Objective Criteria Review Memo for the Bonanza Creek Energy Operating Company LLC Crow Valley 44-32 Pad Form *2A, Document #402328162*

This summary explains how COGCC staff conducted its technical review of the Bonanza Creek Energy Operating Company LLC (Bonanza Creek) Crow Valley 44-32 Pad Form 2A, document #402328162, within the context of SB 19-181 and for the required Objective Criteria. This Form 2A was submitted to Amend Existing Location #422674. The Location will have two wells with pump jacks, two gasoline or diesel motors, four oil tanks, two water tanks, eight separators, two electric motors, one electric generator, two volatile organic compound (VOC) combustors, two cavity pumps, one Modular Large Volume Tank (MVLT) for temporary water storage, one gas compressor, and two pipeline pigging stations. Other Facilities include an automation system, a GL Meter Building, a line heater, exposed and buried gathering and flowlines, and a radio tower. The proposed construction of this Location meets the following Objective Criteria:

- (Criteria #5.c) The proposed Location lies within a Sensitive Area for water resources within proximity to surface water and ground water.

COGCC staff met with the Director to discuss whether the Objective Criteria were sufficiently addressed and whether the Form 2A could be approved with the proposed Best Management Practices (BMPs) and applied Conditions of Approval (COAs). The following sections provide details regarding the evaluation of each criterion.

Criteria #5.c: Oil and Gas Locations within a Sensitive Area for water resources.

Site Specific Description of Applicability of Criteria 5.c: The proposed Location is in a sensitive area due to the Location being located within 90 feet of a surface water feature. The Location is in the southeast quarter of the southeast quarter of Section 32, Township 7 North, Range 62 West, in Weld County, Colorado. The nearest downgradient water features are roadside drainage ditches along Weld County Road (WCR) 74, the closest approximately 90 feet south of the Location edge of disturbance. There is an intermittent surface water drainage located approximately 423 feet southeast of the Location on the south side of WCR 74.

The nearest water well, Division of Water Resources (DWR) permit #269-WCB is plotted approximately 733 feet from the Location. However, the water well is incorrectly plotted in the southwest quarter of the southwest quarter of Section 33, Township 7 North, Range 62 West. Water well DWR #260-WCB is actually located in the northeast quarter of the southwest quarter of Section 33, approximately 3,710 feet from the Location edge of disturbance.The total depth of this well is reported at 280 feet with a static water level reported at 131 feet below ground surface (bgs). The next nearest water well (DWR permit #40417) is also incorrectly plotted near the center of Section 33. This livestock water well DWR permit #40417 with a static water level reported at 30 feet bgs and a total depth of 190 feet bgs, and according to the permit was located in the northwest of the northwest of Section 33 near a drainage. The estimated depth to groundwater on Location of 160 feet bgs was based on the screened interval reported for DWR

water well Permit #40417 and also the reported static water levels in area wells with consideration for the Location elevation difference.

Site Specific Measures to Address Criteria 5.c: A roadside ditch along the north side of WCR 74 is the nearest surface water feature 90 feet from the Location edge of disturbance. Bonanza Creek will implement the following Best Management Practices (BMPs) to address the Sensitive Area for water resources:

1. Perimeter storm water controls, typically a ditch and berm system for perimeter control, will be installed with other BMPs as determined by a third party storm water contractor. A storm water retention and release structure will be installed in compliance with local regulations. Storm water controls will remain in place until the pad is stabilized or reaches final reclamation.
2. A leak detection plan will be prepared and have personnel on Location daily to conduct routine operations and maintenance activity. Bonanza Creek will install a supervisory control and data acquisition (SCADA) system to remotely monitor production tank levels onsite and activate specific valves, which can stop a release on Location.
3. Bonanza Creek will use lined secondary containment for tank batteries and separation equipment will have built-in containment to protect ground water and surface water features located in close proximity to the Location.
4. General housekeeping will consist of neat and orderly storage of materials and fluids. Wastes will be temporarily stored in sealed containers and regularly collected and disposed offsite at permitted facilities. Equipment will be transported offsite for major overhauls and overhauls will not be conducted on Location. If spills occur, cleanup will be implemented within 24 to 48 hours, as appropriate, to minimize commingling of waste materials with storm water runoff. Cleanup will consist of patrolling the roadways, access areas, and other work areas to pick up trash, scrap debris, discarded materials, and contaminated soil.
5. Bonanza Creek uses closed loop drilling and constructs Locations with at least four inches of compacted road base to prevent surface degradation from drilling and production activity, traffic, and to protect ground water by containing liquids and preventing vertical migration of spills.
6. A portable containment liner will be used under the drill rig during drilling activities to protect ground water from spills. Any liquid releases during drilling will be vacuumed up from the liner. The liner will be removed and transferred to the next drilling location once drilling is complete.
7. Closed loop pigging will be used to maintain flowlines to remove flowline deposits without open-ended liquid collection to reduce the potential for spills.

Summary: During the technical review process, and in light of SB 19-181, COGCC staff requested additional information and clarification regarding Bonanza Creek's BMPs for addressing siting conditions and protecting sensitive water resources. The Location is in a

sensitive area for water resources due to proximity to a surface water feature 90 feet away and ground water.

Bonanza Creek will use perimeter construction storm water controls to prevent offsite migration of sediment and impacted storm water, prepare a leak detection plan, use a SCADA system for remote monitoring of tank levels and remote shut-in, use lined secondary containment for tank batteries and built-in containment for separators, compacted road base on location to prevent vertical migration of spills, uses a closed loop drilling system and a portable containment liner beneath the drill rig, and will use a closed loop pigging system for the flowline pipelines.

Director Determination: Based on the Objective Criteria review. The Director has determined that this permit application meets the standard for protection of public health, safety, welfare, the environment and wildlife resources set by SB 19-181.