

Loud and Clear

What public regulatory complaints reveal about Ohio's oversight of oil and gas pollution and whom it serves

SEPTEMBER 2020



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Report available at earthworks.org/loudandclear-OH

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Earthworks is dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

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1

Introduction: The Oil and Gas Pollution Threat

The rapidly expanding oil and gas industry in Ohio is releasing large volumes of greenhouse gases – despite the scientific consensus that current fossil fuel pollution must instead be greatly curtailed to prevent the most catastrophic effects of climate change.¹ This includes methane, which is 86 times more powerful than carbon dioxide over a 20-year time scale.²

At the same time, air quality is threatened in the communities living near oil and gas operations. The main reason is increased pollution from methane and volatile organic compounds (VOCs), which science associates with a range of health problems.³

Yet despite these trends, policymakers (and the general public) continue to assume that state and federal governments have both the will and the resources to adequately oversee a complex and increasingly polluting industry. Years of research and field experience by Earthworks have demonstrated that this is not the reality on the ground.⁴

Currently, state regulatory and enforcement agencies are:

- Inconsistent and insufficient in how they respond to the public
- Primarily focused on issuing permits quickly
- Underfunded and short-staffed
- Subject to the political influence of the oil and gas industry



Earthworks' Community Empowerment Project: Documenting Pollution to Protect People and the Planet

Earthworks started the Community Empowerment Project (CEP) because the oil and gas industry is putting people and the climate at risk – and agencies are failing in their responsibility to prevent that from happening.

Most air pollution from oil and gas operations is invisible, making it easy for companies and regulators to dismiss residents' concerns. CEP's certified thermographers use optical gas imaging (OGI) to make visible the pollution caused by intentional safety releases, equipment failures, and operator errors in oil and gas fields.

CEP staff then use that OGI evidence to file regulatory complaints with relevant state agencies and to document gaps in how they track and address oil and gas air pollution. It is a critical time to do so, with some states already committed to reducing oil and gas pollution and others moving in that direction. This report details findings of CEP's work in Ohio from 2018-2020.

Nearly all state regulatory agencies have a complaint system. If properly designed and implemented, residents can notify regulators about problems at oil and gas sites – being critical “eyes and ears” while gaining needed assistance from public agencies.

For oil and gas regulatory regimes to be effective – in both combating pollution and protecting the public – complaint systems must be accessible, usable, responsive, and transparent.

Robust complaint systems can help to:

- Reduce pollution that harms health and the climate.
- Build trust in agencies mandated to both work with industry and serve the public.
- Respond to community concerns and experiences.
- Make government agencies more effective.
- Foster agency and operator accountability.



Seeing is Believing.

Earthworks uses Optical Gas Imaging to make invisible pollution visible.



By partnering with local residents, Earthworks was able to document the dramatic 2018 blowout at XTO Schnegg well site, Powhatan Point, Belmont County, Ohio. Following an explosion and fire, the site released pollution for nearly three weeks before the operator could get it under control. A year later, researchers determined that this single event generated an estimated quarter of the reported annual methane emissions from the oil and gas sector for the entire state of Ohio.



2

The Complaint Process: Difficult and Opaque for the Public

Ohio's Inaccessible Complaint System: Slow and Disjointed

The Division of Oil and Gas at the Ohio Department of Natural Resources (ODNR) oversees operations at well sites prior to and during production (e.g., site preparation, spacing, and waste storage), as well as operations on public lands. The public can submit complaints on related problems by phone with regional ODNR offices.

The Ohio Environmental Protection Agency (OEPA) oversees air pollution in the state, including from oil and gas operations. The agency accepts complaints by phone, email, and an online form.

In addition, OEPA allows the public to submit complaints as “verified,” a process that can prompt agency investigations. This requires complainants to develop and produce specific documentation and write and submit an affidavit.⁵ Codified in law, the verified complaint process can be used for a wide range of issues and potential environmental violations.⁶

Upon receipt of a verified complaint, OEPA is required to conduct a prompt investigation “such as is reasonably necessary to determine whether a violation, as alleged, has occurred, is occurring, or will occur.”⁷ However, this policy doesn’t define what “reasonably necessary” means, and gives wide latitude to the OEPA to dismiss complaints, for example, if the director determines that violations of the same kind have already been addressed or are unlikely to reoccur. This could leave complainants who continually experience the same problems at nearby sites (e.g., odors and pollution releases) with little recourse.

There are no public requirements for inspectors and other staff to respond to complainants, who can be left hanging for weeks, months, or even longer.



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Neither OEPA nor ODNR have publicly issued any requirements for inspectors and other staff to respond to complainants in particular ways or within specific timeframes. This can leave complainants hanging for weeks, months, or even longer and limits the public's ability to hold regulators accountable for oversight. Perhaps reflecting where the agency's priorities lie, OEPA, in contrast, provides oil and gas operators with extensive information about how inspections are conducted and how to prepare for the arrival of inspectors.⁸

Ohio's agencies do not make information on complaints, subsequent actions taken, or potential resolutions publicly available. OEPA provides an online, searchable eDocument database containing documents related to permits, environmental incidents, inspections, investigation reports, and violations.⁹ However, there is no way for the public to connect complaints with any resulting agency actions – except perhaps to download and review many documents in search of references or other clues.

This process is made even more complicated and difficult because the eDocument system organizes documents by type (permits, inspections, incident reports, etc.), not facilities or locations – in turn requiring individuals to perform many searches in an attempt to find information on the specific sites they're concerned about. In short, the system appears designed for those with prior knowledge of what occurred, such as operators and regulators – while the public is forced to put together a jigsaw puzzle of disparate information, but with important pieces perpetually missing.

A final option for residents is to file public record requests directly with regional OEPA and ODNR offices for specific documents, including any related to their complaints. This can be a time-consuming, complicated process that comes with a considerable lag between when residents experienced problems and when they obtain potentially relevant information.

Ohio's documentation system forces the public to put together a jigsaw puzzle of disparate information, but with important pieces perpetually missing.



Submissions Prompted Some Action, but Little Pollution was Reduced

In the course of about two and a half years, Earthworks made 15 trips to 17 Ohio counties to film oil and gas pollution. We made 123 visits to 76 wells, compressor stations, and processing plants, and documented significant pollution problems at many of them.

During this time, Earthworks staff filed 20 complaints with OEPA and eight with ODNR. In addition, community members used Earthworks' OGI and field documentation to file at least three complaints with the Ohio Department of Health based on the odors and health symptoms they experienced (see page 11).

Only nine (29%) of Earthworks' complaints resulted in actions intended to reduce pollution. Three complaints (10%) generated some oversight action by regulators in the form of an operator contact and inspection, but did not result in the issuance of any violations. Nearly half of the complaints (12, or 39%) didn't lead to any actions by regulators. The results of the remainder (7, or 23%) are unclear, as they were filed more recently and remain open at the time of writing.



Earthworks made 123 visits to 76 wells, compressor stations, and other oil and gas facilities in over two years in Ohio.

RESULTS OF COMPLAINTS — FILED BY EARTHWORKS IN OHIO AS OF JUNE 2020	
Closed — Action taken to reduce pollution	9
Closed — Other regulatory action taken	3
Closed — No action taken	12
Open Complaints	7
Total Complaints Filed by Earthworks	31

Earthworks uses the following three categories to track the regulator and operator responses to our complaints:

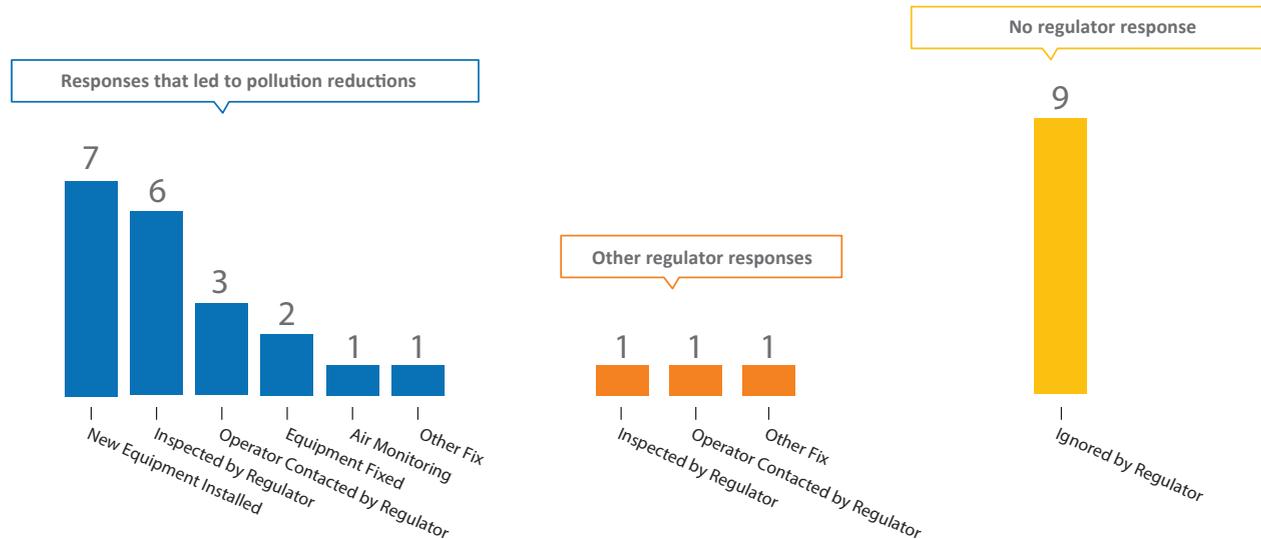
- 1 **Action taken is a regulator action specifically intended to reduce emissions** (i.e., the regulator requires an operator to replace or fix a piece of equipment).
- 2 **Other action is a regulator action** that, while not leading to pollution reductions, does potentially support more oversight (i.e., a regulator inspection or informing an operator of a problem).
- 3 **No action taken** means that agencies lost or ignored complaint submissions or otherwise declined to take action in response to a complaint.



Most of Earthworks' complaints generated at least one type of response, although regulators often had more than one response to a complaint (for example, contacting an operator and requiring an equipment fix intended to reduce emissions).

Every complaint generated at least one type of response, although regulators often had more than one response to a complaint (for example, contacting an operator and requiring an equipment fix that reduced emissions). The graph below shows the different responses of Ohio's regulators to Earthworks' complaints.

These graphs show the types of responses Ohio regulators had to Earthworks' complaints.



Repeated Communication Needed for Agency Response

We found that regulators in Ohio often didn't seem to know how to respond to or handle Earthworks' complaints and OGI video submissions. They would sometimes pass them along to specific regional divisions without following up with Earthworks' staff (the complainants), who themselves had to initiate contact with the agency in order to check the status of the investigation. Obtaining information on whether and how the complaint had been addressed sometimes required multiple filings on the same facility and repeated emails and phone calls over long periods of time.

Regulator responses improved a bit over the course of the project, as Earthworks identified the specific inspectors with purview over given facilities and regions, and built relationships and lines of communication with other regulatory agency staff. There was a clear "luck of the draw" element to the complaint filing process, with considerable variability across regulatory districts and individual inspectors.

This finding reflects Ohio's complete lack of consistent protocols or policies on the handling of and response to public complaints. Some inspectors told Earthworks that there are some internal protocols that they refer to regarding complaint timelines and internal procedures, but none of these appear to be publicly available or otherwise used to ensure accountability to complainants.

More broadly, Earthworks' collection of OGI evidence of pollution has highlighted conditions in Ohio's gas regions for media and policymakers, while affirming the concerns and experiences of frontline residents and encouraging them to file complaints and ask for regulators to respond (see box).

While Earthworks staff – trained professionals focused on this project – successfully communicated with Ohio regulators about specific complaints and were able to pursue some to a point of resolution, the process was time-consuming and results were often unclear and unsatisfactory from the perspective of impacted residents. This underscores the fact that Ohio's frontline residents simply cannot rely on the public complaints system for resolution to the harm they experience.

Ohio's frontline residents simply cannot rely on the public complaints system for resolution to the harm they experience.



Photo: Ted Auch, FraTracker Alliance.



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THE IMPORTANCE OF RESIDENT COMPLAINTS



In Ohio, Earthworks field staff encouraged community members to file complaints in response to problems they experience, whether episodic (such as a blowdown at a compressor station) or ongoing (such as noise and odors). Field staff have supported this process through public workshops and working one-on-one with residents to draft and file complaints.

Earthworks staff found that many Ohio residents were reluctant to file complaints or have their names associated with a complaint filed by Earthworks. Reasons ranged from a lack of confidence that their complaint would make a difference to worry about a backlash from neighbors and employers if they took any actions perceived as opposing the industry.

When residents did agree to file their own complaints along with Earthworks, Ohio regulators appeared to respond with more

substantive investigations than in the absence of resident input.

This was most apparent when Earthworks and residents jointly filed a series of complaints to both OEPA and the Ohio Department of Health (ODH).

In one example, a family whose home is encircled by three compressor stations submitted evidence of their health symptoms to ODH, including photographs of children's nosebleeds and medical diagnoses of adult-onset asthma.

Earthworks simultaneously submitted OGI evidence to ODH and OEPA showing air pollution that could be associated with those health problems.

During the several months of investigation, Earthworks staff served as a liaison between the family and the two agencies, helping facilitate communication and pushing for action. Ultimately, OEPA conducted air monitoring near the complainants' home and the facilities, followed by requirements that operators install noise-reduction equipment.

Living conditions for the family have fortunately improved.

Ohio's regulators will need to take much more action to ensure that the measures put in place hold over time – and are made available to the

countless other frontline families suffering from the impacts of oil and gas activities.

When residents filed their own complaints along with Earthworks, regulators responded with more substantive investigations.



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Limited Oversight Capacity as Industry Surges

In less than a decade, the shale boom transformed Ohio into one of the nation’s leading producers of natural gas.¹⁰ Along with this has come considerable public scrutiny and extensive scientific, peer-reviewed evidence of the adverse impacts to communities and the environment.¹¹

Relative to neighboring Appalachian states, Ohio has pursued limited development of the Marcellus Shale. Instead, the state has focused on the even deeper Utica-Point Pleasant shale formation, a pursuit that pushed gas production 28 times higher in 2018 than it was in 2012.¹² While Ohio’s decades-old conventional oil and gas industry continues to operate, currently about 90% of the state’s production comes from horizontal shale wells.¹³

A lack of data makes it nearly impossible for Ohioans to gain a clear picture of the capacity of their public agencies to oversee the oil and gas industry.

The table below shows the small number of oil and gas inspectors charged with enforcing Ohio’s large and growing number of active emission sources. OEPA and ODNR have different inspection protocols, regional districts, and areas of responsibility (air-related and well site issues, respectively). However, because of the incomplete and variable nature of the data we were able to obtain from OEPA and ODNR, we combined the two agencies in the table.

The lack of publicly available, consistent data on regulatory systems and staff in Ohio means that these numbers, although the best publicly available, are not definitive and reflect Earthworks’ best assessment (as detailed in the endnotes). Given the difficulty that Earthworks’ researchers had in piecing these numbers together, it would be unreasonable to expect Ohioans with time constraints to gain a clear picture of the capacity of their public agencies (OEPA and ODNR) to oversee the state’s oil and gas industry.

OHIO OIL AND GAS INDUSTRY INSPECTION CAPACITY — OEPA and ODNR			
# Active wells and other emission sources	# Inspectors	Approximate ratio of emission sources to inspectors	# Inspections conducted annually
56,000 ¹⁴	43 ¹⁵	1,300	Not available

Most importantly, the figure of 56,000 for active wells and other emissions sources is likely an undercount. As discussed further below, many facilities do not appear to be reporting to OEPA’s Emissions Inventory System. Other comprehensive information sources, including state and federal databases, indicate that the number of active oil and gas wells and facilities in Ohio could be over 100,000.¹⁶



3

Ohio’s Pollution Reduction Measures: Minimal, Now Stalled

Ohio does not have an energy plan and has not set any statewide pollution reduction or climate goals that could be brought to bear to rein in fossil fuel industry pollution. In 2019, the state legislature signaled a move in the opposite direction when it passed House Bill 6, which provides public funds for nuclear and coal plants while reducing mandates for clean energy use by utilities.¹⁷

At the same time, Ohio continues to foster a dramatic expansion of the oil and gas industry, and thus its ever-increasing pollution. In 2015, the Governor of Ohio signed a Memorandum of Understanding with his counterparts in Pennsylvania and West Virginia to establish a “Tri-State Shale Coalition” and jointly promote the expansion and use of Marcellus and Utica Shale resources.¹⁸ The Governors renewed this agreement in 2018, with an eye to supporting—through tax incentives, permits, and other measures—the growth of gas development for use in the power sector and as a feedstock for the fertilizer and plastics industries.



Leak Detection and Repair: Basic with Opportunities for Improvement

Currently, some types of oil and gas operations in Ohio are subject to federal rules to reduce emissions of VOCs and methane using Leak Detection and Repair (LDAR) protocols and the installment of new control technologies.¹⁹ However, Ohio has not taken on the challenge of reducing oil and gas pollution through more comprehensive, state-specific policies for the oil and gas industry, though it has enacted some limited, piecemeal measures.

Starting in 2014, OEPA revised a series of its General Permits (GPs) to include requirements for oil and gas operators to conduct LDAR at new, unconventional operations on a quarterly basis using OGI or another hydrocarbon detection method.²⁰ In 2017, OEPA extended such requirements to additional GPs covering a range of equipment and processes at natural gas compressor stations (e.g., engines, tanks, and pipeline cleaning, or “pigging”).²¹

While necessary, the general permit LDAR requirements are limited because they apply only to new, unconventional (i.e., shale and high-volume fracturing) wells and new facilities. This leaves the tens of thousands of older, conventional wells (i.e., those in formations other than shale, such as limestone and sandstone) effectively uninspected for leaks.

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.²² The sheer number and geographic spread of these conventional wells exacerbates the problem. Earthworks’ field investigations underscore the need for LDAR at all existing operations; using OGI, we found rampant problems at conventional wells in Ohio, including notable emissions from well heads and tanks.

A recent study concluded that conventional wells can have far higher methane leakage rates than unconventional ones due to a higher prevalence of maintenance problems.



In addition, Ohio's GPs allow operators to decrease the frequency of LDAR, if they self-report a low percentage of leaks after just a year (four quarterly inspections), to just one inspection every six months and then, even further, to one inspection a year. This "step down" provision is counter-productive because leaks can occur any time and are more likely to occur if equipment is not fully inspected and maintained on a regular basis. In addition, even small leaks can release large volumes of emissions if left unaddressed, so basing the provision on the percentage of leaking components does not address the volume of emissions being released.

In late 2018, OEPA signaled its intention to develop new, more comprehensive rules to reduce oil and gas pollution at existing operations through LDAR and the adoption of pollution control technologies.²³ OEPA indicated that these rules would be based on the federal rules for both VOC and methane reductions.²⁴ In addition, OEPA indicated it might consider covering even more equipment and facilities than under those requirements and the state's general permits.

However, this promising effort (initiated by the former Governor) is currently at a standstill. Neither OEPA nor the current Governor have taken any steps to adopt comprehensive, state-level oil and gas pollution reduction measures.

Leaks can occur any time and are more likely to occur if equipment is not fully inspected and maintained on a regular basis. In addition, even small leaks can release large volumes of emissions if left unaddressed.

Tracking of Pollution: Limited, Incomplete, and Out of Date

It is entirely unclear whether Ohio's officials have the will or intention to reduce oil and gas pollution over time, and if so, when they will begin that process.

Existing pollution reporting and tracking inventories can provide some information for regulators, policymakers, researchers, and the public on trends to determine a way forward. Unfortunately – and alarmingly given the state's burgeoning oil and gas production and processing – such data is severely limited in Ohio, and the information that does exist is inadequate in significant ways.

■ EPA's Greenhouse Gas Reporting Program (GHGRP).

Ohio's oil and gas operations with the largest volumes of pollution submit annual data on their estimated greenhouse gas emissions directly to the GHGRP.²⁵ This database is frequently used by state and federal regulators, and policymakers, to judge the volume of emissions the oil and gas sector emits. However, the GHGRP only covers sources permitted to release more than 25,000 metric tons of carbon dioxide equivalent (CO₂e) – the common measurement of total greenhouse gases – per year. This effectively excludes thousands of wells, compressor stations, and other facilities that report lower volumes of emissions or are exempt from greenhouse gas reporting requirements entirely, but nonetheless collectively have a widespread, significant pollution impact.



■ **State Emissions Inventory System (EIS).**

Ohio has only one emissions inventory, which covers a wide range of pollution sources in several sectors, including oil and gas operations.²⁶ The EIS, run by OEPA, includes reports for all regulated “criteria pollutants” with federally enforceable air quality standards (ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur oxides, and lead).²⁷ The EIS does not cover the primary greenhouse gases (i.e., carbon dioxide, methane, and nitrous oxide) nor hazardous air pollutants (HAPs), which have acute health impacts.

In addition, the EIS includes only some oil and gas facilities in the category for “point sources,” or stationary facilities. The inventory currently includes data on less than 60 reporting facilities identifiable as related to oil and gas operations (compressor stations and processing plants) – clearly a significant undercount given the extensive oil and gas infrastructure that exists across Ohio.

The EIS does not include any pollution sources related to oil and gas production in its “area source” (individual, dispersed sources) reporting category, such as well site engines and combustors. In addition, OEPA’s last area source inventory is from 2005 – several years before the onset of the current shale gas boom.

A final shortcoming in the EIS is that some facilities report their emissions in pounds and others in tons – making it difficult for members of the public to track trends and patterns, and therefore to hold regulators and operators accountable for growing volumes of pollution.



Pollution viewed with the naked eye versus an OGI camera.

TOP: Triad Hunter LLC Ormet 9 well site, Hannibal, Monroe County Ohio.

BOTTOM: Mark West Energy Partners Humphreys Compressor Station, Barnesville, Belmont County, Ohio.



4

Looking Ahead and Recommendations

When it comes to reining in oil and gas pollution and addressing the industry's climate and health impacts, Ohio's Governor and regulatory agencies are far behind the curve of even the limited progress of many other states. At some point, Ohio will be forced to reckon with this backward and dangerous stance.

In 2017, eight northeastern "downwind" states sued the US Environmental Protection Agency (US EPA) for not requiring "upwind" states, including Ohio, to implement statewide industrial pollution reduction measures.²⁸ The lawsuit sought to have more states added to the Ozone Transport Region, a 13-state area across which the US EPA requires measures to control pollutants that create ozone.²⁹

In addition to being significant sources of VOC pollution, oil and gas operations contribute to the formation of ground-level ozone by releasing significant levels of methane and ethane.³⁰

In light of a recent court ruling favorable to the "downwind" states and other legal pressure, Ohio's regulators and policymakers are likely to be forced to take steps to comprehensively and directly control and track the state's emissions.³¹ In the meantime, Ohio should:

- 1 Adopt a public service lens when assessing complaint systems.** A complaint system is supposed to serve the impacted public. Currently Ohio's only does so if complainants invest considerable time and effort, or indirectly to the extent that professional groups like Earthworks can make use of it in service of communities. A properly functioning system would allow residents to use the complaint system themselves easily and without assistance.
- 2 Shift the burden of proof for problems underpinning complaints.** Earthworks' experience filing complaints and assessing agency response in Ohio has shown the need for a fundamental shift regarding to whom regulators are accountable, and where the "burden of proof" regarding impact lies. Contrary to the agencies' current attitude, if the problems residents are experiencing haven't been resolved, inspectors should continue to investigate until operators can demonstrate they're not causing harm.
- 3 Work directly with impacted community members.** Inspectors often "resolve" complaints by contacting operators to inquire whether there was an operational problem or not. Inspectors should follow up with residents directly and promptly and consider their concerns as possible grounds for enforcement action. The people living daily with oil and gas impacts should be confident that regulators won't dismiss their experiences in favor of communication with industry.



- 4 Create a publicly accessible tracking system for complaints.** Any resident should be able to go online and easily obtain information about the oil and gas facilities that concern them, including the status of complaints they, or others, have filed about specific operations and concerns (e.g., persistent odors, noise, and onset of health symptoms). The timeframe for a response and/or resolution should be made publicly available, alongside the information for reporting complaints.

Every time a member of the public files a complaint, they should receive a tracking number, guidance on use of the complaint tracking system, and information on OEPA and ODNR's procedures for following up on the identified problems and responding to complainants. Impacted residents should not be forced to make multiple calls, send numerous emails, and "connect the dots" among several sources of information.

- 5 Create a publicly accessible map of all complaints.** Community members should be able to easily see where complaints have been filed, via a map that reflects data in the complaint tracking system. They should be able to identify the operators and facilities nearby that could be connected to the problems they're experiencing. This map could also include additional data layers, such as well sites, violations and inspections.

- 6 Start a process to adopt statewide oil and gas pollution control rules.** OEPA should pick up where it left off in 2018 and begin a rulemaking process for LDAR and other pollution control requirements for the state's oil and gas industry. As Earthworks emphasized in comments to the OEPA, future rules should both incorporate - and expand on - federal methane and VOC control requirements.³² This would include, at minimum, coverage of all wells and facilities, including the conventional industry; no loosening of requirements through "step down" provisions; more frequent and timely LDAR protocols; and public notification of significant pollution events.

- 7 Expand and update the Emissions Inventory System.** In light of the established, significant and increasing impacts of the oil and gas industry on climate and health, there is no excuse for Ohio's complete inaction to comprehensively track and assess that pollution over time. OEPA should expand the EIS to include greenhouse gases and HAPs and to ensure that all operating oil and gas facilities statewide are reporting (i.e., both point and area sources).



8 Expand field measurement projects to determine actual volumes of oil and gas pollution. Operators should continue to be required to report data to the Emissions Inventory System, but additional data are needed to obtain a full, accurate picture. Several studies demonstrate that measured emissions can be significantly higher than what operators report to inventories.³³ Direct measurement should occur, at a minimum, near significant pollution sources, such as compressor stations, processing plants, and large well pads. OEPA should then use the results to verify the accuracy of the data that operators self-report to the EIS.

9 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 the significant – if not yet fully quantified – role of Ohio’s oil and gas industry in creating pollution that harms human health and the climate, all of its greenhouse gases, VOCs, and HAPs should be included in this inventory. These data would aid in determining whether state policies and regulations to control 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 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.³⁴

10 Expand and improve both methane and VOC monitoring in oil and gas producing areas. Accurate data is the only way to know the levels of health-harming pollution Ohioans 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 Ohio’s ability to maintain compliance with federal air quality standards. More monitors are needed in areas with growing numbers of oil and gas wells and facilities, and particularly in close proximity to more developed and populated areas. The public should be able to access regularly updated information on these pollutants from the monitors for facilities near them.



Endnotes

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- 2 Gayathri Vaidyanathan, "How bad of a greenhouse gas is methane?" *Scientific American*, 2015. <https://www.scientificamerican.com/article/how-bad-of-a-greenhouse-gas-is-methane/>
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- 12 US Energy Information Administration, Ohio state profile. <https://www.eia.gov/state/?sid=OH>
- 13 Matthew Hammond, Ohio Oil and Gas Association, testimony before the US House Energy and Natural Resources Subcommittee, March 2019.
- 14 This approximate number is based on two sources.
 - 1) Clearly identifiable oil and gas facilities defined as "point sources" in OEPA's Emissions Inventory System, i.e., compressor stations and processing plants. We identified 59 such sources, which represents only currently reporting facilities and is likely an undercount.
 - 2) ODNR data for 2017, reported in Ballotpedia, "Fracking in Ohio," https://ballotpedia.org/Fracking_in_Ohio. In contrast to previous years, the ODNR website does not currently provide up-to-date production and well inventory data for non-shale wells. ODNR provides more recent (2019) production data only for horizontal (Utica and Marcellus Shale) wells, which show 2,500 such wells reporting. Both the ODNR well inventory database and the interactive ODNR well map appear incomplete, with only 10,000 entries downloadable from the former and 1,000 from the latter.
- 15 This approximate number is based on two sources:
 - 1) Estimate provided to Earthworks by OEPA's Public Interest Center of the number of staff assigned to both oil and gas permitting and compliance in the Northeast and Southeast District offices only (i.e., the regions where most unconventional wells and facilities requiring air permits are located).
 - 2) Number of individual inspectors included in the ODNR, Management Inspector Phone List (as of 4/20/20), <https://ohiodnr.gov/wps/portal/gov/odnr-core/divisions/division-e-oilgas/contact/oil-gas-contact>
- 16 Earthworks, Clean Air Council, and FracTracker Alliance, *The Oil and Gas Threat Map*. Ohio state profile and data explanation sections. <https://oilandgasthreatmap.com/>
- 17 Jeremy Peizer, "Nuclear bailout bill passes OH legislature, signed by Gov. Mike DeWine." *Cleveland.com*, July 23, 2019. <https://www.cleveland.com/open/2019/07/nuclear-bailout-bill-passes-ohio-legislature.html>
- 18 Nick Snow, "Governors extend Tri-State shale coalition through 2021." *Oil and Gas Journal*, March 23, 2018.
- 19 EPA's Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution 40 C.F.R. Part 60, Subpart OOOO and Subpart OOOOa.
- 20 General Permits for oil and gas well site operations with small (GP 12.1) and large (GP 12.2) flares.
- 21 General Permits for equipment and sources at natural gas compressor stations and similar facilities (GP 14 series).



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