

Study Finds Spreading of Conventional Oil and Gas Wastewater Poses Danger to Environment and Human Health

December 1, 2022

FNREL Mineral and Energy Law Newsletter

Pennsylvania – Oil & Gas

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On May 26, 2022, Penn State announced that a health study commissioned by the Pennsylvania Department of Environmental Protection (PADEP) to examine the environmental and human health impacts of spreading conventional oil and gas produced water (OGPW) as a dust suppressant concluded the practice is ineffective for that purpose and poses dangers to the environment and human health. See News Release, Tim Schley & Ashley J. WenersHerron, Penn State Coll. of Eng'g, "Oil and Gas Brine Control Dust 'No Better' than Rainwater, Researchers Find" (May 26, 2022). The announcement coincided with PADEP's finalization of the study. See William Burgos et al., Penn State Univ., "Evaluation of Environmental Impacts from Dust Suppressants Used on Gravel Roads" (May 26, 2022) (Study).

Historically, road spreading OGPW was authorized in Pennsylvania, but PADEP placed a moratorium on the practice in response to a 2018 legal challenge and subsequent decision by the Environmental Hearing Board. See *Lawson v. PADEP*, EHB Docket No. 2017-051-B (May 17, 2018). In accordance with Pennsylvania solid waste laws, using OGPW on roads for dust control could continue if conventional operators demonstrated the chemical makeup of the wastewater was similar to commercially available dust suppressants.

The Study assessed the effectiveness and environmental impacts associated with various dust suppressants used on dirt and gravel roadways, which included testing synthetic rainwater, calcium chloride (CaCl_2) brine, soybean oil, and OGPW from three conventional oil and gas operations.

PADEP presented the study results at the July 25, 2022, Oil and Gas Technical Advisory Board meeting. In sum, the study found that OGPW is no more effective than rainwater as a dust suppressant on roadways, likely due in part to OGPW's high sodium concentrations, which can affect how OGPW "sticks" to dust particles. Further, the study showed OGPW actually destabilized gravel roadways, which could lead to more dust and increased long-term road maintenance costs. According to the study results, only CaCl_2 -based brines and soybean oil were effective dust suppressants, with the study's rainfall-runoff experiments showing that CaCl_2 -based brines led to the lowest concentration of total suspended solids washed off the roadbeds. Study at 9.

The study also found that runoff from spreading OGPW on unpaved roadways contained concentrations of barium, strontium, lithium, iron, and manganese that exceeded human-health based criteria and levels of radioactive radium that exceeded industrial discharge standards. In addition, most contaminants contained in the applied dust suppressants washed from the roadbed during rain events. However, roadbeds treated with OGPW retained traces of radium, sodium, iron, and manganese after rainfall events and had the highest concentration of combined radium in runoff. *Id.* at 9–10. The study supports Penn State's conclusions from a similar peer-reviewed study published in 2021. See Audrey M. Stallworth et al., "Efficacy of Oil and Gas Produced Water as a Dust Suppressant," 799 *Sci. of the Total Env't* 149347 (2021).

On September 20, 2022, PADEP informed the Citizens Advisory Council (CAC) that analysis of brine as a co-product submitted by conventional operators to allow for spreading on roadways for dust control did not meet the state's residual waste regulations. PADEP is currently updating waste disposal and handling standards for conventional operations and a draft rulemaking is expected to be presented to oil and gas advisory committees following the December 18, 2022, Pennsylvania Grade Crude Development Advisory Council meeting. See Meeting Minutes, CAC (Sept. 20, 2022); PADEP, "October 2022 Report to the Citizens Advisory Council" (Oct. 2022). A report from PADEP detailing, among other things, conventional operators' compliance with state environmental and regulatory requirements was due to the Governor's Office on September 1, 2022, but has not been made public as of the time

of this report. See 52 Pa. Bull. 4229 (July 30, 2022).

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