ENVIRONMENTAL HEALTH PROJECT

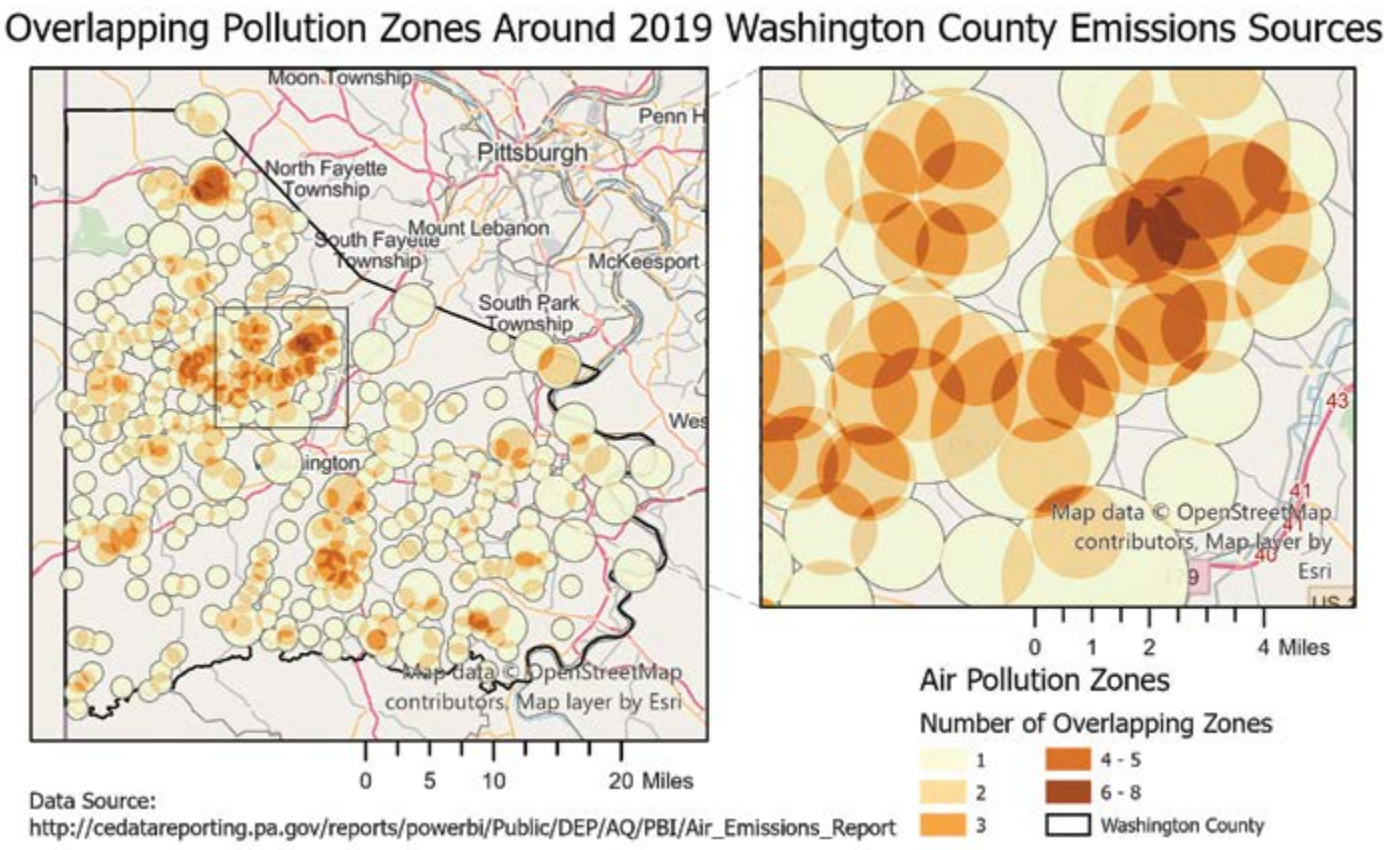
DEFENDING PUBLIC HEALTH SINCE 2012

POSITION STATEMENT on AGGREGATE EMISSIONS

EHP recommends that permitting of any shale gas facility, including expansion of an existing facility, should be based on aggregated emissions from all industry sources in local airsheds, and that such permitting should reflect plausible health exposures and impacts.

SUMMARY STATEMENT

Currently, shale gas facilities are permitted for air pollution emissions as stand-alone entities. Permits do not require consideration of existing or proposed additional emission sources in the local airshed. Emissions from a new facility, when combined with other existing emission sources, may result in dangerous exposure levels in the ambient air, which may cause adverse acute and chronic health impacts.



The Pollution Zones depicted by the circles extend 1 km from gas wells producing emissions in 2019 and 2 km from compressor stations and all other facilities required to report emissions to the PA DEP in 2019. These circles illustrate the overlap of emissions from these sources. Note that emissions from these sources do not actually stay within the circles; the air just outside the circles is not pollution-free.

The Pennsylvania Grand Jury investigating shale gas development recommended the following guideline for aggregating industry emissions[1]:

> **"If air-polluting fracking facilities are stationed in close proximity, treat them as one source, and regulate accordingly. After all, if people live anywhere nearby, their lungs aren't going to care whether the chemicals in the air came from one large source or from many smaller sources all next to each other. It is reasonable to expect our regulatory agencies to take that into account."**

RECOMMENDATIONS

EHP makes the following recommendations regarding aggregate emissions to better protect public health:

1. **PA DEP must aggregate oil and gas facility emissions at a local airshed level.** It is within the power of state governments to reasonably strengthen federal emissions limits. According the U.S. EPA: "Individual states or tribes may have stronger air pollution laws, but they may not have weaker pollution limits than those set by EPA."[2]
2. **PA DEP must measure and account for existing airborne health risks** to communities when conducting inhalation risk assessments.
3. **PA DEP should install air monitoring devices for criteria pollutants and VOCs** in local airsheds in which the shale gas industry operates or plans to operate to track the emission burden in the airshed.
   a. Monitoring data should be available on-line to the public and averaged in 15 minute intervals to capture spikes in emissions.
4. **PA DEP and PA DOH should be required to respond to data from private air monitors** that have been evaluated by the U.S. EPA.
5. **PA DEP should utilize local air monitoring information from the installed monitors:**
   a. When permitting new facilities in an airshed
   b. When permitting an expansion of an existing facility
   c. When multiple facilities are applying for permits in the same local airshed at the same time
   d. When activities include significant increases in truck traffic.
6. **PA DEP should consult public health professionals, including PA DOH, in placement of air monitors.**
7. **A health impact assessment should be required** if the addition of shale gas infrastructure might result in emission levels exceeding health standards.
8. **PA DEP and PA DOH should determine all toxic chemicals that are emitted** and set health protective standards for those toxics based on information from NIOSH, WHO, or standards set by other states.
9. Before issuing permits, **PA DEP should ensure that the additional burden on the airshed should not exceed health-protective limits.**

BACKGROUND

Currently in Pennsylvania, the regulatory criteria for aggregating facilities[3] (non-Title V) is defined as all the pollutant-emitting activities which are:

1. Located on one or more contiguous or adjacent properties (properties located a quarter mile or less apart will be treated as one)
2. Owned and operated by the same person under common control (same company or a subsidiary).

From a health-protective standpoint, **current regulatory criteria revolve around industry parameters and not around health**, leaving populations at risk. People breathe all emissions that mix in an airshed regardless of industrial grouping or ownership, or whether or not properties are abutting.

IMPACTS

Pennsylvania's failure to aggregate shale gas emission sources leads to harmful levels of pollution in local airsheds. This can result in pollution levels that may cause acute health impacts. When such levels occur often and for hours at a time, chronic health impacts can result.

Peer-reviewed research increasingly shows that **human health impacts are associated with shale gas facility emissions** and that these impacts increase the closer one is to shale gas facilities. Living near shale gas development is linked to:[4]

- Worsening asthma symptoms
- Greater risk of adverse birth outcomes, including congenital heart defects, neural tube defects, small for gestational age, low birth weight, preterm delivery, and high-risk pregnancy
- Symptoms including headaches, fatigue, upper and lower respiratory complaints, and skin rashes[5,6]
- Hospitalizations for heart disease complications[7,8]
- Stress, anxiety, depression, and other mental health issues.[9]

Addressing and regulating aggregate emissions in an airshed, as well as considering aggregated emission levels during permitting, should significantly reduce related health impacts.

Photo courtesy of Ted Auch, FracTracker Alliance, 2017

RATIONALE

When multiple smaller sources of air pollution become regulated as one large source of air pollution through aggregation, they can be subject to stricter air emissions standards.

Shale gas development requires multiple facilities and infrastructure of varying size in order to access, transport, refine, separate, and convert the shale gas products—all of which emit air pollutants. Emissions are released into the ambient air and invisible to the naked eye. In addition, the terrain in the Marcellus/Utica region, with its many hills and valleys, can result in pollution further concentrating close to where people work, live, and play, **increasing the risk of health impacts.**

Blinn, et al. (2020) found that aggregating shale gas emissions with a 5 km (3.1 mi) radius of impacted residents tracked with the number of symptoms being reported, indicating an association with the aggregated emissions in an airshed.[10]

Since **the public's health depends on what is in the air where people are breathing it**, setting and enforcing emission limits based on aggregate emissions in a local airshed is essential. Emissions regulations must be supported by air monitoring for criteria pollutants and VOCs to protect nearby communities. Not addressing aggregate emissions results in an open-air experiment on public health, the long-term consequences of which have yet to be seen.

DEFINITIONS

Aggregate emissions: the sum of emissions from all sources in an airshed, which determines the exposure load and risk of health impacts on the resident population.

Airshed: a geographic boundary for air quality standards where lay of the land (hills and valleys) and weather limit the dispersion of pollutants away from the area.[11] Given the topography in Pennsylvania, emissions that are released into the ambient air may stay very local.

Criteria pollutants (Clean Air Act, EPA, 2012): six common pollutants that are regulated based on human health and environmental risks. Shale gas emissions include five of the six: carbon monoxide (CO), sulfur dioxide (SO2), nitrogen oxides (NOx), ozone (smog), particulate matter (PM).

Endocrine disrupting chemicals (EDCs): a chemical or chemical mixture that can interfere with hormone action in the body even at low levels of exposure.

Volatile organic compounds (VOCs): compounds that convert to a gaseous state at room temperature. VOCs vary in toxicity from no impact to immediate responses and high toxicity. Many are possible EDCs.

NOTE: Information in this document refers to Pennsylvania's rules and regulations on emissions

[1] 43rd Pennsylvania Statewide Investigating Grand Jury (2020). Report 1 of the Forty-Third Statewide Investigating Grand Jury, 97. https://www.attorneygeneral.gov/wp-content/uploads/2020/06/FINAL-fracking-report-w.responses-with-page-number-V2.pdf

[2] U.S. Environmental Protection Agency. Regulatory Information by Topic: Air (website accessed 3/24/21). https://www.epa.gov/regulatory-information-topic/regulatory-information-topic-air

[3] PA Department of Environmental Protection (2011), Air Aggregation for Oil and Gas Industries Fact Sheet, https://www.dep.pa.gov/PublicParticipation/CitizensAdvisoryCouncil/Meetings/Documents/FACT%20SHEET_Air%20Aggregation_101211.pdf

[4] Southwest Pennsylvania Environmental Health Project (2020). Health Outcomes Associated with Exposure to Shale Gas Development from Peer-Reviewed Epidemiological Literature. https://www.environmentalhealthproject.org/sites/default/files/assets/resources/health-outcomes-associated-with-exposure-to-shalegas-development.pdf

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[10] Blinn, H.N., Utz, R.M., Greiner, L H., Brown, D.R. (2020). Exposure assessment of adults living near unconventional oil and natural gas development and reported health symptoms in southwest Pennsylvania, USA. *PLOS ONE*, 15(8), e0237325. https://doi.org/10.1371/journal.pone.0237325

[11] Natural Resources Conservation Service, United States Department of Agriculture. Airshed Assessment: Topography, Meteorology and Climatology Impacts on Air Quality (website accessed 3/24/21). https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_043673.pdf

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