

January 14, 2021

Julie Murphy, Director  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**Re: Rule 502.b Variance Request for Wexpro Company  
Bradenhead Valve Access and Monitoring  
BW Musser #1, API 05-081-05453**

Dear Ms. Murphy:

This letter has been prepared to request and substantiate the grant of a variance to Wexpro Company under Colorado Oil and Gas Conservation Commission (COGCC) Rule 502.b for the following COGCC Wellbore Integrity Rules:

- Rule 341.a. Equipment Requirements.  
“(1) The Operator will equip bradenhead access on all Wells to the annulus between the production and surface casing as well as any intermediate casing with appropriate fittings to allow safe and convenient determination of pressure and fluid flow.  
  
(2) To allow for Commission visual inspection at all times, all valves use for annular pressure monitoring will remain exposed and will not be buried. An Operator may use a rigid housing to protect the valves so long as the housing can be easily opened or removed by the  
  
Operator upon request.  
  
(3) These equipment requirements apply to all Wells, regardless of function.”
- Rule 341.b. Bradenhead Monitoring.  
“The Operator will monitor all Wells at a Director-indicated frequency for aspects of well integrity necessary to protect public health, safety, welfare, the environment, including groundwater, potential flow zones, and formations, and wildlife resources and in accordance with this Rule 341.

(1) After Rig Release, Prior to Stimulation. An Operator will monitor all annular casing pressures on a monthly basis. If at any point the bradenhead monitoring pressure is greater than 30% of the true vertical depth (TVD) in feet of the surface casing shoe expressed in psig, the Operator will contact the Director before proceeding with stimulation to determine whether mitigation or other measures are necessary to ensure isolation consistent with the Commission's Rules."

"(4) Through the Remaining Life of the Well. For all Wells in the state, an Operator will monitor and record production casing pressure and all annular casing pressures on a monthly basis or at a Director-approved frequency. If a Well's bradenhead pressure is greater than 30% of the true vertical depth (TVD) in feet of the surface casing shoe expressed in psig, or a lower threshold set by a Commission Order, or if a Well flows liquids or continuous gas from the bradenhead annulus an operator will

- A. Report the bradenhead pressure to the Director on a Form 17, Bradenhead Test;
- B. Take immediate action to remedy such an annular pressure; and
- C. Perform diagnostic testing to determine if the annular casing pressure is sustained. An Operator will report diagnostic testing results to the Director on a Sundry Notice, Form 4, within 60 days of submitting a Form 17 pursuant to Rule 341.b.(4)A. If the diagnostic testing confirms sustained casing pressure, an Operator will develop and implement a pressure management plan and provide the plan with the Sundry Notice."

(5) **Records.** An Operator will keep bradenhead monitoring records required by Rule 341.b. available for inspection by the Director for a minimum of 5 years after the monitoring was performed."

341.c. **Annual Bradenhead Testing and Reporting.** For all Wells other than coalbed methane wells, an operator will perform an annual bradenhead test and submit the data to the Director on a Form 17 or other Director-approved method. For coalbed methane wells, an Operator will perform bradenhead testing in accordance with Rule 608.e.

The BW Musser #1 well is located in Moffat County, CO. The original drilling and completion of the well occurred in Spring of 1930 and was the first wildcat well in the Powder Wash Field. Today, the well continues to produce on average 20 MCFD and supplies gas to power facilities in the area. Due to drilling and completion techniques during the 1930's, many challenges and potential safety issues should be considered when trying to access the well's casing strings 91 years after the completion date.

A well history and timeline of events is below along with an attached wellbore diagram to provide context and understanding of the design of the wellbore.

As mentioned, Wexpro is requesting a variance due to the age and the method in which the wellbore was constructed. Listed below are some major safety and environmental concerns.

1. Access to the casing strings would require digging more than 15 feet below ground level. A large hole would have to be dug around the wellhead in order to provide a safe working environment. Leaving an open hole to access the casing strings could potentially threaten the safety and welfare of wildlife and people. The pictures below are from a well that was drilled in the same decade as BW Musser #1. It illustrates the depth below ground level that casing was landed in the 1930s and the size of hole that would be needed for safe working conditions.



Figure 1: Well Drilled in 1933; Images from Excavation during P&A Operations

2. A large cement pad is located on the surface near the wellbore and would have to be removed in order to provide a safe working space for employees and contractors. Similar cement pads found on other locations have been four feet to seven feet thick with a wide range of material used as fill. See pictures below of BW Musser #1 surface location.



Figure 2: BW Musser #1 Surface Location, Powder Wash Field, CO

3. Due to the size of excavation that would need to occur to safely plumb into annuli for the monitoring requirements to be met and that being prior to the inevitable plugging of this well, it

will absolutely be a stability/safety concern for the work-over rig to rig up on a disturbed and backfilled area. The rig could sink and/or fall over if it does not have a stable base.

4. Existing or retired lines near where we would have to expose (camp utility lines, other flowlines, etc.) are also a safety concern. If a live gas line is hit during excavating, the exposure to pressure could seriously injury or cause death to personnel.
5. Casing integrity and stabilization issues may arise when digging around a wellbore that initially was completed in 1930. Without wellbore stabilization, this could potentially cause more issues downhole, including producing formation fluids migrating into other uphole formations.
6. After reading well reports and sundries filed during the completion of the wellbore, they indicate the 13-3/8" casing is landed in clamps and not in slips with a traditional wellhead that is commonly practiced today. Due to this style of landing method, monitoring bradenhead and annulus casing pressures would not be possible because the annulus is open to the atmosphere. Below is a picture of a well with casing landed in clamps like BW Musser #1.



*Figure 3: F Wilson #3 Casing Clamps, Hiawatha Field, CO*

7. On January 12, 2021; Wexpro field operations dug ten feet (10') deep around the BW Musser 1 wellhead and found that the 8-5/8" casing is landed on top of the 13-3/8" casing with a doughnut plate. During this operation no signs or indication of gas or fluid migration were seen. About a foot below the plate a solid block of cement was found all the way around the 13-3/8" casing. Most likely during 1930 operations, cement was placed in the hole around the wellbore and therefore in the different annuli. Based upon the drilling reports, the amount of cement could be seven feet in depth. The width is unknown. Accessing the casings would require removal of the cement that is currently protecting fluid and gas flow to the surface and the well's stabilization and casing integrity. The picture below illustrates what was discovered.

8. In order to obtain pressures from the 13-3/8" casing, hot tapping would be required. This would involve welding onto 91 year old casing and would be considered a safety issue. Welding on old pipe could cause a hole in the casing and potentially expose any production gas from that casing string. During welding operations with gas present, a fire or explosion can occur.



*Figure 4: BW Musser #1 8-5/8" Casing Landed on top of 13-3/8", Powder Wash Field, CO*

9. There are two existing water wells within close proximity of the BW Musser 1 well.
  - a. B.W. Musser Well No. 2 ("Musser Well 2"), Permit No. 035879-F; and B.W. Musser W. No. 3 ("Musser Well No. 3"), Permit No. 035880-F, are permitted by DWR for use of tributary groundwater from the Wasatch Formation. Water has primarily been used at the Powder Wash Camp and included uses for in-house domestic, dust suppression, equipment washing, and for industrial oil field use, revegetation, and other related uses. Throughout the water well history water analysis have been obtained and there have been no indications of groundwater contamination from the BW Musser 1 well. The water is not used for public or domestic consumption.



Figure 5: Musser Water Wells in Proximity to BW Musser #1, Powder Wash Field, CO

## Well History

### May 1930

The well commenced drilling in May of 1930 and was the first wildcat well drilled in the Powder Wash Field located in Moffat County, CO; deeming this wellbore a historical artifact under Colorado State Historical Preservation (SHPO) guidelines. Any modifications to the wellsite would require Federal BLM approval and a potential review by Colorado SHPO. The original well was drilled to a total depth of 2,152'. During the original completion, three strings of casing were installed and cemented in place.

#### Casing

- 20", 90#, DB8 conductor casing landed at 79' (21' below production floor) and cemented with 20 sacks.
- 15-1/2", 70# DB8 surface casing landed at 1,041' (15'2" below production floor) and cemented with 180 sacks.
- 13-3/8", 54.5# production casing landed in clamps at 2,145' 5" (13' 2" below production floor) and cemented with 275 sacks.

### August 1942

In August of 1942 2" tubing was installed in the wellbore.

#### Tubing

- 2", 4.7#, 8RD production tubing landed at 2,148' (2' 2" below production floor).

### December 1942

The well was deepened in December of 1942 to a total depth of 5,507'. Two strings of casing 8-5/8" and 5-1/2" were installed for a dual completion. A cement plug was placed with 165 sacks from 5,216' to at 5,487'. The well was perforated in a gas sand from 2,870'-2,901' and produced thru the annulus of the

8-5/8" and 5-1/2" casing strings. An oil sand was perforated from 5,101'-5,127' and produced thru the 5-1/2" casing.

#### **Casing**

- 8-5/8", 38# casing landed at 5,180.70' and cemented in two stages with a Two-Stage Cementer at 3,316.32' and total of 782 sacks.
- 5-1/2", 15# 20# casing landed at 3,021.04' and cemented with 15 sacks.

#### **April 1955**

A recompletion was performed in April 1955. An 85 sack cement plug was placed across the bottom perforations from 4,845'-5,130'. The well was perforated from 4,155'-4,185' and plugged back with 90 sacks of cement from 4,012'-4,300'. Perforations were opened from 3,945'-3,955' before a 90 sack cement plug was placed from 3,705'-4,000'. The well was perforated from 3,180'-3,190' before they were squeezed with 65 sacks of cement. Well was cleaned out and logs were ran before perforating from 3,162'-3,190'. A cement retainer was set at 3,005' and the perforations were squeezed with 75 sacks of cement. The 5-1/2" casing was cut at 2,909' and 99 joints and a piece of 5-1/2" casing was removed. Installed 8-5/8" x 7" shop made casing to bring tubing head above cement mat. 2-7/8" production tubing was installed.

#### **Casing**

- 5-1/2", 20# casing cut at 2,909' and approximately 110' remaining in well.

#### **Tubing**

- 2-7/8", 6.5#, 8RD production tubing landed at 2,881.91'. Bottom 3' of bottom joint is perforated with 36 3/8" hole and bullnosed at bottom with a 3/4" hole at bullnosed end.

#### **January 2021**

The well currently produces 20 MCFD from the December 1942 perforations from the Wasatch formation (2,870'-2,901').

We sincerely appreciate your consideration of this variance request. Please contact Scott Colvin, Supervisor District Drilling Operations, at (307) 350-8990 or [Scott.Colvin@dominionenergy.com](mailto:Scott.Colvin@dominionenergy.com); Lindsey Smith, Production Engineer, at (385) 258-7636 or [Lindsey.A.Smith@dominionenergy.com](mailto:Lindsey.A.Smith@dominionenergy.com) ; or Tammy Fredrickson, Senior Permit Agent at (307) 352-7514 or by email at [Tammy.Fredrickson@dominionenergy.com](mailto:Tammy.Fredrickson@dominionenergy.com) with questions.

Sincerely,



Kasey Werkele  
Director of Operations

# Wellbore Diagram

<b>Well Name:</b>	BW Musser 1
<b>County, State</b>	Moffat, CO
<b>Legal Description:</b>	LOT 6 NW NE 5-11N-97W
<b>API:</b>	05-081-05453
<b>SHL:</b>	1,120' FNL 1,520' FEL
<b>Updated By:</b>	Jeff Bluemel
<b>Date Updated:</b>	1/13/2021
<b>Reviewed By:</b>	Lindsey Smith
<b>Reviewed Date:</b>	1/13/2021
<b>Spud Date:</b>	5/21/1930
<b>Re-entry Spud Date:</b>	11/27/1942
<b>TD Date:</b>	4/9/1931
<b>Re-entry TD Date:</b>	4/23/1943
<b>IP Date:</b>	1931
<b>Re-entry IP Date:</b>	4/23/1943
<b>Well TMD:</b>	2,152
<b>Re-entry Well TMD:</b>	5,507
<b>Orientation:</b>	Vertical
<b>Plug Back MD:</b>	3,005
<b>Bridge Plug MD:</b>	
<b>Producing Frac Jobs:</b>	1

<b>Latitude</b>	40.946396
<b>Longitude</b>	-108.311453

<b>As Of Recompletion</b>	5/4/1955
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All measurements are in KB & MD unless otherwise specified.



