date:	2014
Regulatory Info:	Submitted to CPUC through Rule 3206: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


90 MVAR CAPACITOR BANK AT ARAPAHOE 115kV BUS
Location: Denver
ARAPAHOE SW YARD
Capacitor Banks at Arapahoe
Legend
Substations
115kV OH Electric Transmission
115kV UG Electric Transmission
230kV OH Electric Transmission
230kV UG Electric Transmission
23 June 2011 by K. Houston
N
1,000 0 500 1,000 Feet

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Avery Substation

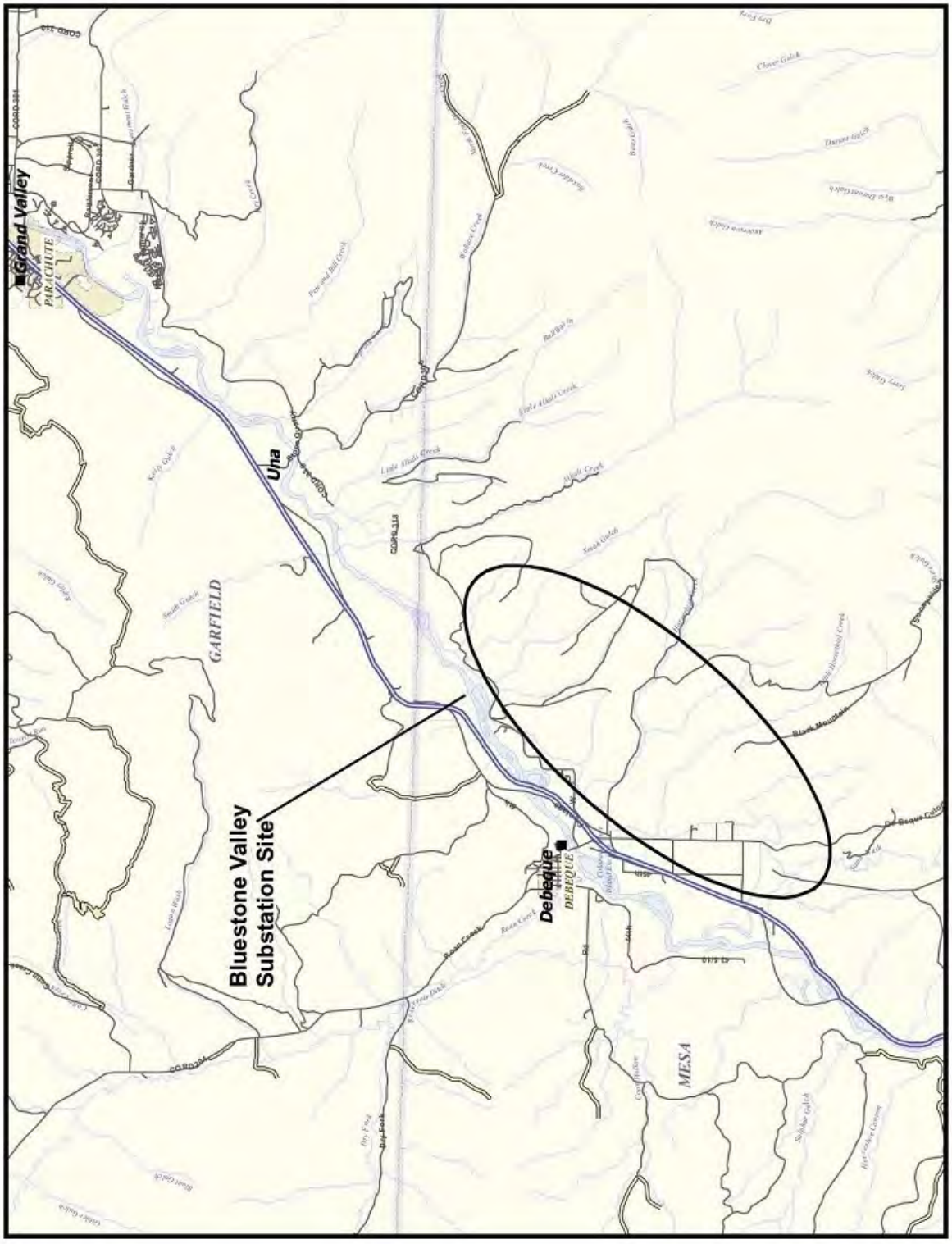
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	New distribution substation located in Weld County. The new substation will tap Platte River Power Authority (PRPA) Ault – Timberline 230kV transmission line.
Voltage Class:	230 kV
Facility Rating:	n/a
Point of Origin/Location:	Avery Substation
Point of Termination:	Avery Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load service
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$16,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2017
Regulatory Info:	CPCN required
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


AVERY SUBSTATION 230/13.8kV, 28 MVA #1
Location: Laramie County
Ault - Timberline 230kV Transmission Line
Ft. St. Vrain - Ault 230kV Transmission Line
Avery Substation
Study Area
AULT
SEVERANCE
TIMBERLINE
FORT COLLINS
TIMNATH
WINDSOR
LOVELAND
Legend
Substations
230kV OH Electric Transmission Line
07 July 2011 by K. Houston
N
Miles

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Bluestone Substation

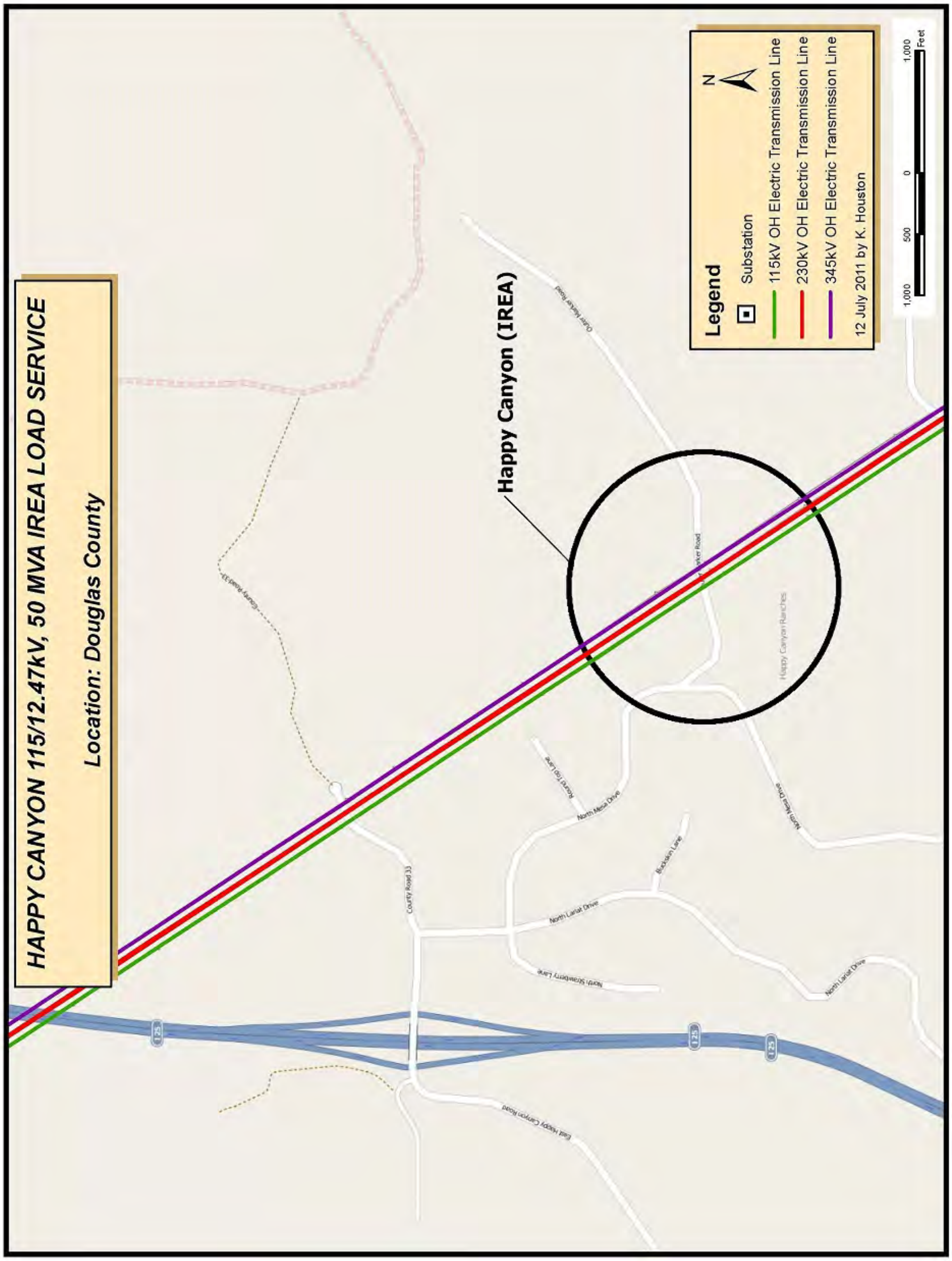
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Construct a new Bluestone Substation that would tap PSCo's Rifle-Parachute-Cameo 230kV line near Debeque, Colorado.
Voltage Class:	230 kV
Facility Rating:	n/a
Point of Origin/Location:	Bluestone
Point of Termination:	Bluestone
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load Service. The substation would provide load service for PSCo and Grand Valley Power (GVP) customers in the area.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	TBD
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	Submitted to CPUC through Rule 3206: No CPCN required
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Tom Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


Grand Valley
Una
Bluestone Valley
Substation Site
Debeque
GARFIELD
MESA

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Happy Canyon Substation

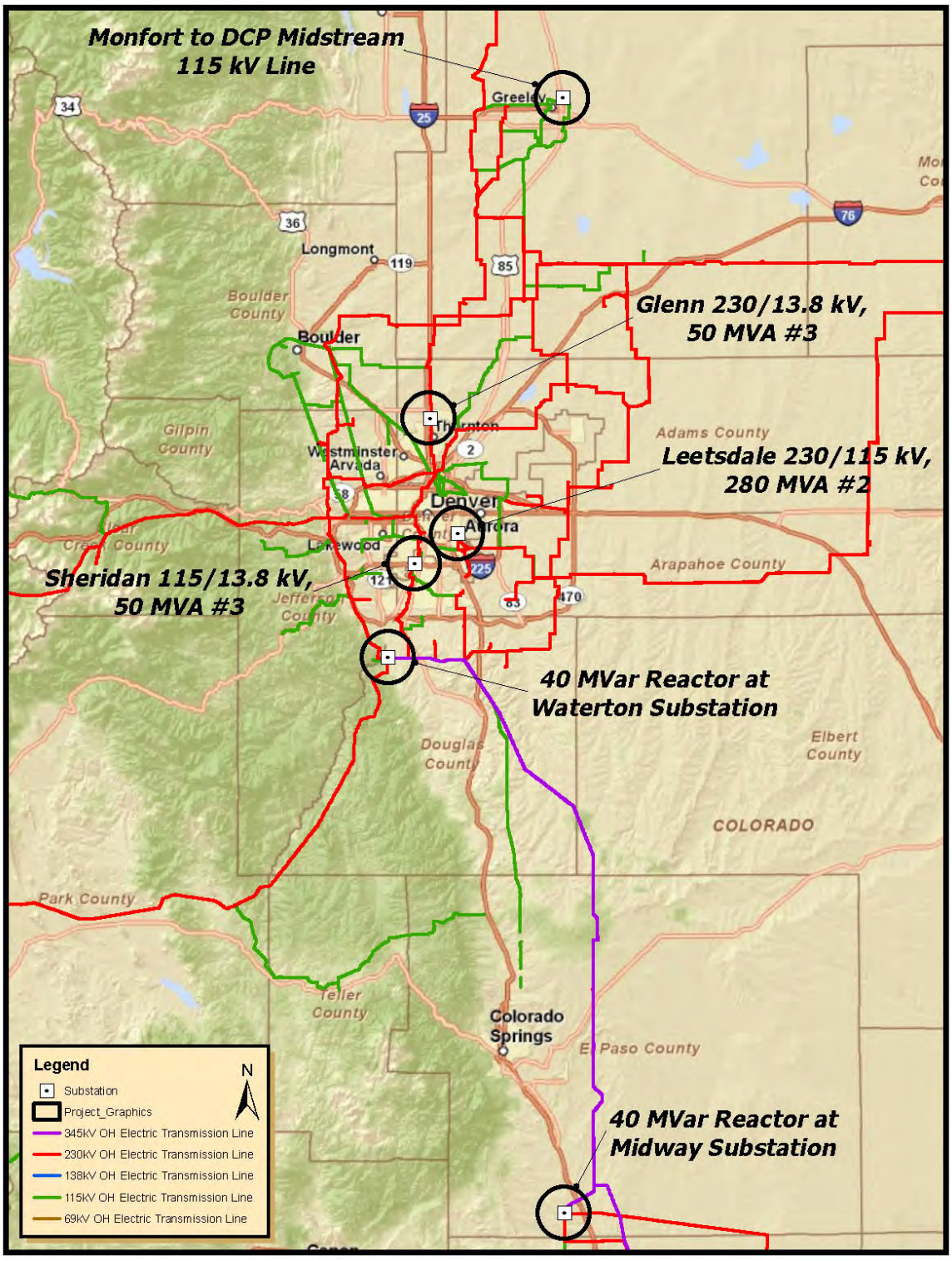
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Construct a 115 kV Happy Canyon Substation tapping PSCo's Daniels Park - Castle Rock 115 kV line to provide load service to IREA.
Voltage Class:	115 kV
Facility Rating:	n/a
Point of Origin/Location:	Happy Canyon Substation
Point of Termination:	Happy Canyon Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load Service. To Serve IREA loads
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$3,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2016
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


HAPPY CANYON 115/12.47kV, 50 MVA IREA LOAD SERVICE
Location: Douglas County
Happy Canyon (IREA)
Legend
Substation
115kV OH Electric Transmission Line
230kV OH Electric Transmission Line
345kV OH Electric Transmission Line
12 July 2011 by K. Houston
N
1,000
500
0
1,000
Feet
County Road 33
North Mesa Drive
North Lariat Drive
I 25

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Leetsdale 230/115 kV #2

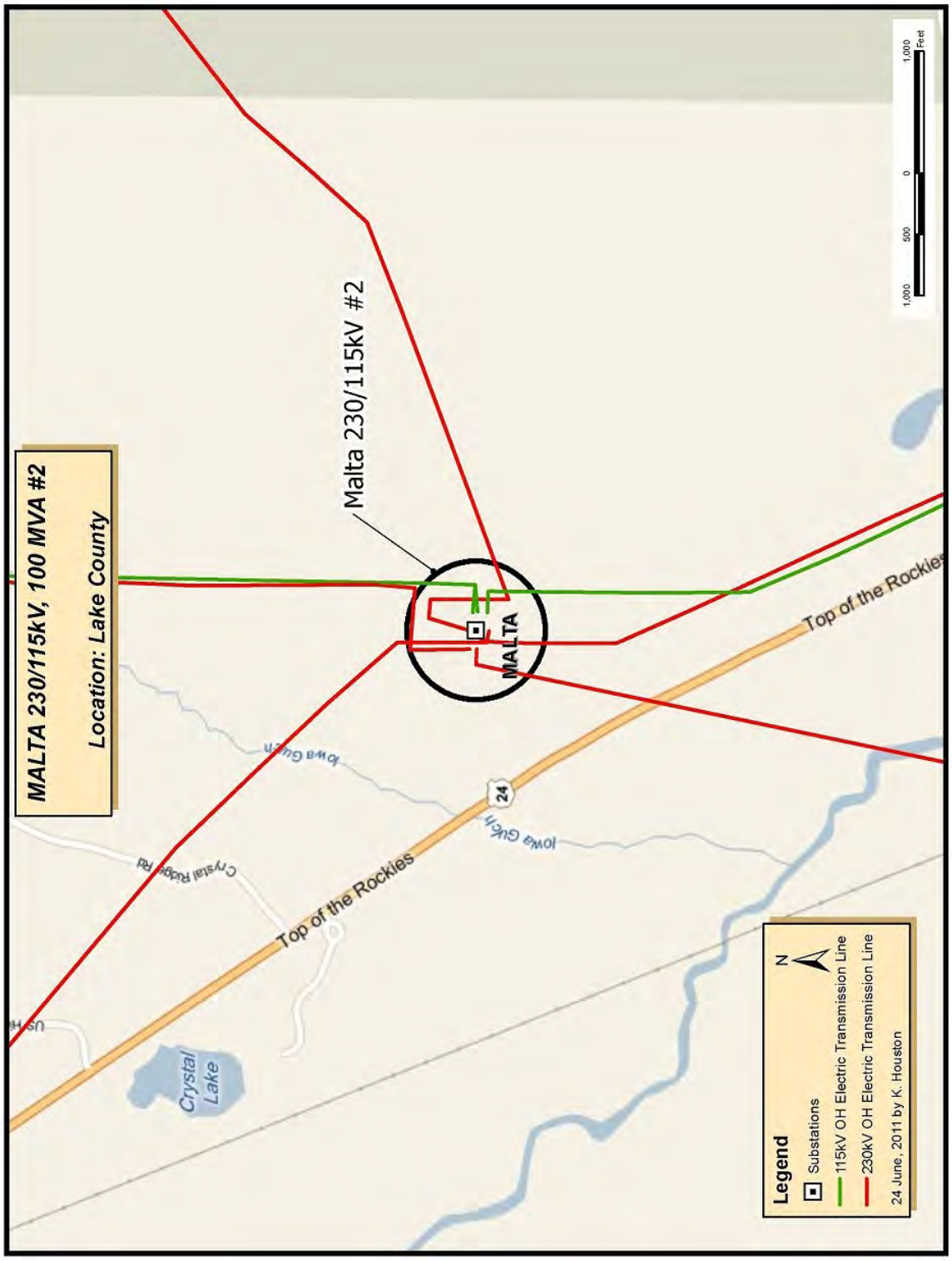
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Add a second Leetsdale 230/115 kV auto-transformer rated to 280 MVA.
Voltage Class:	230 kV
Facility Rating:	280 MVA
Point of Origin/Location:	Leetsdale Substation
Point of Termination:	Leetsdale Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Transformer
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$9,700,000
Schedule:	
Construction Date:	2012
Planned In-Service Date:	2015
Regulatory Info:	Yes
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Monfort to DCP Midstream
115 kV Line
Glenn 230/13.8 kV,
50 MVA #3
Leetsdale 230/115 kV,
280 MVA #2
Sheridan 115/13.8 kV,
50 MVA #3
40 MVar Reactor at
Waterton Substation
40 MVar Reactor at
Midway Substation
Greeley
Longmont
Boulder
Boulder County
Gilpin County
Adams County
Arapahoe County
Jefferson County
Douglas County
Elbert County
Park County
Teller County
El Paso County
Denver
Aurora
Lakewood
Westminster
Arvada
Colorado Springs
COLORADO
Legend
N
Substation
Project_Graphics
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Malta 230/115 kV #2

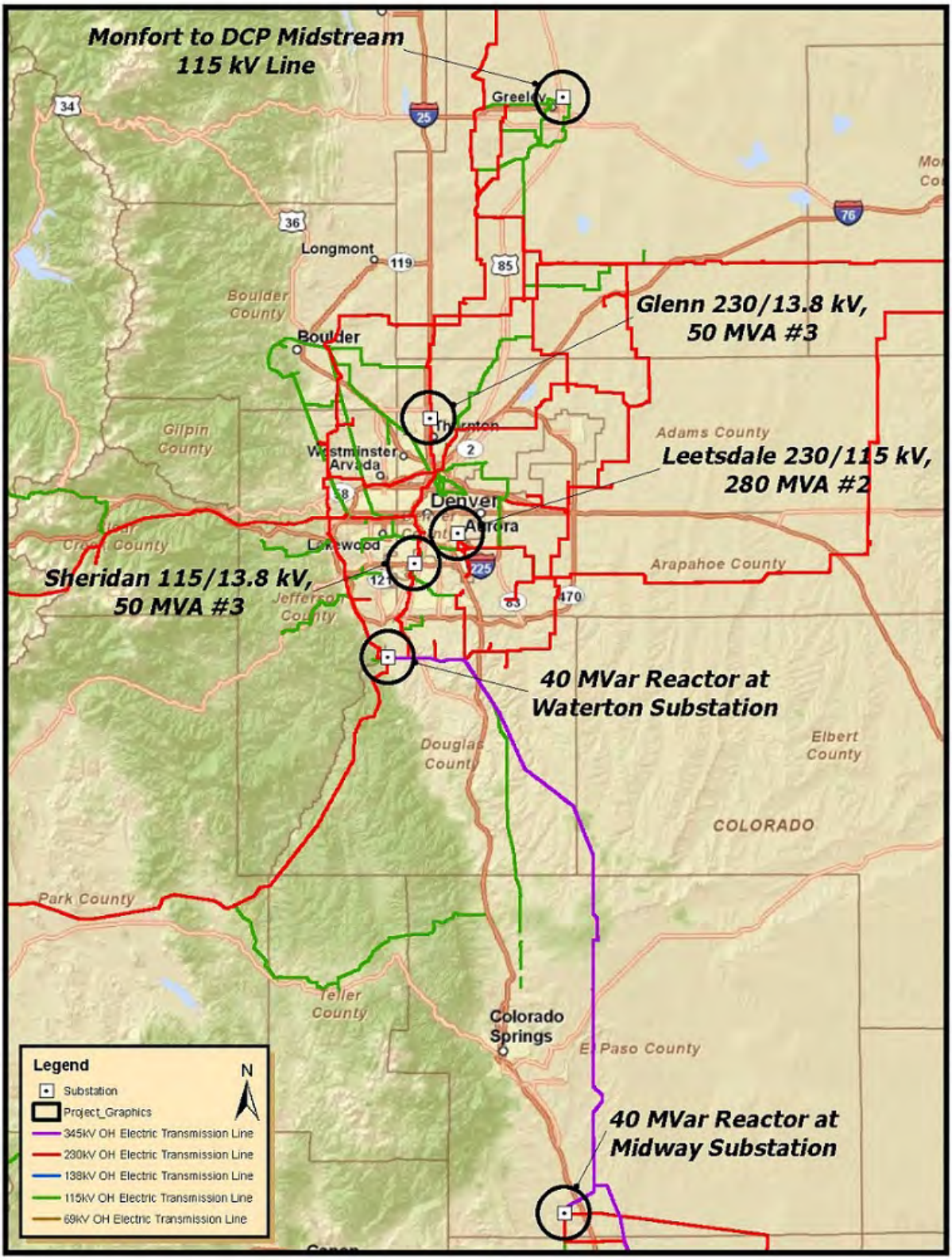
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Install a second 230/115 kV, 100 MVA transformer at Malta Substation, in Lake County, Colorado.
Voltage Class:	230 kV
Facility Rating:	100 MVA
Point of Origin/Location:	Malta Substation
Point of Termination:	Malta Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability. Project would support new loads at the Climax Substation.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$12,800,000
Schedule:	
Construction Date:	2012
Planned In-Service Date:	2014
Regulatory Info:	Rule 3206: No CPCN required
Regulatory Date:	04/30/2011
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


MALTA 230/115kV, 100 MVA #2
Location: Lake County
Malta 230/115kV #2
MALTA
Top of the Rockies
Top of the Rockies
24
Crystal Lake
Crystal Ridge Rd
Iowa Gulch
Iowa Gulch
1,000 0 500 1,000 Feet
N
Legend
Substations
115kV OH Electric Transmission Line
230kV OH Electric Transmission Line
24 June, 2011 by K. Houston

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Midway 40 MVAR Reactor

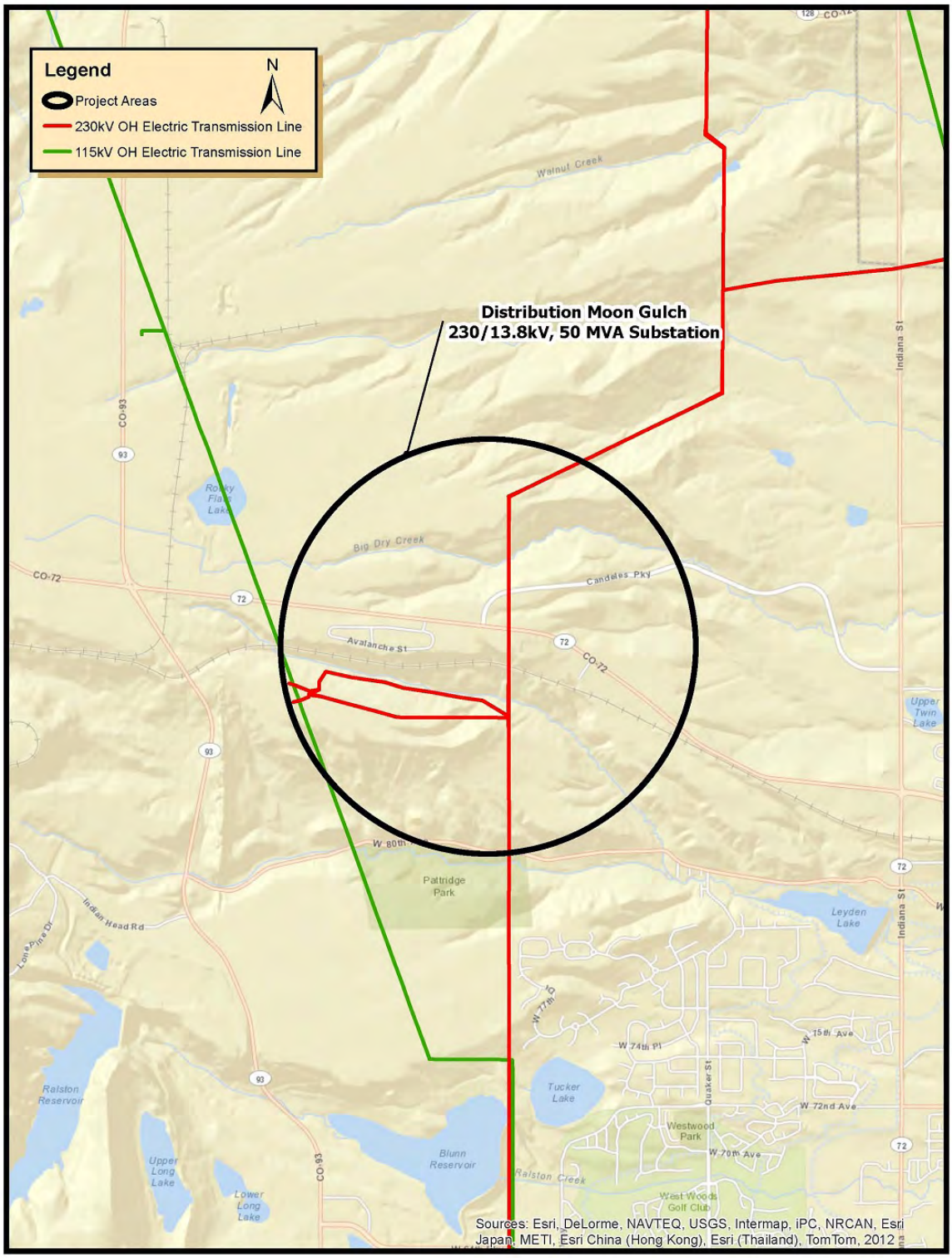
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	The project consists of installing one 13.8 kV, 40 Mvar shunt inductor/reactor on the tertiary winding of the 345/230 kV auto-transformer at Midway.
Voltage Class:	Below 115 kV
Facility Rating:	40 MVAR
Point of Origin/Location:	Midway Substation
Point of Termination:	Midway Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Voltage control
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$2,500,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2014
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Monfort to DCP Midstream
115 kV Line
Glenn 230/13.8 kV,
50 MVA #3
Leetsdale 230/115 kV,
280 MVA #2
Sheridan 115/13.8 kV,
50 MVA #3
40 MVar Reactor at
Waterton Substation
40 MVar Reactor at
Midway Substation
Greeley
Longmont
Boulder
Boulder County
Gilpin County
Adams County
Arapahoe County
Jefferson County
Douglas County
Elbert County
Park County
Teller County
El Paso County
Colorado Springs
Denver
Aurora
Lakewood
Westminster
Arvada
COLORADO
Legend
Substation
Project_Graphics
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line
N

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Moon Gulch 230/13.8 kV, 50 MVA Distribution Substation

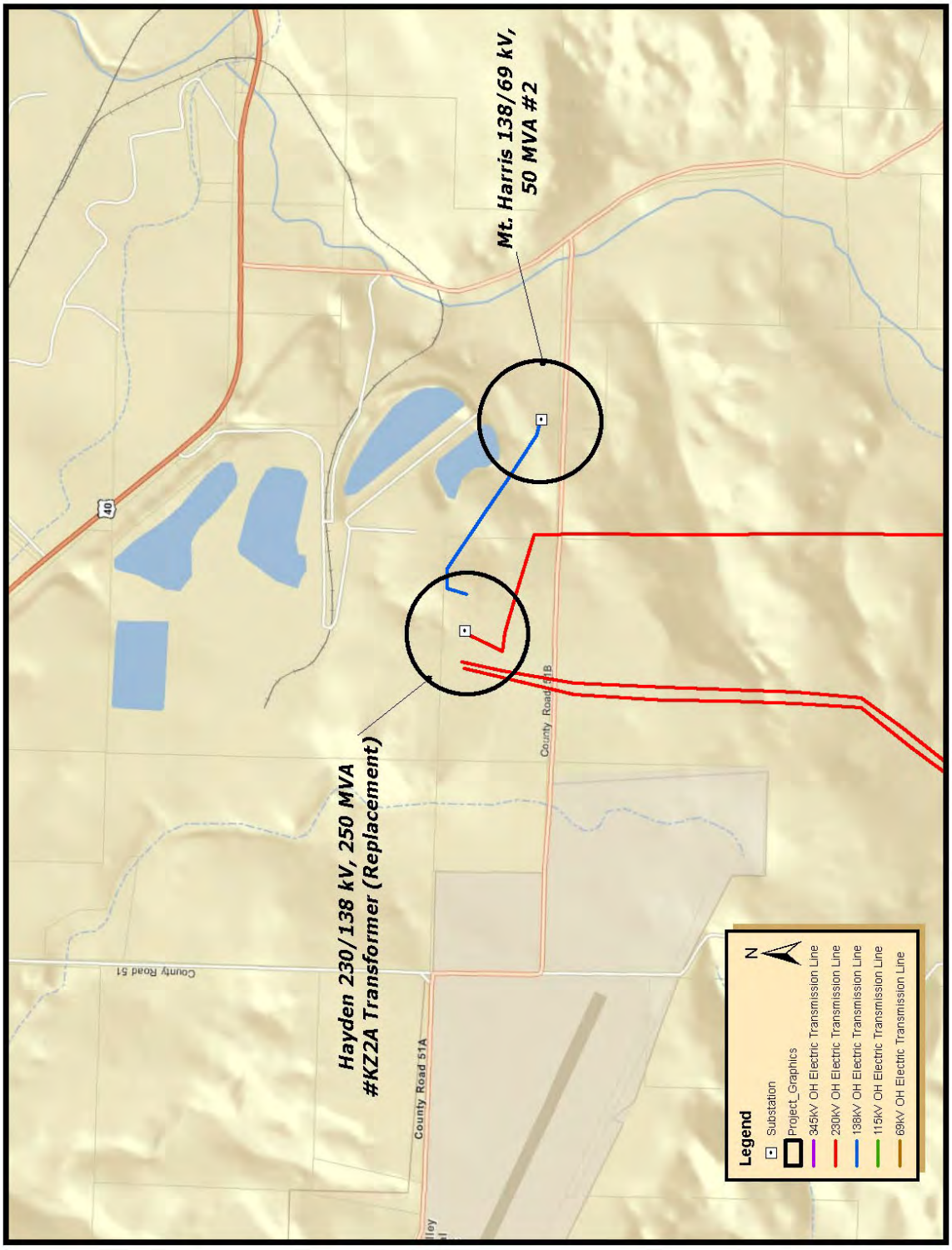
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	A new Moon Gulch Distribution Substation in Jefferson County by tapping the Plains End – Simms 230 kV line.
Voltage Class:	230 kV
Facility Rating:	n/a
Point of Origin/Location:	Moon Gulch Substation
Point of Termination:	Moon Gulch Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load growth
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$2,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2019
Regulatory Info:	CPUC: CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Legend
N
Project Areas
230kV OH Electric Transmission Line
115kV OH Electric Transmission Line
Distribution Moon Gulch
230/13.8kV, 50 MVA Substation
Walnut Creek
Big Dry Creek
Candelas Pky
Avalanche St
CO-72
CO-93
Indiana St
Rocky Flats Lake
Upper Twin Lake
Pattridge Park
Leyden Lake
Indian Head Rd
Lone Pine Dr
W 74th Pl
W 72nd Ave
W 70th Ave
Quaker St
Tucker Lake
Westwood Park
Ralston Reservoir
Upper Long Lake
Lower Long Lake
Blunn Reservoir
Ralston Creek
West Woods Golf Club
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Mt. Harris 138/69 kV #2

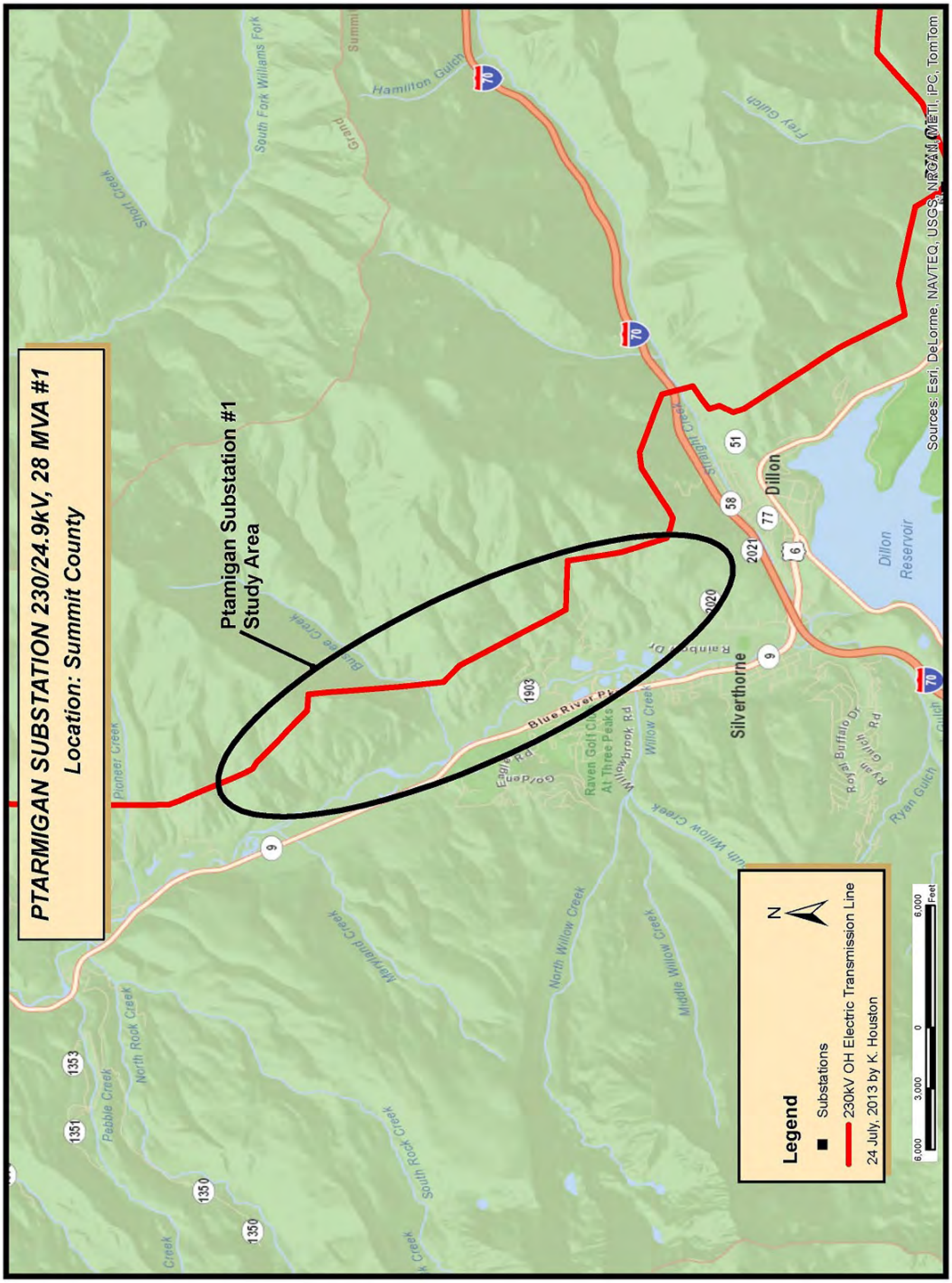
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Add a second Mt. Harris 138-69kV 50 MVA transformer.
Voltage Class:	138 kV
Facility Rating:	50 MVA
Point of Origin/Location:	Mt. Harris Substation
Point of Termination:	Mt. Harris Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Transformer
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Support Yampa Valley EA loads.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$5,900,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2015
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Mt. Harris 138/69 kV,
50 MVA #2
Hayden 230/138 kV, 250 MVA
#KZ2A Transformer (Replacement)
County Road 51
County Road 51A
County Road 51B
40
N
Legend
Substation
Project_Graphics
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Ptarmigan Substation

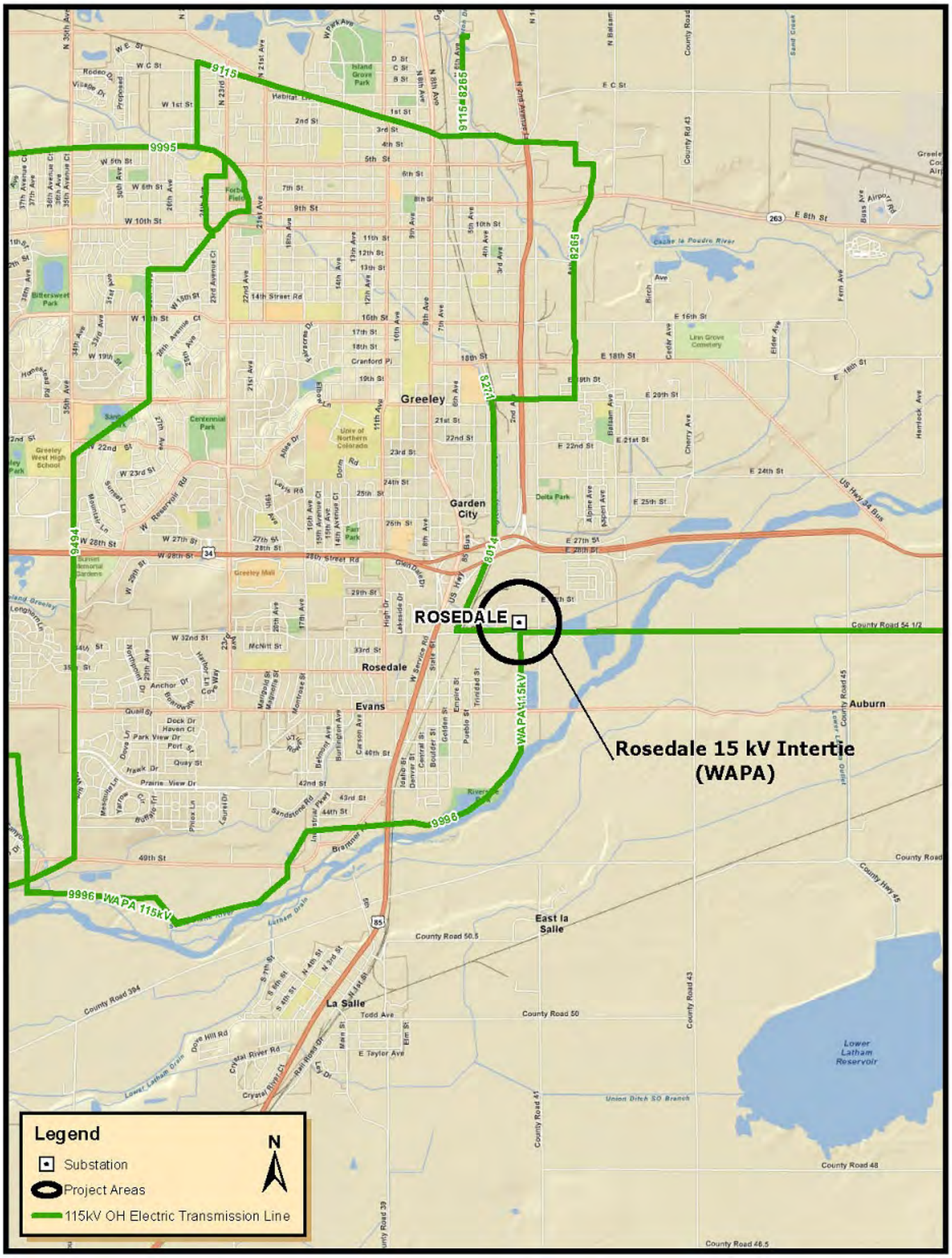
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Construct a new Ptarmigan Substation by sectionalizing PSCo's Blue River - Dillon 230 kV line, near Silverthorne.
Voltage Class:	230 kV
Facility Rating:	n/a
Point of Origin/Location:	Ptarmigan Substation
Point of Termination:	Ptarmigan Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load service
Project Driver (Primary):	Economic
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$22,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2014
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


PTARMIGAN SUBSTATION 230/24.9kV, 28 MVA #1
Location: Summit County
Ptarmigan Substation #1
Study Area
Legend
Substations
230kV OH Electric Transmission Line
24 July, 2013 by K. Houston
6,000 3,000 0 6,000 Feet
N
Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom
Silverthorne
Dillon
Dillon Reservoir
Blue River Pkwy
Rainbow Dr
Raven Golf Club At Three Peaks
Willowbrook Rd
Willow Creek
Straight Creek
Hamilton Gulch
South Fork Williams Fork
Frey Gulch
Pioneer Creek
Maryland Creek
North Willow Creek
Middle Willow Creek
South Rock Creek
North Rock Creek
Pebble Creek
Ryan Gulch
Royal Buffalo Dr
Ryan Gulch Rd

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Rosedale Intertie

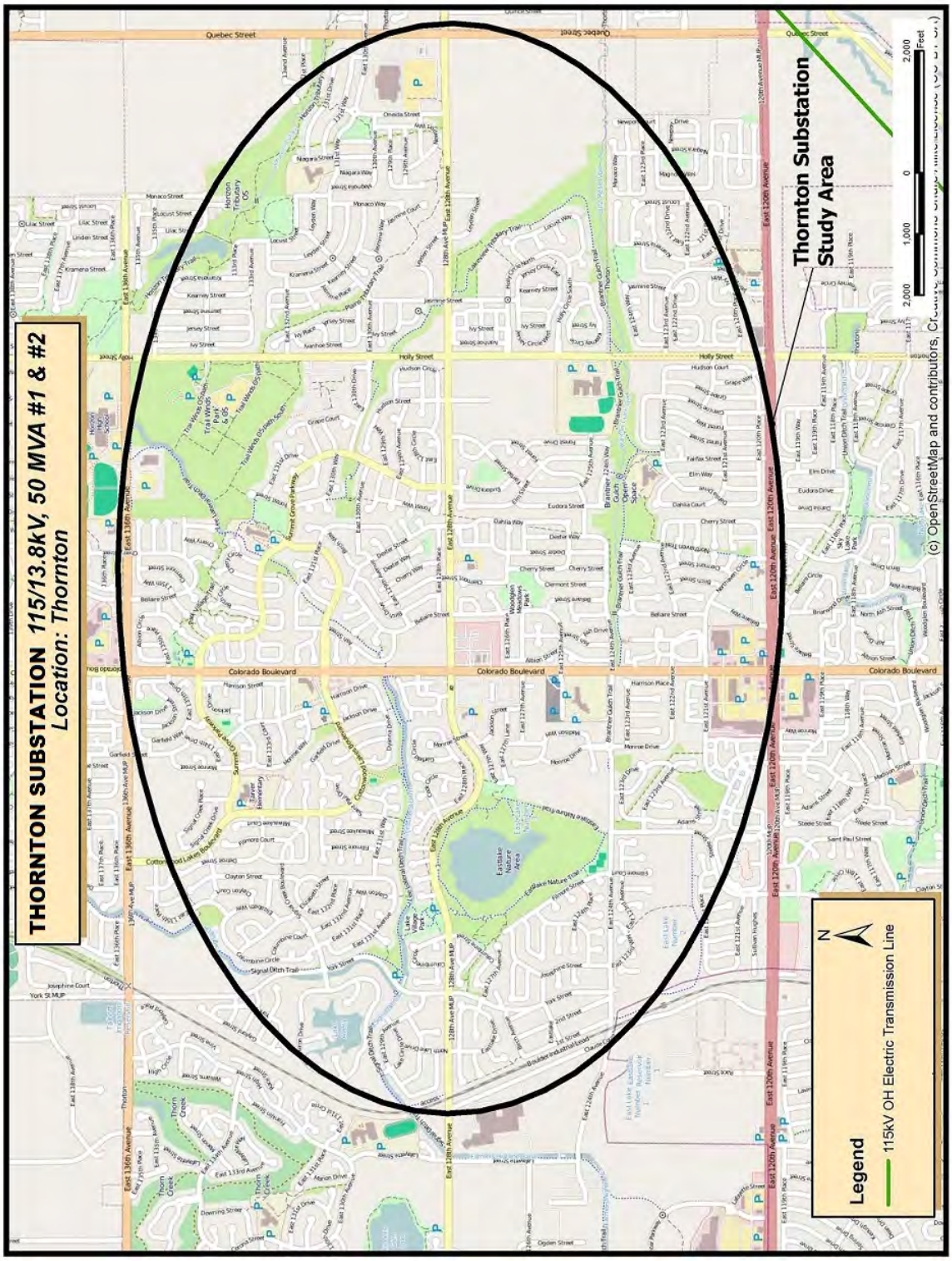
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Sectionalizing WAPA's Weld – Kersey Tap 115 kV line by tapping the line at PSCo's Rosedale substation.
Voltage Class:	115 kV
Facility Rating:	n/a
Point of Origin/Location:	Rosedale Substation
Point of Termination:	Rosedale Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	In-Service
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$10,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2015
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


ROSEDALE
Rosedale 15 kV Intertie
(WAPA)
Greeley
Garden City
Rosedale
Evans
La Salle
East la Salle
Auburn
9115
8265
9995
9494
8271
8014
9996
WAPA 115kV
County Road 54 1/2
Lower Latham Reservoir
Legend
Substation
Project Areas
115kV OH Electric Transmission Line
N

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Thornton Substation

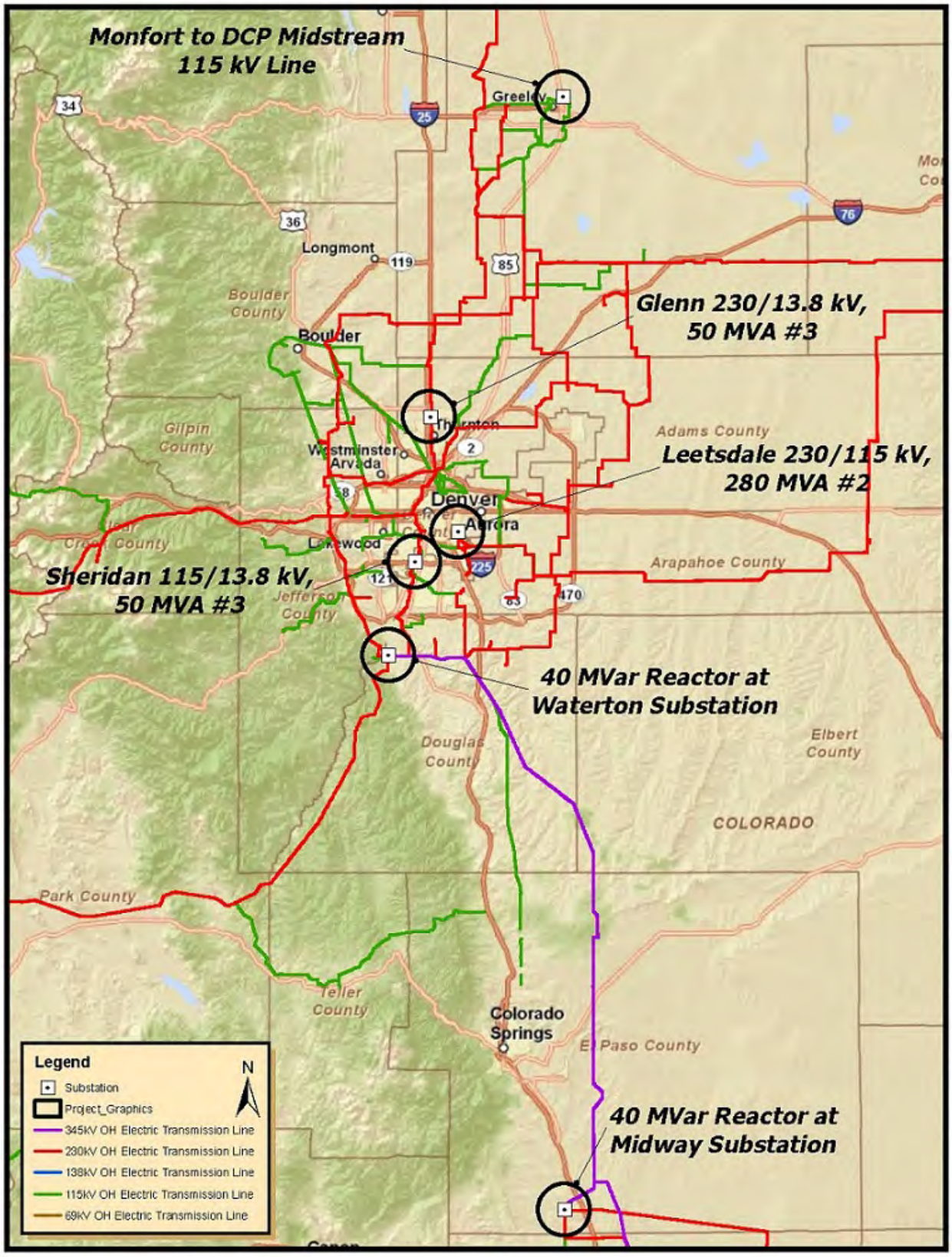
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	New substation in the Thornton area that will be used to serve distribution load.
Voltage Class:	115 kV
Facility Rating:	n/a
Point of Origin/Location:	Thornton Substation
Point of Termination:	Thornton Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load service
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$30,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2017
Regulatory Info:	CPCN Approved
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


THORNTON SUBSTATION 115/13.8kV, 50 MVA #1 & #2
Location: Thornton
Thornton Substation
Study Area
Legend
115kV OH Electric Transmission Line
N
Feet
2,000
1,000
0
2,000
(c) OpenStreetMap and contributors, Creative Commons Share-Alike License (CC BY-SA)
Quebec Street
Holly Street
Colorado Boulevard
East 136th Avenue
East 128th Avenue
East 120th Avenue

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Waterton 40 MVAR Reactor

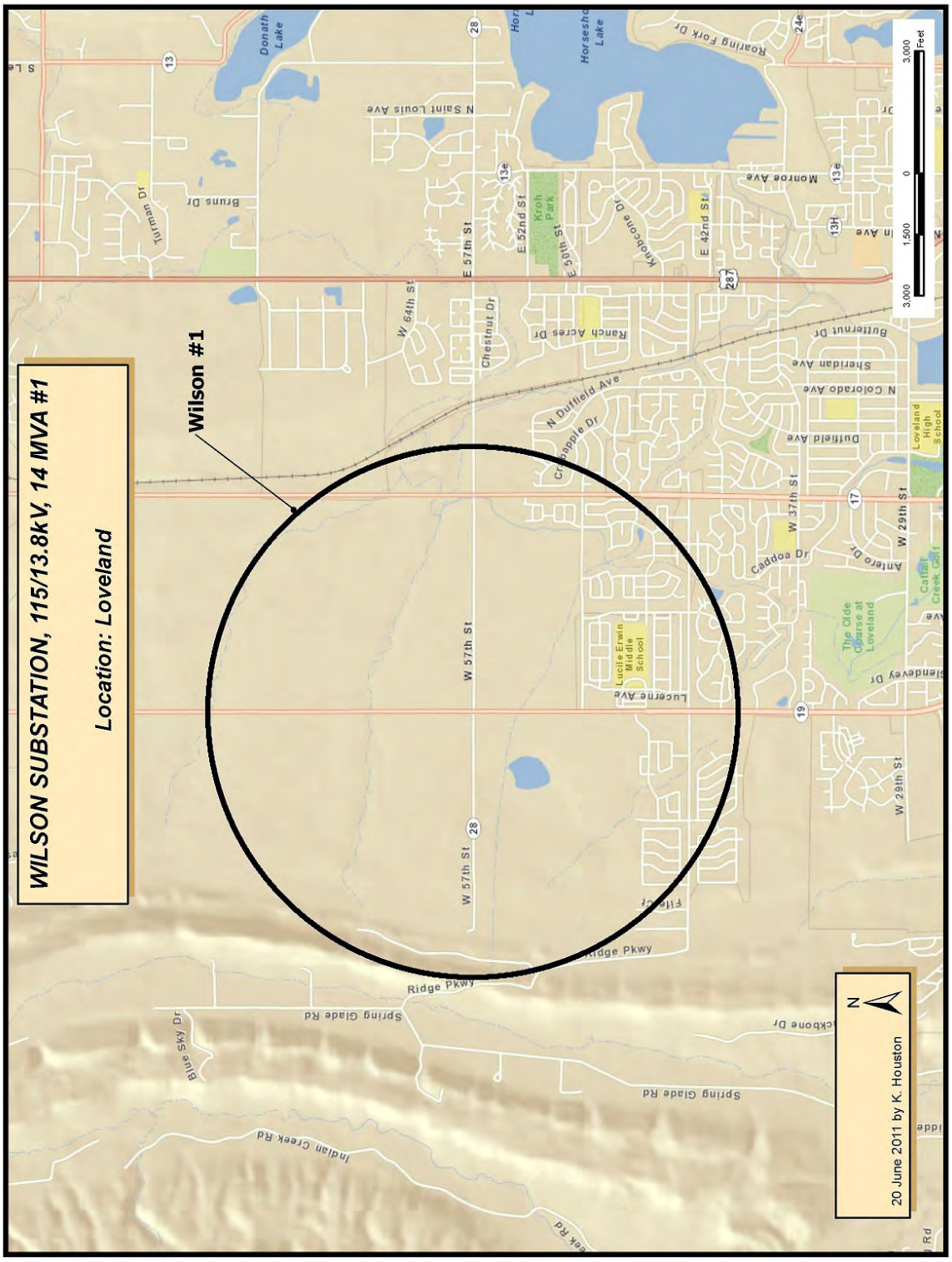
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	The project consists of installing one 13.8 kV, 40 Mvar shunt inductor/reactor on the tertiary winding of the 345/230 kV auto-transformer at Waterton.
Voltage Class:	Below 115 kV
Facility Rating:	40 MVAR
Point of Origin/Location:	Waterton Substation
Point of Termination:	Waterton Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Voltage control
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$1,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2014
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Monfort to DCP Midstream
115 kV Line
Glenn 230/13.8 kV,
50 MVA #3
Leetsdale 230/115 kV,
280 MVA #2
Sheridan 115/13.8 kV,
50 MVA #3
40 MVar Reactor at
Waterton Substation
40 MVar Reactor at
Midway Substation
Greeley
Longmont
Boulder
Boulder County
Gilpin County
Adams County
Arapahoe County
Jefferson County
Douglas County
Elbert County
Park County
Teller County
El Paso County
COLORADO
Westminster
Arvada
Denver
Aurora
Lakewood
Colorado Springs
Legend
Substation
Project_Graphics
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line
N

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Wilson Substation

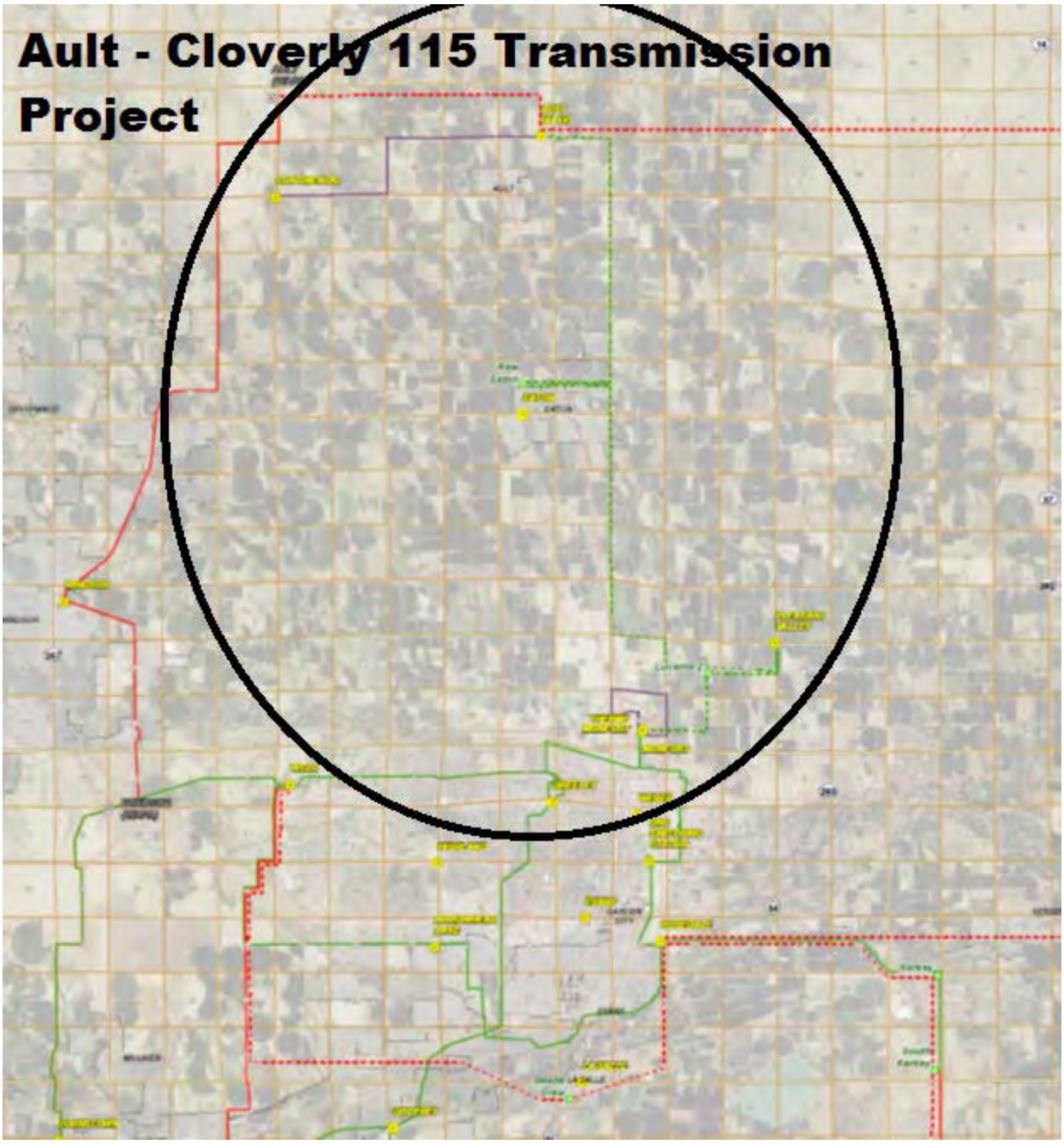
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Construction of a new distribution substation by tapping PRPA's Horseshoe – West 115 kV transmission line. This new substation will be located near Wilson Ave and LCR 28 in Loveland, CO.
Voltage Class:	115 kV
Facility Rating:	n/a
Point of Origin/Location:	Wilson Substation
Point of Termination:	Wilson Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Load service
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$4,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


WILSON SUBSTATION, 115/13.8kV, 14 MVA #1
Location: Loveland
Wilson #1
N
20 June 2011 by K. Houston
Feet
3,000
0
1,500
3,000
Donath Lake
Horseshoe Lake
Roaring Fork Dr
N Saint Louis Ave
Bruns Dr
Turman Dr
E 57th St
E 52nd St
Kroh Park
E 50th St
Knobcone Dr
E 42nd St
Monroe Ave
W 64th St
Chestnut Dr
Ranch Acres Dr
Butternut Dr
Sheridan Ave
N Colorado Ave
N Duffield Ave
Duffield Ave
Crabapple Dr
Loveland High School
W 37th St
W 29th St
Caddoa Dr
Antero Dr
Cattail Creek Golf
The Olde Course at Loveland
Lucile Erwin Middle School
Lucerne Ave
W 57th St
Ridge Pkwy
Spring Glade Rd
Blue Sky Dr
Indian Creek Rd

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Ault-Cloverly 115 kV Transmission Project

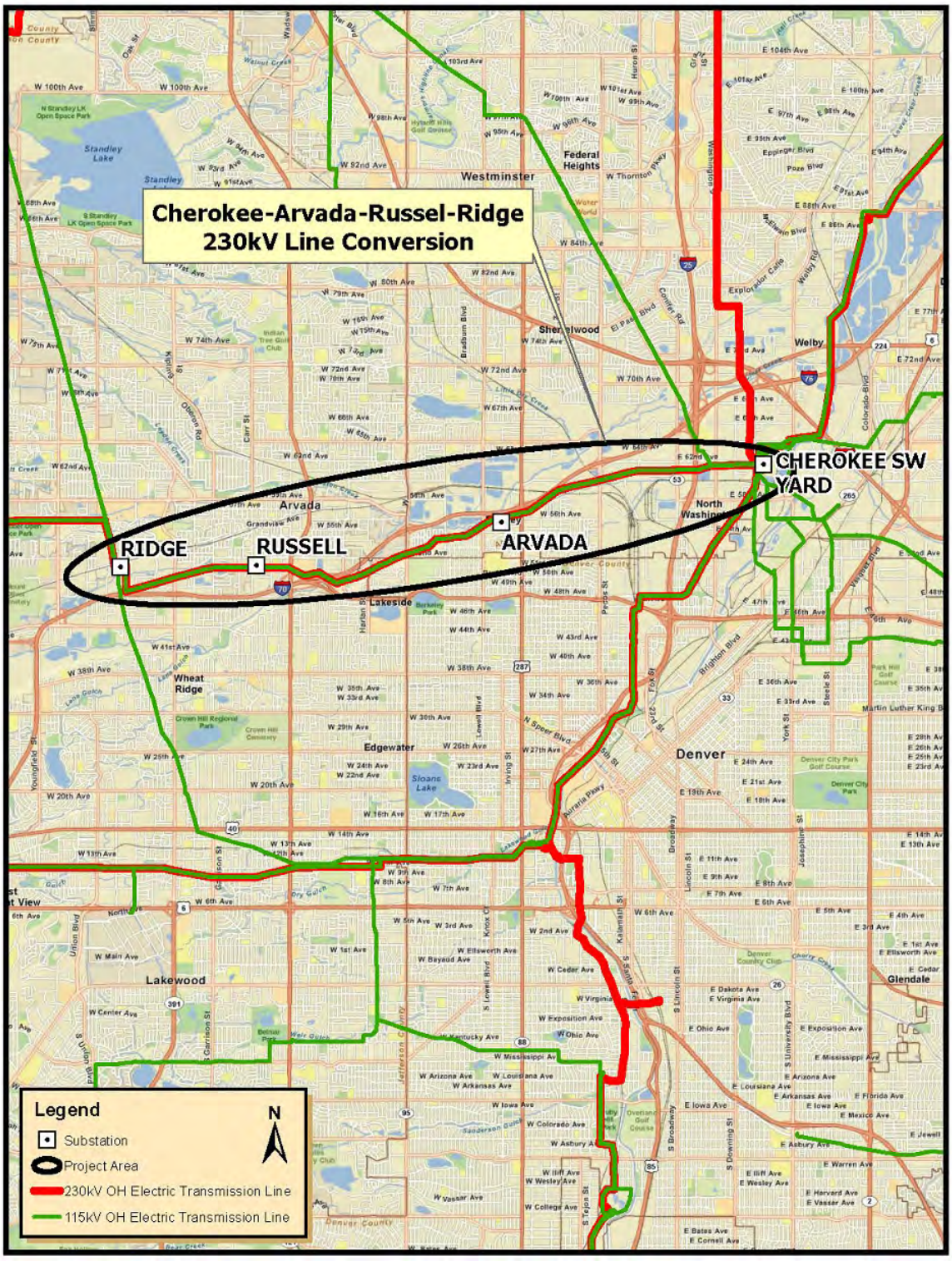
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	Western Area Power Administration
Project Description:	Build 21 miles of new 230/115 kV transmission and three new substations.
Voltage Class:	115 kV
Facility Rating:	159
Point of Origin/Location:	Ault Substation
Point of Termination:	Cloverly Substation
Intermediate Points:	
Length of Line (in Miles):	21.0
Type of Project:	Transmission Line and Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	To increase reliability, load-serving capability and resource accommodation in northeast Greeley.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	
Schedule:	
Construction Date:	
Planned In-Service Date:	2019
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Ault - Cloverly 115 Transmission Project

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Cherokee-Ridge 230 kV Upgrade

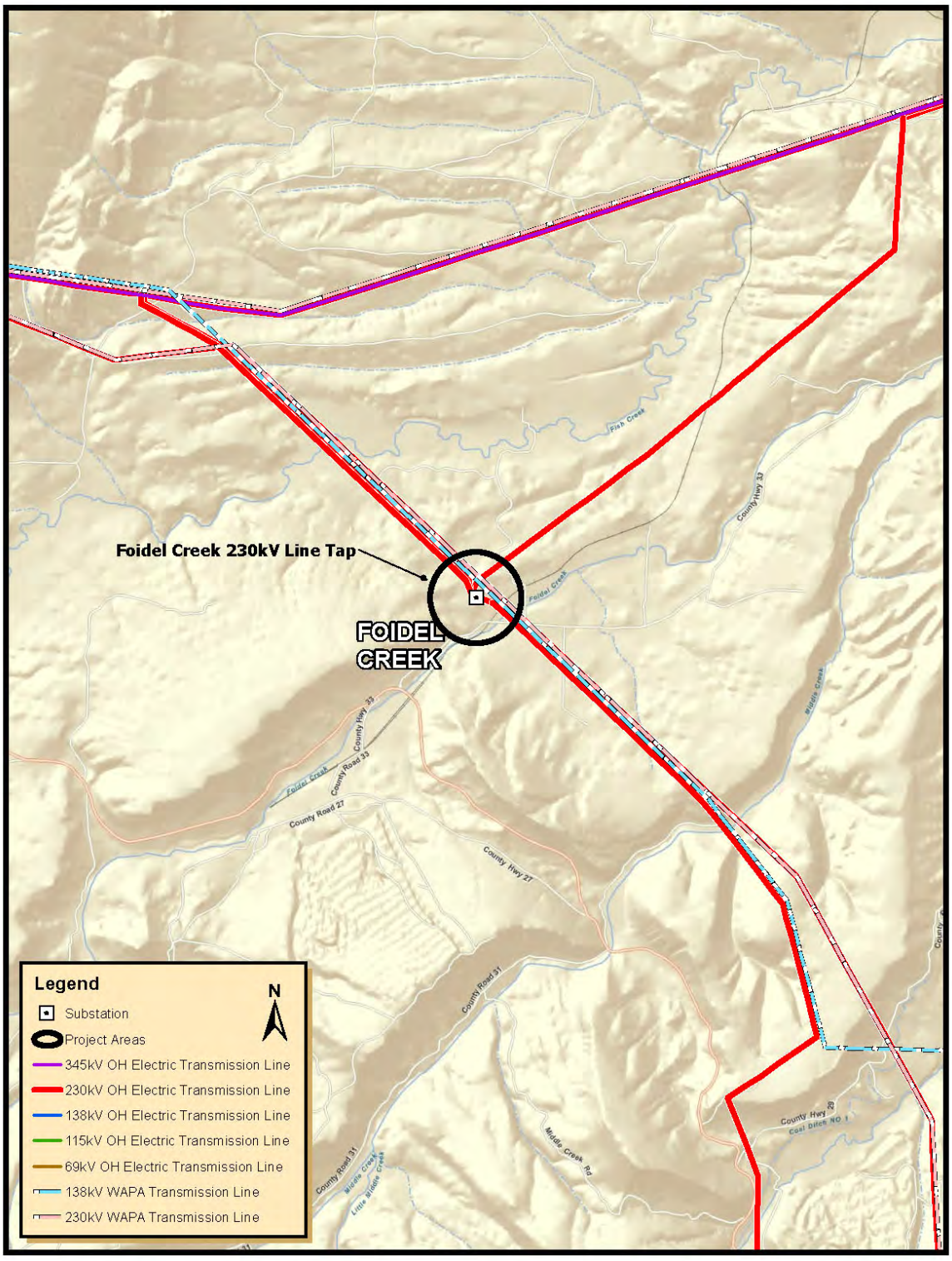
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Convert the existing Cherokee – Arvada – Russell – Ridge 115 kV transmission lines to 230 kV operation.
Voltage Class:	230 kV
Facility Rating:	359 MVA
Point of Origin/Location:	Cherokee Substation
Point of Termination:	Ridge Substation
Intermediate Points:	Arvada & Russell Substations
Length of Line (in Miles):	10.0
Type of Project:	Transmission Line
Development Status:	Under Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability and load service
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$7,100,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2016
Regulatory Info:	CPCN approved
Regulatory Date:	
Permitting Info:	Yes
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Cherokee-Arvada-Russel-Ridge
230kV Line Conversion
CHEROKEE SW YARD
ARVADA
RUSSELL
RIDGE
Westminster
Federal Heights
Sheridwood
Welby
Arvada
Lakeside
Wheat Ridge
Edgewater
Denver
Lakewood
Glendale
Sloans Lake
Legend
Substation
Project Area
230kV OH Electric Transmission Line
115kV OH Electric Transmission Line
N

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Foidel Creek Substation

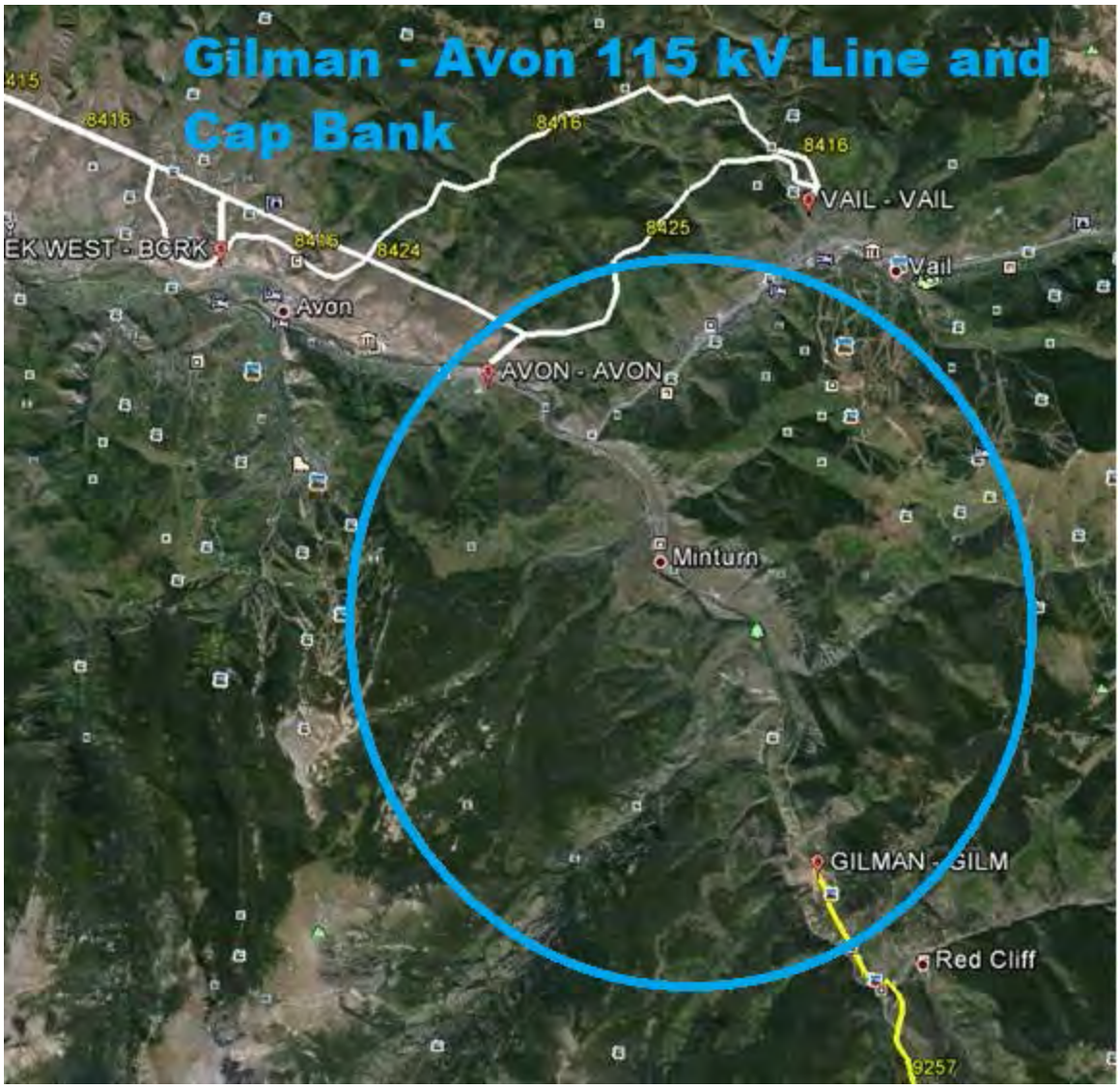
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	The project consists of looping the Hayden-Gore Pass 230kV line into Foidel Creek Substation.
Voltage Class:	230 kV
Facility Rating:	n/a
Point of Origin/Location:	Foidel Creek Substation
Point of Termination:	Foidel Creek Substation
Intermediate Points:	
Length of Line (in Miles):	
Type of Project:	Substation
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$5,700,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2017
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Foidel Creek 230kV Line Tap
FOIDEL CREEK
Legend
N
Substation
Project Areas
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line
138kV WAPA Transmission Line
230kV WAPA Transmission Line
Fish Creek
County Hwy 33
Foidal Creek
Middle Creek
County Road 33
County Road 27
County Hwy 27
County Road 31
Middle Creek Rd
Little Middle Creek
County Hwy 29
Coal Bites NO 1

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Gilman-Avon 115 kV Transmission Line and Cap Bank

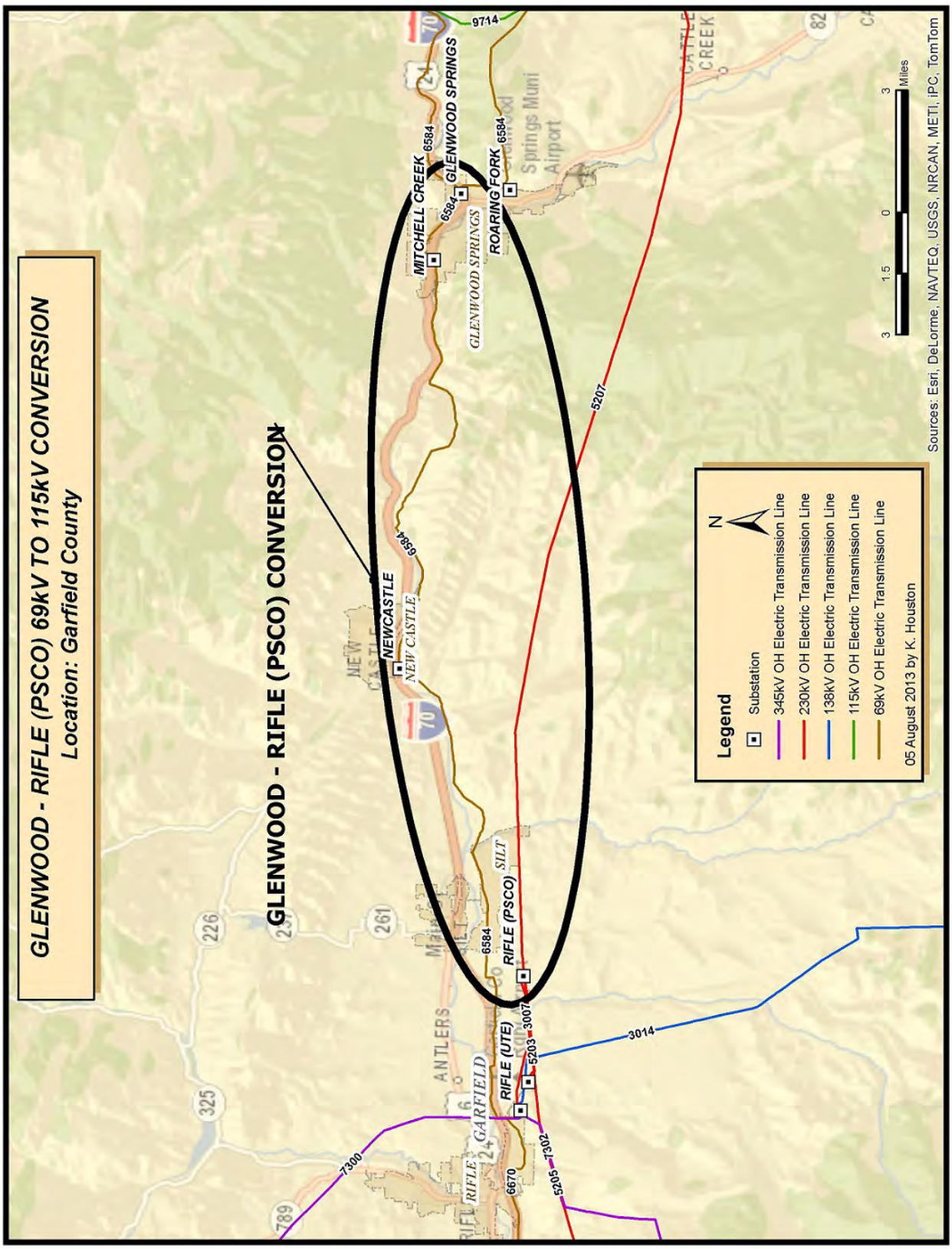
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	New 115 kV line into Avon. New capacitor bank at Vail. Normally open line but used for emergency backup.
Voltage Class:	115 kV
Facility Rating:	159 MVA
Point of Origin/Location:	Gilman Substation
Point of Termination:	Avon Substation
Intermediate Points:	
Length of Line (in Miles):	10.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	
Schedule:	
Construction Date:	
Planned In-Service Date:	2019
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Gilman - Avon 115 kV Line and Cap Bank
8416
8416
8416
VAIL - VAIL
8425
EK WEST - BCRK
8415
8424
Vail
Avon
AVON - AVON
Minturn
GILMAN - GILM
Red Cliff
9257

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Glenwood-Rifle 115 kV Upgrade

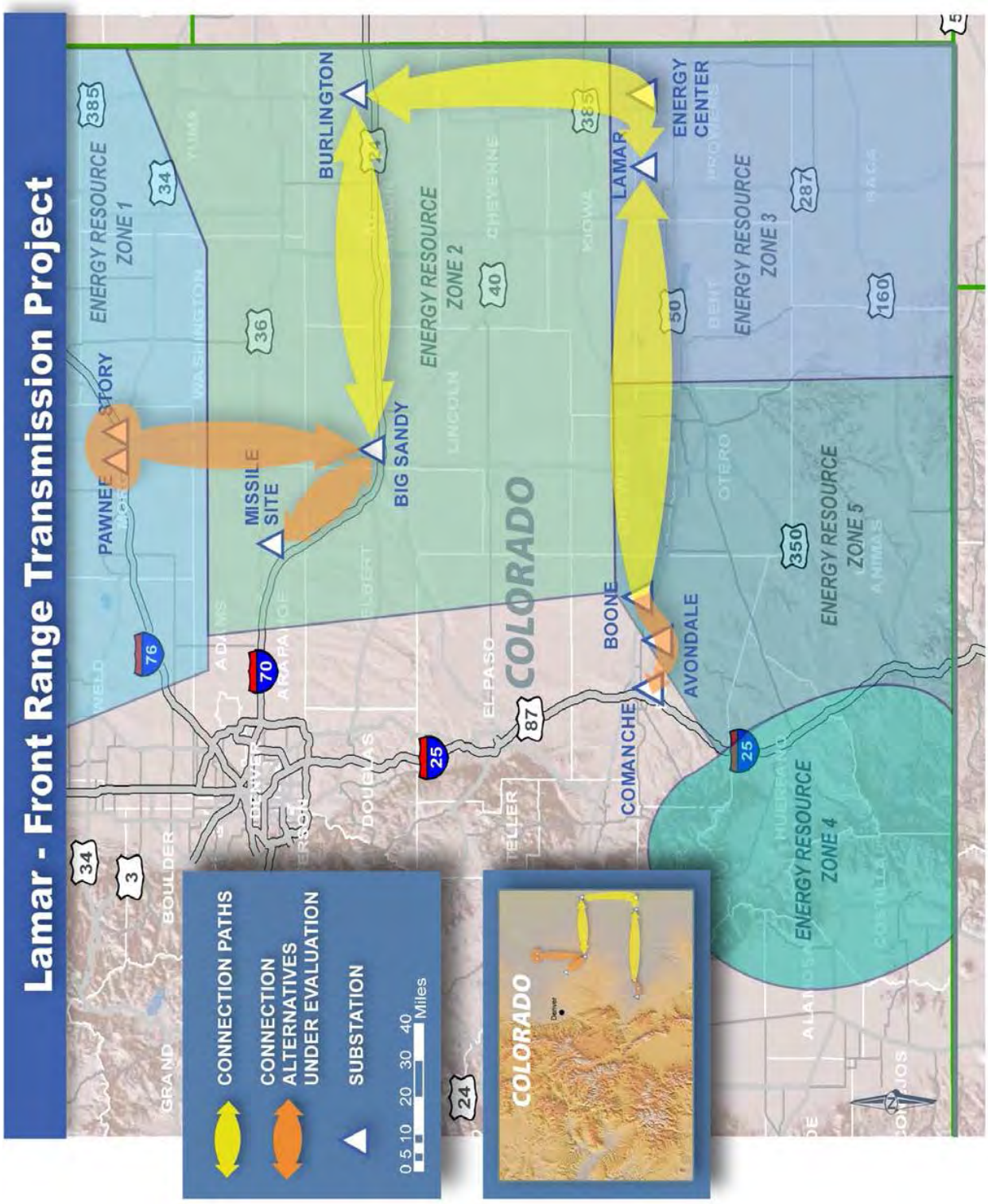
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	The project consists of the upgrade of the Glenwood Springs – Rifle 69kV line to 115kV.
Voltage Class:	115 kV
Facility Rating:	191 MVA
Point of Origin/Location:	Glenwood Substation
Point of Termination:	Rifle Substation
Intermediate Points:	Mitchell Creek & New Castle Substations
Length of Line (in Miles):	26.0
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability and load growth
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$75,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


GLENWOOD - RIFLE (PSCO) 69kV TO 115kV CONVERSION
Location: Garfield County
GLENWOOD - RIFLE (PSCO) CONVERSION
NEWCASTLE
NEW CASTLE
MITCHELL CREEK
GLENWOOD SPRINGS
ROARING FORK
GLENWOOD SPRINGS
RIFLE (PSCO)
RIFLE (UTE)
SILT
ANTLERS
GARFIELD
RIFLE
6584
6584
6584
6584
9714
5207
3014
3007
5203
7300
7302
5205
6670
Springs Muni Airport
Legend
Substation
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
138kV OH Electric Transmission Line
115kV OH Electric Transmission Line
69kV OH Electric Transmission Line
05 August 2013 by K. Houston
N
Miles
Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Lamar-Front Range Project

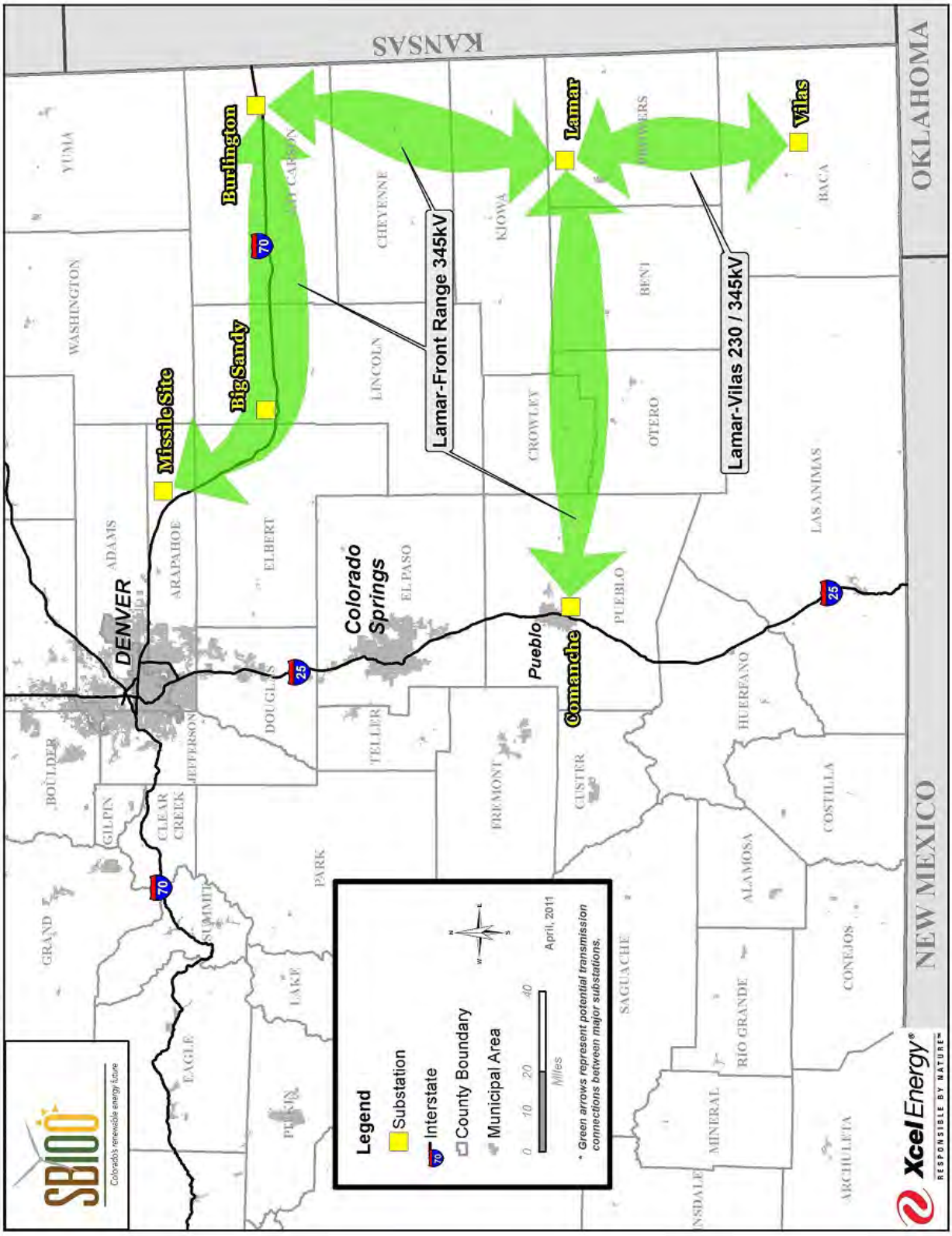
Project Sponsor:	Tri-State Generation and Transmission
Additional Project Participants:	Public Service Company of Colorado/ Xcel Energy
Project Description:	Two high voltage transmission paths from Lamar Substation to Pueblo area and a second path from Lamar to substations near Brush and/or Deer Trail.
Voltage Class:	345 kV
Facility Rating:	2000 MW
Point of Origin/Location:	Lamar, CO
Point of Termination:	TBD: Comanche, Story, Pawnee, Avondale, Lamar, Lamar Energy Center, Burlington, Big Sandy, Missile Site
Intermediate Points:	Burlington, Big Sandy, Boone
Length of Line (in Miles):	300-350
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	Burlington, Big Sandy, Boone
Subregional Planning Group:	CCPG
Purpose of Project:	Tri-State reliability, system load-serving connectivity as regional power provider & future resources. Xcel Senate Bill 07-100 & reliability.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$900,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	303-254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm


Lamar - Front Range Transmission Project
ENERGY RESOURCE ZONE 1
ENERGY RESOURCE ZONE 2
ENERGY RESOURCE ZONE 3
ENERGY RESOURCE ZONE 4
ENERGY RESOURCE ZONE 5
PAWNEE
STORY
MISSILE SITE
BIG SANDY
BURLINGTON
LAMAR
ENERGY CENTER
BOONE
AVONDALE
COMANCHE
COLORADO
CONNECTION PATHS
CONNECTION ALTERNATIVES UNDER EVALUATION
SUBSTATION
0 5 10 20 30 40 Miles
COLORADO

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Lamar-Vilas 230kV Transmission Project

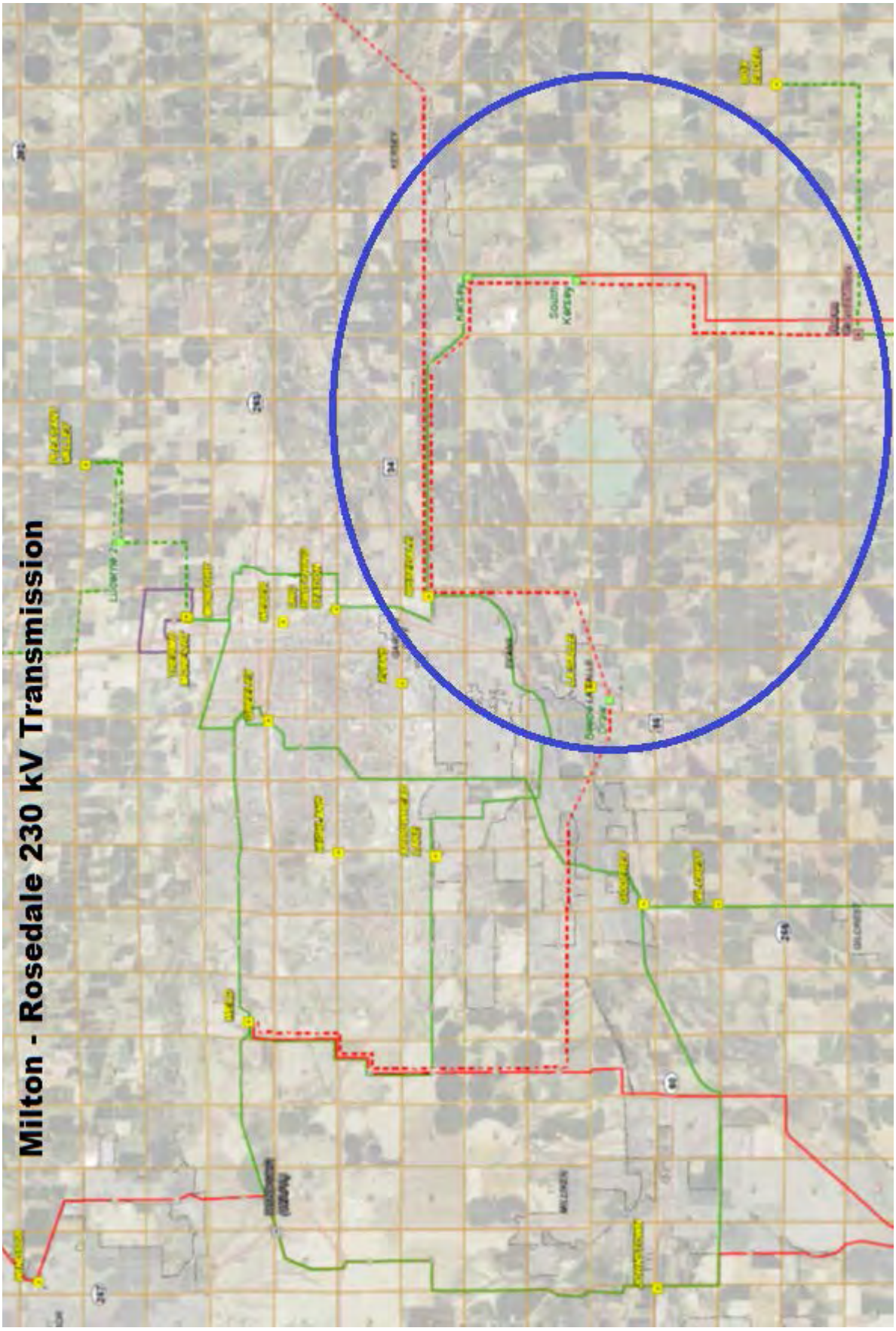
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	Tri-State
Project Description:	New transmission from Lamar to Vilas
Voltage Class:	230 kV
Facility Rating:	200 MW
Point of Origin/Location:	Lamar
Point of Termination:	Vilas
Intermediate Points:	
Length of Line (in Miles):	57.0
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	SB100. Project for Energy Resource Zone 3
Project Driver (Primary):	Public Policy
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$100,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	Submitted to CPUC through Rule 3206: CPCN required
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.sb100transmission.com/


KANSAS
OKLAHOMA
NEW MEXICO
Burlington
BigSandy
MissileSite
Lamar
Vilas
Pueblo
Comanche
Colorado Springs
DENVER
Lamar-Front Range 345kV
Lamar-Vilas 230 / 345kV
Legend
Substation
Interstate
County Boundary
Municipal Area
0 10 20 40
Miles
April, 2011
* Green arrows represent potential transmission connections between major substations.
SB100
Colorado's renewable energy future
Xcel Energy®
RESPONSIBLE BY NATURE™

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Milton-Rosedale 230 kV Transmission Line

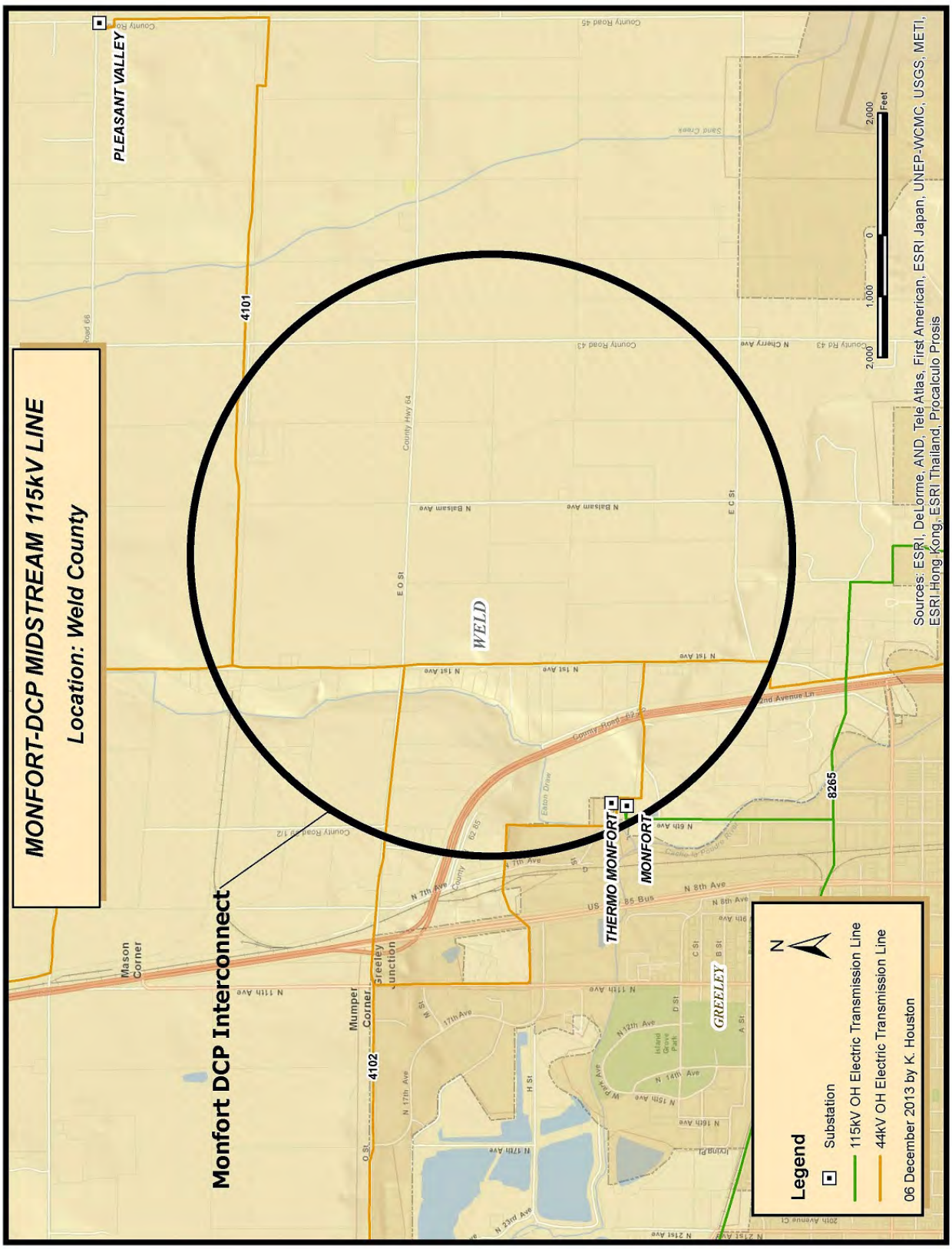
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	Tri-State Generation and Transmission
Project Description:	Build a new 230 kV transmission line as well as add a second 230/115 transformer at Milton substation.
Voltage Class:	230 kV
Facility Rating:	476
Point of Origin/Location:	Milton Substation
Point of Termination:	Rosedale Substation
Intermediate Points:	
Length of Line (in Miles):	7.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increase reliability and load serving capability to Greeley and southwest Weld County.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	
Schedule:	
Construction Date:	
Planned In-Service Date:	2022
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Milton - Rosedale 230 kV Transmission

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Monfort - DCP Midstream Transmission Line

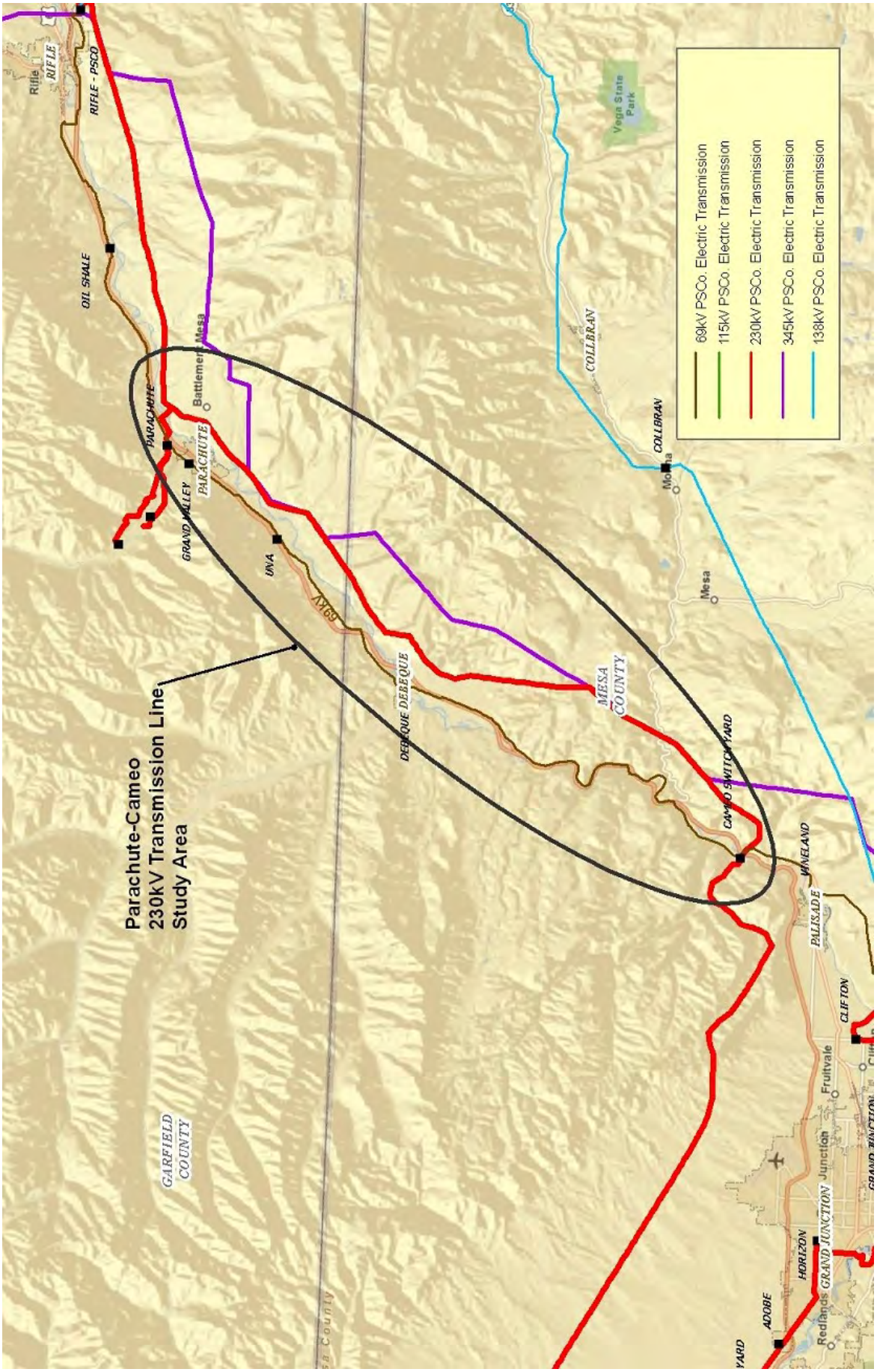
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	New 1.5 mile 115 kV transmission line from PSCo's Monfort Substation to DCP Midstream's new substation for retail load service..
Voltage Class:	115 kV
Facility Rating:	159 MVA
Point of Origin/Location:	Monfort Substation
Point of Termination:	DCP Substation
Intermediate Points:	
Length of Line (in Miles):	1.5
Type of Project:	Transmission Line
Development Status:	Withdrawn
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Retail load service
Project Driver (Primary):	Economic
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$3,500,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2014
Regulatory Info:	CPUC: No CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


MONFORT-DCP MIDSTREAM 115kV LINE
Location: Weld County
Monfort DCP Interconnect
PLEASANT VALLEY
4101
4102
8265
WELD
GREELEY
THERMO MONFORT
MONFORT
Mason Corner
Mumper Corner
Freeley Junction
Legend
Substation
115kV OH Electric Transmission Line
44kV OH Electric Transmission Line
06 December 2013 by K. Houston
Sources: ESRI, DeLorme, AND, Tele Atlas, First American, ESRI Japan, UNEP-WCMC, USGS, METI, ESRI Hong Kong, ESRI Thailand, Procalculo Prosis

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Parachute - Cameo 230 kV Transmission Line

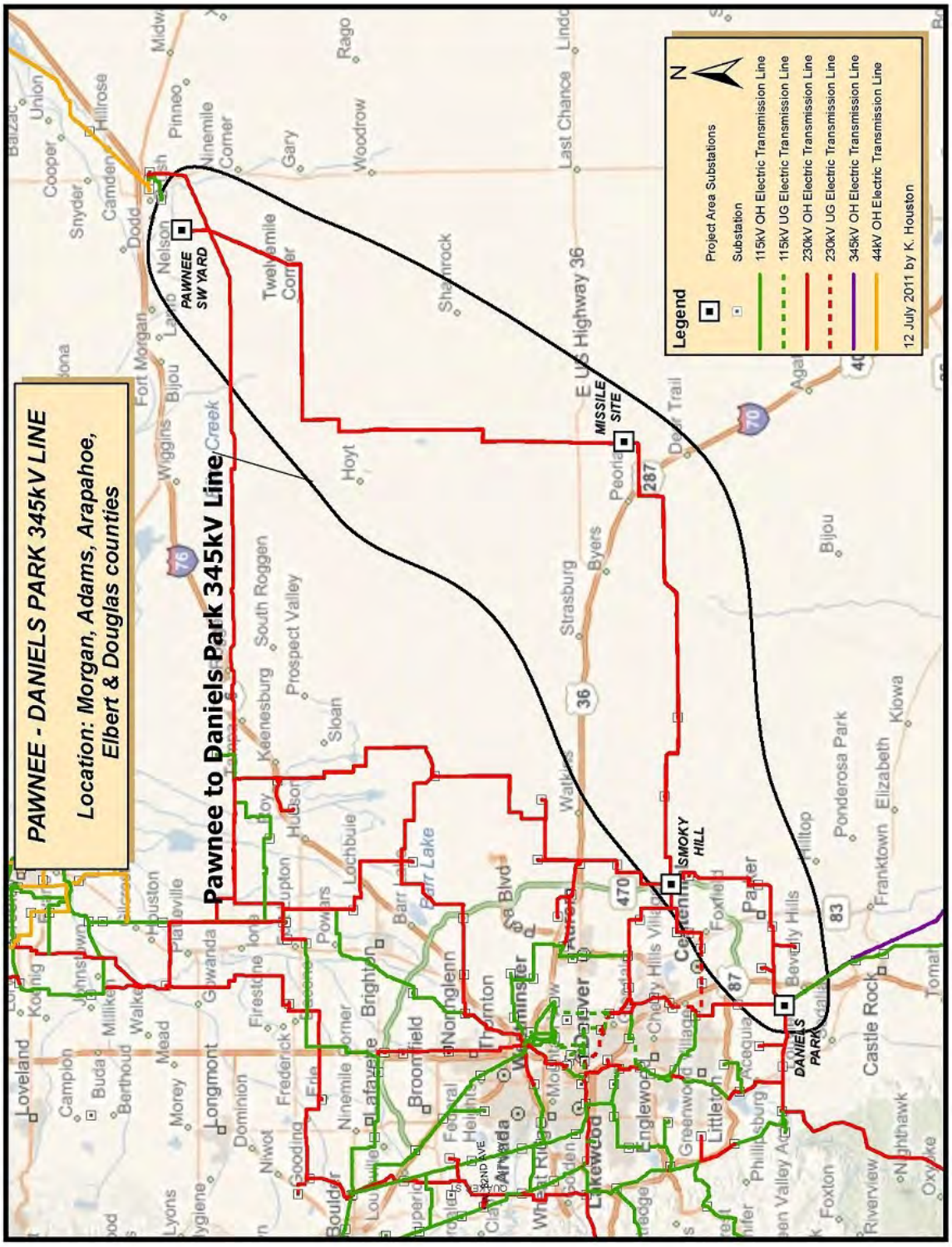
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Construct new 230kV transmission line between the Parachute and Cameo Substations.
Voltage Class:	230 kV
Facility Rating:	576 MVA
Point of Origin/Location:	Parachute Substation
Point of Termination:	Cameo Substation
Intermediate Points:	
Length of Line (in Miles):	31.0
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability. For future load growth in the region.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$52,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	Submitted to CPUC through Rule 3206: CPCN required
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


Parachute-Cameo
230kV Transmission Line
Study Area
69kV PSCo. Electric Transmission
115kV PSCo. Electric Transmission
230kV PSCo. Electric Transmission
345kV PSCo. Electric Transmission
138kV PSCo. Electric Transmission
GARFIELD COUNTY
MESA COUNTY
RIFLE - PSCO
OIL SHALE
PARACHUTE
GRAND VALLEY
UNA
DEBEQUE
CAMEO SWITCHYARD
COLLBRAN
PALISADE
CLIFTON
GRAND JUNCTION
HORIZON
ADOBE
Rifle
Battlement Mesa
Mesa
Fruitvale
Redlands
Vega State Park

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Pawnee - Daniels Park 345 kV Transmission Project

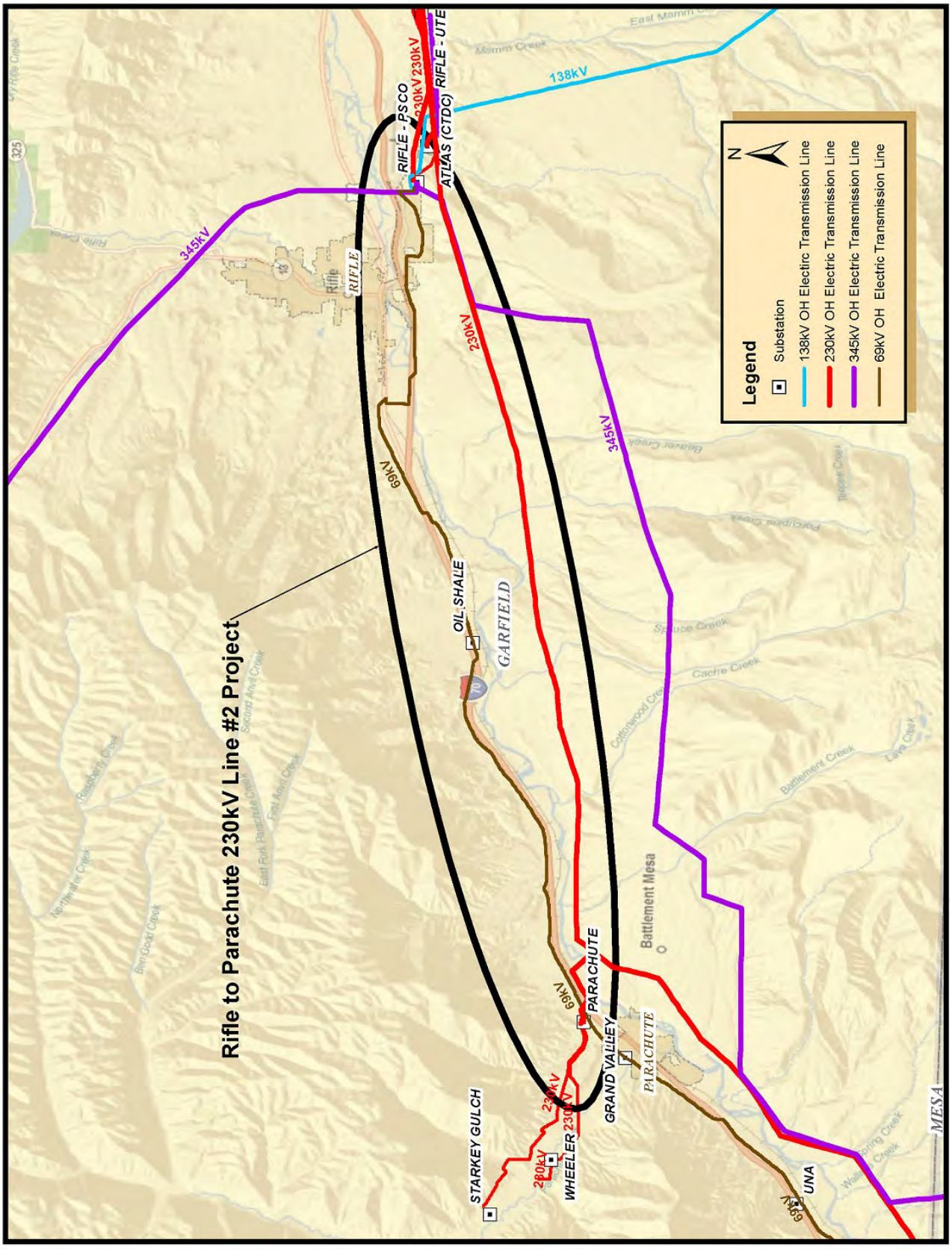
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	345 kV transmission from Pawnee Substation to the Daniels Park Substation. The project will also result in a new Smoky Hill – Daniels Park 345 kV line, and a new Harvest Mile Substation.
Voltage Class:	345 kV
Facility Rating:	1200 MVA
Point of Origin/Location:	Pawnee
Point of Termination:	Daniels Park
Intermediate Points:	Missile Site, Harvest Mile
Length of Line (in Miles):	115.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	SB100. Project would facilitate new resources in Energy Resource Zones 1 and 2
Project Driver (Primary):	Reliability
Project Driver (Secondary):	Public Policy
Estimated Cost (in 2014 Dollars):	$180,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2022
Regulatory Info:	CPUC: CPCN Approved
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.sb100transmission.com


PAWNEE - DANIELS PARK 345kV LINE
Location: Morgan, Adams, Arapahoe, Elbert & Douglas counties
Pawnee to Daniels Park 345kV Line
PAWNEE SW YARD
MISSILE SITE
SMOKY HILL
DANIELS PARK
Legend
Project Area Substations
Substation
115kV OH Electric Transmission Line
115kV UG Electric Transmission Line
230kV OH Electric Transmission Line
230kV UG Electric Transmission Line
345kV OH Electric Transmission Line
44kV OH Electric Transmission Line
12 July 2011 by K. Houston
N
E US Highway 36
Fort Morgan
Brighton
Denver
Aurora
Lakewood
Castle Rock
Littleton
Englewood
Boulder
Longmont
Loveland

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Rifle - Parachute 230 kV Line #2

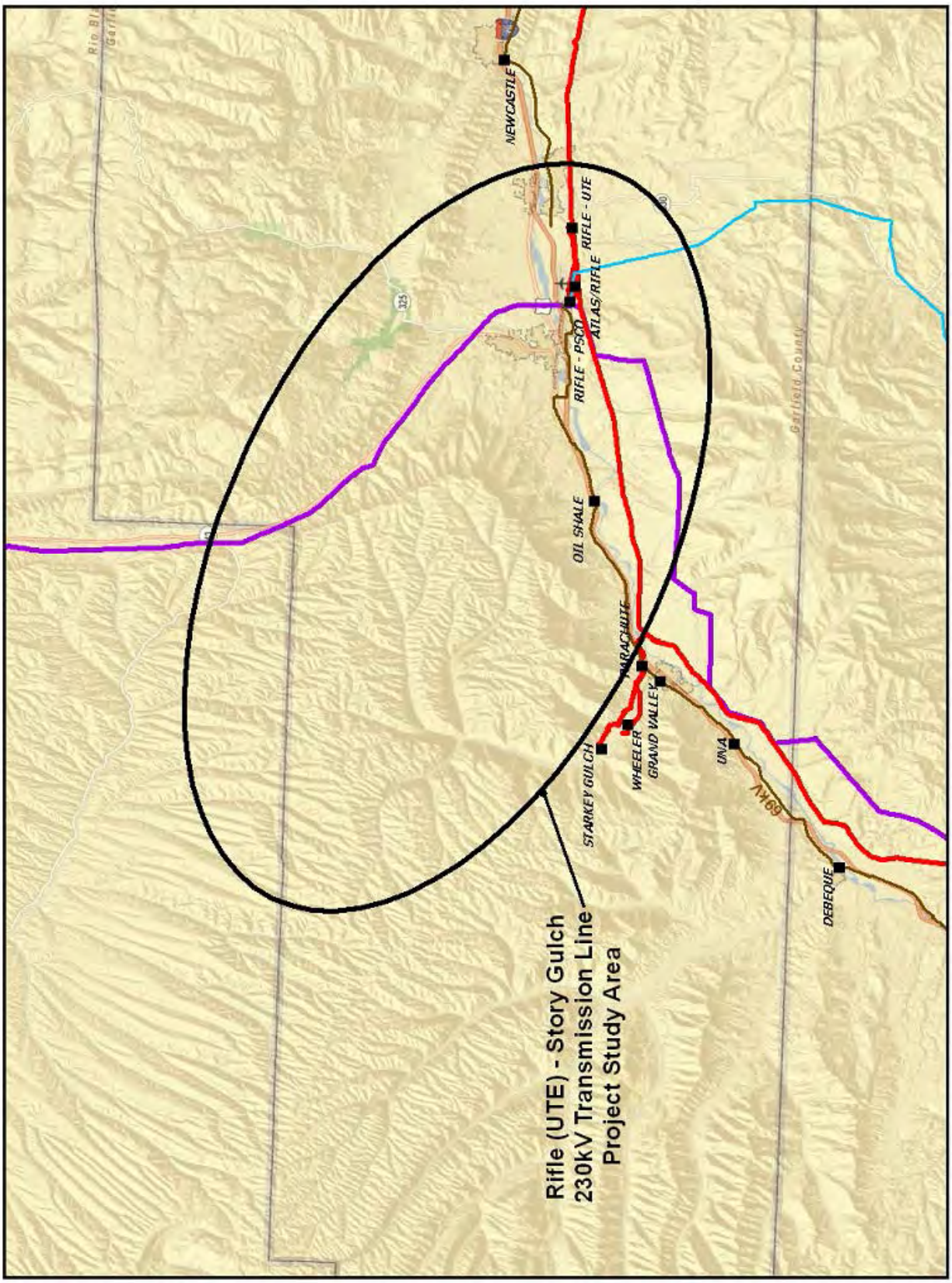
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Second 230 kV line from Rifle Substation to Parachute Substation.
Voltage Class:	230 kV
Facility Rating:	576 MVA
Point of Origin/Location:	Rifle Substation
Point of Termination:	Parachute Substation
Intermediate Points:	
Length of Line (in Miles):	20.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability. Project would serve regional loads.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$26,300,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2016
Regulatory Info:	CPCN Approved in 2013
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Green, Thomas W
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.westconnect.com/documents_results.php?categoryid=181


Rifle to Parachute 230kV Line #2 Project
Legend
Substation
138kV OH Electric Transmission Line
230kV OH Electric Transmission Line
345kV OH Electric Transmission Line
69kV OH Electric Transmission Line
N
RIFLE - PSCO
230kV
230kV
RIFLE - UTE
ATLAS (CTDC)
138kV
345kV
RIFLE
230kV
69kV
OIL SHALE
GARFIELD
345kV
PARACHUTE
69kV
Battlement Mesa
GRAND VALLEY
PARACHUTE
STARKEY GULCH
230kV
230kV
WHEELER
230kV
69kV
UNA
MESA

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Rifle – Story Gulch 230 kV Transmission Line

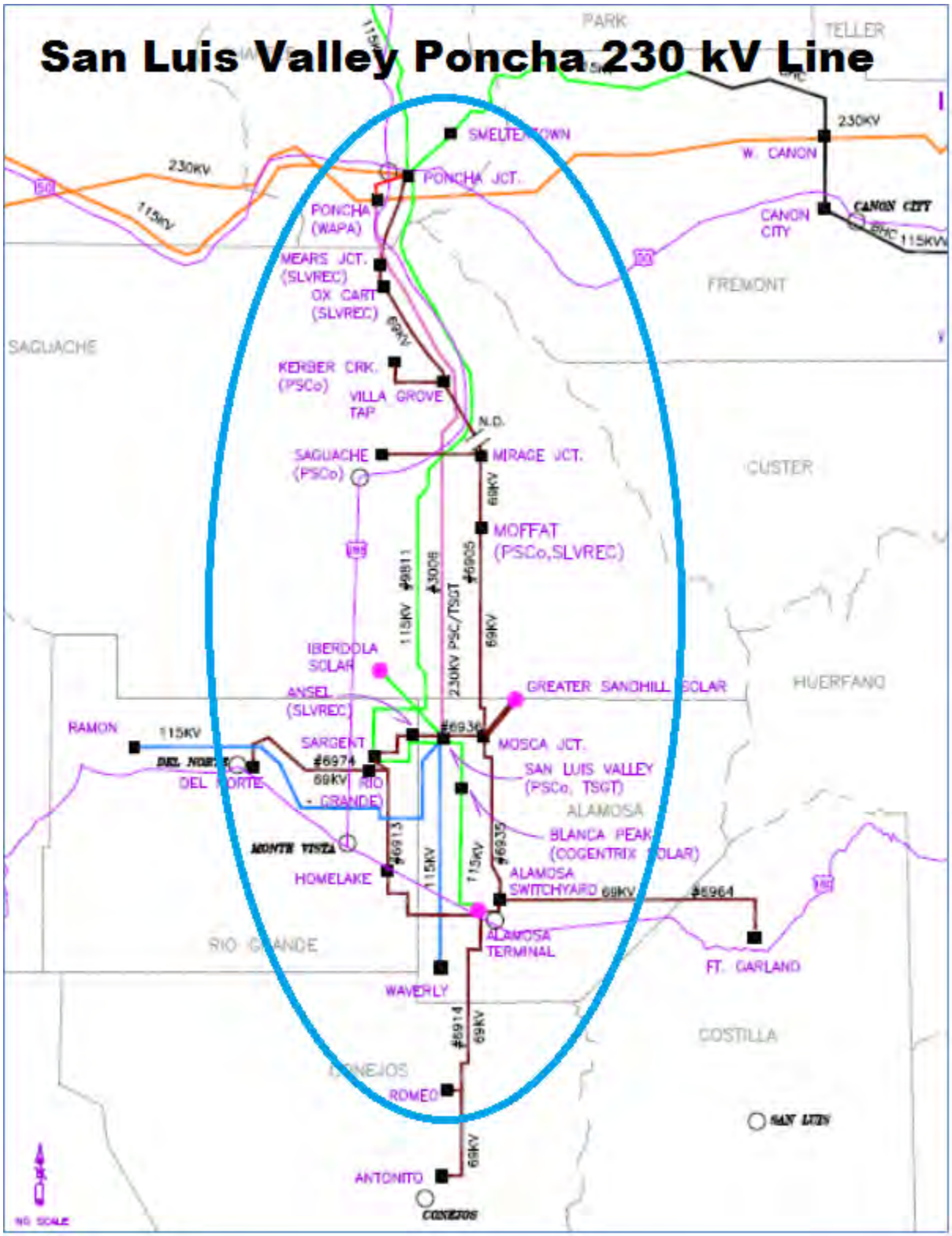
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	None
Project Description:	Construct a single circuit 230 kV transmission line from a new substation called Story Gulch substation to the Rifle (Ute) substation
Voltage Class:	230 kV
Facility Rating:	
Point of Origin/Location:	Story Gulch Substation
Point of Termination:	Rifle (Ute) Substation
Intermediate Points:	
Length of Line (in Miles):	25
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Serve customer load
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	TBD
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	Thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm


NEWCASTLE
RIFLE - UTE
ATLAS/RIFLE
RIFLE - PSCO
OIL SHALE
PARACHUTE
WHEELER
GRAND VALLEY
STARKEY GULCH
UNA
DEBEQUE
Garfield County
Rifle (UTE) - Story Gulch
230kV Transmission Line
Project Study Area

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

San Luis Valley-Poncha 230 kV Line #2

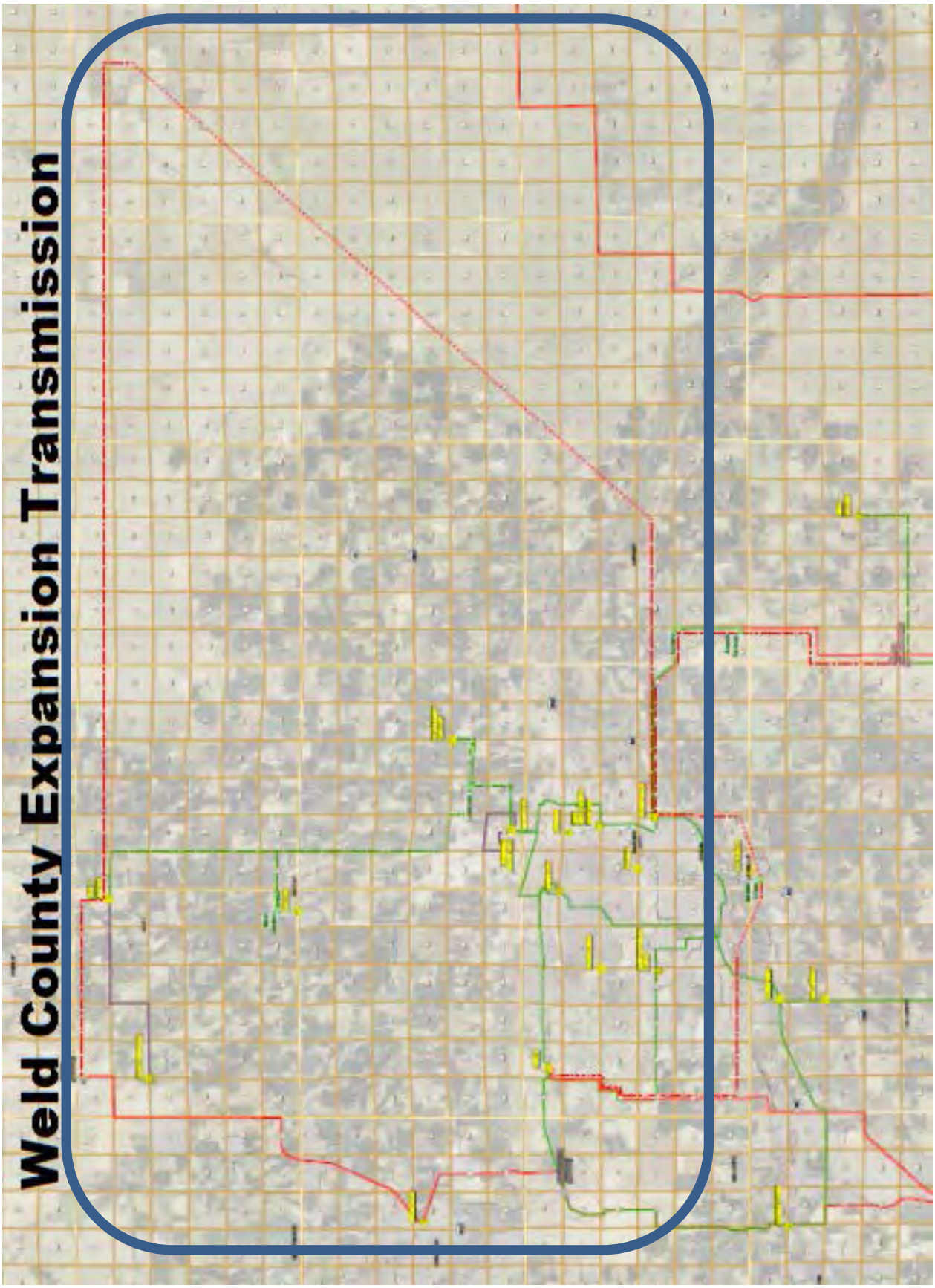
Project Sponsor:	Tri-State Generation and Transmission Association
Additional Project Participants:	Public Service Company of Colorado/ Xcel Energy
Project Description:	Construct a second 230 kV transmission line from San Luis Valley to Poncha.
Voltage Class:	230 kV
Facility Rating:	631 MVA
Point of Origin/Location:	San Luis Valley
Point of Termination:	Poncha
Intermediate Points:	
Length of Line (in Miles):	62
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Provide reliable and adequate load support to San Luis Valley
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$58,000,000
Schedule:	
Construction Date:	
Planned In-Service Date:	2022
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Chris Pink
Email	cpink@tristategt.org
Phone	303-254-3339
Website Information	http://www.tristategt.org/transmissionPlanning/puc3627_TransmissionProjects.cfm


San Luis Valley Poncha 230 kV Line
PARK
TELLER
230KV
W. CANON
SMELTERTOWN
PONCHA JCT.
230KV
115KV
PONCHA (WAPA)
CANON CITY
CANON CITY
115KV
MEARS JCT. (SLVREC)
OX CART (SLVREC)
69KV
FREMONT
SAGUACHE
KERBER CRK. (PSCo)
VILLA GROVE TAP
N.O.
SAGUACHE (PSCo)
MIRAGE JCT.
CUSTER
69KV
MOFFAT (PSCo,SLVREC)
#6811
#3008
#6905
115KV
230KV PSC/TSGT
69KV
IBERDOLA SOLAR
ANSEL (SLVREC)
GREATER SANDHILL SOLAR
HUERFANO
#6936
RAMON
115KV
SARGENT
#6974
69KV
RIO GRANDE
MOSCA JCT.
SAN LUIS VALLEY (PSCo, TSGT)
ALAMOSA
BLANCA PEAK (OGENTRIX SOLAR)
#6913
#6935
115KV
115KV
HOMELAKE
ALAMOSA SWITCHYARD 69KV
#5964
ALAMOSA TERMINAL
RIO GRANDE
FT. GARLAND
WAVERLY
#8914
69KV
COSTILLA
ROMEO
SAN LUIS
69KV
ANTONITO
CONEJOS

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Weld County Expansion Project

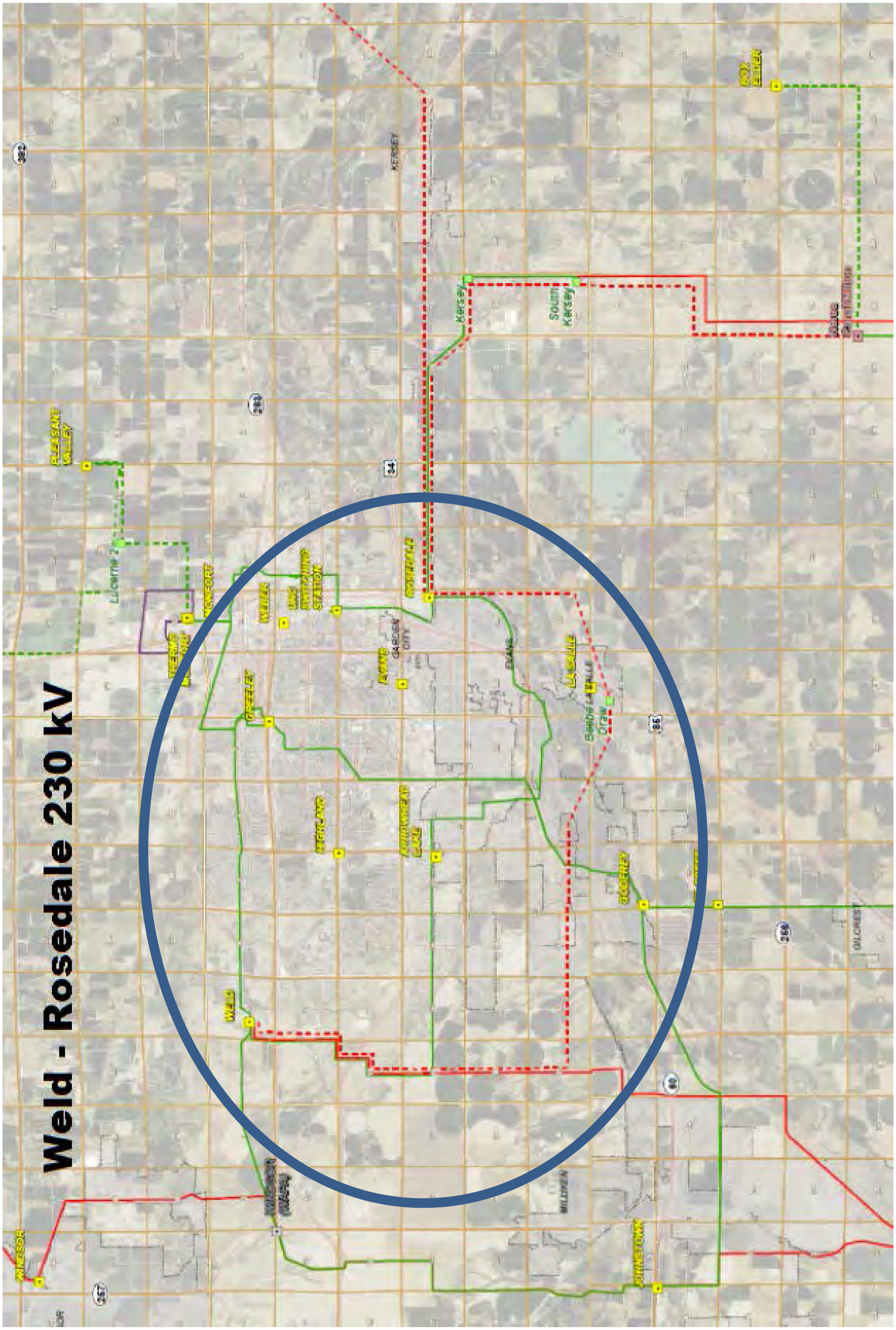
Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	New high-voltage transmission, originating at the Ault Substation, interconnecting to the Greeley network, and terminating south of Greeley.
Voltage Class:	230 kV
Facility Rating:	TBD
Point of Origin/Location:	Ault Substation
Point of Termination:	South of Greeley
Intermediate Points:	Rosedale Substation
Length of Line (in Miles):	TBD
Type of Project:	Transmission Line
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Reliability, load and resource accommodation, and increase TOT7 path.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	Public Policy
Estimated Cost (in 2014 Dollars):	TBD
Schedule:	
Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	Yes
Regulatory Date:	
Permitting Info:	No
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Weld County Expansion Transmission

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Weld - Rosedale 230 kV Line

Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	Build a 230 kV line from Weld substation to Rosedale substation
Voltage Class:	230 kV
Facility Rating:	478
Point of Origin/Location:	Weld Substation
Point of Termination:	Rosedale Substation
Intermediate Points:	
Length of Line (in Miles):	13.0
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	To reduce the risk of overloading Greeley system during planned and forced outage situations.
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	
Schedule:	
Construction Date:	
Planned In-Service Date:	2022
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	
Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Weld - Rosedale 230 kV

Public Service Company of Colorado/ Xcel Energy
2016-2026 Transmission Plan

Wheeler - Wolf Ranch 230 kV Transmission Project

Project Sponsor:	Public Service Company of Colorado/ Xcel Energy
Additional Project Participants:	
Project Description:	The project consists of the construction of a new 230 kV transmission line approximately 18 miles from Wheeler Substation to a new Wolf Ranch Substation to accommodate a new 50 MVA load. The line will also interconnect to the Middle Fork Substation.

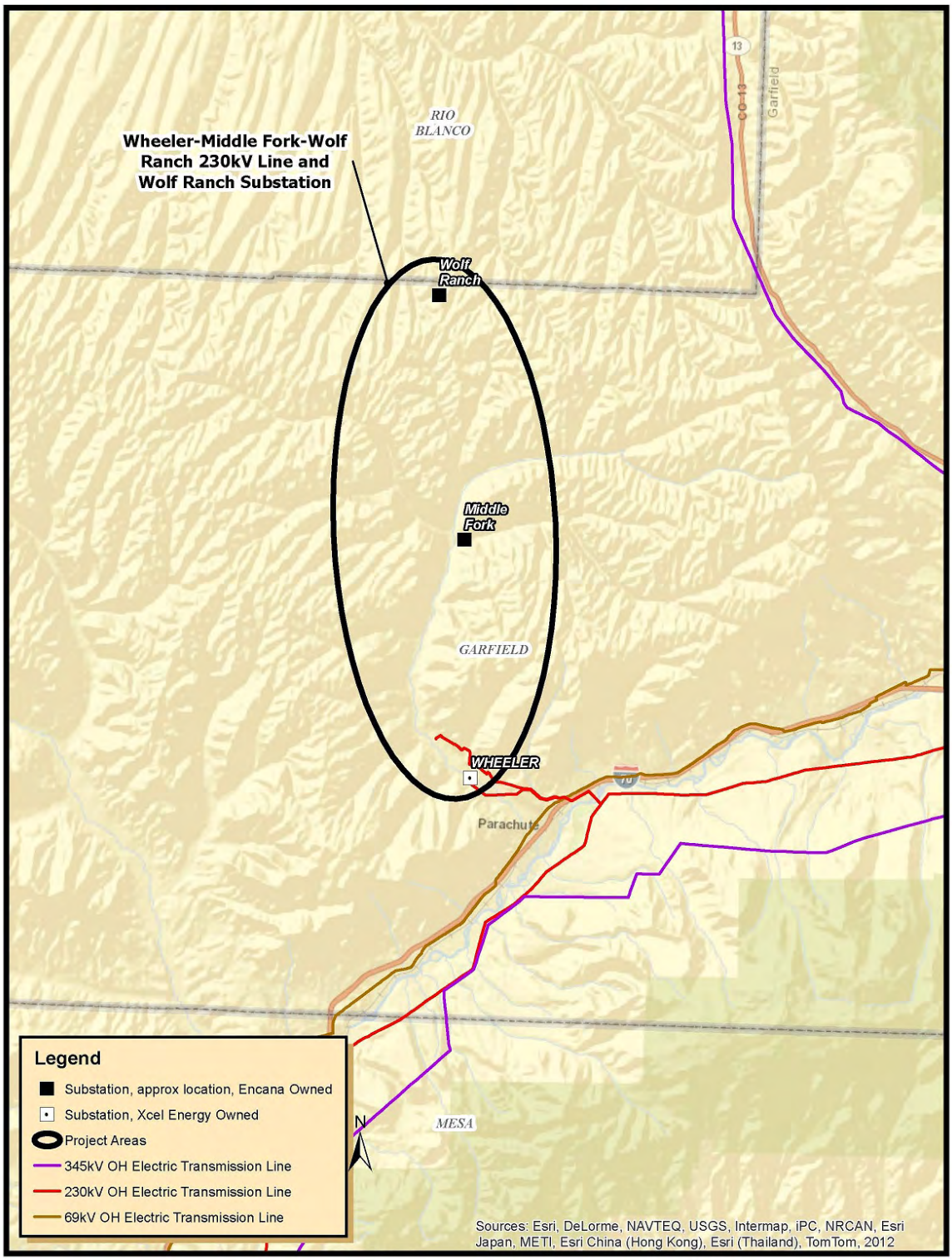
Voltage Class:	230 kV
Facility Rating:	440 MVA
Point of Origin/Location:	Wheeler Substation
Point of Termination:	Wolf Ranch Substation
Intermediate Points:	Middle Fork Substation
Length of Line (in Miles):	18.0
Type of Project:	Transmission Line and Substation
Development Status:	Conceptual
Routing:	
Subregional Planning Group:	CCPG

Purpose of Project:	Load Service
Project Driver (Primary):	Reliability
Project Driver (Secondary):	
Estimated Cost (in 2014 Dollars):	$17,100,000

Schedule:

Construction Date:	
Planned In-Service Date:	TBD
Regulatory Info:	Yes
Regulatory Date:	
Permitting Info:	
Permitting Date:	

Contact Information:	Thomas Green
Email	thomas.green@xcelenergy.com
Phone	303-571-7223
Website Information	


Wheeler-Middle Fork-Wolf Ranch 230kV Line and Wolf Ranch Substation
RIO BLANCO
Wolf Ranch
Middle Fork
GARFIELD
WHEELER
Parachute
MESA
13
CO-13
Garfield
70
N
Legend
Substation, approx location, Encana Owned
Substation, Xcel Energy Owned
Project Areas
345kV OH Electric Transmission Line
230kV OH Electric Transmission Line
69kV OH Electric Transmission Line
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Appendix G

Colorado Springs Utilities

10-Year Transmission Projects

Kelker – Front Range 230 kV Transmission

Project Sponsor: Colorado Springs Utilities

Additional Project Participants: none

Project Description: Redirecting the 230kV Nixon-Kelker line into the Front Range Power Plant, so to terminate at Front Range rather than Nixon.

Voltage Class:	230 kV
Facility Rating:	495 MVA (Normal)
Point of Origin/Location:	Nixon
Point of Termination:	Front Range
Length of Line (in Miles):	14 miles
Type of Project:	Transmission Line
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG

Purpose of Project: To provide a second line into the 460MW Front Range Power Plant and help certain N-2 contingencies.

Estimated Cost (in 2013 Dollars): $1,500,000

Schedule:

Construction Date:	2015
Planned In-Service Date:	2017
Regulatory Info:	
Regulatory Date:	
Permitting Info:	
Permitting Date:	

Contact Information:

Susan Lovejoy
Email slovejoy@csu.org
Phone (719) 668-8384
Website Information: www.csu.org

Appendix H

Comments from the Office of Consumer Council & Responses from Public Service

Questions for First Rule 3627 Report Stakeholder Meeting on Friday, August 14, 2015

A. Questions from CCPG Meetings and Related Presentations

1. From the CCPG meetings presentation and discussion: How is transmission in the San Luis Valley (SLV) being addressed in the Rule 3627 Report?

   Response:
   Rule 3627 requires utilities to identify projects that are 100 kilovolt ("kV") or greater. Every 10-Year Transmission Plan provides information for each of the projects that make up the Public Service Company of Colorado ("PSCo") transmission plan. The information includes a project description, the purpose of the project, the estimated cost, and the status of development. Projects that are not fully defined may be classified as "conceptual". Projects classified as "planned" generally also include an implementation schedule. The Company is still finalizing the Rule 3627 Report to be filed in February 2016 and therefore cannot address all the questions that have been included in this document at this time.

   Notwithstanding, Transmission planning is ongoing for the San Luis Valley ("SLV") through working groups of the Colorado Coordinated Planning Group ("CCPG"). It is expected that the upcoming 10-Year Transmission Plan to be filed in February 2016 will address PSCo's involvement in SLV transmission plans per Rule 3627.

2. From the CCPG meetings presentation and discussion: How are the low voltage issues in lower SLV being addressed in the Rule 3627 report?

   Response:
   See Response to Question No. 1.

3. Will the changes to the timing of the components of South Weld Expansion Plan be identified in the Rule 3627 Report? How is the timing of the components being impacted by lower prices for oil and gas? Will the Rule 3627 Report show that PSCo is joining the South Weld project?

   Response:
   See Response to Question No. 1. In addition, the Southwest Weld Expansion Project ("SWEP") is a Tri-State project that PSCo is considering participating in. Questions regarding the timing of the project should be referred to Tri-State. It is expected that the upcoming 10-Year Transmission Plan to be filed in February 2016 will address PSCo's involvement in any Northeast Colorado transmission plans.

4. What Greeley and East Weld County improvements will be discussed in the Rule 3627 Report? Does the oil and gas load justify the need for these projects at this time? Are oil and gas developers paying for all or most of the costs of these projects? It does not appear possible to justify a Weld-Rosedale line upgrade based on loads in eastern Weld County.

   Response:
   See Response to Question No. 1. In addition, it is expected that the upcoming 10-Year Transmission Plan to be filed in February 2016 will address PSCo's involvement in any Northeast Colorado transmission plans.

5. Given the claims of increased load in the Weld County area as exhibited by both Tri-State's South Weld Project and by PSCo's East Weld needs, will the Pawnee-Ft. Lupton 230 kV to 345 kV upgrade be discussed in the Rule 3627 Report? If not, why not.

   Response:
   The need for a Pawnee – Ft. Lupton upgrade has not been identified by PSCo or the Colorado Coordinated Planning Group ("CCPG"), Northeast Colorado Subcommittee ("NECO") Work Group. In Proceeding No. 14A-0287E, the Office of Consumer Counsel ("OCC") proposed the project as an alternative to the PSCo proposed Pawnee – Daniels Park Project. PSCo was granted, by the Colorado Public Utilities Commission ("CPUC"), a Certificate of Public Convenience and Necessity ("CPCN") for the Pawnee – Daniels Park project and therefore, is not considering alternatives to that project.

6. Will Ault-Rosedale, Ault-Kersey West or other TOT7 projects be included in the Rule 3627 Report? Given the expiration of PSCo's purchase power contracts that have been bringing up to 300 MW to 450 MW of power across TOT7 to PSCo, as shown in the table below, what is the justification for PSCo's participation in a TOT7 project?

Response:

See Response to Question No. 1. In addition, Transmission planning is ongoing for the northeast Colorado area through the NECO Subcommittee of CCPG. It is expected that the upcoming 10-Year Transmission Plan to be filed in February 2016 will address PSCo's involvement in any northeast Colorado transmission plans. PSCo has customer loads in northeast Colorado and is a joint owner in the TOT 7 transfer path. Therefore, participation in any studies of the northeast Colorado area is fully justified.

Table OCC-1 Expiring Public Service Contracts Related to TOT 7			
(Megawatts)			
	Current	Expires	
Purchases that Expire, 2011 ERP, p. 2-58			
Basin 1	100	2015	
Basin 2	75	2015	
Tri-State 2	100	2016	
Tri-State 3	25	2015	
Subtotal	300		
PacifiCorp	150	2022	
Total	450		
Remaining Owned West-Slope Capacity - 2011 ERP Page 2-70			
Hayden 1	139		
Hayden 2	98		
Craig 1	42		
Craig 2	42		
A little hydro and CT			
Total without hydro/CT	321		
Old Total	771		
New Total after Contract Expriations	321	Without PacifiCorp	
New Total after Contract Expriations	471	With PacifiCorp	

B. Questions Related to the Energy Imbalance Market

7. Will joining the Cal-ISO/PacifiCorp Energy Imbalance Market (EIM) be decided before the 3627 transmission report is issued? If so, what will be the impact of the EIM on transmission plans?

   Response:
   No. PSCo does not anticipate any decision with respect to Energy Imbalance Market ("EIM") participation prior to the deadline for filing the Rule 3627 Report.

8. Will the 3627 Report discuss adding transmission lines to Wyoming, with the EIM with PacifiCorp being part of the reason for this?

   Response:
   No. PSCo does not anticipate the tie line to Wyoming would be required in order to participate in the EIM. Potentially, the amount of market integration and associated potential benefits would be higher with increased transfer capability, but no work has been done to estimate if the benefits would exceed the costs.

9. Will the Rule 3627 Report show additional transmission lines or upgrades of existing lines to Four Corners because of the Cal-ISO EIM or because the closure of generating units at Four Corners and San Juan provides a greater opportunity for transactions (sales-purchases) with California and Southwest utilities? What can be done to increase the transmission capacity to the four corners area?

   Response:
   No decisions have been made regarding joining the CAISO/PacifiCorp EIM. As a result, it is uncertain what the transmission implications might be under such a condition.

   The EIM is an energy-only market and does not provide firm transmission capability. Any transmission developments in response to portfolio changes at Four Corners and San Juan would be administered through the traditional open-access process including requests for new service and associated transmission upgrade studies.

C. Questions Related to the Clean Power Plan and Other Federal Actions

10. Will the April, 2016 Rule 3627 Report show the transmission impact of the EPA's Clean Power Plan? If not, where will the transmission impact of the Clean Power Plan be reported?

Response:
PSCo is still evaluating the Environmental Protection Agency ("EPA") final rule and how it might impact the state of Colorado. The Rule 3627 Report may include the impacts of the EPA's Clean Power Plan. However, it is uncertain at this time what those impacts may be.

11. Will PSCo be modifying and re-submitting the joint dispatch proposal to FERC? What, if any, is the impact of the joint dispatch proposal on transmission planning?

Response:
Yes – PSCo anticipates filing a revised joint dispatch proposal to the Federal Energy Regulatory Commission ("FERC") in the Fall of 2015. We do not anticipate any impacts to transmission planning efforts associated with the joint dispatch proposal.

12. Please explain what non-transmission alternatives ("NTAs") are being discussed in the Rule 3627 report. Which transmission lines are being delayed or eliminated by NTAs? If no transmission lines are being delayed or eliminated by NTAs, are NTAs being seriously evaluated as alternatives to transmission lines? What NTAs are being considered to eliminate or delay the need for the Pawnee-Daniels Park transmission line?

Response:
At this time, it is uncertain what, if any NTAs will be discussed in the report. Rule 3627 does not require or mention NTAs. No NTAs are being considered to eliminate or delay the Pawnee – Daniels Park transmission line. In Proceeding No. 14A-0287E, the CPUC granted a CPCN for that project.

D. Questions Related to System Peak Demand, Local Area Peak Demand and the Need for Additional Transmission Lines

13. The system peak demand forecast provides the overall basis for the need for transmission and needs to be included in the Rule 3627 Report.

Response:
It is PSCo's understanding of this question that OCC is asking that system peak demand forecasts be included in the Rule 3627 filing to be made in February 2016. With this understanding, PSCo states as follows:

PSCo disagrees. Rule 3627 requires that the 10-year plan be compliant with all applicable reliability criteria over a range of forecasts. It does not require that PSCo provide the forecasts.

14. What impact does Boulder leaving the PSCo system have on the need for transmission?

Response:
Public Service understands this question to refer to Proceeding No. 15A-0589E, in where the City of Boulder has applied to the CPUC to transfer certain assets from PSCo which are necessary for the operation of a municipal electrical utility. The question assumes that the CPUC will grant such application. With this understanding, PSCo states as follows:

Because the City of Boulder would continue to interconnect with the PSCo system, there is no expected impact on the need for transmission.

15. Please provide year-to-date summer peak demand for 2015 Does 2015 continue a trend of declining or low peak demand since 2012? Was 2012 peak demand an aberration – significantly higher than the years around it (after adjusting for discontinued wholesale demand)? How does the low peak demand of the last three years, and Boulder leaving the system, change PSCo demand forecast? How does low peak demand in the last three years, and Boulder leaving the system, change the need generating capacity and the need for transmission?

Response:
See Response to Question No. 13. This information is outside the scope of Rule 3627.

16. Is PSCo basing its transmission needs on the demand forecast that was most recently approved by the Commission in the Proceeding No. 14A-1057EG, the 2015-2016 DSM Plan? If not, please identify where the Commission approved the demand forecast that is being used to justify the transmission in the Rule 3627 Report.

Response:
PSCo uses the most recent demand forecasts for transmission planning. Forecasts are generally updated twice a year. The Commission does not approve forecasts used for transmission planning. Rule 3627 requires that PSCo demonstrate compliance with reliability criteria over a range of system demands.

17. Does the load in the West Slope oil and gas development area still support the need for the construction of the second Rifle-Parachute 230 kV line?

Response:
Yes. In Proceeding No. 13A-0032E, the CPUC approved the CPCN for the Rifle – Parachute Project that was approved based on current reliability needs. It is scheduled to be completed in 2016.

18. The Pawnee-Daniels Park 345 kV transmission line was approved assuming that Boulder would remain on the PSCo system. With Boulder having formerly notified PSCo that they are leaving, please explain when PSCo will be re-evaluating the need for the Pawnee-Daniels Park transmission line without Boulder.

Response:
Public Service understands this question to refer to Proceeding No. 15A-0589E, in where the City of Boulder has applied to the CPUC to transfer certain assets from PSCo which are necessary for the operation of a municipal electrical utility. The question assumes that the CPUC will grant such application. With this understanding, PSCo states as follows:

In Proceeding No. 13A-0032E the CPUC approved the CPCN for Pawnee – Daniels Park Project. It is scheduled to be completed in 2022. See the Response to Question No. 14.

E. Questions Related to Renewable Power and its Transmission

19. What transmission lines are included in the Rule 3627 Report in order to increase the amount of wind that can be accepted on the PSCo system (besides Pawnee-Daniels Park)?

Response:
As explained in Response to Question No. 1, Rule 3627 requires utilities to identify projects 100 kV or greater. Every 10-Year Transmission Plan provides information for each of the projects that make up the PSCo transmission plan. The information includes a project description, the purpose of the project, the estimated cost, and the status of development. Projects that are not fully defined may be classified as "conceptual". Projects classified as "planned" generally also include an implementation schedule.

If a project has the potential to accommodate additional generation resources, it will be discussed in the Rule 3627 Report.

20. What transmission lines are included in the Rule 3627 Report in order to increase the amount of solar that can be accepted on the PSCo system?

Response:
See Response to Question No. 19.

21. How much additional wind capacity can be accommodated on the PSCo system? Please provide the basis for the answer.

Response:
This information is outside the scope of Rule 3627.

22. How much capacity does PSCo have on the transmission lines from Craig-Hayden to the east slope of Colorado?

Response:
This information is outside the scope of Rule 3627.

23. The Hermosa wind project showed that the Craig-Hayden lines can be upgraded by 300 MW for modest cost by changing the transformers at each end. If PSCo or its independent power supplier paid for the transformer upgrade, would PSCo gain the rights to this 300 MW of additional transmission capacity? Please

explain. Will this upgrade be listed in the Rule 3627 Report as a possible project so that developers are aware of it and can propose wind or natural gas generation projects to utilize this additional transmission capacity?

Response:
PSCo Transmission Planning is unfamiliar with the Hermosa Wind Project. Therefore, it is not expected that it will be listed by PSCo in the Rule 3627 Report. It may be listed by another entity.

24. Does Tri-State's addition of the Burlington-Lamar line change PSCo's capacity on the Boone-Lamar line and generation injection capability in the Lamar area?

Response:
This information is outside the scope of Rule 3627. Notwithstanding, the Burlington – Lamar line does not change PSCo's capacity on the Boone – Lamar line.

25. Can the Boone-Lamar 230 kV transmission line accommodate approximately 210 MW of new wind now that PSCo's contract with SPS has expired? Or can the Boone-Lamar line share this 200 MW of capacity between wind and peaking capacity on the east side of the DC tie?

Response:
This information is outside the scope of Rule 3627. Notwithstanding, it is uncertain if the Boone – Lamar 230 kV transmission line could accommodate 210 MW under the two conditions specified in the question above.

26. What is the plan for the 162 MW Colorado Green wind project whose contract expires in 2018? Will there be a PSCo RFP that Colorado Green can respond to in order to generate without a break in the contract? Is there a chance that Colorado Green will go to Tri-State because PSCo does not have a timely RFP? Or will Colorado Green be able to bid a higher price because the PTC expired and Colorado Green doesn't have to bid against low-cost projects? Or will there be a total of approximately 372 MW of injection capacity on PSCo's Boone-Lamar line after 2018 because the Colorado Green project did not renew its contract?

Response:
This information is outside the scope of Rule 3627.

27. Wind that benefits from the Production Tax Credit (PTC) appears to cost less than coal-fired generation at Craig (using Colowyo coal), Cherokee and Valmont. Please explain why PSCo has not issued a request for proposal (RFP) to contract for more wind capacity before the PTC expires. Please explain why PSCo believes that it is prudent to wait until after the PTC expires to issue an RFP for wind.

Response:
This information is outside the scope of Rule 3627.

28. Wind power that benefits from the Production Tax Credit (PTC) appears to cost less than coal-fired generation at Craig using Colowyo coal.
    a. Please explain what steps PSCo and the other Craig owners are taking to replace Colywyo coal-fired generation with less expensive wind power.
    b. Tri-State, the operator of the Craig plant, has recently contracted for wind from the Carousel and Twin Buttes II wind farm. Did PSCo receive an allocation of these wind contracts to replace Craig generation? Is Tri-State performing its fiduciary duty to the joint owners of Craig by contracting for wind for itself and not for the Craig joint owners?
    c. The Ansuchtz Corporation subsidiary Power Company of Wyoming (PCW) has proposed 2,000 MW to 3,000 MW of wind in southern Wyoming. The initial focus of PCW's sales efforts was directed at California, but recent reports state that PCW wants to branch out to other customers. PCW sates that it wind blows more during the daytime than other wind sources (what capacity credit would be applicable to PCW wind rather than the 12.5% capacity credit for most wind sources). PCW's transmission map shows that a transmission line to or near to Craig is one of the alternatives being considered. Tri-State lists the Craig plant at approximately 1,300 MW of capacity. If the coal units are reduced to half capacity in order to accommodate wind, that means that approximately 650 MW of wind could be taken. If PSCo paid for the transformer upgrade discussed above, it could obtain an additional 300 MW of wind capacity resulting in as much as 900 MW of wind power. Please explain what discussions PSCo has had with PCW.
    d. If PSCo has not discussed a wind purchase with PCW, please explain why not (especially given that their headquarter buildings are located only a few blocks apart). Please explain what new transmission lines and what transmission line upgrades will be considered for the Rule 3627 Report because of PCW or other Wyoming wind purchases.

Response:
a-c.) This information is outside the scope of Rule 3627.
d.) Please see Response to Question No. 1.

F. Long-Term Options and Generation Injection Capability

29. Will any action be proposed in the Rule 3627 Report on the projects listed below? If so, what is the basis for moving them from long-term options to more active consideration?
    - Parachute - Cameo 230 kV Transmission Line
    - Lamar - Front Range 345 kV Transmission Line Project
    - Lamar - Vilas 230/345 kV Transmission Line Project

    Response:
    See Response to Question No. 1.

30. PSCo's direct testimony in Proceeding 14A-0287E showed that generation injection capability is an important consideration in transmission planning. Further, this is useful information for independent power producers looking for locations for their projects. OCC's updated injection capability is provided in the table on the next page. The ones highlighted in grey represent changes from previous filings. Some of the injection capabilities, particularly the west slope ones, were limited to a maximum of 50 MW because that was the size of the Solar Connect RFP. The OCC would appreciate it if PSCo would provide the full injection capability at these sites. The possible 300 MW of injection capability due the increase in transmission capacity using the Craig-Hayden to the east slope line, that was discussed above, has not been included pending the answer to our question. The possible additional 200 MW of injection capability at Lamar that is discussed above has also not been included in the injection capability list shown below. This list is based o three sources: PSCo statements, bids in the 2013 ERP Phase II and existing contract capacities. If PSCo disagrees with any of these injection capability estimates, please provide the basis for the difference.

    Response:
    This information is outside the scope of Rule 3627.

Table OCC-2 Summary of Public Service Injection Capability

Changes in grey from Table CN-6 in OCC Answer Testimony in Proceeding 14A-0287E

Megawatts

Table OCC-2a Compare Injection Capabilities in Recent PSCo Applications

14A-0287E Pawnee-Daniels Park CPCN and 14A-0301E Solar Connect RFP

Megawatts

Location	Interconnection Voltage (kV)	Pawnee-Daniels Park CPCN	14A-0301E Solar Connect RFP *	
Boone	115	0	0-50	
Comanche	230	0	0-50	
Jackson Fuller	230	0	Not listed	
Ft. St. Vrain	230	250	380	**
Missile Site	230/345	0	0-50	
Pawnee	230/345	0-50	0-50	
Lamar	230/345	0	Not listed	
Ault	230	0	Not listed	
San Luis Valley area	115/230	50	0-50	
Poncha	230	Not listed	0-50	
Hartsel	230	34	50	
Cameo***	230	Not listed	190-380	
Collbran***	138	Not listed	50	
Hayden***	230	Not listed	50	
Rifle***	230	Not listed	50	
Uintah***	230	Not listed	50	
Total		**334-384**	**720-1,210**	

* The Solar Connect RFP is for 50 MW of capacity, so 50 MW is the maximum listed.
The RFP states that more than 50 MW may be available at some injection points.
** 14A-0301E lists FSV as 50 MW, but 380 MW was provided in response
to Discovery Request OCC1-6d in 14A-0287E at a cost of $4.5 million.
*** Cameo updated based on Discovery OCC 6-9 in Proceeding 14AL-0660E
Combined west slope total could be less than the sum. 290 MW to 480 MW is used.

Table OCC-2b Capacity from 2013 Solicitation

Bid G006 SWGen Valmont CTs	80
Bid G010 Invenergy Spindle 7FA	157
Bid G002 Genova Deer Trail	233
Total Capacity from 2013 Solicitation	470

Highly Confidential bid data made public in Decision C14-1090. Released 11/10/2014.

Table OCC-2c Existing Site (Brownfield) Expansions

2011 ERP, Proceeding 11A-869E, Vol 1, page 1-46
Assume one or two 190 MW CTs are added at each site.

	Low	High
Cherokee (1x1 CC based on OCC 6-9)	285	285
Ft. St. Vrain		Included above
Rocky Mountain Energy Center (CC, per 6-9)	285	285
Blue Spruce Energy Center	190	380
Pawnee (CTs can be added per OCC 6-9. Is transmission required or share wind capacity?)		
Ft. Lupton (one or two CTs per OCC 6-9, net)	150	300
Total	**910**	**1,250**

Table OCC-2d Capacity Available at Sites of Retired Units

Valmont	184
Arapahoe from 08A-145E Arapahoe CC CPCN	**514 -569**

Table OCC-2e Existing IPP Contracts that Expire by 2024 and Could be Renewed

L&R Statement provided in response to CEC1-9.A1 in Proceeding 14A-0287E

Contract	Year Expiration	Capacity
PacifiCorp	2022	150
Manchief	2021	258
SW Arapahoe CC	2023	121
Total		**529**

Table OCC-2g Cabin Creek Expansion

CPCN filing in Proceeding No. 15A-0304E

Cabin Creek Expansion	**36.6**

Total Capacity	**3,364-4,249**

Appendix I:

CCPG Stakeholder Process

OCC Comments & Responses

To the PSCo

Pawnee - Daniels Park

Transmission Project

CCPG Comment Form

(For Stakeholder Comments, Requests for Clarification, Reliability Studies, Alternative Evaluation, and other General Feedback)

Provide the information in the yellow boxes. If the information is unavailable or unknown, please indicate.

Requester Information:	
Date:	11/26/2014
Requester:	Colorado Office of Consumer Counsel
Address:	1560 Broadway, Suite 200
State & Zip:	Denver, 80202
Requester Contact:	Chris Neil, Office of Consumer Counsel
Title:	Rate/Financial Analyst
Phone Number:	303-894-2124
Email:	chris.neil@state.co.us

General Information:	
Study or Project Name:	Pawnee-Ft. Lupton Transmission Line Upgrade
New Study or Alternative:	Alternative to Pawnee-Daniels Park
Narrative Description:	Please provide an analysis of upgrading the Pawnee-Ft. Lupton line to 345 kV. This is an alternative to the Pawnee-Daniels Park upgrade that would also allow additional injection at the Pawnee and Missile Site substations and ERZ 1 and 2. This alternative is even more important with Tri-State's request for additional transmission lines from Ft. Lupton to the South Weld area (Proceeding No. 14A-0896E). Thri-State's request indicates a need for more injection into the Ft. Lupton area and also results in substantially more take away capacity. The Pawnee-Ft. Luton analysis should examine upgrading the existing single-circuit 230 kV line to single-circuit 345 kV line. Cost estimates should assume that existing structures will be used if possible. That is, changes to only the insulators, wire and transformers at each end. If the existing structures have to be replaced because they are old, then a credit needs to be provided because the old structures would need to be replaced without the upgrade.
Study Horizon Date:	The line could be built in the 2019 time frame for Public Service's needs, but could also be considered to be needed as soon as possible given the oil and gas loads idicated by Tri-State and Public Service.
Geographic Footprint Impacted:	The geographic footprint is the transmission corridor from Pawnee to Ft. Lupton.
Load and Resource Modeling:	CCPG is requested to study the new loads idicated by Tri-State. Public Service should also consider how oil and gas loads in its service territory will impact the need for the Pawnee-Ft. Lupton line.
Transmission Modeling	Transmisison modeling is requested, including how the Pawnee-Ft. Lupton alternative compares with the Pawnee-Daniels Park alternative. That is, Pawnee-Daniels Park should not be consisdered a completed or approved project and included in the base case.
Suggested Participants: (TP's, LSE's, Work Groups)	Participants include Public Service and Tri-State.
Policy Issues to be Addressed: (SB100, RES, FERC, NERC, etc)	This option addresses SB100 and RES as well as the need to meet the new oil and gas loads.
Other Factors to be Considered:	Please compare the cost of the Pawnee-Ft. Lutpon alternative with the cost of the Pawnee-Daniels Park alternative. The amount of additonal injection capacity of each alternative also needs to be determined.
Type (Powerflow or Stability):	Both Powerflow and Stability.

Return To:	
CCPG Chair:	**Wes Wingen**
In care of:	**Black Hills Corporation**
Address:	**PO Box 1400**
City, State, Zip:	**Rapid City, SD 57709-1400**
Phone:	**605-721-2268**
Email:	wes.wingen@blackhillscorp.com

All study requests received from stakeholders will be reviewed and evaluated to determine the appropriate process for addressing.
This planning process does not replace the System Impact Study process. Specific requests for transmission service or generation interconnection will continue to be studied pursuant to existing OATT processes.

January 18, 2015

Chris Neil
Colorado Office of Consumer Council
1560 Broadway, Suite 200
Denver, CO, 80202

Re. CCPG Study Request: Proposed Alternative to Pawnee – Daniels Park

Dear Mr. Neil:

Thank you for your submission of the Colorado Coordinated Planning Group (CCPG) Comment Form, which was received on December 12, 2014. The description indicates that you are interested in an analysis of upgrading the Pawnee – Ft. Lupton line to 345 kV and that this would be an alternative to the Pawnee – Daniels Park Project that is planned by Public Service Company of Colorado (PSCo). According to PSCo, an application for a Certificate of Public Convenience and Necessity for the Pawnee – Daniels Park Project is presently being considered by the Colorado Public Utilities Commission (PUC) under Proceeding No. 14A-0287E. A Recommended Decision that conditionally granted the CPCN was issued by the Administrative Law Judge on November 25, 2014 (Decision No. R14-1405). However, the PUC has not issued a final decision for the CPCN.

According to the Process for Stakeholder Input, an ad-hoc review group is in the process of being created to evaluate your request. However, since the proposed project is an alternative to a project that is the subject of legal proceedings, we do not feel that it is appropriate for CCPG to take any additional action at this time. Once a decision has been made by the PUC, we will be happy to revisit the issue with you.

Again, thank you for your participation in the CCPG planning forum. Please feel free to contact me with any further questions.

Wes Wingen

Chair, Colorado Coordinated Planning Group
Email: Wes.Wingen@blackhillscorp.com

cc: Blane Taylor, Chris Pink, Tom Green, Betty Mirzayi

Appendix J:

CCPG Stakeholder Process Comments & Responses to the CCPG San Luis Valley Studies

(For Stakeholder Comments, Requests for Clarification, Reliability Studies, Alternative Evaluation, and other General Feedback)

Provide the information in the yellow boxes. If the information is unavailable or unknown, please indicate.

Requester Information:	
Date:	13-Jan-15
Requester:	Frank McElvain
Address:	685 East Middlefield Road
State & Zip:	Mountain View, CA 94043-4045
Requester Contact:	Phone: 650 694 5096
Title:	Senior Manager, Consulting
Phone Number:	Cell: 408 239 7825
Email:	frank.mcelvain@siemens.com

General Information:	
Study or Project Name:	San Luis Valley Joint Study Task Force
New Study or Alternative:	SLV to Second Source (Walsenburg, Poncha, Montrose, Pagosa)
Narrative Description:	The San Luis Valley Joint Study Task Force has been created with the primary objective of identifying potential altenratives that address the San Luis valley transmission system deficiencies, which include poor reliability, restrictions on load growth, aging infrastructure, and limited generation export capability. The SLV can be viewed as being served by two transmission lines which are routed through a common corridor from the north. In order to increase reliability, possible alternatives which utilize a different corridor or direction of service would prevent one event (fire, etc.) from necessitating load shedding, or loss of the entire SLV load for an extended period of time. As such, evalution of a line to Walsenburg, Poncha, Montrose, or Pagosa seem like sources that could be leverged to accomplish this goal.
Study Horizon Date:	
Geographic Footprint Impacted:	San Luis Valley, Colorado
Load and Resource Modeling:	Heavy Load, Shoulder season off-peak load, high renewable output
Transmission Modeling	These alternatives could utilize either 115 kV or 230 kV construction. However, it was identified that loss of the present 230 kV line can result in reduced load serving capability. This could imply that it is more likely a 230 kV solution would be necessary to remove the need for load shedding.
Suggested Participants: (TP's, LSE's, Work Groups)	Tri-State Generation and Transmission, Public Service Company of Colorado (Xcel)
Policy Issues to be Addressed: (SB100, RES, FERC, NERC, etc)	NERC Transmission Criteria
Other Factors to be Considered:	
Type (Powerflow or Stability):	Powerflow

Return To:	
CCPG Chair:	**Wes Wingen**
In care of:	**Black Hills Corporation**
Address:	**PO Box 1400**
City, State, Zip:	**Rapid City, SD 57709-1400**
Phone:	**605-721-2268**
Email:	wes.wingen@blackhillscorp.com

All study requests received from stakeholders will be reviewed and evaluated to determine the appropriate process for addressing.
This planning process does not replace the System Impact Study process. Specific requests for transmission service or generation interconnection will continue to be studied pursuant to existing OATT processes.

(For Stakeholder Comments, Requests for Clarification, Reliability Studies, Alternative Evaluation, and other General Feedback)

Provide the information in the yellow boxes. If the information is unavailable or unknown, please indicate.

Requester Information:	
Date:	13-Jan-15
Requester:	Interwest Energy Alliance, Sarah Cottrell Propst, Executive Director
Address:	P.O. Box 8526
State & Zip:	Santa Fe, New Mexico 87504-8526
Requester Contact:	Lisa Tormoen Hickey, Esq.
Title:	Attorney on behalf of IEA
Phone Number:	719-471-9231
Email:	lisahickey@coloradolawyers.net

General Information:	
Study or Project Name:	San Luis Valley Joint Study Task Force
New Study or Alternative:	1) Upgrade lines to Poncha to 230 kV, (including potential for 230 kV Double Circuit) 2) New 230 kV line east to Comanche Substation 3) Upgrade 69 kV line to highest possible rating 4) Analyze locations/need for new substation(s) to accommodate modeling described below to export 500MW to 700MW of new solar
Narrative Description:	Interwest requests all four studies outlined above. Upgrades are appropriate and necessary for reliability to replace infrastructure, accommodate load growth and to remove limits on exports of revewable energy from the San Luis Valley. Expansion of the existing lines and expansion to the north and east are critical. In addition to new lines, the utilities should begin analysis of siting new substations along these rights of way. 1) Upgrade the 69 kV/115 k+B42V line should be upgraded to 230 kV circuit on double-circuit capable structures. This would enable adding a 230 kV circuit in the n+B1ear term with the potential for a second line (double circuit) in the future. 2) New 230 kV line east to Walsenburg (Comanche Substation) to provide looped service to the SLV. 3) Upgrade 69 kV conductor/line to be upgraded to the highest possible rating (^ 100 mVa). The third study is intended to be an alternative study in case the conversation to 115 kV would be too costly, considering all factors including approvals and siting. The alternative study #3 would provide information about opportunities to make the most effective use of existing infrastructure.
Study Horizon Date:	2018
Geographic Footprint Impacted:	San Luis Valley, Colorado, Front Range
Load and Resource Modeling:	Assume load increase 1.5%. Assume an additional 500 MW to 700 MW of utility-scale solar coming out of the San Luis Valley.
Transmission Modeling	
Suggested Participants: (TP's, LSE's, Work Groups)	Tri-State Generation and Transmission, Public Service Company of Colorado (Xcel)
Policy Issues to be Addressed: (SB100, RES, FERC, NERC, etc)	SB-100, Renewable Energy Standard, including increases in overall goals prior to 2013;ES, NERC Transmission Criteria, the Clean Power Plan.
Other Factors to be Considered:	Increased demand for renewables, including utility-scale solar energy, by Xcel Energy, Black Hills Energy, rural coops and municipalities before 2030, over and above the existing Renewable Energy Standard. In addition, several utilities have expressed a desire for additional utility-scale renewables, including solar energy, to serve voluntary demand from their customers. Additional capacity to transmit solar energy from the San Luis Valley can service this demand and reduce costs overall, providing additional hedging benefits against fuel price increases and volatility. Adding more utility-scale solar energy mixed with increasing amounts of wind energy can provide more complementary variable energy generation with diverse resource types and locations. These additions will promote energy security, low costs and stable prices for all Colorado ratepayers.
Type (Powerflow or Stability):	Powerflow

Return To:	
CCPG Chair:	**Wes Wingen**
In care of:	**Black Hills Corporation**
Address:	**PO Box 1400**
City, State, Zip:	**Rapid City, SD 57709-1400**
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All study requests received from stakeholders will be reviewed and evaluated to determine the appropriate process for addressing.
This planning process does not replace the System Impact Study process. Specific requests for transmission service or generation interconnection will continue to be studied pursuant to existing OATT processes.

ALPERN MYERS STUART LLC
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Of Counsel
M. Allen Ziegler, Jr.

Senior Associate
Peggy A. Hayes

January 19, 2015

San Luis Valley Joint Study Task Force
Jonathan Fidrych
James Nguyen
jfidrych@tristategt.org
james.nguyen@xcelenergy.com

Re: Study Requests for SLV Task Force

Dear Jon and James,

Thank you for extending the time period for stakeholder input into the SLV Task Force process. We submit this CCPG Comment Form with study requests on behalf of the Interwest Energy Alliance, a Colorado nonprofit trade association representing the leading utility-scale solar and wind developers working in the West. Interwest appreciates this opportunity to provide input related to transmission development which could serve Colorado ratepayers by increasing capacity for utility-scale solar energy in the San Luis Valley. This increased energy development in the Valley would promote economic development and jobs while reducing greenhouse gas emissions.

As you see, Interwest supports the recommendations already provided by other participants. I will join the conference calls when feasible to provide further input and answer any questions.

Thank you,

Very Truly Yours,

ALPERN MYERS STUART, LLC

By: Lisa Tormoen Hickey

Enclosure
cc: Sarah Cottrell Propst, Executive Director

April 8, 2015

Lisa Hickey
Alpern Myers Stuart, LLC
Interwest Energy Alliance
14 North Sierra Madre St.,Suite A
Colorado Springs, CO, 80903-3311

Re: CCPG Study Request: Proposed Alternative to San Luis Valley Joint Study

Dear Ms. Hickey:

Thank you for your submission of proposed alternatives for the San Luis Valley Joint Study work group via the Colorado Coordinated Planning Group (CCPG) Comment Form, which was received on January 19, 2015. In the comment form, you indicated the desire for us to study three alternatives: 1) Upgrading the Poncha – San Luis Valley 69 kV or 115 kV to 230 kV, 2) Building a brand new 230 kV line from San Luis Valley to Comanche, and 3) Analyzing the export capability of the valley up to 700 MW of new solar generation.

We are in the process of performing the power flow analyses of six major alternatives in the valley and your alternative 1is one of them. Alternative 2 has been looked at extensively through the Certificate of Public Convenience and Necessity (CCPN) filing for the San Luis Valley – Calumet – Comanche Project, which was submitted to the Colorado Public Utilities Commission by Public Service Company of Colorado (PSCo) and Tri-State Generation and Transmission (TSGT). A CPCN was ultimately granted, but neither company is pursuing the project at this time. Finally, your alternative 3 was evaluated based on stressing the system according to our current planning methodology and the ramping up of fictitious generation within the San Luis Valley area until a limitation was reached. This method was used as it does not limit the system to 700 MW if it has a higher export capability.

Again, thank you for your participation in the CCPG planning forum. Please feel free to contact me with any further questions.

Wes Wingen

Chair, Colorado Coordinated Planning Group
Email: Wes.Wingen@blackhillscorp.com

cc: CCPG

COLORADO WORKING LANDSCAPES

COMMUNITY PROSPERITY THROUGH RENEWABLE ENERGY

Via email

TO: James Nguyen, Xcel Energy
Jonathan Fidrych, Tri-State
FROM: John Covert
DATE: February 4, 2015
SUBJECT: Initial Comments concerning Poncha to SLV Transmission Planning

I am pleased with the CCPG decision to form the SLV Transmission Joint Task Force to perform a joint Xcel Energy-Tri-State study to "…evaluate the overall electric system in San Luis Valley to ensure reliability, load growth, and generation." Your leadership in preparing planning scenarios for Task Force consideration is appreciated.

Since 2003, Colorado Working Landscapes has supported energy policies that enhance rural economic development. It is within this context that I ask you to consider incorporating the following assumptions into your planning.

1. That distributed generation, demand response, storage, and energy efficiency measures will reduce the need for 100MW of transfer capacity over the next 20 years.
2. That proposed transmission and distribution infrastructure improvements will a) encourage utility-scale solar projects to be sited beyond Alamosa and Saguache Counties and b) facilitate DSM and other community-based technologies.

As you know, SB-100 Transmission Plans filed with the PUC shall, among other things, "Consider how transmission can be provided to encourage local ownership of renewable energy facilities, whether through renewable energy cooperatives as provided in section 7-56-210, C.R.S., or otherwise;"

Consistent with the above statutory requirement, we believe that distributed generation, demand response, storage, and energy efficiency measures could reduce the need for transmission capacity by 100MW over the course of 20 years. The 100MW number is somewhat arbitrary as is the amount of solar generation that may be exported out of the Valley. Nonetheless, citing these hard-number assumptions is an important component of the planning process.

I was pleased to learn that significant upgrades to PSCo's distribution grid in the Valley are being planned in conjunction with transmission improvements. From 2008 through 2012, Colorado Working Landscapes worked with agricultural producers and the SLV Rural Electric Cooperative to assess current and projected opportunities for distributed generation. With financial support from the Colorado

Department of Agriculture we hired Wendling Consulting, LLC to examine the distribution grid as part of our SLV AgEnergy Project. His site visit to each substation confirmed the need for significant upgrades to PSCo's distribution system. I look forward to gaining an understanding of the improvements being contemplated.

For your information, I have attached a 2012 Resolution adopted by the Rio Grande Board of County Commissioners "promoting local, state, and utility collaboration to advance community-based energy development in the San Luis Valley". Adopted at the request of agricultural producers, this resolution is clear evidence of local support for the recommendations contained herein.

I appreciate the opportunity to participate in your important work and look forward to future Task Force meetings.

John Covert
720-273-9755

cc: Warren Wendling, P.E

Exhibit JAC-1
Docket No. 11A-833E

A Resolution promoting local, state, and utility collaboration to advance community-based energy development within the San Luis Valley

Rio Grande Board of County Commissioners
February 1, 2012

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Filed for Record in
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CINDY HILLr RECORDER
02-01-2012 At 0401 PM.
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201200413715 OR 558 702

Resolution #2012-03

A Resolution Promoting Local, State, and Utility collaboration to advance community-based energy development within the San Luis Valley

WHEREAS, San Luis Valley leaders, like many Colorado communities, are seeking greater choice in determining how its electric load is served;

WHEREAS, community-based energy development, including efficiency measures, will help keep energy dollars in the Valley and thereby promote economic development;

WHEREAS, agricultural, conservational and governmental leaders in the Valley are seeking system reliability improvements, energy efficiency measures and viable business models for community-based energy development;

WHEREAS, Section 7-56-210(1), C.R.S. reads: "It is the policy of this state to encourage local ownership of renewable energy generation facilities to improve the financial stability of rural communities";

WHEREAS, existing state incentives for community-based projects have proven ineffective; and

WHEREAS, the San Luis Valley is a designated Generation Development Area to facilitate State and utility planning for solar development;

NOW THEREFORE BE IT RESOLVED that the Hickenlooper Administration, electric utilities, and the Public Utilities Commission collaborate with SLY leaders to accomplish the following objectives:

1. Meet reliability standards for pumped irrigation loads in the Valley,
2. Adopt incentives that make community-based energy development economically viable,
3. Support development of an efficient delivery system for community-based energy projects,
4. Incorporate a significant level of community-based energy development into the next Energy Resource Plan, and
5. Establish transparent communication with undersigned supporters and stakeholders.

BE IT FURTHER RESOLVED THAT copies of this resolution be delivered to Governor Hickenlooper, the Colorado Public Utilities Commission, Xcel Energy, the Tri-State Generation and Transmission Association and the Colorado Harvesting Energy Network.

The foregoing Resolution was offered by Commissioner Shriver, seconded by Commissioner Davie, and passed on vote of the Board of County Commissioners, Rio Grande County, at a meeting of said Board on the 1•t day of February, 2012.

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BOARD OF COUNTY COMMISSIONERS

RIO GRANDE COUNTY, COLORADO

Dennis Murphy, Jr., Chairman

Doug Davie, Commissioner

Karla Shriver, Commissioner

ALPERN MYERS STUART LLC
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January 15, 2016

Jonathan Fidrych, P.C.
Tri State Generation and Transmission Association, Inc.
jfidrych@tristategt.org

Re: San Luis Valley Transmission Planning study draft report

Dear Jonathan,

On behalf of the Interwest Energy Alliance I submit these comments related to the draft report. We appreciate the Committee's hard work. The study notes that "Previous studies have identified performance issues with the SLV transmission, which include reliability concerns, and limited capability for load service and resource export capability. In addition, there has been a growing concern for the integrity of the aging transmission infrastructure in the area." The first phase addresses reliability and load serving capacity within the Valley. The second phase will address potential export capability and transfer capability.

Reliability is apparently an ongoing issue. Recent data would be appropriate, so the scope of the need and commensurate ability to address that need are addressed adequately by the Study. It appears that 230 kV is required "at a minimum" to resolve reliability issues. The study should specify which reliability issues and in which areas (if not all) of the areas identified as having reliability issues will be resolved by the 230 kV line. It would be helpful to more fully analyze and discuss the additional benefits, reduced reliability issues, from greater expansion.

Interwest questions whether the ability of storage to add additional value to capacity upgrades, or to defer additional transmission or distribution investments while contributing to increased reliability were adequately studied. That is, it is not clear that storage facilities are well represented when they are studied as part of load forecast or load sensitivity studies. There is a growing body of research related to the flexibility, peak-shaving and reliability benefits provided by new storage technologies at the grid level which should be studied in more detail, on a stand-alone basis or in combination with other upgrades, as part of a sensitivity for the analysis. See, e.g., information from the Energy Storage Association, available at: http://energystorage.org/energy-storage/energy-storage-benefits/benefit-categories/grid-infrastructure-benefits; or the DOE Grid Energy Storage white paper, Dec. 2013, available at: http://energy.gov/oe/downloads/grid-energy-storage-december-2013;

Interwest is unsure whether the Study should better explain the potential value of efforts including a generation tripping scheme (GTS) or remedial action scheme (RAS), as a temporary solution to improve reliability and increase export capability until a new line is built. These ideas and the background are more fully discussed in OCC's comments on the study dated January 15, 2016, and Interwest concurs with those comments to the extent that additional measures should be more fully reviewed, and more expansive RAS could enable greater export capability. Time is of the essence, in that federal tax incentives, the need to implement the Clean Power Plan, and other public policy measures warrant near-term attention to the export potential of renewable resources in the Valley. TriState G&T, PSCo and Black Hills will all need additional renewables and will issue solicitations for them with projects to be online prior to 2020. The low cost of renewables in the more diverse geographic areas with the Valley will provide savings to ratepayers, which will partially offset the costs of new transmission upgrades. These measures should receive more attention in the second phase of the Study, and it is likely that greater expansion of the transmission system in the Valley will be warranted to support increased solar and wind generation to be transmitted out of the Valley as soon as it can be permitted and built.

Additional sensitivities should have been included in the Study, including greater solar penetration, consistent with Interwest's initial comments (January 19, 2015), with sensitivities for up to 700 MW of new generation. Interwest supports OCC's requested sensitivity levels ranging from 150 MW to 575 MW in the alternative. Generally, a new double-circuit 230 kV line seems to deserve more consideration to improve aging infrastructure as well as to increase transfer capability and improve reliability in the longer run.

It appears that the Study attempts to take only minimal measures to resolve only the near-term urgent reliability issues. Interwest urges the Committee to look more long term, and the help support critical analysis and planning for 10 to 20 years down the road. The population of the San Luis Valley deserve a reliable, robust electricity supply so they can have predictable serve necessary to improve their economic development prospects. In addition, they are sitting on valuable natural resources in the form of vast solar energy supplies which lie dormant, and will continue to do so in part because of constrained transmission planning. Interwest requests that the Study be revised to add the sensitivities and additional analysis described herein.

Thank you for your work and the opportunity to provide comments.

Very Truly Yours,
Alpern Myers Stuart LLC

By: Lisa Tormoen Hickey

cc: Sarah Cottrell Propst

January 29, 2016

Chris Neil
Colorado Office of Consumer Council (OCC)
1560 Broadway, Suite 200
Denver, CO 80202

Lisa Tormoen Hickey
On Behalf of: Interwest Energy Alliance
Alpern, Myers, Stuart, LLC.
14 North Sierra Madre Street, Suite A
Colorado Springs, CO 80903-3311

Re. Comments to the San Luis Valley Subcommittee Phase I Transmission Study report.

Dear Stakeholders

The Colorado Coordinated Planning Group (CCPG) San Luis Valley Subcommittee (Subcommittee) submits the following in response to your January 15, 2016 comments on the *San Luis Valley Subcommittee Phase I Transmission Study* report. Both the Colorado Office of Consumer Counsel (OCC) and Interwest Energy Alliance (IEA) provided comments in response to a request for stakeholders to review a draft of the report. Many of the OCC's and IEA's comments are similar. For efficiency, the Subcommittee has combined the similar comments and has collectively addressed them. Unique comments are addressed separately.

Before addressing your comments we felt it would be beneficial to clarify the purpose of the CCPG. The CCPG is fundamentally a transmission planning forum. As stated in its Charter, it is a collective body whose goal is to "assure a high degree of reliability in the joint planning, development, and operation of the high voltage transmission system in the Rocky Mountain Region." It is an open and transparent technical forum to complete reliability assessments, develop joint business opportunities, and accomplish coordinated transmission planning under the single-system concept. While the CCPG is many things, it is not a decision making body. Nor is it a venue to deliberate how transmission network customers classify the generation resources in their portfolio. The CCPG will not address generation interconnection or transmission service requests as these are Tariff defined processes that are appropriately handled through each individual company. Further, the study work conducted within the

CCPG is not intended to be a substitute for the work required by an individual Transmission Owner to implement a specific transmission project.

With regard to the San Luis Valley, the relevant Transmission Owners may utilize the Phase I Study, together with the results of subsequent individual studies related to other aspects of possible transmission alternatives, to serve as a basis for a future comparison of viable transmission alternatives relative to other non-transmission alternatives. The comparative evaluation of transmission and non-transmission alternatives is beyond the scope of the Phase I study, but may be considered in future analysis or in conjunction with an application for a certificate of public convenience and necessity, as appropriate.

As you know, the Subcommittee was formed to evaluate transmission alternatives that could address four issues: 1) poor reliability; 2) inadequate load growth capability; 3) insufficient export capability; and 4) aging infrastructure. As poor reliability was deemed the most critical issue, the Subcommittee agreed to divide the study work into two phases. Phase I would focus on reliability, load serving, and aging infrastructure. Phase II will focus on export capability.

Comments common to OCC and IEA:

Both the OCC and IEA requested that historical data be incorporated into the study so that the scope of the system need is addressed adequately. In response, the Subcommittee has supplemented the report with data showing system performance during an outage that occurred on May 28th, 2015. Nevertheless, historical data is not a primary basis for determining the scope of a transmission system need when wide spread outages are involved. The North American Electricity Reliability Corporation (NERC) has established mandatory and enforceable reliability standards in accordance with Section 215 of the Federal Power Act. Regarding the San Luis Valley, NERC's standards do not allow a transmission plan to include Non-Consequential Load Loss (load shedding) to mitigate single contingencies of transmission lines, particularly if the load shedding exceeds 75 MW. Transmission Planners are required to develop Corrective Action Plans to mitigate such issues. At present, the San Luis Valley requires 85 MW of load shedding to prevent system-wide voltage collapse in the event of a 230 kV line outage during peak demand. When triggered, this load shedding scheme would result in blackouts to the rural parts of Rio Grande, San Luis Valley, Conejos, and Costilla counties. Regardless of NERC standards, this approach is not in keeping with a transmission provider's core mission to provide affordable, high quality, reliable service to our customers. In other words, even though widespread outages are not a frequent occurrence, historically, our responsibility to fix the problem is not diminished.

The OCC and IEA recognized that the Phase I Study also discovered some load serving limitations in the underlying distribution system and wanted more clarity on the relationship between the transmission and distribution system concerns. The distribution system limitations exist independent of the larger Bulk Electric System issues. The Subcommittee wanted to make sure these issues were noted, but identifying fixes to them was not an objective of the Phase I Study. Thus, the distribution system issues were not analyzed in detail.

The OCC and IEA wanted more analysis and consideration of cross tripping schemes that would enable more renewable generation to be connected to the San Luis Valley transmission system until a new line is built. As discussed earlier, the primary objective of the Phase I Study was to determine transmission solutions that mitigate the existing potential for wide-spread outages in the region. The viability and design of generator tripping or remedial action schemes are part of generator interconnection studies, which are not performed by the CCPG.

The OCC and IEA wanted more analysis of greater solar generation penetration levels, with sensitivity analysis for up to 700 MW of new generation. As discussed before, the focus of this study was to collectively solve the risk for wide-spread blackouts in the San Luis Valley. The Phase I Study did include a cursory evaluation of export capability to provide some preliminary information to the stakeholders, but this topic will be more fully analyzed in the Phase II Study.

The OCC and IEA expressed concern that the Subcommittee gave insufficient consideration of non-transmission alternatives, in particular generation and energy storage. Unfortunately, the CCPG is an improper venue for this. The CCPG is not intended to be the forum through which utilities consider non-transmission solutions. The respective utilities may later rely, in part, on a CCPG study for 890 purposes, but the CCPG is not a substitute for the work required by an individual Transmission Owner to implement a specific transmission project. The CCPG's expertise is in developing transmission solutions to Bulk Electric System issues. While each company must comparatively consider non-transmission solutions, these types of considerations will be handled in their respective FERC 890 outreach efforts.

Comments unique to OCC:

The OCC asserts that "It is not apparent that PSCo and TriState have embrace and implemented" the FERC 890 requirement to comparatively consider non-transmission alternatives. The OCC's allegation is unfounded and wrong. The CCPG is not intended to be the utilities' 890 compliance forum. The companies have embraced FERC 890 principles as demonstrated by their related outreach efforts.

The OCC asked that Table 18 in the report be clarified with regards to each alternative's impact on aging infrastructure. The Subcommittee appreciates this comment and has clarified the report.

The OCC comments that costs are not discussed in the report and should be addressed. The Subcommittee would like to remind the OCC that the CCPG is not a decision making body. The individual companies will include costs in their decision making process, but the initial construction cost of an alternative is not the only factor that will be considered. The Subcommittee is intended to be a forum to collectively evaluate stakeholder proposed alternatives that meet the needs of the SLV transmission system. Developing engineering cost estimates for each proposed alternative would be time-consuming, unnecessary, sometimes anecdotal (particularly for non-transmission alternatives), and would not add value at this stage of the project development. The companies will describe their cost considerations more appropriately in their CPCN processes.

The studied winter load levels were not clearly described in the report. The Subcommittee appreciates this feedback and has clarified the report.

The OCC provided feedback that the labels for alternatives throughout the report were non-descriptive. The Subcommittee appreciates this feedback and has clarified the report.

The OCC was unclear on the basis for the selection of the load serving ranges. The Subcommittee's goal was to neither over nor under state an alternative's potential load serving capability. The lower winter limit was selected to be more conservative. The upper winter limit was not selected because the Subcommittee felt it was not reasonable to assume the distribution upgrades necessary to achieve the winter upper limit would be implemented as this area is not winter peaking and the upgrades wouldn't be necessary. The upper summer limit was selected presuming that the necessary distribution system improvements would be made in the event loads grew that much, on the other hand.

The OCC questions the difference between the Total Transfer Capability (TTC) determined in this study and the export capability determined in the Proceeding No. 09A-325E studies. The Subcommittee was not involved in the studies that went into Proceeding No. 09A-325E and cannot discuss how they were performed. The TTC in this study was determined as described in the methodology section of the report and in a manner generally consistent with NERC Standard MOD-029. The term "export capability" is sometimes used more loosely than TTC. It is possible that the Proceeding No. 09A-325E studies netted SLV load with generation and called that "export capability."

Comments unique to IEA:

IEA commented that the study should have more fully analyzed the potential additional benefits from greater expansion. The Subcommittee would like to point out that the Phase I Study was primarily a reliability evaluation. Accordingly, it did not delve into potential non-reliability benefits from greater expansion (i.e. higher voltage or double circuit). Several of the alternatives studied met the reliability criteria, therefore, from a reliability standpoint it was not necessary to consider alternatives involving greater expansion that would go above and beyond the identified reliability need. It is conceivable that when export capability is more deeply considered in the Phase II study, there could be a new alternative that involves a larger project that not only meets the reliability needs, but also provides greater export capability in a manner that the "over-build" could be reasonably justified.

IEA advised that the Subcommittee "look more long term, and the help support critical analysis and planning for 10 to 20 years down the road." The Subcommittee would like to respond that given current transmission planning realities, the study is consistent with a 10 year planning horizon. Planning for a 20 year horizon is beyond even what the PUC requires at this time. That doesn't mean that such long term issues aren't considered; the Subcommittee just can't make definite plans for such an uncertain point in the future, especially given the Clean Power Plan and other possible developments.

The Subcommittee would like to thank the OCC and IEA for your active participation in this process. We have included many of your recommended changes to the report and consider it final.

Sincerely,

Chris Pink
Representative, San Luis Valley Subcommittee
(303) 254-3336
Email: cpink@tristategt.org

CC: San Luis Valley Subcommittee, Blane Taylor, Betty Mirzayi

OCC Comments on San Luis Valley Subcommittee Phase I Study

1. Introduction

The San Luis Valley (SLV) Subcommittee was formed to evaluate the transmission system in and around the San Luis Valley (Valley) and "develop system alternatives that would improve the transmission system between the SLV and Poncha substations (Poncha)."

The Office of Consumer Counsel (OCC) submits these comments as requested in the draft of the Phase I Transmission Study (Study) dated December 16, 2015, prepared by the SLV Subcommittee of the Colorado Coordinated Planning Group (CCPG). "Phase I" of the Study focused on resolving transmission reliability issues and transmission lines to increase load serving capacity within the San Luis Valley, with some preliminary analysis to gain a relative understanding of potential export capability. Export potential will be the focus of Phase II of the SLV Study.

In preparing these comments, the OCC reviewed documents, testimony and decisions issued in Consolidated Proceeding Nos. 09A-324E and 09A-325E (Proceeding No. 09A-325E) in which TriState and PSCo sought a CPCN to construct the San Luis Valley-Calumet-Comanche transmission project in the Valley. Because of arguments raised in those proceedings and addressed in Commission decisions, the OCC recommends that more information be provided in the Study to address the concerns raised by intervening parties and how the issues raised are being addressed in the Study or are no longer relevant to the Study.

2. Reliability

Page 2 of the Study discusses the reliability need for additional transmission. The data in the 09A-325E proceedings showed that from 1993-1998, TriState reported one outage and from May 2000 through May 2007, 13 outages were reported for which OCC calculated an average of approximately six minutes per year.[1] It would be helpful if the Study provided an update to the historical data in order to support the contention from the modeling studies that the reliability concern is significant enough to justify the cost of constructing a new 230 kV line given the data provided in 09A-325E proceedings.

[1] See Ex. 36, JRD-13 (James R. Dauphinais) admitted in Proceeding No. 09A-325E

Another of OCC's concerns with the Study is that the 230 kV line appears to address reliability issues primarily near the SLV substation. The maps that the SLV Subcommittee presented at the CCPG meetings show that there are also reliability issues in the southern and eastern parts of the Valley. It would be helpful if reliability issues in these areas were addressed in the Study. If the transmission proposals will not improve the reliability in these outlying areas, that should be explained in the Study.

3. Export Capability and Use of a Remedial Action Scheme

Page 3 of the Study states, "The existing transmission in the SLV region also limits the amount of generation that can be exported out of the Valley." Export capability is examined in the Study, but the Study does not address the use of a "generation tripping scheme" or a remedial action scheme (RAS). A generation tripping scheme could allow for 525 MW of generation to be accommodated until such time as new transmission facilities are in service, according to the information presented in Proceeding No. 09A-325E.[2] If implemented in the Valley, the effect of a generation tripping scheme would be to turn down generation on those rare occasions when the existing San Luis Valley - Poncha 230kV line is out.

Paragraph 85 of Decision C11-0288 issued in Proceeding No. 09A-325E Trinchera argued that, "…the additional 525 MW of new generation [could] be added by implementing a Remedial Action Scheme (RAS) to curtail generation during peak loads;…" This potential 525 MW of additional generation in the Valley that can be exported through the use of a RAS was not addressed in the Study and should be.

As stated in the Trinchera Statement of Position filed in Proceeding No. 09A-325E,[3] the RAS could be used as a bridge or temporary solution in order to accommodate additional renewable generation in the Valley until a new transmission line is built. This may allow TriState and PSCo to take advantage of the recent extension of the federal production tax credit (PTC) and 30% investment tax credit (ITC) of 30%. The PTC and 30% ITC were recently extended for five years by Congress but with declining levels in the later years. Both TriState and PSCo are likely to issue solicitations for new generation in Phase II of their electric resource plans (ERPs) in

[2] See Ex. 33 at 31:9-23 (James R. Dauphinais) admitted in Proceeding No. 09A-325E.
[3] Trinchera SOP, Proceeding No. 09A-325E, filed Feb. 25, 2010, page 40-41.

2016 or 2017 with projects needing to be online by 2017 or 2018 in order to qualify for the full amount of the PTC or 30% ITC. Any new transmission facilities installed in the Valley will likely not be available for projects bid into this round of solicitations and, therefore, unlikely to qualify for the full tax credits. However, if the RAS is employed, TriState and PSCo may be able to obtain renewable projects that will be able to qualify for the full amount of the PTC and 30% ITC.

Both TriState and PSCo are likely to acquire significant amounts of renewable resources in these solicitations in order to help meet the State's Renewable Energy Standard, to comply with the Environmental Protection Agency's (EPA) Clean Power Plan and because the renewable resources are cost effective due, in part, to the taking advantage of the tax incentives. Thus, the use of the RAS in the Valley should be an important component in the next round of solicitations.

Some may argue that the generation resources acquired using the RAS should not be considered "firm" resources until a new transmission line was built. The argument appears to be that this capacity would not be considered firm because the loss of a single line could result in the loss of this capacity due to curtailment under the RAS. However, "Firm" capacity does not mean that generation is available 100% of the time or that it always must be available at the time of system peak demand. Coal-fired units such as PSCo's largest unit, Comanche 3, generally have forced outage rates (FOR) or the more representative, equivalent forced outage rates (EFOR) in the range of 5% to 10%[4]. This would mean that there could be forced outage of service for about 26,000 to 52,000 minutes per year[5] compared to the minimal amount of outages for the SLV 230 kV transmission line discussed above from 1993-2007. Moreover, Comanche 3 was out of service during the time of system peak demand in 2013, which also resulted in the need for PSCo

[4] National outage data are available in the Generating Unit Availability Data System (GADS) at http://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx. FOR and EFOR data for PSCo's units was provided in Confidential Attachment OCC 3-29.A1 in Proceeding No. 14A-0660E.

[5] 5% equals 0.05 * 8,760 hours per year * 60 minutes per hour = 26,280 minutes. 10% equals 0.10 * 8,760 hours per year * 60 minutes per hour = 52,560 minutes. Technically, the FOR/EFOR calculations should exclude the time that the plant is not available for planned outages and the time that the plant is not needed to be on line, but this provides a simple order of magnitude comparison.

to provide about 250 MW of backup power to the unit's minority owners.[6] Nevertheless, generation from Comanche 3 is considered firm capacity.

The reliance on a single power line is also not a justification for rejecting the use of the RAS or claiming that the capacity would not be firm. There are a number of existing power plants that are connected though a single line. A recent example was discussed in the testimony filed in the South Weld Electric Project (SWEP) proceeding which stated that one reason for the SWEP project was because the 272 MW J.M. Shafer plant was connected to the system by a single line: "Presently, the entire station relies on a single tie line to the Fort Lupton Substation and would be isolated for an outage of that tie line."[7] A quick glance at the Denver transmission map[8] shows that the Blue Spruce and Knutson plants are connected to the system with a single line, and the state transmission map[9] shows that the Fruita unit is on a single line. Nevertheless, generation from a power plant which relies upon a single power is considered firm capacity.
Further, an emphasis on firm peak capacity is misplaced. ***Energy*** production from these renewable resources is important. One purpose of renewable generators is to displace conventional energy production and its associated emissions.

The value of 525 MW of additional capacity may need to be updated or modified based on the amount of capacity that can be transmitted beyond the Poncha substation. In this transmission export analysis, it may be appropriate to reduce generation at conventional generators in order to accommodate the renewable resources out of the Valley. This may be appropriate where the purpose is to reduce emissions, but this approach may also have an impact on the firm capacity rating (or lack thereof) for the renewable resources. If an existing conventional generator must be backed down in order to export the Valley's renewable energy and the conventional generator already represents firm capacity, then the new renewable resource may not represent firm capacity.

Nevertheless, renewable generation that uses a RAS may be firm capacity and may be more reliable than conventional generating units, especially considering that the RAS is a temporary

[6] 2014 Xcel Energy Annual Report and Form 10-K, page 15 of Form 10-K.
[7] Direct Testimony and Exhibits of Mark H. Stout, Proceeding No. 14A-0896E, filed August 26, 2014, p. 10.
[8] Exhibit DPK-2, Proceeding No. 14A-0287E, filed March 28, 2014.
[9] Exhibit DPK-1, Proceeding No. 14A-0287E, filed March 28, 2014.

bridge until the new transmission line is built. Thus, such criticisms do warrant rejecting the use of the RAS.

The additional 525 MW of capacity from the RAS, or the modified version of it, should be included in the PSCo's upcoming ERP that is due to be filed on February 29, 2016. The solar community should also be directly notified of this change in order for it to prepare for the Phase II solicitations. If additional renewable resources were added though the use of the RAS, it would also provide more justification for a new transmission line. The line would be justified based for both reliability reasons and to support the addition of renewable resources that had already been added.

4. Non-Transmission Alternatives

The Study should also have a section addressing non-transmission alternatives in order to comply with FERC Order 890 requirements. This omission is emphasized in these comments because there has also not been any indication that non-transmission alternatives were adequately considered in the Northeast Colorado transmission studies. It is not apparent that PSCo and TriState have embraced and implemented this new FERC requirement.

While non-transmission alternatives are mentioned in the Study, these alternatives must be more adequately studied and addressed in a separate section of the Study. The draft report states on page 5, "As for distributed generation, demand response, storage, and energy efficiency measures, they are considered as part of the load forecast or load sensitivity studies." This brief comment does suggest to the OCC that these measures were adequately considered.

The Study also includes in section 9.10 "Sensitivity C" on page 16 which addresses a non-transmission alternative of adding 50 MW of generation. This sensitivity case could also be included in the separate section addressing non-transmission alternatives of the Study with more of an explanation as to why it was deemed insufficient.

Generation alternatives are not adequately examined, however. For example, what about generation sensitivity cases with 75 MW, 100 MW or 150 MW of capacity? How much generation is required to prevent voltage collapse? Some level of generation in the Valley would appear to prevent voltage collapse. It appears that generation may be a viable alternative to

building new transmission lines for reliability purposes. PSCo's 2015 update to its ERP stated that it expects to require approximately 1,000 MW of incremental resources.[10] Locating 75 MW or 100 MW to 150 MW out of this 1,000 MW of incremental resources should be addressed and considered.

The key non-transmission alternatives that should be evaluated, however, are cases with varying amounts of utility-scale solar in the Valley. Alternative cases should be examined with solar capacity ranging from roughly 150 MW to 575 MW. The Study should examine how the transmission system will respond with different levels of solar generation and determine whether solar capacity may be able to prevent voltage collapse.

Changes are being developed in invertors. Because of anticipated short term improvements in inverters, will advanced inverter functionality resolve some of the reliability issues in the Valley? Should the development of advanced inverters be considered given the amount of solar that could be developed in the Valley? Could the use of advanced inverters mitigate or delay the need for expensive transmission lines and avoid a costly mistake?

It may be necessary for this Study to be updated after the 2016/2017 round of ERP Phase II solicitations in order to determine how projected new generation impacts the transmission system, if generation in the Valley is selected.

5. Other Issues

Page 4 of the Study identifies aging infrastructure as an issue. As an observation, Table 18 on page 24 identifies whether aging infrastructure has been addressed in each alter**at**ive. Sometimes the answer in Table 18 is not clear. Table 18 shows a "Yes" for Alternative 2 indicating that the 115 kV line has been rebuilt, but does not acknowledge that the 69 kV line has not been rebuilt. Similarly, Alternative 6 rebuilds the 69 kV line but not the 115 kV line.

In addition, the old transmission lines may need to be rebuilt regardless of what is done to add a new transmission line. That is, Alternative 3 with a new 230 kV line may not be the real solution because the old lines are not rebuilt. Rather, the real solution may have to be Alternative 5 or 6 which is to build the new 230 kV line and also rebuild the 69 kV or 115 kV line. The Study

[10] 2015 Annual Progress Report to the 2011 Electric Resource Plan, filed October 30, 2015, page 4.

needs to be clearer about whether the old lines will need to be rebuilt, and if so, then to examine possible alternatives after this initial assumption.

Related to the Study, costs are not discussed and should be addressed. For example, if the new 230 kV line is a $20 million project, that requires one level of consideration. But if this new line has a cost of $60 million, then another level of review is appropriate. Costs need to be provided in the Study. Further, the need to rebuild the old lines may also impact the cost of the alternatives. If an old line must be rebuilt regardless of the need for a new line, then this becomes a fixed cost. The additional cost of converting the line from for 69 kV or 115 kV to 230 kV would be less.

The winter load needs to be reviewed or supported. Page 7 states, "Further, all contingency analysis assumed a SLV area load of 150 MW for heavy loading and 45 MW for light loading for the selected base cases." This suggests that the 2020 ***Heavy Winter*** case assumes a load of 150 MW. The winter cases are those that demonstrate most of the reliability problems in Tables 3-16, and the winter case is used for the export projection in Section 10.3. The use of 150 MW of load in the winter case is not consistent with the information that is presented in the Study. Figure 2 on page 6 shows a winter load that is lower than 150 MW. If there are data that demonstrate that 150 MW for winter load is reasonable, then those data need to be provided in the Study. Otherwise, the winter analyses should be rerun with a valid value for winter load that is based on available data.

The study would be clearer if a title of the alternatives identified on page 3 were repeated rather than just listed the title as Alternative 1, 2, etc. For example, the title on the bottom of page 17 could state, "Rebuilding the SLV-Poncha 69 kV line to 115 kV, Alternative 1, …" and the title to Alternative 2 could state, "Rebuild San Luis Valley – Poncha 115 kV to 230 kV, Alternative 2…." The reader would not have to flip back to page 3 to see which alterative was being addressed.

Regarding the addition of a new 230 kV line, Alternative 3, on page 23 states, "Alternative 3 has a load serving range of 130-280 MW for the winter case and 155-180 MW for the summer case. Taking the lowest winter and highest summer limit would result in a combined load serving range of 130-180 MW. Assuming these distribution system deficiencies are addressed, this

alternative would mitigate the need for UVLS [under voltage load shedding]." Why is the highest summer limit selected? The conservative approach would seem to be to use the lowest winter and the lowest summer limits, which would result in a combined load serving range of 130-155 MW for this alternative. This would barely meet recent loads much less allow much room for load growth.

Page 23 also states the ULVS would be needed for Alternatives 4 and 5. The Alternative 4 discussion states, "Based on this analysis, it is likely that UVLS would be needed whenever load levels exceed 140 MW due to underlying 69 kV distribution system deficiencies." It appears that ULVS was excluded without factual justification. Please explain? Is this statement for Alternative 4 the same for Alternative 3?

Page 24 states, "With that knowledge, the TTC [total transfer capability] for the base case has been determined to be 94.5 MW." The export capability in Proceeding No. 09A-325E was determined to be 185 MW (firm - without the RAS). What is the reason for this difference? Does this difference impact the TTC discussed for the alternative cases?

6. Conclusion

The Study's conclusion on page 26 states that another 230 kV line is needed. Tables 7 and 8 for the Alternative 3 with a new 230 kV line show that this alternative only resolves the worst of the reliability issues in the SLV. The OCC believes that there are more reliability issues that should be addressed and resolved. The aging infrastructure issues have also not adequately been addressed. More supporting data demonstrating historical reliability and the winter loads need to be provided. The use of a temporary RAS should be examined as a temporary bridge to allow greater amounts of generation to be added prior to when the new transmission line goes into service. Greater amounts of generation and particularly solar generation should also be studied. A separate section of the report discussing non-transmission alternatives should be included. The Study may need to be updated after the next round of capacity solicitations. Finally, the Study needs to include estimated transmission line project costs in order to provide an appropriate frame of reference for evaluating and selecting proposed alternatives.

Appendix K:

CCPG Stakeholder Process

OCC Comments & Responses

to the CCPG

Northeast Colorado Studies

CCPG Comment Form

(For Stakeholder Comments, Requests for Clarification, Reliability Studies, Alternative Evaluation, and other General Feedback)

Provide the information in the yellow boxes. If the information is unavailable or unknown, please indicate.

Requester Information:	
Date:	26-Jun-15
Requester:	Chris Neil, Colorado Office of Consumer Counsel
Address:	1560 Broadway, Suite 200
State & Zip:	CO 80202
Requester Contact:	chris.neil@state.co.us
Title:	Rate/Financial Analysit
Phone Number:	303-894-2124
Email:	chris.neil@state.co.us

General Information:	
Study or Project Name:	OCC Comments Related to PSCo's SWEP and Expansion Alternative Analysis Presentation of June 17, 2015
New Study or Alternative:	Several alternatives are identified in the attached discussion. Those that pass an initial screening could be studied in detail.
Narrative Description:	See attached discussion.
Study Horizon Date:	Not specified in PSCo's presentation, though PSCo indicates a near-term consideration and long-term aspect.
Geographic Footprint Impacted:	Northeast Colorado, Greeley, TOT7, and South Weld
Load and Resource Modeling:	Oil and gas loads are the driving factor for transmission additions, as discribed in the attached document.
Transmission Modeling	Transmission modeling of the alternatives discussed in the attached document, for those that pass an initial screening.
Suggested Participants: (TP's, LSE's, Work Groups)	Northeast Colorado Work Group
Policy Issues to be Addressed: (SB100, RES, FERC, NERC, etc)	Not directly applicable. Could possibly be a related to SB 100 and RES.
Other Factors to be Considered:	Impacts both PSCo and Tri-State. Costs of the alternatives needs to be considered.
Type (Powerflow or Stability):	Powerflow modeling of the alternatives discussed in the attached document, for those that pass an initial screening.

Return To:	
CCPG Chair:	**Wes Wingen**
In care of:	**Black Hills Corporation**
Address:	**PO Box 1400**
City, State, Zip:	**Rapid City, SD 57709-1400**
Phone:	**605-721-2268**
Email:	wes.wingen@blackhillscorp.com

All study requests received from stakeholders will be reviewed and evaluated to determine the appropriate process for addressing.
This planning process does not replace the System Impact Study process. Specific requests for transmission service or generation interconnection will continue to be studied pursuant to existing OATT processes.

January 7, 2016

Chris Neil
Colorado Office of Consumer Council (OCC)
1560 Broadway, Suite 200
Denver, CO, 80202

Re. OCC comments to the Northeast Colorado (NECO) Subcommittee.

Dear Mr. Neil:

Thank you for your comments and suggestions for alternatives to be considered by the NECO Subcommittee. Your meaningful participation in the planning process for Northeast Colorado, and all the other CCPG subcommittees for that matter, is valuable and helps ensure that transmission planning in Colorado is done on a comprehensive, transparent, and state-wide basis.

This letter is a summary of how CCPG has either addressed or plans to address your comments and suggestions for alternatives.

You provided formal input to the NECO Subcommittee on two occasions: June 26, 2015 and October 13, 2015. In response, CCPG formed an ad-hoc task force, consisting of members of the NECO Subcommittee, to review and categorize your input. Follow up meetings where held on September 17, 2015 and December 2, 2015.

Your input submitted on June 26th consisted of fifteen sections, several of which contained multiple comments and suggestions for alternatives. The task force drafted diagrams of each of your proposed transmission alternatives during the meeting on September 17th, primarily so that they could confirm their understanding of your suggestions.

Your October 13th comments consisted of additional northern Greeley alternatives resulting from the September 17th meeting.

On December 2, the task force again convened with you to ensure that each alternative was understood by the subcommittee.

Of the fifteen sections of input submitted on June 26th, eight were for comment only. We reflected on your comments and discussed them with you during the September 17th and December 2nd follow up meetings. These were numbered 1, 2, 6, 7, 12, 13, 14, and 15.

Some of the alternatives were in lieu of transmission projects already under construction. Tri-State has received a Certificate of Public Convenience and Necessity (CPCN) from the Colorado Public Utilities Commission (PUC) and is presently constructing SWEP. Some of the alternatives proposed in your June 26th input contemplate changing the SWEP plans, which is not practical at this stage. Therefore, alternatives that modify the current SWEP plans were not analyzed, as was discussed during the follow

up meetings. These were numbered 3a, 4b, 4c1, 4c2, 5a, 5a2, 5c, 5d, 5e1, 5e2, 9a, 9b, 10a, 10b, 10c, 11a, 11b, 11c, and 11d1.

Also, some of the alternatives were electrically similar and were therefore combined.

A parred down list of alternatives to be considered by the NECO Subcommittee was developed through this process. The table below summarizes what the ad-hoc task force considers to be the remaining suggestions. The table also lists some of the potential benefits of your suggestions and how CCPG and the NECO Subcommittee will consider them in the future.

Alternative/Suggestion	**Consideration**
New Ennis – Rattlesnake Ridge 115 kV.	This addition would provide looped transmission service to Ennis Substation This may be considered by NECO in the future depending on load development at Ennis and the southern SWEP system
New Ennis – "Ennis South" 115 kV.	"Ennis South" is a new substation on the Pawnee – Ft. Lupton 230kV line. This addition could provide a strong transmission source to Ennis. This may be considered by NECO in the future depending on load development at Ennis and the southern SWEP system.
New "Rattlesnake South" substation.	This substation would connect one or both 230kV lines that run south of Rattlesnake Ridge and also tie to the SWEP lines. This may be considered by NECO in the future depending on load development on the southern SWEP system.
Convert the South Kersey – Kersey West 115 kV line to a double-circuit line.	This is being considered by Tri-State and PSCo.
New Neres – Box Elder – Willoby 115 kV line.	This addition would provide looped transmission service to Box Elder. This may be considered by NECO in the future depending on load development on the northern SWEP system.
Construct Ault – New Ault – New Eaton – New Pleasant Valley – Lucerne – Monfort as a double-circuit 115 kV line rather than a single-circuit line.	Replaces old 44 kV lines with new 115 kV and completes the 115 kV loop around Greeley from the north to east. Also, with the closure of the Godfrey – Ft. Lupton line and the addition of SWEP, a double circuit line would essentially create two new paths from Ault to Denver. This will be considered by the NECO Subcommittee in the future.
Construct Ault – New Ault – New Eaton – New Pleasant Valley – Lucerne – Monfort as a 230 kV line rather than a 115 kV line.	Initially operated at 115 kV. This is consistent with the long-term plan that new load serving lines should be designed to be 230 kV capable. This will be considered the NECO Subcommittee in the future.

This letter summarizes how CCPG has addressed or plans to address your comments and suggestions for alternatives regarding transmission developments in northeastern Colorado. If you do not feel they have been or will be adequately addressed, please let me know as soon as possible.

Again, thank you for your participation and contributions to CCPG's transmission planning efforts. Please feel free to contact me or the NECO Subcommittee Chair, Mike Rein, with any other concerns or questions.

Sincerely,

Jeremy Brownrigg
Vice-Chair, Colorado Coordinated Planning Group
(970) 266-7979
Email: brownriggj@prpa.org

CC: NECO Subcommittee

OCC Comments Regarding PSCo's June 17, 2015 Presentation Titled SWEP and Expansion Alternative Analysis

The Office of Consumer Counsel ("OCC") provides the following informal comments and suggestions for alternatives that could be considered in comparison with the alternatives discussed by PSCo on June 17, 2015. If any of the alternatives are deemed promising, they could be advanced to more detailed analysis and modeling.

There appeared to be some alternatives that PSCo did not consider. Tri-State also indicated that slower load growth may lead it to consider more incremental transmission additions.

Nothing in these comments should be construed as an endorsement of any alternative or approval by the OCC of any alternative.

1. Projected loads drive transmission needs. Tables 1 and 2 below summarize the loads studied by PSCo from slides 7 and 9 of PSCo's presentation. PSCo states that it has 47 MW of existing load. Table 1 below summarizes the loads for PSCo's "base case" that includes 110 MW of new PSCo load. Table 2 summarizes the loads that PSCo apparently considered in Alternative No. 4 that includes 195 MW of new PSCo loads. Loads were split between Tri-State and PSCo by substation. The Milton and Neres Canal loads were listed together in PSCo's presentation, so the split between Tri-State and PSCo is not clear. In these discussions, all of the load at Milton/Neres Canal has been assigned to PSCo. The PSCo loads are probably a little on the high side, therefore.

   The oil and gas loads are uncertain with the recent decline in oil and gas prices. Yet the loads drive the need for the transmission facilities. The loads need to be provided to the Commission in order to justify the new transmission facilities, and there needs to be confidence in the load projections.

   Oil and gas load development will drive transmission development, but oil and gas development could result in some less than optimal solutions. For example, if oil and gas loads develop at Ennis before there is enough load to add the Rattlesnake Ridge substation, then the Eniss South substation may need to be built even though the Eniss-Rattlesnake Ridge transmission line would have been less expensive.

Table 1 Northeast Colorado Oil and Gas Loads and Transmission Requirements					
Base with 110 MW of New PSCo Load					
From PSCo NECO Presentation of June 17, 2015					
Megawatts					
	Tri-State	PSCo	Total		
Northern Substations					
Rosedale		42	42		
South Kersey	12		12		
Milton/Neres Canal		25	25	T/P Spllit?	
Box Elder		52	52		
North Total	**12**	**119**	**131**		
Southern Substations					
Rattlesnake Ridge	120		120		
Colfer	74		74		
Ennis		63	63		
South Total	**194**	**63**	**257**		
Total NECO	**206**	**182**	**388**		

Table 2 Northeast Colorado Loads for Alternative No. 4				
Alternative 4 with 195 MW of New PSCo load				
From PSCo NECO Presentation of June 17, 2015				
Megawatts				
	Tri-State	PSCo	Total	
Northern Substations				
Rosedale		65	65	
South Kersey	12		12	
Milton/Neres Canal		25	25	T/P Spllit?
Box Elder		80	80	
North Total	**12**	**170**	**182**	
Southern Substations				
Rattlesnake Ridge	120		120	
Colfer	74		74	
Ennis		97	97	
South Total	**194**	**97**	**291**	
Total NECO	**206**	**267**	**473**	
Additional Load Split Calculation				
	Start	Pct of Total		
Rosedale	42	26.8%	65	
Box Elder	52	33.1%	80	
Ennis	63	40.1%	97	
Total	157	100.0%	242	
Additional 85 MW				

Southern Substations

2. PSCo's presentation seemed to focus on additional loads in the Rosedale-Milton-Box Elder area. Tables 1 and 2 show, however, that the majority of the load is located near the southern substations and that there is significant load in the Ennis-substation area in particular.

3. Rattlesnake Ridge-Ennis. One alternative that could be considered to improve the southern system load serving capability and reliability is a transmission line from Rattlesnake Ridge to Ennis. This appears to be a distance of about five to six miles on the attached transmission map.[1] This transmission connection is expected to have modest costs because it would not require any additional substations to be built (assuming Rattlesnake Ridge is built). This transmission line would loop in Ennis and, therefore, improve the reliability in the Ennis area.

[1] Originally Exhibit DPK-2 from Proceeding No. 14A-0287E. The map shows the sections from the township and range division of the west, and sections are assumed to be about 1 miles on a side.

This transmission line would also improve the reliability of Rattlesnake Ridge when the Rattlesnake Ridge to Greenhouse transmission line was out.

This Rattlesnake Ridge-Ennis line will also be identified in several of the alternatives discussed below. In some situations, a double circuit line might be appropriate.

a. An initial option might start with Greenhouse to Rattlesnake Ridge to Ennis. More transmission components could be added as load grew.

4. Add connection to Ennis from Pawnee-Ft. Lupton transmission line.
    a. New substation south of Ennis. Another alternative would be to build a new 230 kV-115 kV substation on the Pawnee-Ft. Lupton line south of Ennis, called Ennis South in this discussion. Ennis South would improve the reliability between it and the Ft. Lupton substation. Ennis South could reduce the transmission line to Ennis to only a one-mile radial line or the line could be converted to double circuit for greater reliability depending on the loads in the Ennis area.
    b. A variation on the above is to cut the 230 kV Pawnee-Ft. Lupton line and run it up one side of double circuit transmission towers to Ennis and back down the other side of the poles. This would locate the 230 kV substation at Ennis. This would appear to enable a substantial amount of load to be served in the Ennis area.
    c. Could Tri-State serve its Rattlesnake Ridge loads from the east at Ennis? Or the Rattlesnake Ridge-Ennis line and Rattlesnake Ridge substation could be built to serve loads in Rattlesnake Ridge area. As loads grew, then the Greenhouse to Rattlesnake Ridge line could be added.
    d. Replacing the conductor on the Ft. Lupton to Ennis line should be considered at some point (that seemed to be mentioned someplace).

5. Connect Rattlesnake Ridge to PSCo lines south of there.
    a. Another alternative might be to add a substation south of Rattlesnake Ridge on the PSCo lines. This new substation is called Rattlesnake South in this discussion. The suggested location for this substation is at the point that the Ft. Lupton to Ennis line comes up to the Pawnee-Ft. Lupton and Ft. St. Vrain-Keenesburg lines (see Exhibit DPK-2). From this point, and assuming transmission lines follow section lines and make square corners, it would be about two to three miles to Rattlesnake Ridge. Placing it here has the advantage of being able to connect to the Ft. Lupton-Ennis line and thereby improve the reliability between Rattlesnake South and Ft. Lupton.
        i. It might be possible to serve the initial Rattlesnake Ridge area loads directly from Rattlesnake South and then add the Rattlesnake Ridge substation as loads increased.
        ii. The Greenhouse to Rattlesnake Ridge line could also be added as load grew.
        iii. Tri-State stated in the SWEP case that it preferred using its own lines. One alternative as load grew would be that instead of adding the Greenhouse to Rattlesnake Ridge transmission line, this new line would go from Greenhouse to Rattlesnake South and then up to Rattlesnake Ridge. This would then be entirely a Tri-State line with an additional connection to PSCo at Rattlesnake South.

b. From Rattlesnake South, Ennis would now be a radial line of about 5 miles, which is much shorter than it is now. The Rattlesnake South-Ennis line could be converted to double circuit to improve reliability, or the Rattlesnake Ridge-Ennis line could be added to loop in Ennis.
c. It is not clear whether it would be better to connect this Rattlesnake south substation to the Pawnee-Ft. Lupton line or the Ft. St. Vrain-Keenesurg line, which is part of PSCo's outer transmission belt. The Ft. St. Vrain-Keenesburg line might be preferred if there was going to be an eventual connection to Ault because it would flow to PSCo's outer transmission belt.
d. It might be interesting to consider connecting both the Pawnee-Ft. Lupton and Ft. St. Vrain-Keensburg 230 kV transmission lines at Rattlesnake South. This would mean that the Pawnee connection would include PSCo's outer transmission belt, and Pawnee would have connections directly with the Ft. St. Vrain, Ft. Lupton and Keenesurg substations. If the Pawnee line were upgraded to 345 kV, it might stop at Rattlesnake South given all the connections there.
e. As above with Ennis South, an alternative would be to cut one of PSCo's 230 kV lines and run it up and back on double circuit transmission towers to Rattlesnake Ridge. The 230 kV substation would then be located at Rattlesnake Ridge. This alternative would be start directly south of Rattlesnake Ridge and would require only a one mile diversion of the 230 kV transmission line (and would not connect to the Ft. Lupton-Ennis line). This alternative would create a strong connection at Rattlesnake Ridge and would eliminate the cost of one substation (Rattlesnake South).
    i. The Rattlesnake Ridge to Ennis line could be built to loop in Ennis.
    ii. The Greenhouse to Rattlesnake Ridge line could be added as load grew.
    iii. Again in consideration of Tri-State's desire to use its own lines, the transmission line from Greenhouse substation could go up to the takeoff point of this new diversion. It would connect at that point to the line going to Rattlesnake Ridge. PSCo's line would be re-connected so that it did not divert to Rattlesnake Ridge. The Greenhouse-Rattlesnake Ridge line would then be entirely Tri-State's, and there would no longer be a connection with PSCo.

Northern Substations

6. Rattlesnake Ridge to Milton/Neres Canal. It is not clear what triggers the need to add a connection between the southern system's Rattlesnake Ridge substation and the northern system's Milton/Neres Canal. If there is a strong connection in the south as discussed above, then the southern system may not need a connection to the north until substantial new load has been added.

7. Rosedale Substation. Tables 1 and 2 above show the load at Rosedale substation is projected to range from 42 MW to 65 MW. Because Rosedale has many transmission connections; it would appear that Rosedale should be able to handle load of tis magnitude.

8. South Kersey substation. South Kersey is an existing 115 kV substation. Table 1 shows a load of 12 MW at South Kersey, which is not changed in Table 2, and the substation should be adequate to handle loads of this magnitude.
    a. Eventually Kersey West-South Kersey may need to be converted to double circuit.

9. Milton/Neres Canal substations. Table 1 shows a load of 25 MW at Milton/Neres Canal (this load is not changed in Table 2). It appears that Milton is an existing, PSCo 44 kV substation. Milton may be able to serve the load in the area until it grows beyond a certain point. Milton might even be able to serve all the 25 MW of load except for the additional load at Box Elder.
    a. Adding a 115 kV transmission line and the Neres Canal substation would improve the ability to serve the load in the area.
    b. Since South Kersey to Milton/Neres Canal will be a new transmission line, it should be built as double circuit or double circuit poles with just one side installed in order to accommodate additional load growth or reliability considerations.

10. Box Elder substation. Box Elder is expected to have the largest load among the northern substations: 52 MW in the base case and 80 MW in Alternative 4. PSCo appears to increase the Milton/Neres Canal-Box Elder transmission line to 115 kV in order to accommodate this additional load. However, this is a radial line to Box Elder.
    a. Loop in Box Elder. It would be good to loop in Box Elder somehow. One alternative might be to extend a line from Box Elder to Willoby. This would result in a Willoby-Box Elder-Milton/Neres Canal-South Kersey loop. Powerflow modeling would be necessary to confirm it, but it would appear that this 115 kV loop would be able to meet the projected loads at the substations in this loop that total 89 MW (Base) to 117 MW (Alternative 4).
        i. That is, this loop could handle these loads without the connection to the southern substations. Adding the Rattlesnake Ridge-Milton/Neres Canal connection would further enhance the reliability of this system.
    b. If one of the southern alternatives results in a strong substation at Ennis, PSCo may be tempted loop in Box Elder by connecting it to Ennis. It does not appear to be that much farther from Box Elder to Ennis than it is from Box Elder to Willoby. This might create a SWEP East alternative. This also could result in a semi-direct connection from Pawnee to Greeley.
    c. Is 69 kV reasonable for the lines in the Milton and Box Elder areas? If the oil and gas loads end up being revised towards the lower end of the range, would 69 kV be adequate to serve them? 69 kV seems to have been a standard in many rural applications. Of course, that was when the connection was mostly with farm loads and not large oil and gas loads.

11. Rosedale-Kersey West alternatives:
    a. Re-conductor Rosedale-Kersey West (part of PSCo's Alt. 3).
    b. Does a stronger southern system or the addition of the Box Elder-Willoby connection eliminate the need for a second circuit on the Rosedale-Kersey West line to address the Alt 0-Limiting Contingencies (Slide 6)?

c. Convert 115 kV Rosedale-Kersey West to double circuit
d. Convert to 115 kV the existing 44 kV Milton-LaSalle line and add a new 115 kV substation near La Salle on the Weld-Rosedale line. This is basically parallel to and provides a second circuit like a second Rosedale-Kersey West circuit.

12. 230 kV Weld-Rosedale-Milton Recommendation. PSCo recommendation is a 230 kV Weld-Rosedale-Milton alternative (Alternative No. 4 in its presentation). Table 1 and Table 2 show that the need for this upgrade is based on approximately 119 MW of new PSCo load at the northern substations in the base case and 170 MW of new PSCo load at the northern substations in Alternative No. 4. This 230 kV configuration seems excessive given the loads in the area and their locations.

13. Ault-Rosedale Alternative. A long term consideration shown in PSCo's presentation is to connect Ault with Rosedale (slide 14). This line could help address issues in the larger area, such as TOT7 limitations. This Ault-Rosedale line also appears to address the same issues among the northern substations that PSCo's proposed Weld-Rosedale-Milton line aaddresses. PSCo seems to prefer to eventually add both the Weld-Rosedale-Milton 230 kV line and the Ault-Rosedale 230 kV line.

    It appears that only one of these two lines should be built. Weld-Rosedale-Milton is less expensive than Ault-Rosedale. If Ault-Rosedale is not going to be built, then Weld-Rosedale-Milton is the less expensive alternative. But if both lines are going to be considered, then adding just Ault-Rosedale is less expensive than building both the lines.

14. Ault-Kersey West instead of Ault-Rosedale depending on who was building the line and where the oil and gas loads develop. PSCo may prefer Ault-Rosedale; Tri-State may prefer Ault-Kersey West.
    a. Going to Kersey West could eliminate the need for a second circuit on the Rosedale-Kersey West line if the focus is on the oil and gas loads to the east.
    b. That could leave a weak link to Greeley, however.

15. Cost of alternatives. The cost of the alternatives has not been provided, and cost is obviously an important consideration.

Northeast Colorado Transmission Committee
Additional Northern Greeley Alternatives Resulting from the 9/17/2015 Meeting
From the Office of Consumer Counsel after review with PUC Staff

Northern Greeley Alternatives

PSCo's proposed Ault-New Ault-New Eaton-New Pleasant Valley-Lucerne-Monfort ("Northern Greeley") replaces 44 kV with 115 kV and completes the 115 kV loop around Greeley from the north to east.

1. Double-Circuit 115 kV. PSCo is proposing a single-circuit 115 kV line. We suggest also studying a double-circuit 115 kV line from Ault to Monfort.
    a. With the closure of the Godfrey to Ft. Lupton line and the addition of SWEP, a double circuit line would essentially create two new paths from Ault to Denver.

2. 230 kV Capable Line initially operated at 115 kV. PSCo is proposing a single-circuit 115 kV line from New Ault to Monfort. We suggest also studying building this line as a 230 kV capable line that would initially be operated at 115 kV.
    a. This would involve determining whether PSCo can obtain sufficient right-of-way to upgrade from 44 kV to 230 kV from Ault to Monfort.
    b. Eventually, the sections from Monfort to Rosedale to Kersey West and down to SWEP could also be considered for conversion to 230 kV.
    c. This is consistent with the long-term plan that new load serving lines should be designed to be 230 kV capable.

3

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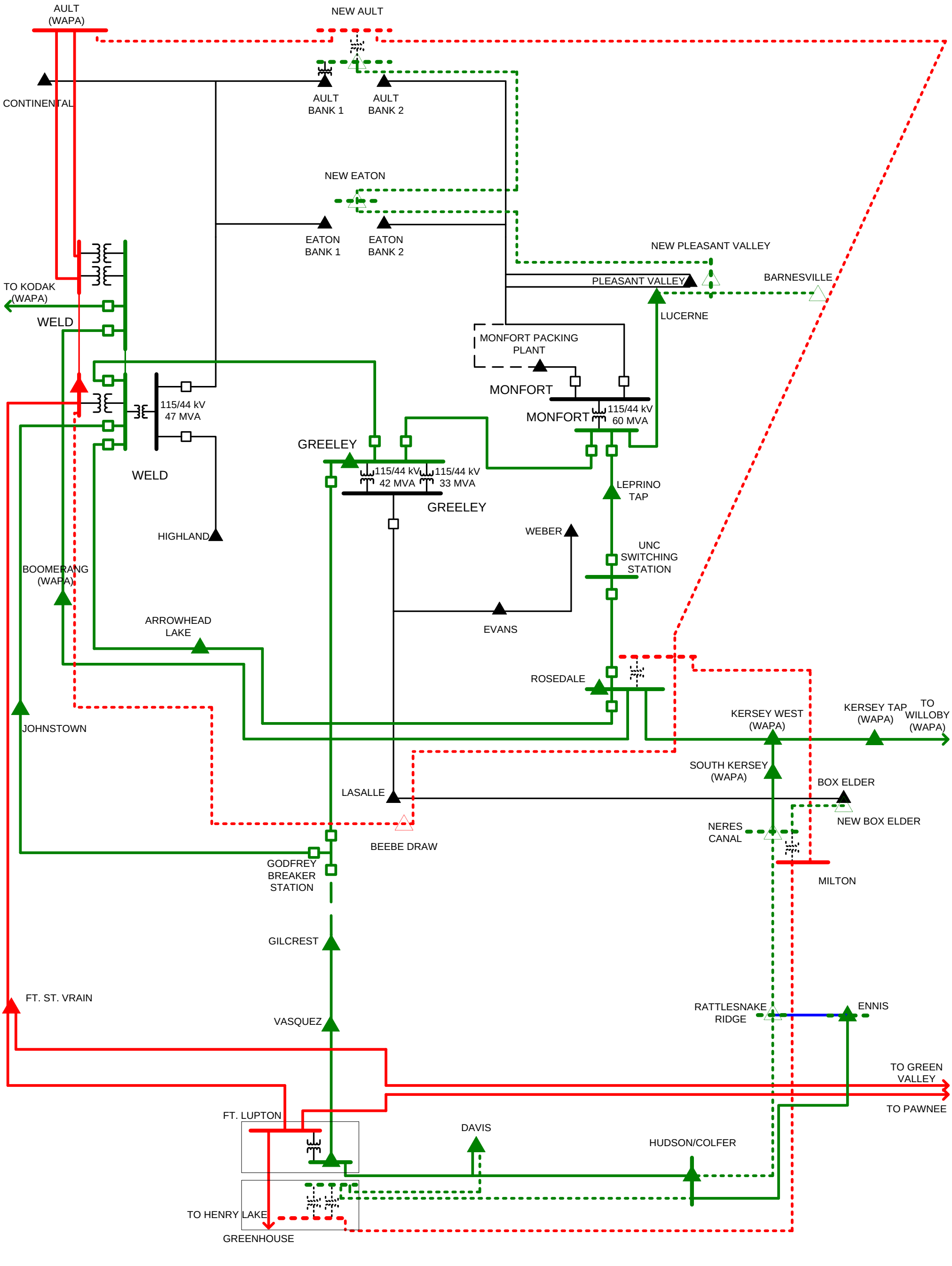

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NEW EATON
EATON BANK 1
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TO PAWNEE
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DAVIS
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RATTLESNAKE SOUTH "SUPRER SUB" 230/115 TRANSFORMER
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LEPRINO TAP
HIGHLAND
WEBER
UNC SWITCHING STATION
BOOMERANG (WAPA)
ARROWHEAD LAKE
EVANS
ROSEDALE
JOHNSTOWN
KERSEY WEST (WAPA)
KERSEY TAP (WAPA)
TO WILLOBY (WAPA)
SOUTH KERSEY (WAPA)
BOX ELDER
LASALLE
NERES CANAL
NEW BOX ELDER
BEEBE DRAW
GODFREY BREAKER STATION
MILTON
GILCREST
X
REMOVE NERES – RATTLESNAKE FOR ALT 3A – 10a
FT. ST. VRAIN
RATTLESNAKE RIDGE
ENNIS
VASQUEZ
TO GREEN VALLEY
TO PAWNEE
FT. LUPTON
DAVIS
HUDSON/COLFER
TO HENRY LAKE
GREENHOUSE

ALTERNATIVE
ROUTES

9/4/2015

230 kV System — Proposed
115 kV System — Proposed
44 kV System — Alternatives

AULT (WAPA)
NEW AULT
CONTINENTAL
AULT BANK 1
AULT BANK 2
NEW EATON
EATON BANK 1
EATON BANK 2
NEW PLEASANT VALLEY
PLEASANT VALLEY
BARNESVILLE
LUCERNE
TO KODAK (WAPA)
WELD
MONFORT PACKING PLANT
MONFORT
MONFORT 115/44 kV 60 MVA
115/44 kV 47 MVA
WELD
GREELEY
115/44 kV 42 MVA
115/44 kV 33 MVA
GREELEY
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HIGHLAND
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ROSEDALE
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KERSEY TAP (WAPA)
TO WILLOBY (WAPA)
DOUBLE CIRCUIT
SOUTH KERSEY (WAPA)
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LASALLE
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TO PAWNEE
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ALTERNATIVE
ROUTES

9/4/2015

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ALTERNATIVE
ROUTES

9/4/2015

230 kV System — Proposed
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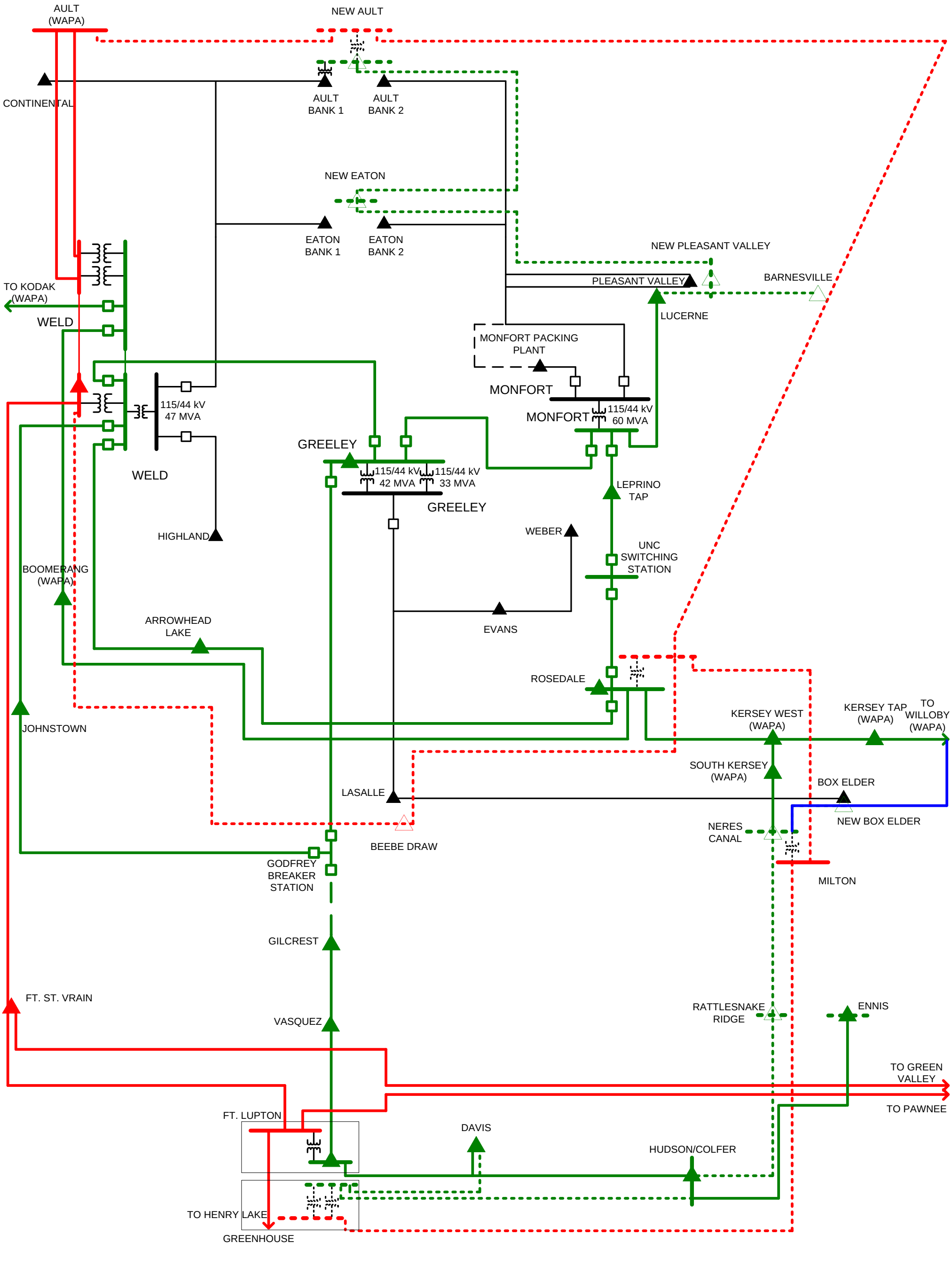

ALTERNATIVE
ROUTES

9/4/2015

230 kV System — Proposed
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NERES CANAL
NEW BOX ELDER
BEEBE DRAW
MILTON
GODFREY BREAKER STATION
REMOVE NERES – RATTLESNAKE
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GILCREST
FT. ST. VRAIN
RATTLESNAKE RIDGE
ENNIS
VASQUEZ
TO GREEN VALLEY
TO PAWNEE
FT. LUPTON
DAVIS
ENNIS SOUTH 230/115 kV TRANSFORMER
HUDSON/COLFER
TO HENRY LAKE
GREENHOUSE

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Appendix L:

CCPG Stakeholder Process

CCPG Stakeholder Process

Colorado Coordinated Planning Group
Process for Consideration of Stakeholder Input

I. Purpose

The Colorado Coordinated Planning Group (CCPG) is a regional electric transmission forum that operates to assure a high degree of reliability in joint planning, development, and operation of the high voltage transmission system in the Rocky Mountain Region of the Western Electricity Coordinating Council (WECC). It is the transmission planning forum to facilitate reliability assessments, develop joint business opportunities, and accomplish coordinated planning under the single-system planning concept. One of the goals of the CCPG forum is to provide opportunities for interaction with interested parties and individuals ("Stakeholders"). The objective of this document is to describe how Stakeholders can participate in CCPG planning activities.

The purpose is to:

1. Provide additional opportunity for ("Stakeholders") to submit comments and study requests to the electric transmission planning process. Comments may include suggestions, requests for clarifications, and other feedback pertaining to the process. Requests may include proposals for alternatives to an existing study, or suggestions for a new study. This opportunity includes requests for a reliability planning study to CCPG or to an impacted Transmission Provider ("TP");

2. Provide a process for CCPG and TP's to review, categorize, and process the Stakeholder comments and requests;

3. Promote a better understanding of the specific interests and concerns of Stakeholders and encourage participation in CCPG transmission study plans, including study scopes, methodologies, alternatives, and results;

4. Provide a process to provide Stakeholders with the rational for the final disposition and determination of their comments and to provide a repository for those responses.

Where CCPG is not the proper forum to evaluate and consider comments, other forums will be employed.

II. Process for Consideration of Requests

A. Form

A primary tool that Stakeholders can use to submit comments is the "Comment Form". The form can be found at www.westconnect.com/ccpg.

B. Submission

Any CCPG member or Stakeholder ("Requester") may submit a form. The form is inclusive, therefore some Stakeholders may simply use it to make a comment or ask for clarification on a transmission project. Other Stakeholders may use the form to request CCPG or an impacted Transmission Provider to conduct a reliability planning study.

Colorado Coordinated Planning Group
Process for Consideration of Stakeholder Input

Requests should be submitted to the acting chair of CCPG or as stated on the form. Requests received by WestConnect or an individual TP should be forwarded to the acting CCPG chair.

C. Information

Requesters are encouraged to supply as much information as possible to describe their comments, requests for clarifications, suggestions, and other feedback, and the nature of the study if requested. This information can include:

1. **Study or Project Name**
   Provide a suggestion for a name for the study request, transmission alternative, or general comment.

2. **New Study or Alternative**
   Is this a request for a new study or an alternative to an existing plan or study?

3. **Narrative Description**
   Describe the purpose of the comments, requests for clarifications, suggestions, and other feedback and requests in detail.

4. **Study Horizon Date:**
   Provide a year or years for system modeling. Consideration should be given to the likely timing of implementation for transmission.

5. **Geographic footprint of interest**
   - Does the request impact the regional, subregional, or smaller area?
   - Examples: WestConnect, CCPG, Foothills, Front Range, etc.

6. **Load and Resource Parameters:**
   Describe both the load conditions and resource availability.
   - Loading details may include
     - peak or off-peak (what percentage of peak)
     - season (summer, winter, spring, fall)
     - time-of-day (day, night, time, etc.)
   - Resource details may include:
     - specific details of existing or new generation to include in models
     - how to model renewable generation (percentage of nameplate)
     - generation patterns to achieve a certain flow or stress on the system
     -

7. **Transmission Modeling**
   Describe the transmission topology used for the study?
   - What transmission plans should be included or excluded?
   - What transmission paths are of interest to monitor?
   - Is there an area of congestion to be evaluated?
   - Should the study consider up-scaling of transmission?

Colorado Coordinated Planning Group
Process for Consideration of Stakeholder Input

8. **Suggested Participants**
   - What parties should participate?
   - Can the study be accommodated by existing CCPG work groups?
   - Could or should the study be performed by a single TP?

9. **Policy issues to address**
   - Is this related to a national or local public policy objective?
   - Examples: SB100, RES, FERC1000

10. **Other Factors**
   - List any other pertinent factors to consider.

11. **Type of Study**
   - Powerflow, stability, short circuit?

D. Review

Once the CCPG chair receives the request form, a determination will be made as to whether adequate information has been provided. The Chair may contact the Requester to ask for additional details.

The Chair will facilitate an ad-hoc review group (Review Group) to review and categorize the request. The Review Group categorization will determine:

1. If the request is reasonable from a reliability planning perspective

2. Who should be responsible? (CCPG or a smaller sub-group of CCPG; or should the study be forwarded to a larger group such as WestConnect or TEPPC)

3. The likely scheduling for completing the analysis requested

E. Consideration

The Review Group may consider the following questions to determine the response to the request:

a) Which portion(s) of the CCPG transmission system shall be under consideration in the study?

b) Would the request be of interest to multiple parties?

c) Does the request raise policy issues of national, regional, or state interest?

d) Can the objectives of the study be met by existing or planned studies?

e) Would the study provide information of broad value to customers, regulators, transmission providers and other interested Stakeholders?

f) Does the request require an economic (production cost) simulation or can it be addressed through technical studies, (power flow and stability analysis)?

F. Response

Once the Review Group has determined that the request is reasonable and has verified the purpose and intent of the request, a written response will be developed and provided to the Requester and CCPG.

If the Review Group determines that the request cannot be accommodated by CCPG or any TP, an explanation will be provided.

If the Review Group determines that the request can be accommodated, then the response will provide information as to the recommended logistics for how the request will be handled, including the responsible parties and a schedule for completion.

CCPG will maintain a record of all comments and requests received, as well as the disposition. These records will also be posted on the CCPG section of the WestConnect website.

CCPG Comment Form

(For Stakeholder Comments, Requests for Clarification, Reliability Studies, Alternative Evaluation, and other General Feedback)

Provide the information in the yellow boxes. If the information is unavailable or unknown, please indicate.

Requester Information:	
Date:	
Requester:	
Address:	
State & Zip:	
Requester Contact:	
Title:	
Phone Number:	
Email:	

General Information:	
Study or Project Name:	
New Study or Alternative:	
Narrative Description:	
Study Horizon Date:	
Geographic Footprint Impacted:	
Load and Resource Modeling:	
Transmission Modeling	
Suggested Participants: (TP's, LSE's, Work Groups)	
Policy Issues to be Addressed: (SB100, RES, FERC, NERC, etc)	
Other Factors to be Considered:	
Type (Powerflow or Stability):	

Return To:	
CCPG Chair:	Susan Lovejoy
In care of:	Colorado Springs Utilities
Address:	111 S. Cascade Ave
City, State, Zip:	Colorado Springs, CO, 80903
Phone:	719-668-8384
Email:	SLovejoy@csu.org
PSCo Rep:	Thomas Green
In care of:	Public Service Company of Colorado
Address:	1800 Larimer St.,
City, State, Zip:	Denver, CO, 80202
Phone:	303-571-7223
Email:	thomas.green@xcelenergy.com

All study requests received from stakeholders will be reviewed and evaluated to determine the appropriate process for addressing.
This planning process does not replace the System Impact Study process. Specific requests for transmission service or generation interconnection will continue to be studied pursuant to existing OATT processes.

III. Glossary

Acronym	Term	Definition
CCPG	Colorado Coordinated Planning Group	
FERC	Federal Energy Regulatory Commission	Approves rates for wholesale sales of electricity and transmission in interstate commerce for jurisdictional utilities, power marketers, power pools, power exchanges and independent system operators.
NERC	North American Electric Reliability Council	The electric reliability organization (ERO) certified by the Federal Energy Regulatory Commission to establish and enforce reliability standards for the bulk power system.
OASIS	Open Access Same-time Information System	
OATT	Open Access Transmission Tariff	Documentation resulting from the FERC Order 890 requirement that transmission owners provide open, non-discriminatory access on their transmission system to transmission customers.