

Extraction Livingston Pad Public Comments

Introduction

As part of the technical review of the Extraction Oil and Gas LLC's (Extraction) Livingston Facility Form 2A Oil and Gas Location Assessment (Document #401477008) and related Form 2 Applications for Permit to Drill, Colorado Oil and Gas Conservation Commission (COGCC) staff reviewed and considered the Public Comments received. The COGCC is providing this memo with a summary of the received comments and how the issues raised in comments are addressed on the permits through COGCC Rules and operator proposed Best Management Practices (BMPs).

Background

Extraction submitted the Livingston Pad Form 2A in compliance with Rule 303.b.(1)A. The proposed location is in the City and County of Broomfield (Broomfield) and the right to construct is granted by a Surface Use Agreement with Broomfield. There are 19 horizontal wells planned with no oil or water storage tanks planned. The nearest Building Unit from a proposed well is a home 1308 feet to the north, across the Northwest Parkway; the closest planned production facility to a home is 1486 feet. There are neighborhoods one-quarter mile to the north (across the highway) and one-half mile to the south and southeast. The proposed Oil and Gas Location is not within a COGCC defined Exception Zone or Buffer Zone and is not in an Urban Mitigation Area.

Extraction and Broomfield entered into an Operator Agreement approved by the Broomfield City Council on October 24, 2017. As part of the Operator Agreement, Extraction submitted to Broomfield a "Comprehensive Drilling Plan" (Broomfield CDP) which consisted of the information required in the local government's Use by Special Review Permit and associated mitigation plans. The Broomfield CDP was not intended to meet the requirements of COGCC Rule 216., which provides operators may propose Comprehensive Development Plans – also referred to as CDPs- to the COGCC. Extraction did not, and was not required to submit a COGCC Rule 216. Comprehensive Development Plan to the COGCC. The COGCC was not involved in the Broomfield CDP process. The Broomfield CDP was not approved prior to submittal, review, or (contemplated) approval of the Livingston Pad Form 2A;. Oil and gas development at this site has been part of the development plan for Broomfield for several years, since Noble Energy, Extraction's predecessor in interest, negotiated an agreement (for the Lowell Pad) for this site with Broomfield in 2012 after obtaining a Use by Special Review (USR) in 2011.

Extraction's Form 2A and associated Form 2s for the Livingston Pad passed COGCC's completeness review and were uploaded for COGCC staff technical review on January 25, 2018, at which time the public comment period commenced. With extensions granted, the public comment period was open until March 2, 2018. Since the applications have been in process, COGCC staff has had numerous discussions with the operator and has met with the operator and with Broomfield to discuss various aspects of this and other Oil and Gas Locations proposed in Broomfield. Among the topics discussed were the specific BMPs proposed on the Form 2A and how they relate to certain provisions of the Operator Agreement.

At COGCC's request, Extraction prepared a document responding to the public comments submitted to COGCC. Extraction's response document addresses the following public concerns: the operator agreement between Extraction and Broomfield; site-specific nuisances, including, traffic, noise, lights, odors, dust and emissions/leak detection; coordination with local emergency responders regarding safety, fire and explosion risks, and proximity to schools; and risk to drinking water and potential spills. The document is attached to the Form 2A as document #2316335.

Public Comment Process

COGCC received 312 public comments for the Livingston Pad Form 2A and Form 2s. There were 152 comments on the Form 2s and 170 comments on the Form 2A. There were 166 unique comments, from approximately 130 commenters.

COGCC Rule 305.d. describes the process for receiving comment on each permit application submitted. In the case of the Livingston permits the normal 20 day comment period was extended first by 10 days by the Director based on the request of the Local Governmental Designee (LGD) and a second time at the Director's discretion since some members of the public expressed difficulty engaging with and using COGCC's public comment system. The comment period was open for a total of 36 days during which COGCC developed and released a new public comment portal that did not rely on the Silverlight™ software platform. COGCC Staff reviewed and considered all public comments received on the Form 2A and Form 2 permit applications, however, COGCC does not respond to each individual comment or commenter. This longstanding public comment review and response policy was explained by the Commission in the Statement of Basis and Purpose to the 2008 Rulemaking, addressing COGCC Rule 305. (2008 Statement of Basis and Purpose at p.18)

COGCC rules allow the Director to place technically feasible and economically practicable Conditions of Approval (COAs) on permits when necessary and appropriate. For the Livingston Pad Form 2A, COGCC worked with Extraction to develop site-specific BMPs for the Location and did not rely on prescriptive COAs. The BMPs were developed and applied to eliminate, minimize, or mitigate potential adverse impacts to public health, safety and welfare, including the environment; BMPs also provide specificity as to how Extraction plans to comply with certain provisions of COGCC rules.

The COGCC Oil and Gas Location Assessment (OGLA) group, Engineering group, and Permitting group reviewed the permits for compliance with COGCC rules. COGCC Staff found the Form 2 and Form 2A applications to be in compliance with COGCC's rules and with COGCC's mission to foster the responsible development of the state's oil and gas resource in a manner that will avoid or minimize adverse impacts, and protect public health, safety and welfare and the environment. The following section includes a discussion of some of the concerns and issues addressed in the public comments.

Public Comment Summary

The dominant sentiment expressed in public comments received by COGCC was the request for COGCC to deny the permit applications based on a variety of reasons. However, it is not within COGCC's statutory mandate to deny a permit for a well that the operator has a demonstrable right to construct

and mineral interest to develop unless the application fails to comply with COGCC Rules or the Colorado Oil and Gas Conservation Act.

Of the site-specific comments, most commenters expressed concerns about:

- The Operator Agreement between the City of Broomfield and Extraction;
- Submittal of permits to COGCC prior to finalizing the Broomfield CDP;
- Incorporating the BMPs as stated in the Operator Agreement into the Form 2A;
- Health and safety concerns regarding potential explosions, fires, and toxic releases;
- The siting of the Livingston Pad near the planned drinking water reservoir;
- The proximity of pads (including other Oil and Gas Locations proposed by Extraction) to a school;
- The proximity of pads (including other Oil and Gas Locations proposed by Extraction) to residential development;
- Traffic on Lowell Boulevard and Sheridan Parkway;
- Environmental concerns, including contamination from spills; or
- The Martinez lawsuit.

These concerns are discussed specifically in the sections that follow.

Operator Agreement with Extraction and Broomfield

Many comments expressed concerns that COGCC's permit process was not taking into account the Operator Agreement between Extraction and Broomfield. Aside from attending public meetings, presenting information to the City Council and Broomfield's Oil and Gas Task Force, and engaging in numerous meetings with Broomfield staff, COGCC was not party to the terms of the Operator Agreement and COGCC is not a signatory to the agreement. In its October meeting, COGCC Commissioners instructed staff to ensure that Extraction's Form 2A applications in Broomfield "comport with" the Operator Agreement. Consistent with the Commission's direction, Staff reviewed the Operator Agreement. COGCC finds that the proposed Oil and Gas Locations are those that were included in the executed Operator Agreement, including the Livingston Pad and that the negotiated BMPs and COAs are sufficiently protective of public health, safety, welfare and the environment, including wildlife resources. It is important to note that the exact terms and conditions of the Operator Agreement remain a private party agreement between two outside parties, and those terms and conditions are enforceable as civil matters by either party not the COGCC

Form 2A processing and approval prior to finalizing the Broomfield CDP

A dominant concern was that Extraction did not finalize the Broomfield CDP prior to submitting permits to COGCC.

COGCC is aware that Broomfield and Extraction had not finalized the Broomfield CDP prior to Extraction's submittal of the Form 2A and Form 2 permits to COGCC. However, COGCC's permitting process is independent from local permitting processes and operators commonly submit permit applications to COGCC prior to finalizing their agreements with local governments or obtaining their

local permits. The timing of Broomfield's permitting process is also independent of COGCC's permitting process. COGCC's Rules include a provision for an operator to elect to develop a Comprehensive Development Plan, however, the process engaged by Extraction and Broomfield was not intended to satisfy Rule 216 and COGCC was not involved in the development of the Broomfield CDP.

Incorporation of BMPs on the Operator Agreement into the Form 2A and Form 2

Public commenters also expressed concern that COGCC did not incorporate all BMPs in Exhibit B of the Operator Agreement onto the Form 2A or Form 2. The BMPs in Exhibit B related to surface equipment or operations, not downhole work and are discussed below as they relate to the Livingston Pad Form 2A.

Extraction submitted the Livingston Pad Form 2A with the BMPs from Exhibit B. COGCC evaluated these BMPs during the technical review and determined that many were not appropriate for inclusion on a Form 2A (COGCC's evaluation criteria is explained below). COGCC and Extraction worked to develop an alternative set of BMPs for the Form 2A and COGCC included Broomfield in this revision process. The BMPs incorporated into the Livingston Pad Form 2A are enforceable by COGCC and address human health, safety, welfare and the environment.

The terms and conditions in the Operator Agreement, including the BMPs in Exhibit B were negotiated and agreed to by Broomfield and Extraction; COGCC did not have a role in their development. Not including the Exhibit B BMPs on the Form 2A, does not diminish Broomfield's ability to enforce the BMPs and the other terms and conditions of the Operator Agreement.

BMPs on COGCC permits enforceable by COGCC carry the same weight as Rules, the Colorado Oil and Gas Conservation Act, and as other permit entries and information, including Conditions of Approval. COGCC does not include BMPs if (1) COGCC does not have the ability to respond to and resolve potential complaints regarding the BMP (not within COGCC's statutory authority), or (2) COGCC does not have the ability to inspect for compliance with the BMP (not within COGCC's jurisdictional authority or expertise).

COGCC used the following guidelines to determine if the Exhibit B BMP was appropriate for inclusion on the Livingston Pad Form 2A:

- Exhibit B BMPs that require compliance with local codes or local regulations cannot be regulated or enforced by COGCC and were not included on the Form 2A.
- Exhibit B BMPs that have subjective language where compliance determinations are made by Broomfield or a third party were not included on the Form 2A.
- Exhibit B BMPs that pertain solely to interactions between Broomfield and the operator (e.g. requirements for Extraction to meet with or provide notice or records to the local government) cannot be regulated or enforced by COGCC and were not included on the Form 2A.
- Exhibit B BMPs that restated a COGCC Rule or Rules were not included on the Form 2A because the operator is already required to comply with the COGCC Rules.

- Exhibit B BMPs that conflicted with or weakened a COGCC Rule or Rules or introduced language that would make it more difficult for COGCC to enforce a current Rule were not included on the Form 2A.
- Exhibit B BMPs that address issues that COGCC does not have authority to regulate and enforce (i.e. CDPHE or Federal jurisdiction) were not included on the Form 2A.

By using the above criteria, COGCC removed numerous Exhibit B BMPs, revised others, and replaced some with additional language appropriate for COGCC enforcement. This level of review results in a permit that COGCC's Field Inspection Unit has the authority to inspect and enforce, without sacrificing public health, safety or welfare and ensures that oil and gas operations are regulated in a consistent, effective manner throughout the state.

Health and Safety – concerns regarding Explosions, Fire and Toxic Releases

The majority of public comments expressed concerns about health and safety, with specific concerns about fires, explosions, and poisonous or toxic releases.

The Form 2A for the Livingston Pad contains information regarding the planned number of wells, number and type of facilities and distances from nearby homes and other building units. As mentioned above the proposed Location is not considered a Designated Setback Location.

Comments raising concerns regarding fires, explosions, and poisonous or toxic releases referenced an incident that occurred on an Oil and Gas Location operated by Extraction in December 2017, in which an explosion and fire occurred during flowback operations. The explosion and fire were confined to the Oil and Gas Location and although one contract worker was injured, no injuries to the public were reported. Extraction has reported to COGCC and Broomfield that it has examined its procedures and has taken numerous measures in response to the incident that they are implementing at all their Oil and Gas Operations, including at the Livingston location. These are detailed in Extraction's April 18, 2018 letter to Broomfield, which has been attached to the Livingston Form 2A as document # 2316327.

Planned reservoir and drinking water concerns

COGCC has been aware of Broomfield's plans to construct a drinking water reservoir west of Sheridan Boulevard and south of the Northwest Parkway since meetings with the LGD and other staff in 2011. The proximity of this proposed drinking water resource has factored into COGCC's review of the Livingston Pad Form 2A. The reservoir plans have changed somewhat over time, including the reduction in size and the resultant movement farther west from the proposed Livingston Pad. Several measures have been incorporated into Extraction's plans to ensure the safety of the drinking water supply, once the reservoir is constructed.

A pipeline network will be in place to transport oil, gas, and produced water from the location. The pipeline will eliminate the need for large capacity liquids storage (tanks) and loading and transport via trucks. The reduced quantities of liquids stored on site and reduced handling will decrease the likelihood of a spill and further decreases the potential for a large spill.

Although oil and water storage tanks are not listed on the Form 2A, COGCC recognizes that there will be vessels on location for retention time and liquids separation, and flashing off volatile gasses to stabilize the oil or condensate before transport and to store liquids during maintenance. The production facilities will be remotely monitored through Extraction's SCADA system for upset conditions, loss of pressure, and other alarms which would indicate a spill. The monitoring system will allow for remote shut in, if necessary, and will have automatic shut in capabilities for certain situations.

Leak detection and flowline integrity - Extraction provided a best management practice for a leak detection plan following COGCC rules 604.c.(2).F. The leak detection plan BMP includes monitoring production facilities on daily to weekly basis by visually inspecting wellheads, vessels/tanks, and fittings. An infrared camera will be used to inspect above ground flowlines and piping on a quarterly basis for the first five years. Extraction has committed to bi-annual flow line testing per COGCC regulations. Testing flowlines twice as often as required by COGCC allows for earlier detection of potential leaks. Although the results of the individual inspections and pressure tests will not be provided to COGCC (for efficiency purposes), Extraction must maintain records of their inspections and COGCC can inspect them at any time, if necessary.

Secondary Containment - The separators and transfer tanks will have lined secondary containment. The location will also have perimeter (tertiary) containment.

Extraction has committed to meet COGCC Rule 604.c.(2).G for process vessel or containers to be in a lined area with a steel-ring berm that is sized to hold 150 percent of the largest single vessel or container. The secondary containment for the production on location includes a synthetic or engineered liner that is tied back to the steel ring, preventing spill from leaving the contained area. Tertiary containment, consisting of an earthen berm, will surround the production facilities. All new equipment will be anchored to avoid movement during flooding conditions.

Extraction will install a system for the automated and remote (manual) monitoring and shutdown of production facilities. The system will automatically notify Extraction in the event of abnormal operations and Extraction will have the capability to remotely shut down production. If necessary, the system will automatically shut down production in emergencies. As part of the system, Extraction has designed the site with safety valves controlled by a programmable logic computer at each wellhead.

Proximity to schools

The planned Livingston location is greater than a mile from any existing school or other COGCC defined High Occupancy Building Unit. The planned siting of the Oil and Gas Location is in compliance with COGCC Rules which allow administrative permit approval if a proposed well or production facility is greater than 1,000 feet from a High Occupancy Building Unit.

Martinez Lawsuit

The COGCC received several comments regarding whether the Court of Appeals holding in the "Martinez" case (*Martinez v. Colo. Oil & Gas Conservation Comm'n*, 2017 COA 37) is applicable to staff's

review of the Livingston Pad Form 2A. The Court of Appeals' decision in *Martinez* is currently under review by the Colorado Supreme Court. Staff conducted its review of the Livingston Pad Form 2A in accordance with its Rules and the Colorado Oil and Gas Conservation Act. The COGCC's Rules provide for the protection of public health, safety, and welfare in connection with oil and gas development.

Volatile Organic Compound and Odor Concerns

Several public comments expressed concern with the health effects of potential air emissions and the odors associated with oil and gas operations. Extraction has provided BMPs on the Form 2A to address odors during the drilling, completions and flowback, and production phases of operation:

- **Drilling Phase:**
Extraction has committed to using a synthetic and diesel mix drilling mud with less aromatic properties than full diesel mud. A mud cooling system will be used to minimize the volatilization of hydrocarbons in the drilling mud. Extraction committed to using additives to prevent odors, but will not mask odors with the use of fragrances.

Extraction has committed to using an electric rig for drilling, minimizing diesel exhaust. The distance to nearby Building Units will dissipate exhaust from vehicles and other equipment.

- **Completions/Flowback Phase:**
During completions and flowback, Extraction has provided information in compliance with COGCC Rule 805 and 912 for green completions. Flaring will only occur during upset conditions. Emissions control devices will be used during completions and flowback that meet CDPHE regulations. Extraction has committed that saleable gas will not be flared but either directed to a pipeline or the wells will be shut-in until the gas line is available.

Extraction has committed to ambient air monitoring for Volatile Organic Compounds (VOCs) and explosive gases during flowback with "4-gas" monitors placed throughout the Oil and Gas Location. The monitors will have high level alarms for worker safety and personnel will be trained to respond to alarm conditions.

- **Production Phase:**
Extraction has committed to a tankless location with piping of liquids and gas to an offsite centralized processing facility in Weld County. Eliminating production tanks eliminates the opening of thief hatches on tanks during truck load-out and thereby eliminating that source of hydrocarbon emissions to the atmosphere. There will be an emissions control device on location for controlling by-product from the separation process. Saleable gas will not be flared, unless in emergency or upset condition as allowed by COGCC Rules.

Production equipment on location will be powered by electricity, minimizing the need for diesel or natural gas generators, therefore minimizing exhaust sources from the location. The gas generator planned on the location a backup if there is an interruption in electricity.

The leak detection plan includes daily, weekly, and quarterly monitoring (both visually and with an infrared camera) of wellheads, production vessels, and fittings which will minimize the release of hydrocarbon vapors to the atmosphere. Additionally, Extraction has committed to

conducting flowline integrity tests twice annually to identify subsurface leaks in a timely manner.

Traffic Concerns

Extraction has committed to coordinating a traffic plan with Broomfield prior to commencement of drilling operations. Extraction has committed to transporting fresh water to the Livingston Pad via pipeline for completions operations. The planned liquids pipeline will eliminate the truck transport of oil and produced water from the location. The use of pipelines will result in a major reduction of truck traffic during the completion and production phases of operations.