

# Oil and Natural Gas Production (ONGP) Health Concerns

## ONGP in Pennsylvania

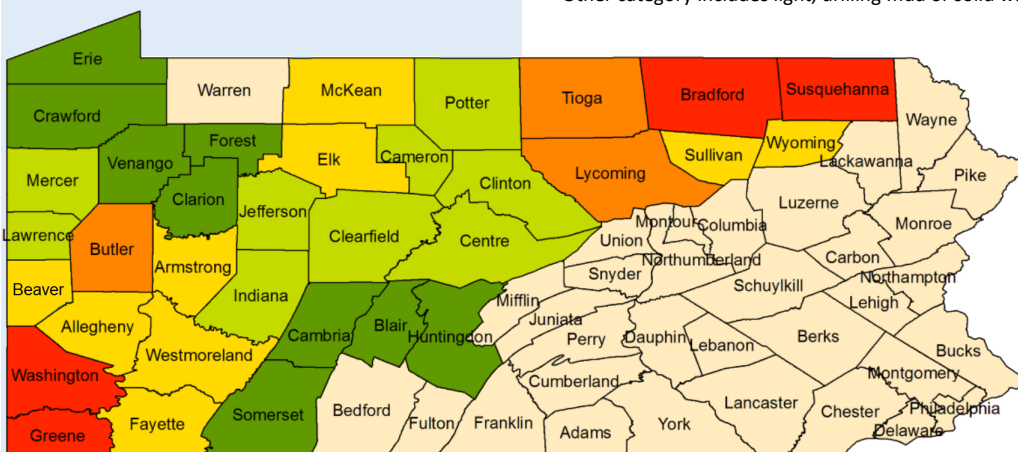
ONGP is a significant industry in Pennsylvania. The latest wave of ONGP activity in the state began in 2005 with the start of unconventional oil and natural gas development (UONGD). Unconventional wells are distinct from conventional wells by the geologic formation being tapped. They use horizontal and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

As of June 30, 2018, the Pennsylvania Department of Environmental Protection (DEP) reported there were 9,885 active unconventional wells in the state. Thirty-four of Pennsylvania's 67 counties had active unconventional wells, with Washington (1,628), Susquehanna (1,418) and Greene (1,244) 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.

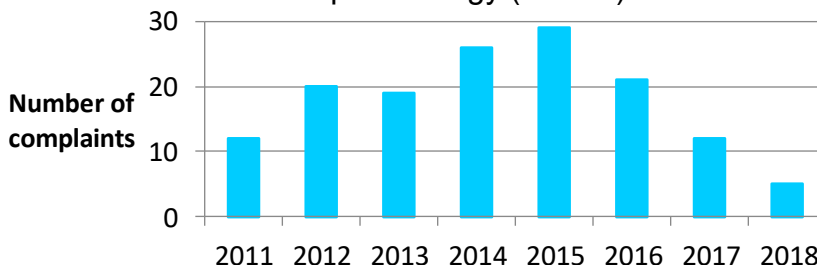
As of June 30, 2018, DOH received 144 ONGP-related health complaints, with Washington (38), Susquehanna (26) and Bradford (21) counties having the most health complaints.



**Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania, as of June 30, 2018\***

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

**Figure 1. Total Health Complaints Logged by DOH Division of Environmental Health Epidemiology (N=144)**



**Table 1. Reason for Contact (N=144)**

Reason	Jun 2018	2018 YTD	Total since 2011	% of Total since 2011
General inquiry	0	0	24	16.7%
News update/alert	0	0	3	2.1%
Information sharing	0	0	12	8.3%
Formal health complaint <sup>a</sup>	3	5	105	72.9%

<sup>a</sup>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<sup>a</sup> (N=144)**

Source	Jun 2018	2018 YTD	Total since 2011	% of Total since 2011
Water	2	4	99	68.8%
Air	1	2	87	60.4%
Soil	0	1	22	15.3%
Noise	0	1	47	32.6%
Truck traffic	0	1	45	31.3%
Other <sup>b</sup>	0	1	42	29.2%
Missing	0	0	9	6.3%

<sup>a</sup>More than one environmental source of concern may be selected per complaint.

<sup>b</sup>Other category includes light, drilling mud or solid waste, vibrations or seismic testing, etc.

## Referrals

Thirty-three percent of June 2018 health complaints were referred by ATSDR, EPA or another federal agency.

Sixty-seven percent of June 2018 health complaints were referred by a private water supplier.

## Number of wells

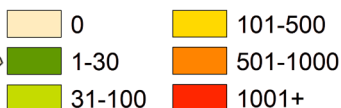


Table 3. Demographic Information of Individuals in ONGP Registry with a Formal Health Complaint (N=105 formal health complaints, 227 individuals\*)

Characteristic	Jun 2018	2018 YTD	Total since 2011	% of Total since 2011	<b>Demographic Summary</b> This table summarizes the demographic and health insurance information of individuals included in the formal health complaints received for the month of June 2018, YTD 2018 and total since 2011. This does not necessarily reflect the demographic characteristics of the entire community.
Female	3	5	120	52.9%	
Male	1	2	103	45.4%	
Missing	0	0	4	1.8%	
Non-Hispanic white	4	7	73	32.2%	
Non-Hispanic black	0	0	0	0.0%	
Hispanic	0	0	0	0.0%	
Other	0	0	1	0.0%	
Missing	0	0	153	67.4%	
0-17 years old	0	0	38	16.7%	
18-64 years old	3	4	107	47.1%	
65+ years old	1	3	32	14.1%	
Missing	0	0	50	22.0%	
Any private insurance	2	4	50	22.0%	
Public only insurance	2	2	20	8.8%	
Uninsured	0	1	6	2.6%	
Missing	0	0	151	66.5%	

\*Table excludes general inquiries, news updates and information sharing complaints. Each health complaint may pertain to more than one individual.

Race/ethnicity, age and health insurance were not systematically collected until March 2017. Percentages within each group may not sum to 100% due to rounding.

Table 4. Health Information of Individuals in ONGP Registry with a Formal Health Complaint (N=105 formal health complaints, 227 individuals\*)

Symptom group	Jun 2018	2018 YTD	Total since 2011	% of Total since 2011	<b>Symptom Summary</b> This table summarizes the symptoms reported by individuals for the month of June 2018, YTD 2018 and total since 2011.
Cardiovascular	1	1	39 (10) <sup>†</sup>	17.2%	
Dermatological	1	3	88	38.8%	
Ear	0	1	29	12.8%	
Eye	1	3	49	21.6%	
Gastrointestinal	0	0	81	35.7%	
General systemic <sup>a</sup>	2	3	78	34.4%	
Neurological	1 (1) <sup>†</sup>	2 (1) <sup>†</sup>	99 (4) <sup>†</sup>	43.6%	
Psychological	1	2	53 (7) <sup>†</sup>	23.3%	
Respiratory	3	5 (1) <sup>†</sup>	128 (19) <sup>†</sup>	56.4%	
Urogenital	1	2	24 (6) <sup>†</sup>	10.6%	
Missing	0	0	36	15.9%	

\*Table excludes general inquiries, news updates and information sharing complaints. Each health complaint may pertain to more than one individual.

<sup>a</sup>Includes sleep disturbance, fatigue, fever, chills, night sweats, shaking, weight loss/gain, decreased appetite, muscle aches/cramps, joint pain, fainting and swelling

<sup>†</sup>Numbers in parentheses correspond to newly diagnosed conditions relevant to that symptom group: heart disease and/or hypertension (cardiovascular group), neurological disease (neurological), psychological disease (psychological), asthma or COPD (respiratory), kidney disease or failure (urogenital). They do not represent pre-existing conditions. Therefore, someone could report that UONGD exacerbated their asthma (noted in the respiratory count) but was diagnosed before UONGD activity started in their area (not reflected in number of parentheses).

#### Health Overview 2018 Year-to-Date based on Formal Health Complaints (N=5 complaints, 7 individuals)

- ☐ 43% of individuals reported being in poor or fair health.
- ☐ 29% of individuals reported being disabled.
- ☐ 14% of individuals reported being diagnosed with cancer since 2011.
- ☐ 100% of individuals visited the doctor for their health concerns.
- ☐ Two (40%) 2018 YTD complaint cases had concerns about animal health (livestock or pets).



The following charts show data for counties that have more than 500 active unconventional oil and natural gas wells. As of June 30, 2018, seven counties had more than 500 active unconventional wells (exact number of wells in parentheses):

**Washington (1,628) Susquehanna (1,418) Greene (1,244)**  
**Bradford (1,210) Lycoming (853) Tioga (736) Butler (524)**

**Table 5. Environmental Source of Concern by County (All Complaints since 2011)**

Source	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Water	22	21	6	19	1	2	3
Air	31	14	3	6	3	1	2
Soil	8	1	2	4	0	0	0
Noise	19	8	3	3	0	1	1
Truck traffic	20	8	2	3	1	1	1
Other <sup>a</sup>	19	8	2	4	0	0	1
Missing	3	0	0	0	1	0	0

County-specific numbers of complaint cases are as follows: 38 (Washington), 26 (Susquehanna), 6 (Greene), 21 (Bradford), 5 (Lycoming), 2 (Tioga) and 3 (Butler). More than one environmental source of concern may be selected per complaint.

<sup>a</sup>Other category includes light, drilling mud or solid waste, vibrations or seismic testing, etc.

**Table 6. Health Symptoms by County (Individuals with a Formal Health Complaint since 2011)**

Symptom group	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Cardiovascular	6	8	3	12	0	1	0
Dermatological	23	24	6	10	6	0	0
Ear	7	5	0	3	2	0	0
Eye	15	10	2	5	3	1	0
Gastrointestinal	21	22	6	14	0	0	2
General systemic <sup>a</sup>	22	16	7	10	0	2	2
Neurological	27	19	6	15	1	2	3
Psychological	20	11	2	4	3	0	2
Respiratory	37	28	10	15	3	1	2
Urogenital	6	6	1	4	3	0	1
Missing	16	2	3	8	0	0	1

County-specific numbers of individuals are as follows: 63 (Washington), 52 (Susquehanna), 15 (Greene), 33 (Bradford), 7 (Lycoming), 2 (Tioga) and 5 (Butler).

<sup>a</sup>Includes sleep disturbance, fatigue, fever, chills, night sweats, shaking, weight loss/gain, decreased appetite, muscle aches/cramps, joint pain, fainting and swelling

By far, most oil and natural gas-related complaints received by DOH have been related to unconventional oil and natural gas development. We have received three complaints related to conventional oil and natural gas development since 2011.

Figures in this report may slightly differ from previous reports due to the potential for ongoing data collection. Please contact the Division of Environmental Health Epidemiology for more details at 717-787-3350 or [env.health.concern@pa.gov](mailto:env.health.concern@pa.gov).

