

July 26, 2018

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

Re: Noble Energy, Inc. Preliminary Comprehensive Drilling Plan Comments

Dear Director Murphy:

The Colorado Department of Public Health and Environment (the Department) is providing comments on the preliminary Noble Energy, Inc. (Noble) Comprehensive Drilling Plan (CDP) located in Weld County (Docket No. 180700613).

The Department commends Noble for their holistic approaches to oil and gas exploration and production. Noble has, and will continue to be, an important leader throughout Colorado. The preliminary CDP is yet another example of that commitment to excellence.

The Department respectfully recommends that Noble employ best management practices throughout the project area and is providing comments on the following topics:

- Inspector access
- Electrical equipment and devices
- Odors from drilling and completion activities
- Management of exploration and production waste
- Installation of pipelines
- Leak detection and repair
- Plugging and abandonment of vertical wells

Inspector access

The ability to provide compliance oversight is important to both the Department and to Noble. From time to time, inspectors with the Department's Air Pollution Control Division have experienced challenges accessing portions of the CDP area. In order to facilitate compliance inspections, the CDP might address the right of access for all relevant portions of the CDP area. The Department acknowledges that the issue of inspector access may be potentially contentious and it understands the legal and historical challenges of this issue. However, the Department notes that the CDP process is designed to overcome challenges like this and facilitate solutions for all parties. The Department is appreciative of the steps Noble has taken to date on this matter and is confident that a solution will be secured going forward.



Electrical equipment and devices

The Department acknowledges that Noble's Gen IV Econode design will encourage implementation of "fit for purpose" automation, according to electrical and control schematics. The Department recommends that Noble utilize electrical equipment and devices to the extent practicable in order to reduce emissions from diesel and natural gas powered equipment and devices.

Odors from drilling and completion activities

The Department supports Noble's commitment to limit odors from materials storage. The Department recommends that Noble continue to pursue methods and practices to reduce odors during each phase of the exploration and production process throughout the duration of the CDP, including but not limited to: using chillers and chemicals to mask or neutralize hydrocarbon odors emulating from drilling mud; using a squeegee to remove drilling fluids from the drilling pipe as they exit the wellbore and; using covered containers to store the drilling mud on the well site and; minimizing the use of diesel fuels as additives in drilling mud.

Management of exploration and production waste

The Department acknowledges that Noble will dispose of exploration and production waste, including oil-based mud, to an offsite disposal facility in Colorado which is approved by the Department. The Department recommends that the CDP's section on exploration and production waste management (section 5, page 10) be revised to include testing for and proper disposal of technologically enhanced naturally occurring radioactive materials (TENORM). Additionally, Noble is encouraged to follow and participate in the TENORM stakeholder process currently being undertaken by the Department's Hazardous Materials and Waste Management Division. Information about this stakeholder process can be found at <https://www.colorado.gov/pacific/cdphe/tenorm-reg-dev>.

Management of Flowback and Produced Water

The Department acknowledges that Noble intends to dispose of flowback and produced water through licensed third-party wastewater injection facilities. The Department believes this is the preferred method compared to disposal by evaporation in open surface impoundments. However, the Department encourages Noble to consider all available means to recycle and reuse these waters beneficially.

Installation of pipelines

The Department supports Noble's commitment to not commence commercial production at any specific oil and gas location until adequate pipeline takeaway capacity is available at the facility. This practice ensures that green completions will be utilized to the extent practicable during flowback operations and that the flaring of natural gas will be minimized, thus reducing emissions from well sites.

Minimization of Flaring

The Department supports Noble's commitment to ensure gas gathering pipelines are in place and to not use flares at any location except in emergencies and during maintenance. The CDP



area is within the Denver Metro/North Front Range (DMNFR) ozone nonattainment area. The flaring of natural gas produces nitrogen oxides (NOx) as well as additional volatile organic compound (VOC) emissions due to incomplete combustion. Both pollutants contribute to ozone formation.

In 2008, EPA came out with a stricter ozone standard and the DMNFR was designated as a “Marginal” nonattainment area for this standard. Although Colorado’s air quality is getting better, meeting the 2008 ozone standard continues to be a challenge.

The Department recommends that Noble limit the use of flares to the extent practicable in order to facilitate emission reduction efforts.

Implementation of “Tankless” Facility Design

The Department supports Noble’s commitment to expand the use of their Gen IV Econode design in the proposed development area. The Department believes well production facility design to minimize or eliminate the use of traditional atmospheric hydrocarbon and produced water storage tanks controlled by flares is the best practice. This design reduces or eliminates a significant contributor (e.g. storage tanks) of VOC and NOx emissions which are the primary contributors to ozone formation. When supported by 3-phase gathering system pipelines, Noble is also able to reduce or eliminate substantial truck traffic and hydrocarbon loading loss emissions that otherwise occur from transfer to and transport of produced fluids off site via mobile sources. Noble is to be commended for their efforts to date around their Econode design.

Leak detection and repair

The Department supports Noble’s commitment to incorporate routine best practices under its Leak Detection and Repair (LDAR) program including the use of infrared cameras and other innovative technologies for leak detection. The Department stands ready to support Noble’s pursuit of any “next generation” detection technologies.

Plugging and abandonment of vertical wells

The Department supports Noble’s commitment to plug and abandon virtually all legacy vertical wells operated by Noble in the CDP area. The Department recommends that the CDP’s section on plugging and abandonment (section 11, page 10) be revised to include a requirement that Noble implement measures to control unnecessary and excessive venting, to protect public health and the environment, and to ensure that vapors and odors from well plugging operations do not constitute a nuisance or hazard to public welfare.

Conclusion

The Department applauds Noble for its work to date to develop a strong CDP. As the preliminary CDP develops over the coming months, the Department may submit additional comments in an effort to minimize the impacts from oil and gas operations on public health and the environment.



Sincerely,

Sean Hackett
Oil and Gas Liaison
Colorado Department of Public Health and Environment

