Hogback 115/69 kV Substation

Project Sponsor:	Black Hills Colorado Electric
Additional Project Participants:	
Project Description:	New 115/69 kV substation west of Cañon City on the West Station – Hogback 115 kV line. Formerly known as "Cañon City Area 115 kV/69 kV Substation" in 2018 Rule 3206 Report.
Voltage Class:	115 kV
Facility Rating:	80 MVA
Point of Origin/Location:	Hogback 115/69 kV substation
Point of Termination:	
Intermediate Points:	
Length of Line (in Miles):	N/A
Type of Project:	Substation
Development Status:	In Construction
Routing:	
Subregional Planning Group:	CCPG
Purpose of Project:	Increased reliability and load growth capacity.
Estimated Cost (in 2021 Dollars):	$9.9 Million
Schedule:	
Construction Date:	2020
Planned Completion/In-Service Date:	Jan 2022
Regulatory Info:	Approved – Colorado PUC: Decision No. C17-0539-E.
Regulatory Date:	July 10, 2017
Permitting Info:	
Permitting Date:	
Contact Information:	Lindsay Briggs, Supervisor Transmission Planning
Email	Lindsay.briggs @blackhillscorp.com
Phone	605-721-2240

West Station-Hogback 115 kV Line and New Hogback Substation

Description. Given their interrelatedness, we describe these two previously reviewed projects together. The proposed West Station – Hogback 115 kV line (formerly referred to as the West Station-West Cañon 115 kV line) would provide additional import capacity along with increased reliability into the Cañon City 115 kV system. The new line will also provide a second connection into the Penrose distribution system, eliminating the impacts of a single outage loss of load. Additionally, the new line will accommodate a new Pueblo West distribution substation to relieve existing distribution system constraints and facilitate developing load growth in that community. Past TPL-001-4 reliability[1] 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. 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. A limited number of options to alleviate the 115 kV line overloads were available for consideration due to the geographic challenges and transmission system configuration. 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. A new 115/69 kV substation west of Cañon City was added to the project since it would decrease the loading issues on the existing Portland & Cañon City 115/69 kV transformers as identified in past reliability studies and provide increased operational flexibility. This substation is labeled as Hogback in the project map below. A summary of 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 a new 115/69 kV substation west of Cañon City (Hogback). 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 Hogback substation located to the west of the Cañon City area to support the Cañon City 69 kV network. Upgrades to the existing 69 kV facilities may be 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 Hogback substation for 115 kV single circuit H-Frame structures. The Hogback substation will

[1] Including both BHCT TCPC & CCPG studies

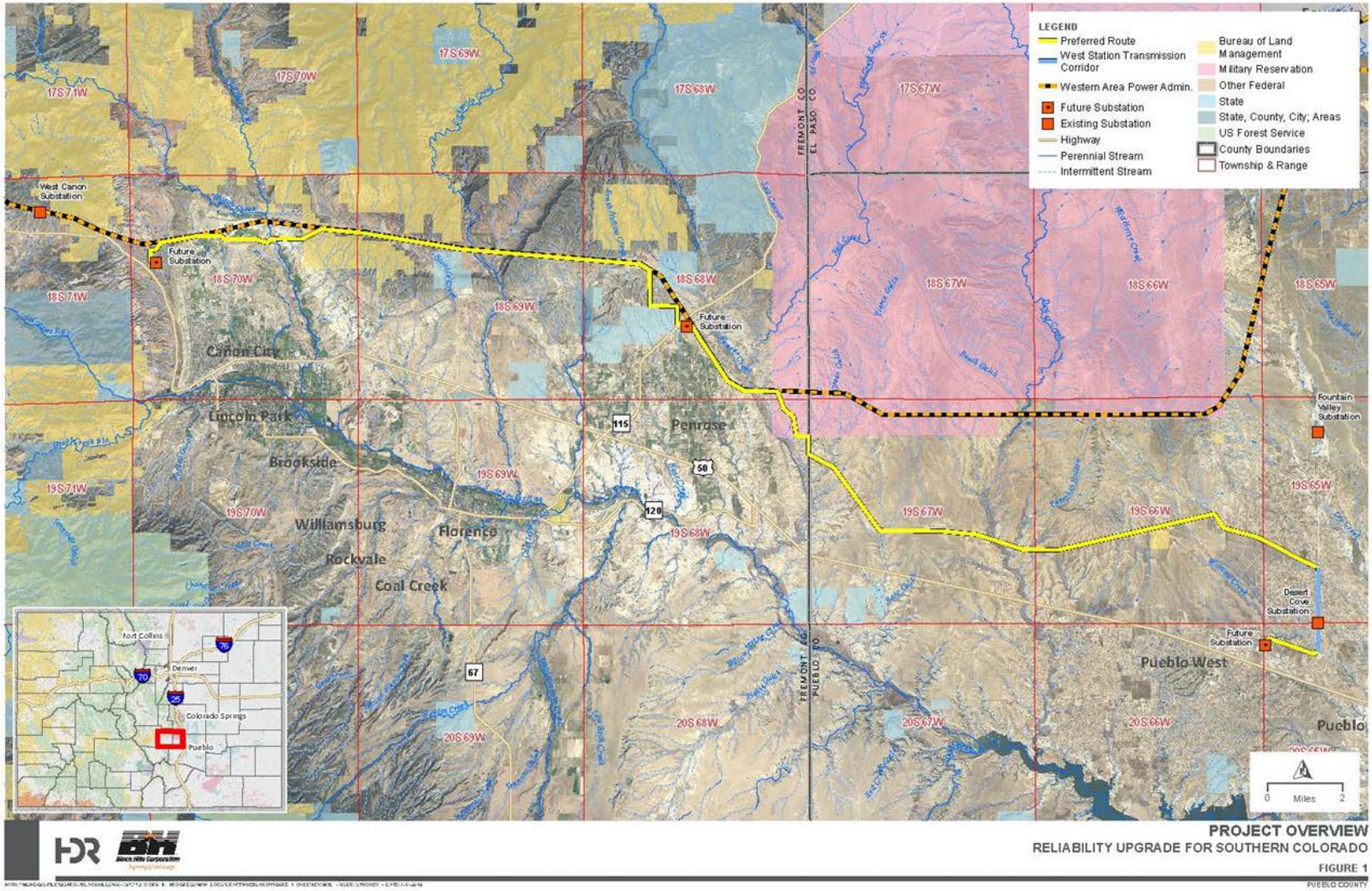
intersect the Cañon City Plant-West Cañon 115 kV line in the northwest corner of Cañon City which will complete the circuit to West Cañon.

- Since the West Cañon-Arequa Gulch 115 kV line is geographically nearby the proposed site of the new Hogback 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.
- The routing of the new transmission line will readily accommodate a proposed distribution substation in the Pueblo West community. The accommodation of the new Pueblo West substation will 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. Discussions with impacted customers during the permitting process resulted in changes to the line route to maintain project objectives while preserving customers' viewshed.
- The routing of the new transmission line will accommodate a proposed distribution substation in the Penrose community. Penrose is currently served via single radial 69 kV line. The new North Penrose substation will increase reliability and load serving capability in the Penrose 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 Penrose-Hogback 115 kV circuit will 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 these two projects in the 2015 Rule 3206 filing for informational purposes only. Transmission planning analysis has subsequently refined the project scope. Potential joint participation was under consideration in the San Luis Valley Subcommittee within the Colorado Coordinated Planning Group (CCPG). There was absence of interest in joint participation by other entities as well as any foreseeable long-term drivers to justify construction 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 will be 125 feet wide to accommodate an additional circuit or an increase in operating voltage if needed. The total overall cost is estimated at $33.3 million, including the transmission line and the new Hogback substation.

Consideration of project alternatives including energy storage systems (Rule 3206(d)(I)(D)). Not applicable. The two projects were designed and planned prior to the rule requirement effective date of March 2, 2019.

Decision. In Decision No. C17-0539-E, the Commission determined that the two projects were in the ordinary course of business and that a CPCN was not necessary.


LEGEND
Preferred Route
West Station Transmission Corridor
Western Area Power Admin.
Future Substation
Existing Substation
Highway
Perennial Stream
Intermittent Stream
Bureau of Land Management
Military Reservation
Other Federal
State
State, County, City; Areas
US Forest Service
County Boundaries
Township & Range
West Canon Substation
Future Substation
Canon City
Lincoln Park
Brookside
Williamsburg
Florence
Rockvale
Coal Creek
Penrose
Fountain Valley Substation
Desert Cove Substation
Pueblo West
Pueblo
Fort Collins
Denver
Colorado Springs
Pueblo
0 Miles 2
PROJECT OVERVIEW
RELIABILITY UPGRADE FOR SOUTHERN COLORADO
FIGURE 1
PUEBLO COUNTY