

BCU 14L Well Pad

Odor Mitigation Plan COGCC Rule 304.c.(4) and 426



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BCU 14L Well Pad Odor Mitigation Plan Rule 304.c.(4)



1. INTRODUCTION – RULE 304.C.(4)

The BCU 14L Odor Mitigation Plan (OMP) was developed in compliance with COGCC Rule 304.c.(4) *Odor Mitigation Plan* as part of the 304 Rule series for Form 2A Oil and Gas Location Assessment and COGCC Rule 426: *Odors*.

Laramie Energy, LLC (Laramie) (Operator # 10433) will operate in accordance with applicable requirements of COGCC Rule 426, including best management practices, to prevent odors from creating a nuisance or hazard to public health, safety, and welfare.

2. ODORS - RULE 426

Laramie is dedicated to reducing odor nuisances. Two (2) Residential Building Units (RBU) exist within 2,000 feet of the BCU 14L well pad (BCU 14L). No Designated Outside Activity Area exists within 1-mile radius of the Location. The BCU 14L is an existing well pad which was previously permitted, but never constructed. Laramie is proposing to construct the well pad to drill 10 new directional wells.

Operational phases which may result in odor are drilling, completions flowback, and production.

3. DRILLING

Drilling activities will occur for approximately 42 days at the BCU 14L. Laramie will use water-based bentonite drilling fluids, rather than oil-based drilling fluids. Laramie reduces the potential for odors during drilling by solely using water-based bentonite drilling fluids.

Laramie will utilize the following Best Management Practices to reduce odors during drilling activities:

- All drilling fluid will be fresh water bentonitic based with negligible amounts of natural odors, rather than oil-based drilling fluids. After passing over the shale shakers, cuttings are transported through a closed loop piping system to a centrifugal dryer which removes the majority of drilling fluids. The remaining dry cuttings and the drilling fluid is then returned to the active pit system for reuse.
- Cuttings will continue to be dried and managed within the cuttings management area on site. Dry natural gas formations in this area do not typically have oil-saturated cuttings like other parts of the state. Drying agents (i.e. sawdust, wood pellets, etc.) will be mixed in daily to absorb free water from cuttings and continue to reduce odors.
- Drilling fluid will be built, recycled and maintained within an enclosed pre-mix tank or mud tank.
- Engine exhausts will be directed up and away from the nearest RBU, which is located 1192 feet to the southeast.

A site-specific air quality monitoring plan will be prepared for this location and submitted to the CDPHE for approval. Monthly reports will be prepared and submitted to the CDPHE



with summaries from the monitors.

4. COMPLETIONS AND FLOWBACK

Completions and flowback activities will occur for approximately 34 days. Laramie implements green completions (as defined by the 100 series rule) practices during this phase of operations.

Laramie will utilize the following Best Management Practices to control odors during completion activities:

- Laramie will utilize green completions practices and contain flowback liquids in pressurized and closed top tanks while sending gas to sales.
- Any liquid hydrocarbon will be contained in flowback vessels for shipment to sales.
- Any hydrocarbon liquid accumulation in frac tanks from carryover will be skimmed as needed and hauled off to sales.
- Open top flowback tanks will not be used.
- Frac tank lids will be closed at all times and only opened for maintenance and calibration activities as allowed per CDPHE Regulation 7.

5. PRODUCTION

After drilling, completions, and flowback activities are complete, production operations will commence.

- During production, Laramie will utilize existing pipelines to route natural gas from the production facility to sales.
- Produced water will be transported by an existing water line during the production phase, reducing odor impacts from truck loading and traffic.
- Condensate loadouts will be controlled with a vapor balance system. Tank thief hatches will remain shut during quality/quantity determinations as well as for the duration of the truck loadouts.
- Tank emissions will be controlled with an enclosed combustion device at least until VOC emissions drop below 2 tons per year. Enclosed combustion devices will be inspected at least weekly for proper operation.
- Laramie will conduct periodic performance tests of enclosed combustion devices to ensure 95% hydrocarbon destruction efficiency.
- Audio, Visual, Olfactory (AVO) observations will be conducted at least weekly to detect hydrocarbon leaks. Any leaks identified will be repaired per CDPHE regulations. Identifying and quickly repairing these small leaks further reduces the potential impacts from odors.
- LDAR Inspections will be conducted monthly using a FLIR Optical Gas Imaging (OGI) camera. Any leaks identified will be repaired per CDPHE regulations. Identifying and quickly repairing these small leaks further reduces the potential impacts from odors.
- Laramie will install non-emitting pneumatic controllers.

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- Laramie will utilize best management practices as defined in Regulation 7 to reduce well unload frequencies.

6. MONITORING AND DETECTING ODORS

CDPHE Regulation 7 Part D, Section VI requires air monitoring during drilling and completions, and the first 6 months of well operation (during initial production when they are at their highest.). Laramie will monitor for VOC emissions at the BCU 14L.

Laramie will conduct AVO (Audio Visual, Olfactory) inspections two to three times a week in accordance with Rule 609.d. *Audio Visual Olfactory Inspections*. The olfactory aspect of an AVO inspection will identify odor issues onsite. **Table 1** details Laramie’s procedures for AVO inspections.

**Table 1. AVO Inspection Procedures
AVO (Audio Visual, Olfactory)**

AVO (Audio Visual, Olfactory)	
Audio	Listen for any gas leaks or any noise out of the ordinary
Visual	<ul style="list-style-type: none"> a. Visual signs of a gas leak (bubbling, staining, or leaking around components. b. Tanks- visual signs of seeping or leaking on tanks. Check for fluids in containment. Check valving to insure closed tight an no seeping or leaking. c. Wells and wellheads- check for visual signs of gas leaking from tree and around base of well. d. Location overall- Inspect location for wet spots not associated with natural conditions (rain, snow, run-off, etc.). Check for staining and odor during work on site. e. Travel between sites inspect flowline corridors for any bubbling, leaking, staining or wet spots not associated with natural conditions (rain, snow, run-off, etc.).
Odor	Check for odors not normally associated with site

Laramie will perform monthly FLIR camera inspections to identify gas leaks. Monitoring of gas leaks will further reduce potential odors.

Laramie will perform weekly inspections of tank control devices to ensure potentially odorific tank hydrocarbon emissions are being properly destroyed.

7. COMPLAINT SYSTEM

In the event an odor complaint is received, Laramie will assess operations to determine appropriate measures to minimize any future odor. Laramie will conduct an assessment of equipment and activities to identify if a specific type of equipment or activity resulted in the odor complaint. Once a determination of the cause of odor has been identified, Laramie will repair or replace needed equipment or components.



8. CUMULATIVE ODORS

The BCU 14L location will operate in accordance with the new CDPHE Regulation 7 requirements outlining the use of non-emitting pneumatic devices, limited/controlled well unloading, truck loadout, tank measurement, and flow meter installation for the combustor. These new regulations are anticipated to reduce the emissions which will have a correlating reduction in odors.

Three air monitors will be installed at the BCU 14L for continuous air monitoring for VOCs. Air monitors and a meteorological station will monitor and record real-time data from ten days prior to drilling to six months after the last well goes to sales. CDPHE requires pre-approval for the layout and requires notifications if predetermined thresholds of VOCs are exceeded in either of the monitors.

The well pad location is upwind and varying topographically of the surrounding area will further reduce potential impacts of odor. The cumulative impacts from odors of the proposed BCU 14L and near oil and gas facilities are anticipated to be low.

Laramie assessed existing oil and gas facilities and locations within a 2,000-foot radius of each the two RBUs. **Table 2** provides distances and directions of the RBUs from the BCU 14L WPS.

Table 2. Distances and Directions of RBUs

RBUs within 2,000 feet of BCU 14L	Distance and Direction from BCU 14L
RBU # 1	1192 Feet Southeast
RBU # 2	1812 Feet Southwest

Existing oil and gas locations within a 2000-foot radius of RBU # 1 includes one well pad. One producing well is located at the Werne #14-12 Pad. **Table 3** provides details on odor and emission control regarding existing oil and gas facilities within a 2000-foot radius of RBU #1.

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Table 3. Oil and Gas Locations & Facilities within 2,000-foot Radius of RBU #2

Location/ Facility Type	Location/ Facility	Location/ Facility ID	Distance And Direction From RBU #1	Existing Odor and Emission Control
Well Pad	Werne #14-12 Pad	Location ID 312704	1200 feet northwest	<p>LDAR inspections are voluntarily conducted semi-annually using a FLIR Optical Gas Imaging (OGI) camera to identify and repair gas leaks.</p> <p>Audio, Visual, Olfactory (AVO) observations will be conducted at least monthly in accordance with Rule 609.d. <i>Audio Visual Olfactory Inspections</i> to detect and repair hydrocarbon leaks.</p> <p>Laramie will utilize best management practices in accordance with CDPHE Regulation 7 to reduce well unload frequencies.</p> <p>All truck loadouts are conducted via submerged fill.</p>

Existing oil and gas facilities within a 2000-foot radius of RBU # 2 includes one oil and gas location, one water treatment facility and a compressor station. The RBU was purchased by Laramie, the Operator, in 2020 by the current RBU owner. All oil and gas facilities within a 2000-foot radius of RBU #2 were existing and active at the time of purchase of the RBU in 2020 from Laramie. Existing oil and gas locations and facilities within 2,000 feet are owned and operated by Laramie. **Table 4** provides details on odor and emission control regarding existing oil and gas facilities within a 2000-foot radius of RBU #2.

Table 4. Oil and Gas Locations & Facilities within 2,000-foot Radius of RBU #2

Location/ Facility Type	Location/ Facility	Location/ Facility ID	Distance And Direction From RBU #2	Existing Odor and Emission Control
Well Pad	NVega 4B	Location ID 311764	1164 feet southeast	<p>LDAR inspections are voluntarily conducted semi-annually using a FLIR Optical Gas Imaging (OGI) camera to identify and repair gas leaks.</p> <p>Audio, Visual, Olfactory (AVO) observations will be conducted at least monthly in accordance with Rule 609.d. <i>Audio Visual Olfactory Inspections</i> to detect and repair hydrocarbon leaks.</p> <p>Laramie will utilize best management practices in accordance with CDPHE Regulation 7 to reduce well unload frequencies.</p> <p>All truck loadouts are conducted via submerged fill.</p>
Compressor Station	Mega Vega Station Compressor Station	Facility ID 430003	830 feet southwest	<p>The compressor station and water treatment facility currently operate under the same Title V Operating Permit #100PME354 issued by CDPHE on April 1, 2019. CDPHE conducts an annual full compliance inspection of all permit conditions and compliance is self-certified semi-annually by a Laramie Responsible Official.</p>
Water Treatment Facility	Harrison Creek Water Treatment Facility (HCWTF)	Location ID 425510; Facility ID 441238	800 feet west	<p>Permit conditions which control odor include LDAR inspections, AVO inspections, combustor inspections, combustion control of separators, tanks, and dehydrators, engine stack testing, a RACT approved pre-treatment train for the produced water impoundments, instrument air powered pneumatic controllers, a loadout vapor balance system, and submerged fill loadouts.</p> <p>The facilities are staffed and inspected at least daily and continuously remote monitored through a platform that allows for remote alerting and shut-in capabilities.</p>
	HCWTF Impoundments	Location ID 442127		
	HCWTF DAF	Location ID 413056	280 feet southwest	