

## West Station-West Cañon 115 kV Transmission Project

<b>Project Sponsor:</b>	Black Hills Colorado Electric
<b>Additional Project Participants:</b>	
<b>Project Description:</b>	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:	New North Cañon 69 kV
Length of Line (in Miles):	42
Type of Project:	Transmission Line and Substation
Development Status:	Planned
Routing:	
Subregional Planning Group:	CCPG
<b>Purpose of Project:</b>	Increased reliability
<b>Estimated Cost (in 2017 Dollars):</b>	\$23 Million
<b>Schedule:</b>	
Construction Date:	2019
Planned Completion/In-Service Date:	Q4 2021
Regulatory Info:	Approved - Colorado PUC: Decision No. C17-0539-E
Regulatory Date:	July 10, 2017
Permitting Info:	
Permitting Date:	
<b>Contact Information:</b>	Wes Wingen, Manager of Transmission Planning
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

## North Cañon 115/69 kV Substation

<b>Project Sponsor:</b>	Black Hills Colorado Electric
<b>Additional Project Participants:</b>	
<b>Project Description:</b>	New 115/69 kV substation near 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:	Planned; this is change from Conceptual status in last year's report.
Routing:	
Subregional Planning Group:	CCPG
<b>Purpose of Project:</b>	Increased reliability and load growth capacity.
<b>Estimated Cost (in 2017 Dollars):</b>	\$9.9 Million
<b>Schedule:</b>	
Construction Date:	2021
Planned Completion/In-Service Date:	Q4 2021
Regulatory Info:	Approved - Colorado PUC: Decision No. C17-0539-E
Regulatory Date:	July 10, 2017
Permitting Info:	
Permitting Date:	
<b>Contact Information:</b>	Wes Wingen, Manager of Transmission Planning
Email	wes.wingen@blackhillscorp.com
Phone	605-721-2268

### **West Station-West Cañon 115 kV Line and New North Cañon Substation**

The proposed West Station – West Cañon 115 kV line would provide additional import capacity along with increased reliability into the Cañon City 115 kV system. Past TPL-001-4 reliability<sup>1</sup> and interconnection studies along with current summer peak operational studies have shown overloads on the Portland-Skala, Skala-Cañon City, and Portland-West Station #1 and #2 115 kV lines. Also the West Cañon 230/69 kV transformer, which supports the Cañon City network from the west end, is a long lead time piece of equipment that adds additional overload scenarios to the above mentioned 115 kV lines if the transformer were to fail. A corrective action plan has been developed per the TPL-001-4 standard to provide a solution. Limited options due to the geographic area and transmission system were considered to alleviate the 115 kV line overloads, including rebuilding the existing 115 kV lines. Due to the nature of the system, rebuilding the existing 115 kV lines feeding into the Cañon City network would be challenging due to operational constraints as they are the only source into Cañon City. The best overall option was identified as a new 115 kV line that would feed into the Cañon City network from the 115 kV West Station substation. The new line will provide additional capacity into the load center and eliminate the need to sectionalize the existing 115 kV system to prevent post-contingency overloads. The new line will also provide the ability to reliably rebuild the constrained 115 kV line segments between Portland and Cañon City at a future time. The addition of a new North Cañon 115:69 kV substation was added to the project since it would decrease the overloading issues on the existing Portland & Cañon City 115:69 kV transformers as identified in in past reliability studies, and provide increased operational flexibility. A summary of the project components is as follows:

- The West Station - Desert Cove 115 kV rebuild project was previously completed using double circuit structures to accommodate the new West Station to West Cañon 115 kV circuit up to Desert Cove. The new transmission line will continue on from Desert Cove to West Cañon. This project will be constructed within existing right-of-way where possible, and new right-of-way will be obtained in a manner to minimize disruption.
- 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.
- Obtain new right-of-way westward from the Desert Cove transmission corridor to the new North Cañon substation for 115 kV single circuit H-Frame structures. The new North Cañon substation will intersect the Cañon City Plant-West Cañon 115 kV line in the northwest corner of Cañon City which will complete the circuit to West Cañon.
- Since the West Cañon-Areque Gulch 115 kV line is geographically nearby the proposed site of the new North Cañon substation, bisecting it with the new substation would add additional reliability. This option will not be implemented initially, but the new substation will be designed to accommodate the additional terminals later to balance initial cost with future flexibility.
- New right-of-way is being explored that may run parallel to the existing Midway -West Cañon 230 kV line for a majority of the line length to minimize disruption to the surrounding area. Per WECC's

---

<sup>1</sup> Including both BHCT TCPC & CCPG studies

Long Term Planning Tool, the existing corridor is considered WECC Risk Class 1: Area Following Existing Linear Corridor and is preferable to higher Risk Class corridors.

- The routing of the new transmission line is under evaluation to potentially accommodate a future distribution substation in Pueblo West. The accommodation of the new substation would increase reliability and load serving capability in the Pueblo West area of the Black Hills system without materially impacting project costs or the planned benefits to the Cañon City area.
- The facility rating of the West Station – North Cañon 115 kV circuit should be at least 221 MVA Summer and 274 MVA Winter (795 ACSR Drake @ 100°C).
- The engineering and design work associated with the substation portion of the project will be performed to ensure that the completed project will meet the established noise and magnetic field requirements as stated in Rule 3206 (f) and Rule 3206 (e), respectively. Namely, the noise level of the substation will not exceed 50 db(A) at a distance of 25 feet beyond the property line, and the magnetic field level at the property line, one meter above the ground will not exceed 150 MilliGauss.
- The engineering and design work associated with the transmission line portion of the project was performed and also meets the established noise and magnetic field requirements.

Black Hills initially included this project in the 2015 Rule 3206 filing for informational purposes only. Transmission planning analysis has subsequently refined the project scope. Potential joint participation in the project was under consideration in the San Luis Valley Subcommittee within the Colorado Coordinated Planning Group (CCPG). There was absence of interest in joint participation in the project by other entities as well as any foreseeable long term drivers to justify constructing the project at a higher voltage. The best-cost solution was determined to have the project designed, constructed, and operated as a single 115 kV circuit. The additional right-of-way that will be acquired for this project will be 125 feet wide to accommodate an additional circuit or an increase in operating voltage if needed. The total overall cost of the project is estimated at \$32.9M, including the transmission line and the new North Cañon substation. The completion date of the line and substation portion of the project is scheduled for Q4 2021.

In Decision C17-0539-E, the Colorado Public Utilities Commission found that the original project was in the ordinary course of business and that a CPCN was not necessary.

