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Pennsylvania Environmental Quality Board

Re: Proposed Rulemaking: Control of VOC Emissions from Oil and Natural Gas Sources (Regulation #7-544)

Submitted by email to RegComments@pa.gov

July 27, 2020

Dear Environmental Quality Board members:

Earthworks thanks the Department of Environmental Protection (DEP) for presenting this final draft of the proposed rulemaking for Control of VOC Emissions from Oil and Natural Gas Sources for the oil and gas sector and for the opportunity to submit public comment.

Please accept these comments on behalf of Earthworks, a national nonprofit organization committed to protecting communities and the environment from the impacts of mining and energy development while seeking sustainable solutions. For more than 25 years, we have fulfilled our mission by working with communities and grassroots groups to reform government policies, improve corporate practices, influence investment decisions, and encourage responsible materials sourcing and consumption.

Earthworks also supports, by reference here and as signatories, technical comments regarding this rulemaking submitted by the Clean Air Council.

In sum, we applaud the DEP's decision to exceed the federal Control Technique Guidelines (CTGs) in some areas, and to incorporate many strong aspects of federal New Source Performance Standards (40 CFR Subpart OOOO and OOOOa), including quarterly leak detection and repair (LDAR). We support the strong repair schedule of five and fifteen days for the first and final repair attempts, respectively. We also commend the threshold of 500 parts per million (ppm) of methane or equivalent for defining a "leak" using a gas detector instrument.[1]

We are also pleased that the DEP took the important step of officially grounding the rule in the Pennsylvania Air Pollution Control Act, which affirms the Department's mandate to protect the health and welfare of Pennsylvania residents. This step in effect connects the current rulemaking to the fact that oil and gas operations release significant levels of methane and ethane, which contribute to the formation of ground-level ozone.[2]

We note that continued expansion of the oil and gas industry in Pennsylvania challenges the state's ability to maintain overall air quality standards, particularly in light of its inclusion in the Ozone Transport Region, a 13-state area across which the US Environmental Protection Agency requires measures to control pollutants that create ozone.[3]

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202.887.1872
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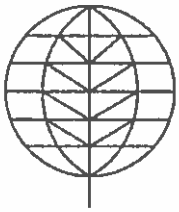
[1] Proposed rule, §129.122, Definitions, Acronyms, and EPA methods.

[2] Fiore, A. M., West, J.J., Horowitz, L.W. et al. "Characterizing the tropospheric ozone response to methane emission controls and the benefits to climate and air quality." *Journal of Geophysical Research*, 2008.

[3] Regulations for Ozone Transport Regions are in CAA §184. See also EPA, Nonattainment and Ozone Transport Region (OTR) SIP Requirements," https://www.epa.gov/ground-level-ozone-pollution/nonattainment-and-ozone-transport-region-otr-sip-requirements



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As discussed below, Earthworks believes that key improvements to the proposed rule are still required to ensure meaningful emissions reductions and prevent further erosion of the climate and Pennsylvanians' health. As recent studies confirm, the shale gas boom of the last decade has worsened the state's air quality,[4] while the industry's emissions appear to be nearly 16 times higher than what operators report to the state.[5]

Importantly, none of the high-level improvements recommended in the following comments would expand the scope of the rule, but they are essential to ensuring that the rule lives up to its stated purpose of helping protect human health, the environment, and the climate.

For several years, DEP staff, the environmental community, and impacted residents have been engaged in this rulemaking process, as well as the associated adoption of general permits for pollution control at unconventional oil and gas operations. The additional changes detailed here are essential to reflect the public's input and knowledge about pollution impacts due to Pennsylvania's oil and gas operations.

Earthworks' two key recommendations are also being made by numerous other organizations and impacted residents statewide engaged in this rulemaking process: remove the exemption for low-producing operations and the step-down provision for LDAR requirements. Notably, these changes were also highlighted in a recent statement on Pennsylvania's proposed rule by a group of 50 investors with nearly $4 trillion in assets.[6]

Apply rules equally by eliminating the low-producer exemption

The conventional oil and gas industry is a substantial contributor to Pennsylvania's air pollution and climate impact, and should not be exempted from this rulemaking. Yet, the current draft of the rule does not apply LDAR requirements to low producers--and therefore the vast majority of conventional well sites.

In fact, DEP estimates that only about 300 conventional oil and gas wells would be covered by the proposed rule, out of the more than 71,000 that report production volumes to the state.[7] In addition to the sheer number and geographic spread of conventional wells, they continue to account for many regulatory violations, the proportion of which increased in the last two years.[8] This calls into question whether and how conventional operators are inspecting and maintaining their sites and controlling pollution--a problem that would be addressed in part through LDAR requirements.

In 2016, a peer-reviewed study on methane leaks from oil and gas operations in the Marcellus Shale region concluded that conventional wells can have far higher leakage rates than unconventional ones due to a greater prevalence of equipment maintenance problems.[9] This underscores why "low producing" wells aren't necessarily "low emitters."

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[4] Mayfield, E.N., Cohon, J.L., Muller, N.Z. et al. "Cumulative environmental and employment impacts of the shale gas boom," *Nature Sustainability*, 2019.

[5] Environmental Defense Fund, Explore Pennsylvania's oil and gas pollution, https://www.edf.org/energy/explore-pennsylvanias-oil-and-gas-pollution

[6] Ceres, "50 investors with US$4 trillion in assets back strong methane emissions regulations in Pennsylvania," July 9, 2020, https://www.ceres.org/news-center/press-releases/50-investors-us-4-trillion-assets-back-strong-methane-emissions

[7] DEP, Executive Summary, Control of VOC Emissions from Oil and Natural Gas Sources 25 Pa. Code Chapters 121 and 129, December 2019. https://www.dep.pa.gov/Business/Air/Pages/Methane-Reduction-Strategy.aspx

[8] DEP, 2018 Oil and Gas Annual Report. https://www.depgis.state.pa.us/2018OilGasAnnualReport/index.html

[9] Omara, Sullivan, Li, et al. "Methane Emissions From Conventional and Unconventional Natural Gas Production Sites in the Marcellus Shale Basin." *Environmental Science and Technology*. February 2016.

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At the same time, non-Marcellus Shale operators are not required to report their emissions to DEP, obscuring their contribution to the state's pollution burden. However, a recent scientific analysis estimated that over half of Pennsylvania's methane emissions from oil and gas wells come from conventional operations.[10] It is therefore faulty and risky for DEP to assume that they *don't* emit at levels high enough to have a significant impact on air quality and climate.

Using industry-standard optical gas imaging (OGI) technology, Earthworks has documented problems at conventional wells in Pennsylvania, including frequent leaks from well casings and emissions from tank batteries. We have reported this pollution to the DEP (and Department of Conservation and Natural Resources as appropriate) via formal complaints; however, we have also documented continued problems during repeat visits to some of these facilities. This OGI footage can be viewed at the links in the following table.

Operator and site name	Location	OGI footage
Coastal Petroleum Corporation Mallory Warrant 4874 Well #1	McKean County	https://youtu.be/DACt4a4dbm0
Unknown operator Sugar Run 2 Well Site	McKean County	https://youtu.be/3aOzxOE3X-Q
Unknown operator Unknown Well Site on Fire Road	McKean County	https://youtu.be/8lJ6xdFQ1J8
Snyder Brothers, Inc. South Swamp Angel 5571-10 Well Site	McKean County	https://youtu.be/pl0Ue2-WhSI
American Oil FC-172 Well Site	McKean County	https://youtu.be/twR7zu4mWjQ
Diversified Gas & Oil Miller-B Well Site	McKean County	https://youtu.be/DPWbtBzsmio
Unknown operator Unknown Site, API #37-083-48889	McKean County	https://youtu.be/mg1OPUOrtI4
Allshouse	McKean County	https://youtu.be/yE6KuWk_hwA

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[10] Environmental Defense Fund, Pennsylvania's Oil and Gas Emissions Data, 2020, https://www.edf.org/pa-oil-gas/#/air-emissions

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Sugar Run #122 Well Site		
Howard Drilling, Inc. WT 3122 #1 Morris	McKean County	https://youtu.be/xMXzkt052hQ
Wilmoth Interests, Inc. OGO-30524	McKean County	https://youtu.be/zwsThH-H3wg
Howard Drilling, Inc. WT. 3122 #43	McKean County	https://youtu.be/o34BxgWwPtA
Snyder Brothers, Inc. Lot 3 #48	McKean County	August 2019: https://youtu.be/HWvVcsqSSLk August 2018: https://youtu.be/5wVe2HdhihM
Bull Run Resources LLC Fogle Well # 310	Warren County	https://youtu.be/h0NDVqXt9YE

A prime example of the importance of requiring LDAR for low-producing wells can be seen in the Snyder Brothers Inc. Lot 3 #48 well. In August 2018, Earthworks conducted OGI to document emissions from a tank hatch and a leak near the well shaft; we reported these problems to DEP in a formal complaint. A DEP inspector responded and visited the site, later reporting to Earthworks staff that he had tightened the well shaft part that was leaking.

The inspector acknowledged that the amount of leaking gas shown in the OGI video we submitted appeared significant, but that he could not issue a violation to Snyder Brothers for either the tank emissions or the leak because current Pennsylvania regulations allow such well sites to release large quantities of emissions. When asked how long these components had been leaking, the inspector indicated there was no way of knowing. According to DEP well production records, the last site inspection was conducted five years prior--meaning the leak and tank emissions could have persisted for years without detection or repair.

Standardize LDAR requirements by removing the step-down provision

The proposed rule includes requirements that operators conduct LDAR on a quarterly basis. However, in short order the rule deeply undermines the potential effectiveness of this requirement by allowing operators to decrease the frequency of LDAR if operators self-report a low percentage of leaks in the course of just half a year (two quarterly inspections).

This "step down" provision is counterproductive because leaks can occur any time and are more likely to occur if equipment is not fully inspected and maintained at regular, frequent intervals. Through Earthworks' extensive field experience in Pennsylvania and other oil and gas producing states, we have found examples of leaks that recur after an initial fix or that were missed in recent inspections.

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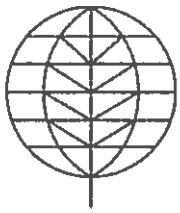

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For example, at the low-producing Snyder Brothers well described above, Earthworks documented subsequent leaks just one year after our initial investigation and the fix made by the DEP inspector. In August 2019, we returned to the site and again documented tank hatch emissions along with seemingly new (or at least previously undetected) leaks from valves at a small compressor at the site.

In addition, even small leaks can release large volumes of emissions if left unaddressed. Basing the provision on the percentage of leaking components is illogical and problematic, as it does not address the *volume* of emissions being released. This approach is designed to reduce the workload and costs for operators, but compromises emissions control. If leaks are not detected in a timely manner and are allowed to persist for long periods of time, they can have a considerable cumulative impact on air quality, health, and the climate.

Add clarity and verifiability to LDAR program

We encourage DEP to clarify its criteria for acceptable leak detection methods. Regarding LDAR requirements, the proposed rule allows for use of OGI, gas detectors compliant with the US Environmental Protection Agency's (EPA) Method 21, or "[a]nother leak detection method approved by the Department." The rule does not specify what process the DEP would use to consider and approve alternative methods; such ambiguity in criteria and standards could create a risk to the DEP regarding the effectiveness of the LDAR requirement.

Further, there is a risk that the rule relies heavily on audible, visible, and olfactory (AVO) inspections to detect leaks from fugitive emissions components and covers and closed vent systems. It prescribes monthly AVO inspections to detect "defects that could result in air emissions." While AVO methods may help alert inspectors to the presence of some leaks, AVO is not a substitute for a robust LDAR program.

Using OGI cameras, Earthworks has documented leaks at many facilities in several states that do not exhibit audible, visual (to the naked eye), or olfactory signals of a leak. In these cases, an AVO inspection would have resulted in a "false negative," and the leaks would have gone undetected and unrepaired.

Further, AVO relies on the subjective experiences of workers and inspectors and variable conditions (e.g., wind direction and noise levels). Some emissions sources--such as vapors from tall condensate tanks--may not be located in such a way as to be detectable by sound, sight, or smell. In our fieldwork experience, using an olfactory test is especially challenging because chemical and gas odors constantly permeate some sites.

AVO inspections are at best a necessary screening tool, but should be employed in conjunction with--rather than as a substitute for--a reliable leak detection method. Furthermore, DEP should maximize the potential effectiveness of this method by strengthening the AVO inspection requirement to require weekly, rather than monthly, AVO inspections. By way of example, the New Mexico Environment Department (NMED) recently released draft regulations that propose requiring weekly AVO inspections.[11]

California's greenhouse gas reduction rules for the oil and gas sector stipulates that operators should conduct quarterly inspections of their sites using OGI as a screening tool

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[11] New Mexico Environment Department, Oil and Natural Gas Regulation for Ozone Precursors, §20.2.50. https://www.env.nm.gov/new-mexico-methane-strategy/wp-content/uploads/sites/15/2020/07/Draft-Ozone-Precursor-Rule-for-Oil-and-Natural-Gas-Sector-Version-Date-7.20.20.pdf-Precursor-Rule-for-Oil-and-Natural-Gas-Sector-Version-Date-7.20.20.pdf

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to find visible leaks, followed by measurement using a gas analyzer.[12] In Colorado, operators with oil and gas pollution sources within 1,000 feet of residences, schools, businesses, and recreational venues are required to conduct inspections using OGI more often than in other settings.[13]

As a way to strengthen the effectiveness of LDAR and reduce the burden upon regulators and the regulated community, we suggest that DEP consider an alternative compliance pathway using third-party verification as a complement to required LDAR compliance schedules.

DEP and operators could partner with third parties such as private consultants, academic institutions, and non-governmental organizations to detect and report emissions leaks. DEP could require third party verifiers to use the same or similar approved leak detection methods (i.e., OGI or EPA Method 21). These parties could provide valuable assistance to regulators and operators by revealing leaks most in need of repair, in turn allowing DEP to focus inspection and enforcement resources more efficiently.

We also strongly recommend that the DEP incorporate provisions to allow credible, third-party information indicating operator noncompliance submitted to or obtained by the Department as evidence of a presumed violation, as proposed in the draft NMED regulations.[14]

Strengthen additional provisions in the rule

We strongly recommend that DEP eliminate gaps in the proposed rule by strengthening the following provisions:

- Include all sources covered in Pennsylvania's general permits (GP5 and GP5a).[15] There is simply no logical reason to exempt from regulation certain existing sources that DEP deems worthy of coverage at new sites. Pollution control requirements for new and existing sources should be consistent and as comprehensive as possible. Currently, the proposed rule does not specify requirements for emissions control of internal combustion engines, truck load-out, enclosed flares, liquids unloading, or pigging operations.
- Require that all operators use zero-bleed pneumatic controllers. Federal New Source Performance Standards for methane and VOC control encourage the replacement of continuous bleed pneumatics, and it is possible to further reduce emissions by requiring zero-bleed controllers. For example, California no longer allows installation of any continuous bleed pneumatic controllers, with British Columbia soon to follow suit. DEP should consider whether a situation of "zero bleed" could be attained by routing exhaust back to the gas stream or to an enclosed flare, or electrifying the unit.

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[12] CARB, Oil and Gas Methane Regulation, https://ww2.arb.ca.gov/resources/fact-sheets/oil-and-gas-methane-regulation

[13] Colorado Air Quality Control Commission, Regulation 7, Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions, adopted December 19, 2019. https://www.colorado.gov/pacific/cdphe/aqcc-regs

[14] Part 20.2.50.27 of https://www.env.nm.gov/new-mexico-methane-strategy/wp-content/uploads/sites/15/2020/07/Draft-Ozone-Precursor-Rule-for-Oil-and-Natural-Gas-Sector-Version-Date-7.20.20.pdf

[15] Permits posted at DEP's Framework of Actions for Methane Reductions from the Oil and Gas Sector, https://www.dep.pa.gov/Business/Air/Pages/Methane-Reduction-Strategy.aspx

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- Apply the 2.7 tons per year (tpy) potential to emit (PTE) emissions threshold for LDAR requirements at *all* existing tanks at all facilities. Operators should be prohibited from skirting this requirement by splitting their PTE into multiple, interconnected tanks, referred to as tank batteries. Instead, DEP should specify that the PTE covers the entire combined tank system.
- Increase the emissions reduction requirement for control devices to 98%, as proposed in previous versions of the rule. Given the severity of the methane and VOC pollution problem, and the availability of technologies to maximize emission control, operators should be required to do better.

Ensuring accurate emissions measurement and reporting

In order to determine the effectiveness of the proposed rule and any other emissions reduction measure, DEP will need to ensure more comprehensive and accurate emissions reporting and measurement. We take this opportunity to describe further measures for DEP's consideration going forward.

Require conventional industry emissions reporting. Several years ago, DEP took the positive step of requiring operators of unconventional wells and facilities to report their greenhouse gas, VOC, and hazardous air pollutants to the state. DEP should uniformly require *all* operators to report their annual hydrocarbon emissions. Allowing the conventional industry to avoid this requirement deprives Pennsylvanians of a full and accurate picture of the oil and gas industry's contribution to air pollution and climate change, and as discussed above, makes indefensible any assumption that the conventional industry is *not* a significant source of emissions. The DEP should ensure public access to and transparency of emissions reporting for the conventional industry, as it does with data for the unconventional shale industry.

Expand field measurement projects to determine actual volumes of oil and gas pollution. Operators should continue to be required to report data to DEP emission inventories, even though this does not provide a full, accurate picture of emissions volumes. Several studies demonstrate that measured emissions can be significantly higher than what operators report to inventories, including in Pennsylvania.[16] Field measurements should occur at minimum near significant pollution sources (e.g., compressor stations, processing plants, and large well pads). DEP should then integrate this information into its review of the data submitted by operators to emission inventories to verify the accuracy of those data.

Develop an inventory of "excess" emissions. It's important to track and assess events that cause pollution above permitted levels (e.g., malfunctions and 'blowdowns'). Given Pennsylvania's climate goals and expressed commitment to reining in oil and gas pollution, greenhouse gases, VOCs, and hazardous air pollutants should be included in this inventory. These data would aid in determining whether state policies and regulations to rein in oil and gas pollution are actually effective, or not.

This inventory would also help paint a clearer picture of oil and gas impacts on health. Environmental health research confirms that large, episodic emission events can cause

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[16] Alvarez, R.A., Zavala-Araiza, D., Lyon, D.R. et al. "Assessment of methane emissions from the US oil and gas supply chain." *Science*, 2018; Barkley, Davis, Feng, et al. Forward Modeling and Optimization of Methane Emissions in the South Central United States Using Aircraft Transects Across Frontal Boundaries." *Geophysical Research Letters*, 2019.

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health impacts immediately or in as little as 1-2 hours, in part because toxicity is determined by the concentration of the chemical and intensity of exposure.[17]

Expand and improve both methane and VOC monitoring in oil and gas regions. Accurate data is the only way to know the levels of health-harming pollution Pennsylvanians are being exposed to. Given the role of methane and ethane in forming ground-level ozone pollution, reducing oil and gas emissions will be key to Pennsylvania's ability to meet federal air quality standards.

More monitors are needed in areas with growing numbers of oil and gas wells and facilities, particularly in close proximity to more developed and populated areas. The public should be able to access regularly updated information on the monitors and facilities near them. While DEP's ambient air monitoring network has expanded in recent years, the pollutants being tracked are limited and inconsistent, while key oil and gas areas continue to lack coverage.[18]

Thank you for your consideration and the opportunity to comment on the proposed rule, and all the work and agency resources invested in its development. The vital adjustments described above will help ensure that this proposed rule can result in meaningful reductions in the oil and gas industry's pollution and, in turn, impacts on health and climate in Pennsylvania.

Sincerely,

Leann Leiter
Pennsylvania & Ohio Field Advocate
Earthworks' Community Empowerment Project
PO Box 142, Canonsburg, PA 15317
lleiter@earthworks.org
202-899-5681

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Washington, DC 20006
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[17] Brown, D., Weinberger, B., Lewis, C., and Bonaparte, H. "Understanding exposure from natural gas drilling puts current air standards to the test." *Reviews on Environmental Health*, 2014.

[18] Comments on Pennsylvania's 2018 Annual Ambient Air Monitoring Network Plan, July 2018. https://earthworks.org/cms/assets/uploads/2019/01/PA-DEP-2018-Air-Monitoring-Network-Plan.pdf