

Oil and Natural Gas Production (ONGP) Health Concerns in Pennsylvania

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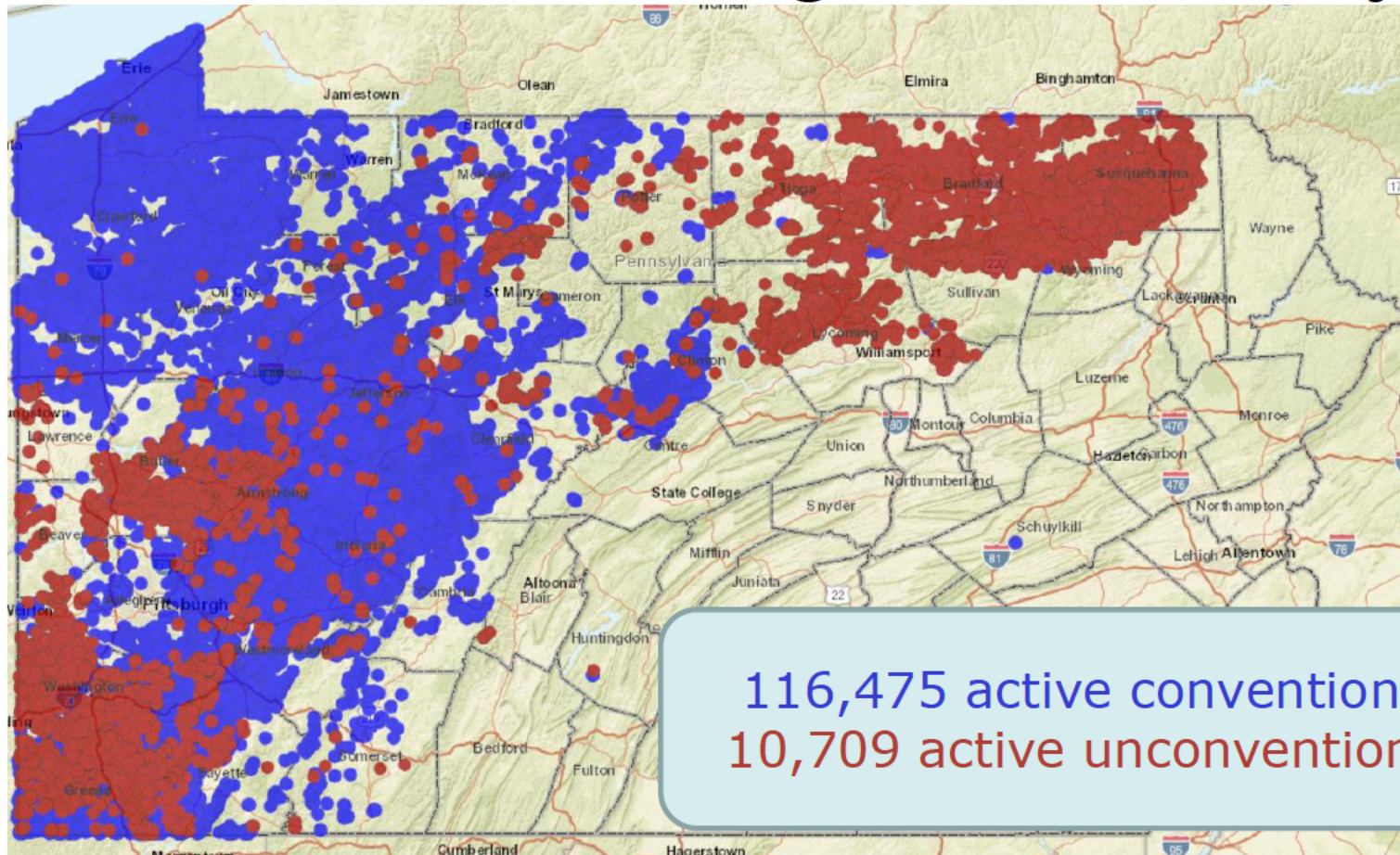


1

ONGP and Public Health in Pennsylvania

- Where it's located
- Types of infrastructure needed
- Potential health effects

Active oil and natural gas wells in Pennsylvania



116,475 active conventional wells
10,709 active unconventional wells

Types of infrastructure needed:

- Well pads
 - 1500 heavy truck trips per unconventional pad (Graham et al., 2015)
 - Hundreds of thousands of abandoned wells in PA (Kang et al., 2016)
- Compressor stations
- Pipelines
- Wastewater disposal

Environmental health concerns include:

- Water contamination
- Air pollution (diesel exhaust, VOCs, silica)
- Noise and truck traffic
- Light
- Radiation
- General stress

Potential air pollution-related health effects of ONGP (drawn from McKenzie et al., 2012):

- Asthma exacerbation and difficulty breathing
- Eye, nose, and throat irritation
- Headaches
- Cancer
- Birth defects (neural tube defects)

Epidemiologic evidence has found associations between unconventional ONGP in Pennsylvania and the following:

- **Adverse birth outcomes**

(Casey et al., 2016; Currie, Greenstone & Meckel, 2017; Hill, 2018; Stacy et al. 2015)

- **Increased respiratory problems**

(Peng, Meyerhoefer, & Chou, 2018; Rasmussen et al., 2016; Tustin et al., 2017)

Limitations of existing epidemiologic studies:

- Proxy measure of exposure
- Retrospective cohort study design
- Non-probability sampling (e.g., reliance on medical records data)



2

DOH ONGP-related Health Registry

- Purpose of the registry
- How it works
- Limitations

Purpose of the registry:

- To gather consistent information from Pennsylvania residents with ONGP-related health concerns/symptoms
- To respond to residents with ONGP-related health concerns by evaluating environmental or clinical data, when available
- To inform research on ONGP and health outcomes

How the registry works:

- Electronic questionnaire administered over phone (launched March 2017)
 - Survey lasts 15 minutes to 1 hour
 - Includes questions on demographics, health symptoms/conditions believed to be related to ONGP, and environmental issues

How the registry works:

- Environmental evaluation, if applicable
 - Mainly rely on DEP for water sampling (sampling may also be done by ONGP company or self-contracted firm)
 - DEP does not typically conduct air sampling on an ad-hoc basis for ONGP-related health concerns
- Letter or email sent to complainant summarizing health risk associated with water quality

Limitations of the registry:

- Self-reported complaints (sample bias, causation undetermined)
- DOH has only advisory role
- DOH does not conduct environmental sampling
- DEP forwards complaints to DOH; outreach efforts to increase public awareness of our health registry have been mostly unsuccessful



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ONGP-related Health Registry Findings

- Who has complained
- Primary health symptoms reported
- Future plans

ONGP-related Health Registry Findings

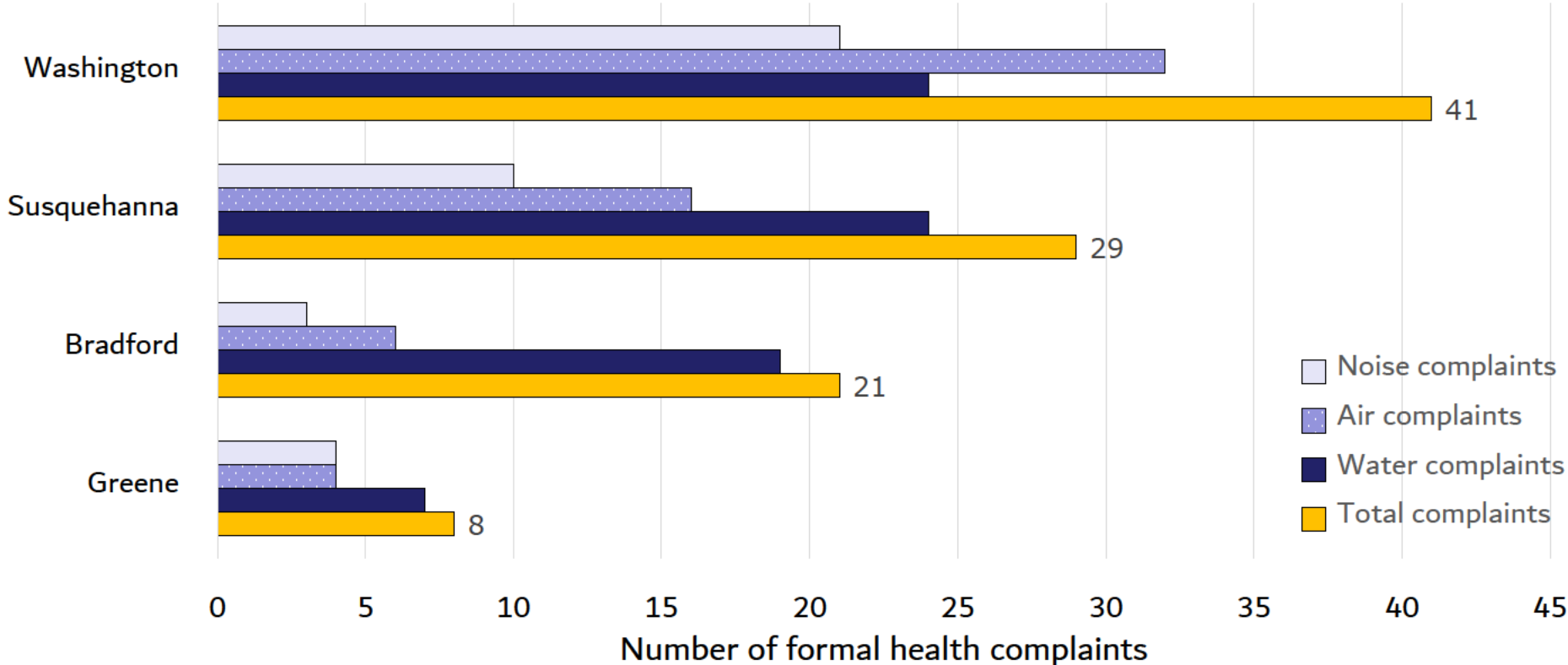
As of June 2019, DOH has received:

- 121 formal health complaints representing 258 total individuals
- 160 total complaints (from 2011 to 2017, DOH logged other inquiries in addition to formal health complaints)
 - In comparison, DEP received more than 9,000 public complaints about environmental issues in areas of unconventional gas development from 2004 through November 2016 (Phillips & Hurdle, 2017)

ONGP-related Health Registry Findings

Number of Complaints by County, Total and by Environmental Source of Concern

(Top 4 Counties with Most Overall Complaints)



Source: DOH ONGP Health Complaints Registry (through Quarter 2 2019)

Quarter 2 2019 ONGP-related Health Registry Report

ONGP Quarterly Report | Quarter 2 2019 (April to June)

Oil and Natural Gas Production (ONGP) Health Concerns

ONGP in Pennsylvania

ONGP is a significant industry in Pennsylvania. The latest wave of ONGP activity in the state began in 2005 with the start of unconventional oil and natural gas development (UONGD). Unconventional wells are distinct from conventional wells by the geologic formation being tapped. They use horizontal and vertical drilling and hydraulic fracturing ("fracking") to access traditionally unavailable reservoirs of oil and natural gas.

As of June 30, 2019, the Pennsylvania Department of Environmental Protection (DEP) reported there were 10,821 active unconventional wells in the state. Thirty-four of Pennsylvania's 67 counties had active unconventional wells, with Washington (1,720), Susquehanna (1,560) and Greene (1,355) counties having the greatest numbers of active unconventional wells.*

ONGP Health Registry

In response to growing concerns about UONGD, the Pennsylvania Department of Health (DOH) developed a confidential health registry to better track and respond to public health complaints related to ONGP.

As of June 30, 2019, DOH received 160 ONGP-related health complaints, with Washington (41), Susquehanna (29) and Bradford (21) counties having the most health complaints.

Figure 1. Total Health Complaints Logged by DOH Division of Environmental Health Epidemiology Since 2011 (N=160)

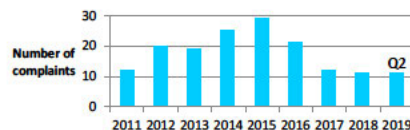


Table 1. Reason for Contact (N=160)

Reason	Q2 2019	2019 YTD	Total since 2011	% of Total since 2011
General inquiry	0	0	24	15.0%
News update/alert	0	0	3	1.9%
Information sharing	0	0	12	7.5%
Formal health complaint*	4	11	121	75.6%

*General inquiries, news updates/alerts and information sharing cases were no longer logged in the health complaints registry effective March 2017.

Table 2. Environmental Source of Concern* (N=160)

Source	Q2 2019	2019 YTD	Total since 2011	% of Total since 2011
Water	4	10	111	69.4%
Air	2	4	95	59.4%
Soil	2	5	29	18.1%
Noise	0	2	53	33.1%
Truck traffic	1	2	49	30.6%
Other*	0	1	45	28.1%
Missing	0	0	9	5.6%

*More than one environmental source of concern may be selected per complaint.

*Other category includes light drilling mud or solid waste, vibrations or seismic testing, etc.

Referrals

Seventy-five % of Q2 2019 health complaints were referred by DEP.

Twenty-five % of Q2 2019 health complaints were referred by ATSDR, EPA, or a similar federal agency.

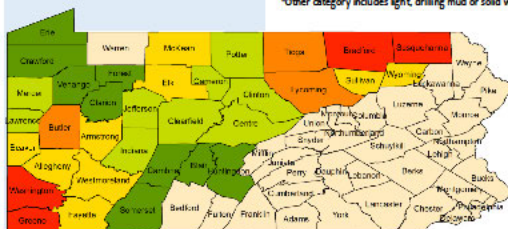
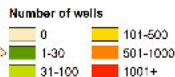


Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania, as of June 30, 2019*

*Based on the number of active wells from DEP Spud Data Report, Wells Drilled by County



Future Plans

1. Strengthen outreach efforts.
2. Propose research ideas for state funding to universities
3. Collaborate with stakeholders

Contact Us!

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Environmental Health

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ENVIRONMENTAL HEALTH ASSESSMENT PROGRAM

[The Health Assessment Program \(HAP\)](#) works to protect the health of communities from harmful environmental exposures by providing health-based educational services and preparing technical health consultation documents.

OIL AND NATURAL GAS PRODUCTION HEALTH CONCERNS

[The Oil and Natural Gas Production \(ONGP\) Health Concerns](#) unit administers the [ONGP-related health complaints registry](#) for Pennsylvania residents.

ADULT BLOOD LEAD EPIDEMIOLOGY AND SURVEILLANCE

[The Pennsylvania Adult Blood Lead Epidemiology and Surveillance \(ABLES\)](#) program reports the number of adults ages 16+ in Pennsylvania with elevated blood lead levels and the source of their exposure.



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DO YOU HAVE A HEALTH CONCERN ABOUT THE ENVIRONMENT?

Could contaminated air, soil or water be affecting your health?



Have questions about environmental health? The department has epidemiologists available to answer questions about a range of environmental health issues.



Have a health concern related to oil and gas production? The department has a registry to track health complaints. Call 717-787-3350 to add your information.



Need community resources? The department has relationships with state and local stakeholders that can help you address your environmental health concerns.

CONTACT US:

717-787-3350 or env.health.concern@pa.gov



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